CHAPTER 8

TRANSPLANTATION

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TRANSPLANTS PERFORMED IN 2010

Figure 8.1

Number of Kidney Transplant Operations
Total (Living Donors)

Year	Australia						New Zealand				
	1st	2nd	3rd	4th	5th	Total	1st	2nd	3rd	4th	Total
1963	5	1	0	0	0	**6 (0)**	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 (34)**	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)**	68	13	2	0	**83 (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	447	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 (168)**	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 (273)**	80	8	2	0	**90 (49)**
2007	527	75	11	0	2	**615 (271)**	112	9	2	0	**123 (58)**
2008	708	84	16	5	0	**813 (354)**	111	10	1	0	**122 (69)**
2009	673	88	11	0	0	**773 (327)**	109	12	0	0	**121 (67)**
2010	744	83	18	1	0	**846 (296)**	104	5	1	0	**110 (60)**

AUSTRALIA

The 846 transplant operations performed in 2010 are a substantial increase over 2009 and continue the overall trend of improvement since the early 2005.

The 2010 numbers represents a transplant rate of 38 per million population per year, compared with 35 per million in 2009. There has been a progressive increase in the number of kidney transplants from non-heart beating donors (Figure 8.4); in 2010 such kidneys accounted for 21% of deceased donor kidney transplants.

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

Living donor transplants accounted for 35% (296 grafts) in 2010, down from 42% in 2009 (326 grafts) and 44% in 2008 (354 grafts).

Primary recipients (those receiving a first transplant) received 88% of all kidneys transplanted in 2010, similar to recent years.

NEW ZEALAND

The number of transplant operations (110) performed in 2010 represents a transplant rate of 25 per million population per year compared with 28 in 2009 (Figure 8.1).

The percentage of living donors remained steady at 55% of all operations in 2010 (Figure 8.3). There were no transplants from non-heart beating donors in 2010.

Of the grafts performed in 2010, 95% were to primary recipients, reflecting a reduced number of subsequent grafts in 2010.

Figure 8.2

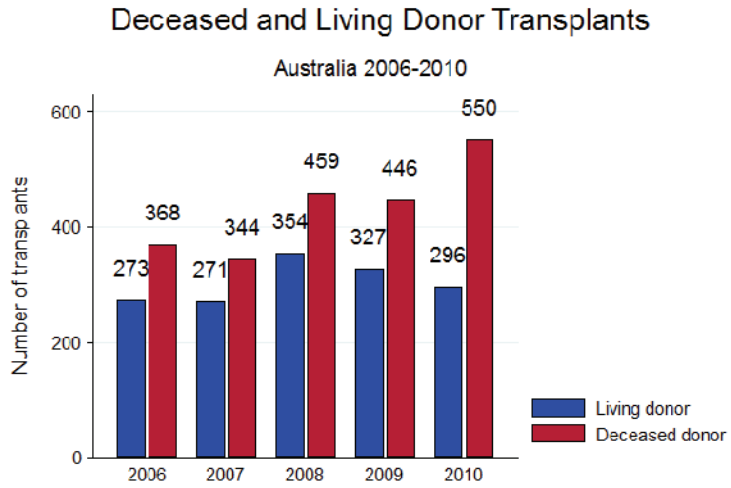


Figure 8.3

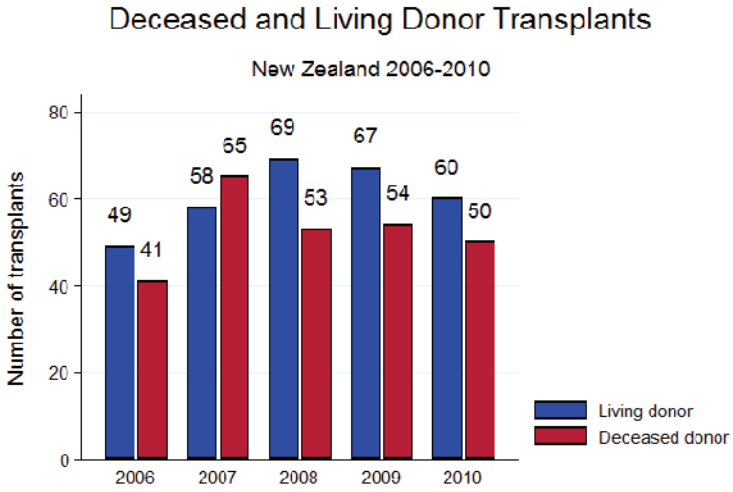
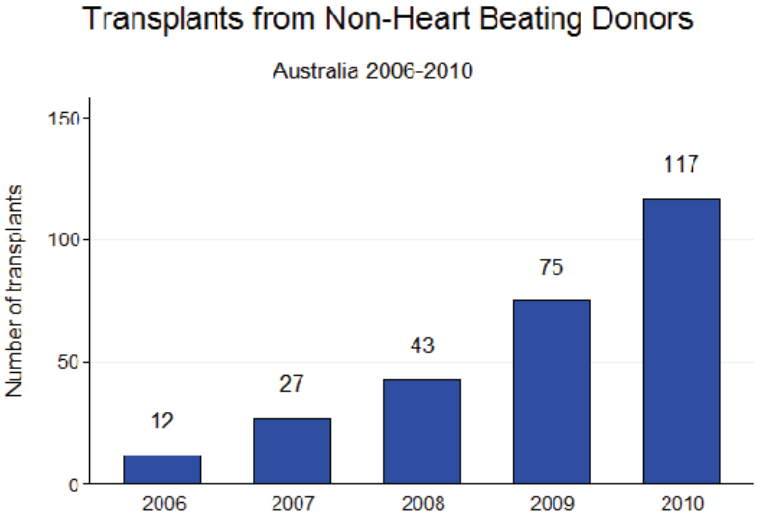


Figure 8.4



TRANSPLANT RATE OF PATIENTS DIALYSED

In Australia transplantation was performed in 7% of patients who received dialysis in 2010.

Of all patients in the 15-64 year age group who received dialysis treatment during 2010, 11% were transplanted in 2010, compared with 10% in 2009 (Figure 8.6).

The ratio of transplantation to numbers dialysing in Australia was the highest in the age groups 5-14 years (42%) and 0-4 years of age (26%) and continued to decline with increasing age (Figure 8.7).

In New Zealand, transplantation was performed for 121 (4%) of patients, compared with 4.5% in 2009 (Figure 8.5).

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 8.8).

Figure 8.5

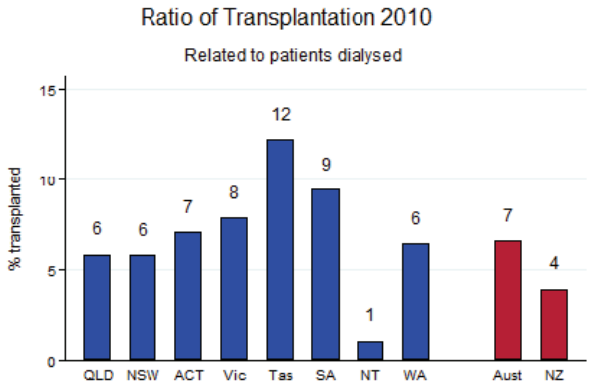


Figure 8.6

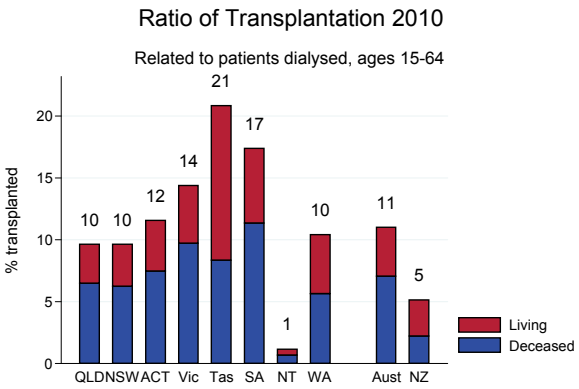


Figure 8.7

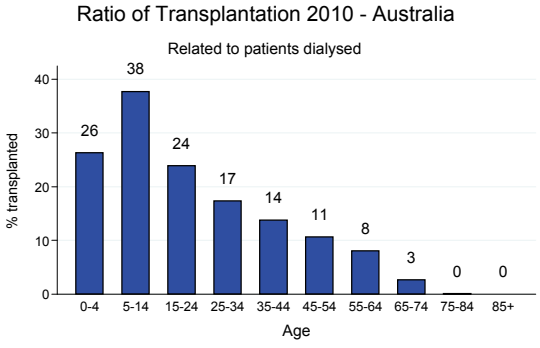
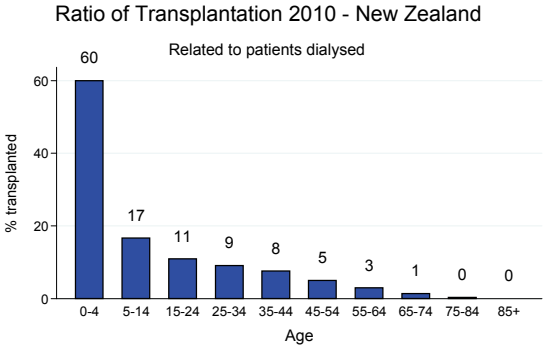


Figure 8.8



* Pre-emptive transplant patients included

AGE OF RECIPIENTS TRANSPLANTED IN 2010

Figure 8.9

Graft Number and Age of Patients Transplanted 2010

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	
Australia											
Deceased	1	2	7	8	40	76	134	143	67	1	478
	2	0	1	4	7	11	21	10	2	0	56
	3	0	0	0	2	4	6	3	0	0	15
Living Donor	1	3	11	34	35	54	51	61	15	2	266
	2	0	1	3	4	5	7	7	0	0	27
	3	0	0	0	0	2	0	1	0	0	3
Total		**5**	**20**	**49**	**88**	**152**	**220**	**225**	**84**	**3**	**846**
New Zealand											
Deceased	1	1	0	3	4	5	13	11	7	1	45
	2	0	0	0	0	1	2	1	0	0	4
	3	0	0	0	0	0	1	0	0	0	1
Living Donor	1	2	2	6	9	14	13	11	2	0	59
	2	0	0	0	0	1	0	0	0	0	1
Total		**3**	**2**	**9**	**13**	**21**	**29**	**23**	**9**	**1**	**110**

AUSTRALIA

The median age of transplant recipients in 2010 was 50 years compared with 49 years in 2009. The age range was 1 to 79 years (Figures 8.9 and 8.10).

The transplantation rate per million for each age group and as a percentage of dialysed patients for each age group are shown in Figures 8.7 and 8.10.

NEW ZEALAND

The 2010 median age of transplant recipients in 2010 was 46.5 years. The age range was 2 to 76 years (Figures 8.9 and 8.11).

Recipients aged between 35 and 54 years comprised 45% of the total. Thirty precent of recipients were over 54 years of age in 2010.

Figure 8.10

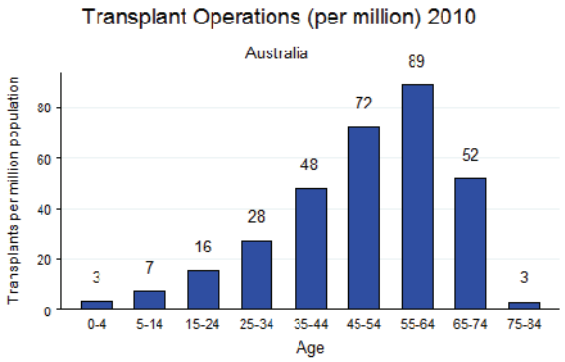
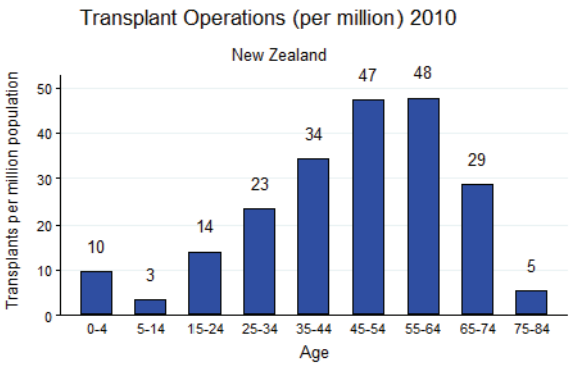


Figure 8.11



ETHNICITY OF TRANSPLANT RECIPIENTS

AUSTRALIA

Figure 8.12.

For the 15-64 year age group in 2010, 14.4% of dialysed Caucasoid patients were transplanted. For Australian Aboriginals and Torres Strait Islanders (ATSI), the numbers receiving transplants remains low.

In contrast, the number of ATSI patients dialysed continues to increase each year.

Figure 8.12 **Australia**

Transplantation Rate - Age Group 15-64 years 2001 - 2010

Year	Caucasoid			Aboriginal and Torres St. Islanders			All Patients		
	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate
2001	3673	433	11.8%	675	21	3.1%	4954	503	10.2%
2002	3724	479	12.9%	729	17	2.3%	5088	549	10.8%
2003	3789	414	10.9%	783	12	1.5%	5250	478	9.1%
2004	3873	491	12.7%	856	25	2.9%	5436	581	10.7%
2005	4040	460	11.4%	929	20	2.2%	5713	548	9.6%
2006	4239	480	11.3%	988	27	2.7%	6034	578	9.6%
2007	4377	471	10.8%	1064	17	1.6%	6324	557	8.8%
2008	4481	602	13.4%	1175	29	2.5%	6623	724	10.9%
2009	4480	574	12.8%	1197	23	1.9%	6694	687	10.3%
2010	4396	607	13.8%	1205	27	2.2%	6661	734	11.0%

NEW ZEALAND

Figure 8.13.

Amongst the 15-64 year age group, the proportion of Maori and Pacific People who received a renal transplant in 2010 was substantially lower than other groups.

Figure 8.13 **New Zealand**

Transplantation Rate - Age Group 15-64 years 2001 - 2010

Year	Caucasoid			Maori			Pacific People			All Patients		
	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate
2001	511	71	13.9%	465	15	3.2%	267	5	1.9%	1328	101	7.6%
2002	541	70	12.9%	494	12	2.4%	267	15	5.6%	1397	102	7.3%
2003	545	64	11.7%	531	16	3.0%	271	13	4.8%	1442	101	7.0%
2004	542	65	12.0%	558	10	1.8%	285	12	4.2%	1483	96	6.5%
2005	568	73	12.9%	563	3	0.5%	303	3	1.0%	1523	82	5.4%
2006	567	59	10.4%	606	9	1.5%	322	5	1.6%	1599	80	5.0%
2007	576	82	14.2%	618	15	2.4%	344	6	1.7%	1650	111	6.7%
2008	586	84	14.3%	620	12	1.9%	376	9	2.4%	1699	112	6.6%
2009	599	77	12.9%	636	13	2.0%	405	6	1.5%	1782	101	5.7%
2010	587	62	10.6%	660	17	2.6%	442	8	1.8%	1848	95	5.1%

AUSTRALIA AND NEW ZEALAND

Figure 8.14 shows this data in another format.

In Australia in 2010, 3.3% of transplant recipients were of Aboriginal/TSI ethnicity.

In New Zealand, 18% of transplant recipients were Maoris and 8% were Pacific People.

Figure 8.14

New Transplanted Patients 2006 - 2010
Related to Ethnicity

Race	2006	2007	2008	2009	2010
Australia	**(641)**	**(615)**	**(813)**	**(773)**	**(846)**
Caucasoid	537 (83.8%)	524 (85.2%)	675 (83.0%)	651 (84.2%)	706 (83.5%)
Aboriginal/Torres St. Islanders	27 (4.2%)	18 (2.9%)	31 (3.8%)	24 (3.1%)	28 (3.3%)
Asian	59 (9.2%)	56 (9.1%)	83 (10.2%)	75 (9.7%)	83 (9.8%)
Other	18 (2.8%)	17 (2.8%)	24 (3.0%)	23 (3.0%)	29 (3.4%)
New Zealand	**(90)**	**(123)**	**(122)**	**(121)**	**(110)**
Caucasoid	65 (72.2%)	91 (74.0%)	93 (76.2%)	91 (75.2%)	71 (64.5%)
Maori	10 (11.1%)	17 (13.8%)	12 (9.8%)	19 (15.7%)	20 (18.2%)
Pacific People	7 (7.8%)	6 (4.9%)	10 (8.2%)	6 (5.0%)	9 (8.2%)
Asian	8 (8.9%)	9 (7.3%)	7 (5.7%)	5 (4.1%)	8 (7.3%)
Other	-	-	-	-	2 (1.8%)

AUSTRALIAN REGIONAL TRANSPLANTATION ACTIVITY

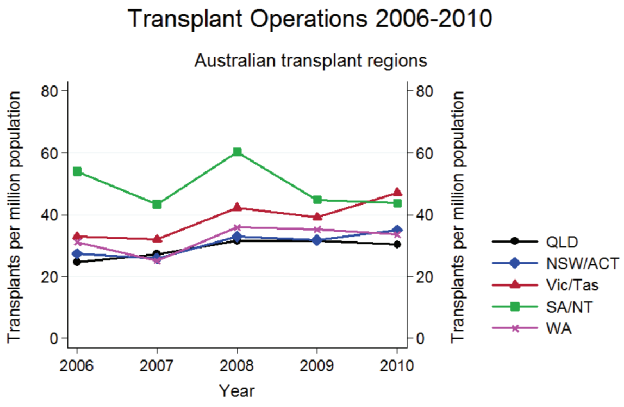
Figure 8.15

Transplants in each Region 2006 - 2010
Number of Operations
(per Million Population per year)

State	2006	2007	2008	2009	2010
Queensland	101 (25)	114 (27)	136 (32)	140 (32)	137 (30)
New South Wales / ACT *	195 (27)	187 (26)	243 (33)	238 (32)	265 (35)
Victoria / Tasmania *	185 (33)	183 (32)	246 (42)	233 (39)	285 (47)
South Australia / NT *	96 (54)	78 (43)	110 (60)	83 (45)	82 (44)
Western Australia	64 (31)	53 (25)	78 (36)	79 (35)	77 (34)
Australia	**641 (31)**	**615 (29)**	**813 (38)**	**773 (35)**	**846 (38)**

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

Figure 8.16



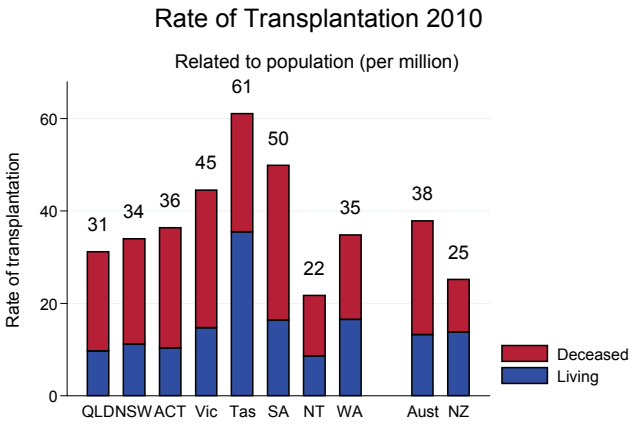
The rate of transplantation for each transplant region is shown in Figures 8.15 and 8.16.

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

The transplant rates for residents of each State and New Zealand are shown in Figure 8.17.

The highest rate (61 per million) occurred in Tasmania followed by South Australia (50 per million) and Victoria (45 per million). The lowest rate (22 per million) was in the Northern Territory.

Figure 8.17



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

LIVING DONOR TRANSPLANTS

Figure 8.18

Living Donor Operations as a Proportion(%) of Annual Transplantation
Australia 2006 - 2010

Recipient Age Groups	Year of Transplantation				
	2006	2007	2008	2009	2010
00-04 years	100%	89%	75%	55%	60%
05-14 years	55%	56%	59%	71%	60%
15-24 years	71%	65%	67%	73%	76%
25-34 years	48%	57%	53%	54%	44%
35-44 years	37%	38%	36%	41%	40%
45-54 years	37%	42%	41%	39%	26%
55-64 years	40%	35%	39%	37%	31%
65-74 years	41%	45%	44%	33%	18%
75-84 years	0%	0%	0%	0%	67%
All Recipients	**43%**	**44%**	**44%**	**42%**	**35%**

Figure 8.19

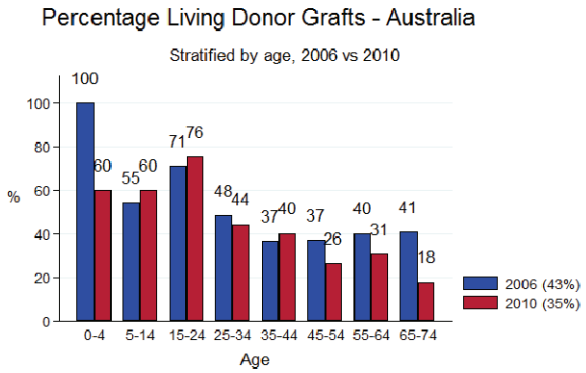
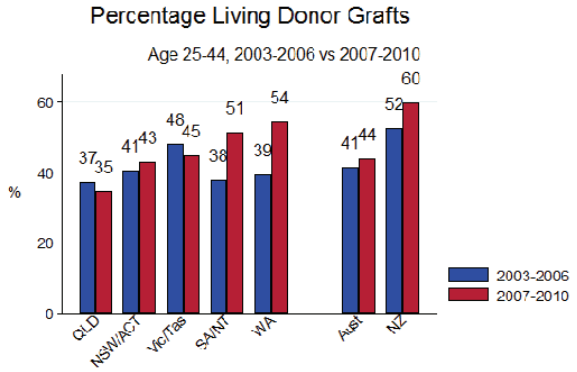


Figure 8.20



AUSTRALIA

There were 296 living donor kidney transplants performed in 2010 in Australia, representing 35% of all transplant operations.

Figure 8.19 shows the age-related proportion of living donor transplants for the years 2006 and 2010. The overall proportion of living donors decreased in most age groups.

The proportion of living donor transplants for each State and New Zealand for recipients aged 25-44 years is shown for the years 2003-2006 and 2007-2010 in Figure 8.20. Overall there has been an increase in this age group for both countries from 2003-2006 to 2007-2010, the highest in New Zealand in 2010 (60%).

The proportion of genetically unrelated donors was 40% (119 donors) in 2010 compared with 43% (142 donors) in 2009, shown in Figure 8.22. Sixty two percent of living unrelated donors were spouses or partners. The age distribution of living donors is shown in Figure 8.21.

The first paired kidney exchange transplants were performed in 2007 in Western Australia and there were a further five in 2008, followed by another two in 2009 and eight in 2010. There was one non directed donor in 2010. Forty of the living donors in 2010 were blood group incompatible with the recipient, up from 30 in 2009 (Figure 8.24).

NEW ZEALAND

The rate of living donor transplantation decreased by 10% (60 donors) in New Zealand in 2010, as shown in Figure 8.23.

There were 23 genetically unrelated kidney donors in 2010, compared with 25 in 2009.

Fifty-five percent of grafts were from a living donor.

Unrelated donors represented 38% of all living donors in 2010, shown in Figure 8.23. Nine of these were from a spouse or partner.

There were four non-directed donors in 2010 (compared with six in 2009) (Figure 8.25).

Figure 8.21

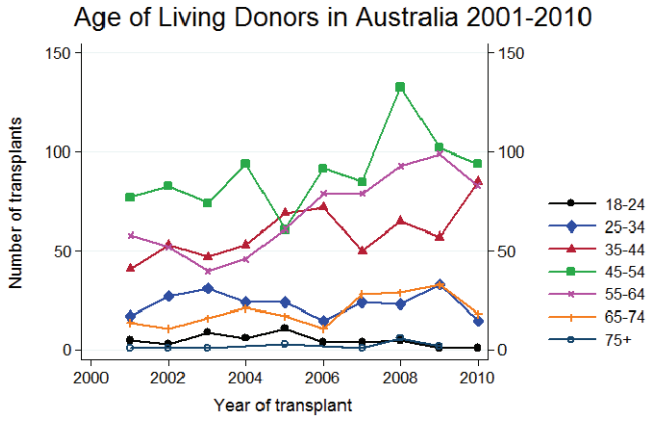


Figure 8.22

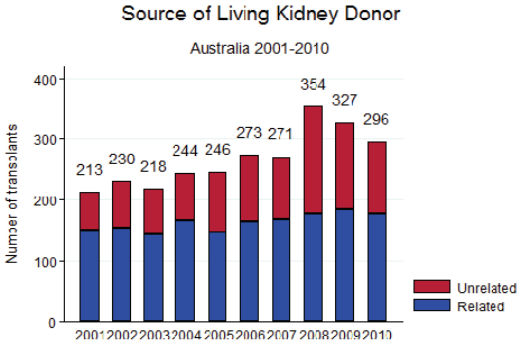


Figure 8.23

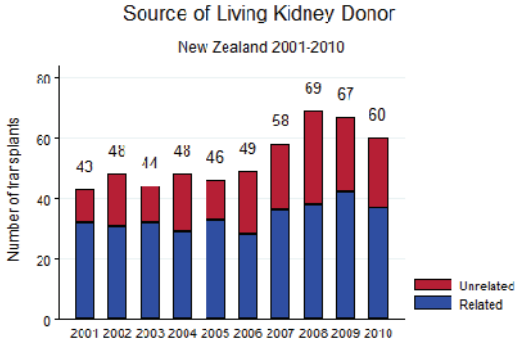


Figure 8.24

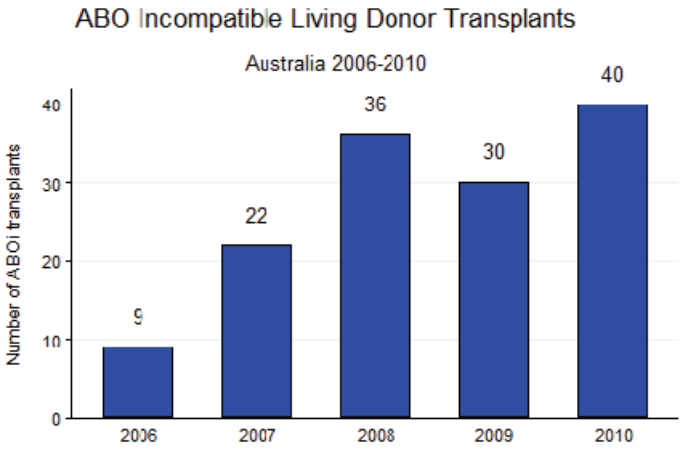


Figure 8.25

Source of Living Donor Kidneys 2006 - 2010

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

Source	Australia					New Zealand				
	2006	2007	2008	2009	2010	2006	2007	2008	2008	2010
Total Living Donors	**273**	**271**	**354**	**327**	**296**	**49**	**58**	**69**	**67**	**60**
Related	**(165)**	**(168)**	**(178)**	**(185)**	**(177)**	**(28)**	**(36)**	**(37)**	**(42)**	**(37)**
Mother	40	60	46	53	48	5	5	7	5	3
Father	35	37	41	27	37	3	5	9	6	5
Brother	25	21	35	32	28 (2+)	6 (1x)	5	5	12	10
Sister	35 (1+)	29 (1+)	32 (1+)	43 (2+)	36 (1x)	6	11	8	8	6
Son	9	7	3	4	7	4	4	2	3	3
Daughter	6	3	6	4	4	3	3	1	4	2
Grandfather	2				1					
Grandmother	1		2	5	3					
Cousin	5	7	5	5	4	1	2	2		3
Nephew				2			1			
Niece	1	1		1	1			1	2	1
Uncle	1	2	1	3	1			1		2
Aunt	5	1	7	6	7			1	2	2
Unrelated	**(108)**	**(103)**	**(176)**	**(142)**	**(119)**	**(21)**	**(22)**	**(32)**	**(25)**	**(23)**
Wife	53	40	64	63	47	5	8	5	2	5
Husband	17	14	35	33	21		5	5	1	2
Mother-in-Law	1	1		1	1					
Father-in-Law /Adoptive Father			1		1					
Son-in-Law / Adoptive Son			2	1					1	
Stepdaughter										
Stepfather	2	1	2				1	1		1
Stepmother			1							
Sister-in-Law	2	2	4	4		1		1		
Brother-in-Law	2	3	1	3	1			1		1
Partner	6	6	10	6	6	1	1		1	2
Fiance / Fiancee	1									
Friend	16	15	27	18	16	10	6	10	13	7
Stepsister / Stepson	1		2		1				1	
Non-Directed	2	1	6	4	1	4	1	8	6	4
Pathological	4	16	13	6	11					
Paired Kidney Exchange		2	5	2	8			1		1
Other	1	2	3	1	5					

Figure 8.26

Gender of Living Donor Kidneys 2007 - 2010

Source and State/ Country of Transplant	2007			2008			2009			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Related												
NSW/ACT	42%	58%	59	58%	42%	62	48%	52%	65	37%	63%	46
Vic/TAS	39%	61%	61	39%	61%	56	26%	74%	58	42%	58%	66
QLD	41%	59%	22	35%	65%	17	31%	69%	26	57%	43%	21
SA/NT	42%	58%	19	50%	50%	24	44%	56%	16	40%	60%	20
WA	57%	43%	7	39%	61%	18	55%	45%	20	42%	58%	24
Australia	**42%**	**58%**	**168**	**47%**	**53%**	**177**	**39%**	**61%**	**185**	**42%**	**58%**	**177**
New Zealand	**42%**	**58%**	**36**	**47%**	**53%**	**38**	**50%**	**50%**	**42**	**57%**	**43%**	**37**
Unrelated												
NSW/ACT	42%	58%	31	31%	69%	52	38%	62%	42	41%	59%	37
Vic/TAS	34%	66%	29	52%	48%	60	35%	65%	40	41%	59%	39
QLD	45%	55%	22	33%	67%	27	41%	59%	29	36%	64%	22
SA/NT	14%	86%	7	29%	71%	17	86%	14%	7	38%	63%	8
WA	36%	64%	14	33%	67%	21	38%	63%	24	23%	77%	13
Australia	**38%**	**62%**	**103**	**38%**	**62%**	**177**	**40%**	**60%**	**142**	**38%**	**62%**	**119**
New Zealand	**45%**	**55%**	**22**	**39%**	**61%**	**31**	**40%**	**60%**	**25**	**43%**	**57%**	**23**

TIMING OF LIVING DONOR TRANSPLANTS

The timing of living donor transplants relative to the start of dialysis is shown in Figure 8.27.

The proportion of all primary living donor transplants performed "pre-emptively" in Australia was 35%, compared with 37% in 2009. This continues a broader trend of increasing use of pre-emptive transplantation (Figure 8.28). Forty percent had received dialysis treatment for twelve months or longer prior to a first living donor graft.

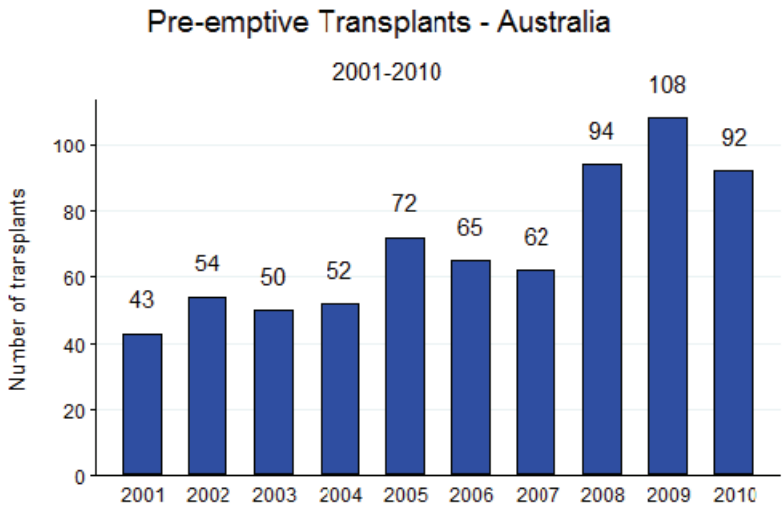
The proportion of pre-emptive primary living donor transplants in New Zealand was 25% in 2010, compared with 31% 2009 (Figure 8.27). Fifty-six percent received dialysis for twelve months or longer prior to being transplanted.

Figure 8.27

Timing of Live Donor Transplantation for Primary Grafts in Relation to Date of Dialysis Start by Year of Transplant 2006 - 2010

		2006	2007	2008	2009	2010
Aust	Pre-emptive	65 (27%)	62 (26%)	94 (30%)	108 (36%)	92 (35%)
	<1 month post dialysis	7 (3%)	7 (3%)	5 (2%)	10 (3%)	6 (2%)
	1 month to <1 year post dialysis	66 (27%)	55 (23%)	77 (24%)	81 (27%)	62 (23%)
	>=1 year post dialysis	105 (43%)	116 (48%)	141 (44%)	99 (33%)	106 (40%)
NZ	Pre-emptive	9 (21%)	23 (43%)	20 (30%)	18 (31%)	15 (25%)
	<1 month post dialysis	-	1 (2%)	2 (3%)	1 (2%)	1 (2%)
	1 month to <1 year post dialysis	12 (28%)	9 (17%)	14 (21%)	8 (14%)	10 (17%)
	>=1 year post dialysis	22 (51%)	21 (39%)	30 (45%)	32 (54%)	33 (56%)

Figure 8.28



FUNCTIONING TRANSPLANTS AT 31ST DECEMBER 2010

AUSTRALIA

There have been 19,034 transplant operations performed on 16,357 patients since 1963. Of these, 8,382 grafts were functioning at 31st December 2010.

Fourteen percent of operations and 12% of functioning grafts were regrafts. Living donor transplants accounted for 23% of operations and 37% of functioning grafts (Figure 8.29). The number of operations performed by each hospital during this period is shown in Appendix I, available on the Web.

The number of functioning grafts at the end of 2010 represents a 6% increase over the previous year. The annual rate of increase has remained steady (Figure 8.31 and 8.32).

The prevalence of functioning grafts in each State is shown in Figures 8.31 and 8.32. South Australia/Northern Territory has the highest prevalence of functioning renal transplants (539 per million). The lowest prevalence was in Queensland (337 per million).

The age distribution of functioning transplants as a proportion of patients on renal replacement therapy is shown in Figures 8.34 and 8.35. The proportion depending on living donor grafts is greater in the younger age groups (Figures 8.34 and 8.35).

The details of age are shown figure 8.36, and details of age, gender and ethnicity are shown in figure 8.39.

The majority of recipients with functioning grafts were male (61%). The ethnic origin of recipients was Caucasoid 87%, Asian 8%, Aboriginal and Torres Strait Islanders 2% and Others 2% (Figure 8.39).

The 8,382 grafts functioning at the end of 2010 represent 44% of all kidneys transplanted since 1963. Thirty-four percent of grafts were functioning ten or more years and 9% for 20 or more years. There were 150 recipients with grafts functioning 30 years or longer (Figure 8.40). The longest graft had functioned for 42 years at 31st December, 2010.

Figure 8.29

Summary of Kidney Transplantation Australia 1963 - 2010

		Performed	Functioning*
Deceased Donor	First	12342	4590
	Second	1887	567
	Third	308	100
	Fourth	46	16
	Fifth	4	1
	Total	14,587	5,274
Living Donor	First	4015	2827
	Second	371	238
	Third	52	38
	Fourth	8	5
	Fifth	1	0
	Total	4,447	3,108
Total		**19,034**	**8,382**

* Lost to follow up not included

NEW ZEALAND

There have been 3,515 operations performed on 2,967 patients since 1965 with 1,442 grafts still functioning at 31st December 2010 (Figure 8.30). Sixteen percent of operations and 10% of functioning grafts were regrafts. Kidneys from living donors accounted for 26% of operations and 42% 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 8.36. The majority were male (50%) and the racial distribution was Caucasoid 77%, Maori 7%, Pacific People 10% and Asian 6% (Figure 8.39).

The majority (69%) of functioning grafts were in the 35-64 year age group and the mean and median ages were 50 and 52 years respectively. The modal age group was 55-64 years (Figure 8.36).

The 1,442 grafts functioning at the end of 2010 represent 39% of all kidneys transplanted since 1965. The longest surviving graft had functioned for 40 years at 31st December 2010. There were 138 grafts functioning for 20 or more years and 18 for 30 or more years (Figure 8.41).

Figure 8.30

Summary of Kidney Transplantation New Zealand 1965 - 2010

		Performed	Functioning*
Deceased Donor	First	2174	719
	Second	394	78
	Third	75	17
	Fourth	7	0
	Total	**2,650**	**814**
Living Donor	First	897	583
	Second	72	41
	Third	6	4
	Total	**975**	**628**
Total		**3,625**	**1,442**

* Lost to follow up not included

Figure 8.31

Functioning Transplants 2001 - 2010
Transplanting Region, Australia and New Zealand
(Number Per Million Population)

Year	QLD	NSW/ACT *	VIC/Tas *	SA/NT *	WA	Australia	NZ
2001	1063 (293)	1823 (264)	1455 (276)	669 (391)	496 (261)	**5506 (284)**	**1063 (273)**
2002	1109 (299)	1905 (274)	1538 (288)	702 (408)	528 (274)	**5782 (294)**	**1116 (282)**
2003	1150 (302)	2006 (287)	1581 (293)	736 (425)	530 (271)	**6003 (302)**	**1168 (290)**
2004	1185 (304)	2104 (299)	1651 (302)	790 (453)	562 (283)	**6292 (313)**	**1221 (299)**
2005	1220 (305)	2177 (307)	1721 (311)	810 (461)	617 (306)	**6545 (321)**	**1239 (300)**
2006	1258 (308)	2269 (317)	1830 (326)	846 (476)	657 (319)	**6860 (331)**	**1247 (298)**
2007	1315 (313)	2314 (319)	1925 (337)	881 (489)	678 (321)	**7113 (338)**	**1283 (303)**
2008	1372 (318)	2422 (329)	2056 (353)	933 (511)	717 (329)	**7500 (349)**	**1348 (316)**
2009	1449 (327)	2529 (338)	2204 (370)	962 (520)	748 (333)	**7892 (359)**	**1400 (324)**
2010	1521 (337)	2687 (354)	2381 (393)	1011 (539)	782 (341)	**8382 (375)**	**1442 (330)**

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

Figure 8.32

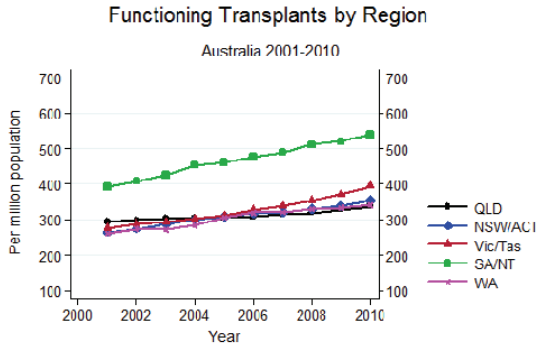


Figure 8.33

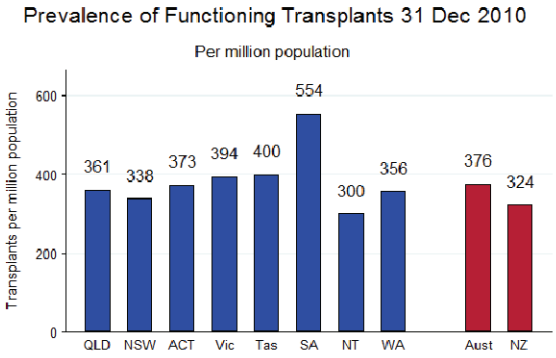


Figure 8.34

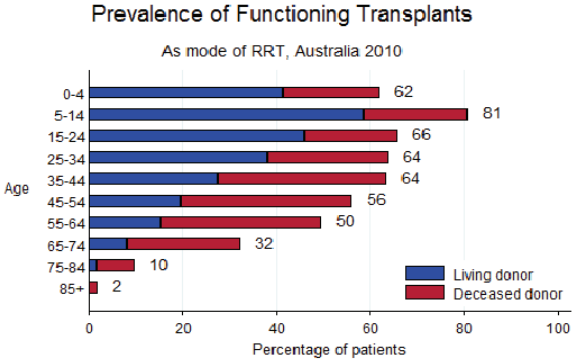


Figure 8.35

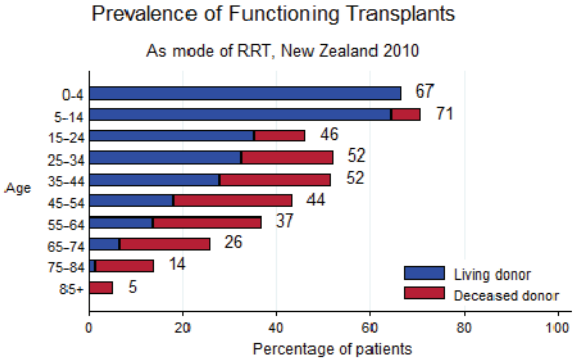
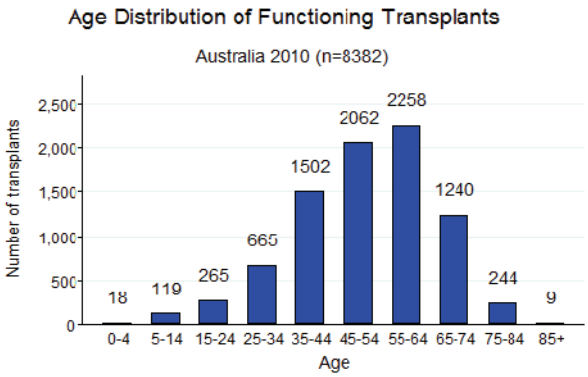


Figure 8.36

Age of All Functioning Transplant Patients
Resident Country at Transplant 31-Dec-2010

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		**18**	**119**	**265**	**665**	**1502**	**2062**	**2258**	**1240**	**244**	**9**	**8382**
Deceased Donor	1	5	30	69	218	703	1131	1377	865	184	8	4590
	2	1	3	10	42	111	168	161	56	14	1	567
	3	-	-	1	8	30	35	19	7	-	-	100
	4	-	-	-	-	5	8	2	-	1	-	16
	5	-	-	-	-	-	-	1	-	-	-	1
	Total	**6**	**33**	**80**	**268**	**849**	**1342**	**1560**	**928**	**199**	**9**	**5274**
Living Donor	1	12	82	173	365	572	649	633	300	41	-	2827
	2	-	4	11	31	66	57	55	10	4	-	238
	3	-	-	1	-	13	13	9	2	-	-	38
	4	-	-	-	1	2	1	1	-	-	-	5
	Total	**12**	**86**	**185**	**397**	**653**	**720**	**698**	**312**	**45**	**-**	**3108**
New Zealand		**4**	**22**	**58**	**130**	**247**	**362**	**384**	**194**	**40**	**1**	**1442**
Deceased Donor	1	-	2	13	45	92	174	219	137	36	1	719
	2	-	-	1	4	17	30	20	6	-	-	78
	3	-	-	-	-	5	7	3	2	-	-	17
	Total	**-**	**2**	**14**	**49**	**114**	**211**	**242**	**145**	**36**	**1**	**814**
Living Donor	1	4	20	43	74	118	135	136	49	4	-	583
	2	-	-	1	7	14	13	6	-	-	-	41
	3	-	-	-	-	1	3	-	-	-	-	4
	Total	**4**	**20**	**44**	**81**	**133**	**151**	**142**	**49**	**4**	**-**	**628**

Figure 8.37



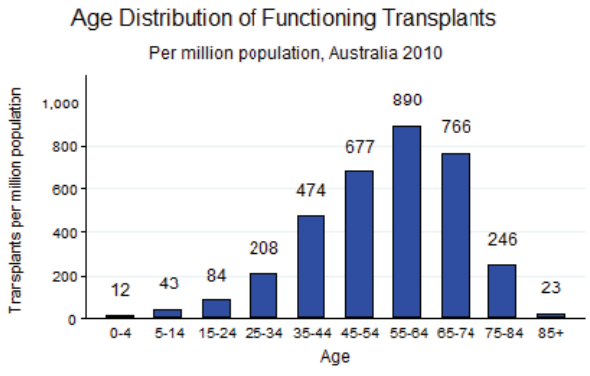
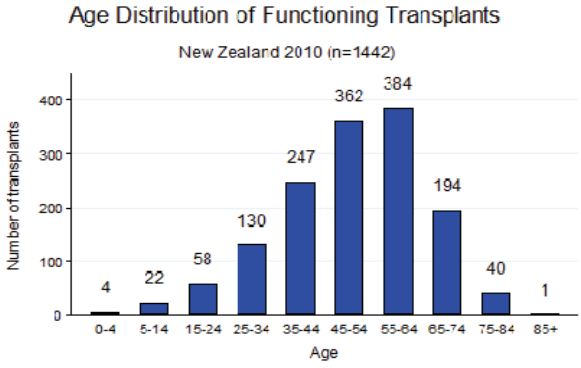


Figure 8.38



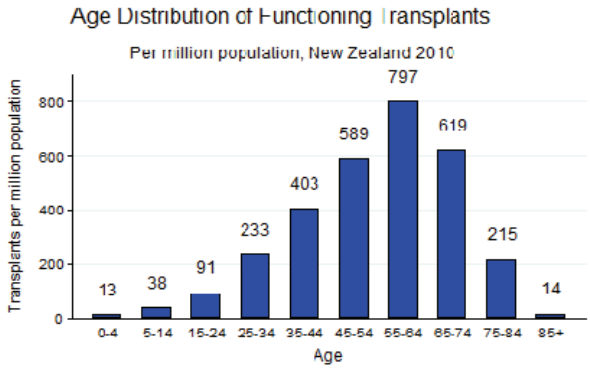


Figure 8.39

Functioning Transplant Patients - Resident Country at Transplant Related to Ethnicity and Age Group 31-Dec-2010

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		**18**	**119**	**265**	**665**	**1502**	**2062**	**2258**	**1240**	**244**	**9**	**8382**
Female	Caucasoid	3	39	90	210	494	661	704	452	119	5	2777
	Aboriginal/TSI	-	1	3	6	18	28	15	4	-	-	75
	Asian	-	5	9	22	60	100	92	28	6	-	322
	Other	2	4	4	10	19	27	16	7	1	-	90
	Total	**5**	**49**	**106**	**248**	**591**	**816**	**827**	**491**	**126**	**5**	**3264**
Male	Caucasoid	9	64	135	363	819	1103	1257	688	112	4	4554
	Aboriginal/TSI	-	1	6	6	16	33	30	10	-	-	102
	Asian	2	4	12	34	58	87	109	40	4	-	350
	Other	2	1	6	14	18	23	35	11	2	-	112
	Total	**13**	**70**	**159**	**417**	**911**	**1246**	**1431**	**749**	**118**	**4**	**5118**
New Zealand		4	22	58	130	247	362	384	194	40	1	1442
Female	Caucasoid	1	5	24	41	79	104	129	63	17	1	464
	Maori	-	1	2	4	5	16	11	2	-	-	41
	Pacific People	-	5	4	7	14	14	7	7	4	-	62
	Asian	-	-	-	10	9	10	6	1	1	-	37
	Other	-	-	-	1	-	-	-	-	-	-	1
	Total	**1**	**11**	**30**	**63**	**107**	**144**	**153**	**73**	**22**	**1**	**605**
Male	Caucasoid	2	10	22	51	111	173	179	86	13	-	647
	Maori	-	-	1	7	6	14	13	11	3	-	55
	Pacific People	1	-	4	4	10	22	20	14	1	-	76
	Asian	-	1	1	4	10	8	17	10	1	-	52
	Other	-	-	-	1	3	1	2	-	-	-	7
	Total	**3**	**11**	**28**	**67**	**140**	**218**	**231**	**121**	**18**	**-**	**837**

Figure 8.40

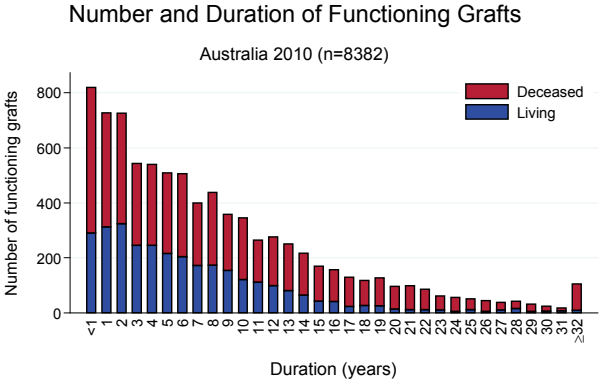
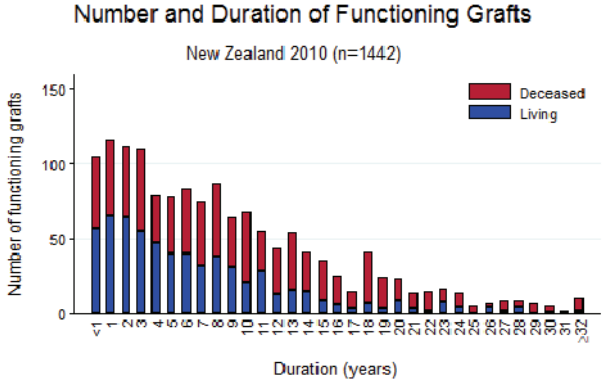


Figure 8.41



RATES OF GRAFT LOSS

The rates of loss of graft function and death with a functioning graft in Australia in 2010 were 2.3% and 1.7% per patient year respectively; in total 4% of grafts at risk were lost. The rate of loss of graft function (but not deaths with functioning graft) decreased slightly from 2009 (Figure 8.42).

In 2010, the rate of loss of graft function in New Zealand was 2.1% and death with functioning graft was 2.2%; in total 4.3% of grafts at risk were lost (Figure 8.42).

The causes of graft failure from 2001 to 2010 are shown In Figure 8.43.

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

The importance of death with function, chronic allograft nephropathy and other causes of graft loss after one year is evident in Figure 8.44.

Among the causes of death with functioning graft, cardiac disease and malignancy were predominant. (Figure 8.44)

Figure 8.42

Graft Loss Rate 2001 - 2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Australia	**(5835)**	**(6111)**	**(6325)**	**(6653)**	**(6915)**	**(7186)**	**(7475)**	**(7926)**	**(8273)**	**(8738)**
Death with Function	2.6%	2.3%	2.3%	2.1%	2.4%	2.0%	2.2%	2.2%	1.7%	1.7%
Loss of Graft Function	2.8%	2.9%	2.7%	3.1%	2.8%	2.5%	2.5%	2.9%	2.8%	2.3%
All Losses	5.4%	5.2%	4.9%	5.3%	5.1%	4.5%	4.7%	5.1%	4.5%	4.0%
New Zealand	**(1133)**	**(1180)**	**(1227)**	**(1273)**	**(1314)**	**(1329)**	**(1370)**	**(1405)**	**(1469)**	**(1510)**
Death with Function	2.2%	2.7%	2.2%	2.2%	2.3%	2.6%	3.2%	1.9%	2.3%	2.2%
Loss of Graft Function	3.8%	2.7%	2.5%	1.8%	3.3%	3.5%	2.9%	2.1%	2.4%	2.1%
All Losses	6.0%	5.4%	4.7%	4.0%	5.6%	6.0%	6.1%	3.9%	4.7%	4.3%

Figure 8.43

Year of Graft Loss Due to Death or Failure 2001 - 2010

Loss	Cause of Failure	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Australia												
Failed	Death with Function	152	138	143	143	163	143	162	172	143	152	**1511**
	Rejection - Acute	7	8	3	5	3	7	11	10	16	8	**78**
	Chronic Allograft (CAN)	112	108	113	143	134	105	131	172	151	143	**1312**
	Rejection - Hyperacute	-	-	-	-	-	1	-	2	-	-	**3**
	Vascular	12	16	15	18	13	14	8	14	17	12	**139**
	Technical Problems	2	3	3	2	4	5	2	4	3	3	**31**
	Glomerulonephritis	8	15	12	13	16	23	15	9	15	14	**140**
	Non Compliance	7	11	10	8	6	3	8	6	12	5	**76**
	Other	15	16	13	19	15	19	14	16	14	17	**158**
Total		**315**	**315**	**312**	**351**	**354**	**320**	**351**	**405**	**371**	**354**	**3448**
New Zealand												
	Death with Function	25	32	27	28	30	34	44	26	34	33	**313**
Failed	Rejection - Acute	1	1	1	-	2	2	1	1	1	-	**10**
	Chronic Allograft (CAN)	31	22	16	15	24	31	21	20	29	17	**226**
	Rejection - Hyperacute	-	-	-	1	-	-	-	-	-	-	**1**
	Vascular	1	1	1	-	4	-	3	1	2	3	**16**
	Technical Problems	2	1	2	-	2	3	1	-	-	-	**11**
	Glomerulonephritis	2	1	4	2	3	6	4	5	-	5	**32**
	Non Compliance	2	3	3	1	1	1	6	1	1	5	**24**
	Other	4	3	4	4	8	4	4	1	2	2	**36**
Total		**68**	**64**	**58**	**51**	**74**	**81**	**84**	**55**	**69**	**65**	**669**

Figure 8.44

Graft Losses 2006 - 2010

Cause of Loss	Australia			New Zealand		
	Graft Function			Graft Function		
	<1 year	>= 1 year	Any Time	<1 year	>= 1 year	Any Time
Death with functioning Graft						
Cardiac	26 (39%)	182 (26%)	208 (27%)	4 (31%)	47 (30%)	51 (30%)
Vascular	5 (8%)	74 (10%)	79 (10%)	1 (8%)	5 (3%)	6 (4%)
Infection	23 (35%)	117 (17%)	140 (18%)	2 (15%)	23 (15%)	25 (15%)
Social	2 (3%)	42 (6%)	44 (6%)	2 (15%)	5 (3%)	7 (4%)
Malignancy	6 (9%)	230 (33%)	236 (31%)	3 (23%)	66 (42%)	69 (40%)
Miscellaneous	4 (6%)	61 (9%)	65 (8%)	1 (8%)	12 (8%)	13 (8%)
Total	**66 (100%)**	**706 (100%)**	**772 (100%)**	**13 (100%)**	**158 (100%)**	**171 (100%)**
Graft Failure						
Rejection - Acute	31 (22%)	21 (2%)	52 (5%)	1 (6%)	4 (2%)	5 (3%)
Rejection - Chronic Allograft (CAN)	9 (6%)	693 (78%)	702 (68%)	1 (6%)	117 (70%)	118 (64%)
Rejection - Hyperacute	3 (2%)	-	3 (<1%)	-	-	-
Vascular	50 (35%)	15 (2%)	65 (6%)	6 (38%)	3 (2%)	9 (5%)
Technical Problems	11 (8%)	6 (1%)	17 (2%)	4 (25%)	-	4 (2%)
Glomerulonephritis	9 (6%)	67 (8%)	76 (7%)	1 (6%)	19 (11%)	20 (11%)
Non Compliance	1 (1%)	33 (4%)	34 (3%)	1 (6%)	13 (8%)	14 (8%)
Other	30 (21%)	50 (6%)	80 (8%)	2 (12%)	11 (7%)	13 (7%)
Total	**144 (100%)**	**885 (100%)**	**1029 (100%)**	**16 (100%)**	**167 (100%)**	**183 (100%)**

IMMUNOSUPPRESSION

AUSTRALIA

In Australia in 2010 Tacrolimus was used initially in 86% and Cyclosporine in 14% of primary deceased donor grafts. The proportion of patients initially using Tacrolimus has increased since 2003, as shown in Figure 8.45. The number of patients still taking Prednisolone two years after transplantation has increased since 2003 and is now 92%, for patients transplanted in 2008.

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 8.45 **Australia**

Immunosuppressive Therapy - Primary Deceased Donor Graft 2003 - 2010

	Year	Aza	CyA	Tacrol	MMF	MPA	Sirol	Everolimus	Pred	Number of Deceased Donor Grafts
Initial treatment	2003	8 (3%)	187 (68%)	77 (28%)	190 (69%)	52 (19%)	10 (4%)	-	258 (94%)	274
	2004	6 (2%)	212 (59%)	136 (38%)	309 (85%)	25 (7%)	10 (3%)	1 (<1%)	360 (99%)	362
	2005	9 (3%)	131 (41%)	172 (54%)	299 (94%)	4 (1%)	17 (5%)	-	308 (97%)	319
	2006	-	155 (51%)	139 (45%)	260 (85%)	24 (8%)	3 (1%)	19 (6%)	296 (97%)	306
	2007	2 (1%)	139 (48%)	140 (49%)	244 (85%)	36 (13%)	-	5 (2%)	285 (99%)	287
	2008	2 (1%)	137 (35%)	240 (61%)	364 (93%)	22 (6%)	-	-	389 (99%)	391
	2009	4 (1%)	62 (16%)	310 (82%)	356 (95%)	13 (3%)	-	3 (1%)	375 (100%)	376
	2010	-	66 (14%)	409 (86%)	427 (89%)	36 (8%)	1 (<1%)	3 (1%)	477 (100%)	478
Treatment at 12 months	2003	22 (9%)	124 (50%)	104 (42%)	161 (64%)	45 (18%)	15 (6%)	-	222 (89%)	250
	2004	23 (7%)	129 (39%)	162 (49%)	236 (72%)	46 (14%)	31 (9%)	1 (<1%)	304 (93%)	328
	2005	23 (8%)	83 (29%)	172 (59%)	229 (79%)	21 (7%)	29 (10%)	3 (1%)	262 (90%)	291
	2006	12 (4%)	94 (34%)	145 (52%)	216 (78%)	27 (10%)	21 (8%)	20 (7%)	259 (93%)	278
	2007	13 (5%)	86 (32%)	149 (56%)	189 (71%)	51 (19%)	12 (5%)	14 (5%)	252 (95%)	265
	2008	17 (5%)	84 (23%)	251 (70%)	288 (80%)	37 (10%)	12 (3%)	9 (2%)	345 (96%)	361
	2009	18 (5%)	41 (12%)	282 (80%)	283 (80%)	37 (10%)	18 (5%)	10 (3%)	341 (96%)	354
Treatment at 24 months	2003	19 (8%)	104 (43%)	103 (43%)	165 (69%)	40 (17%)	19 (8%)	-	206 (86%)	240
	2004	30 (9%)	116 (36%)	154 (48%)	219 (68%)	45 (14%)	41 (13%)	5 (2%)	283 (88%)	320
	2005	23 (8%)	76 (27%)	156 (55%)	220 (78%)	23 (8%)	45 (16%)	5 (2%)	238 (84%)	282
	2006	15 (6%)	81 (30%)	144 (53%)	207 (76%)	31 (11%)	23 (8%)	25 (9%)	248 (92%)	271
	2007	12 (5%)	79 (31%)	152 (59%)	181 (70%)	54 (21%)	14 (5%)	13 (5%)	243 (94%)	259
	2008	20 (6%)	80 (23%)	233 (67%)	269 (78%)	39 (11%)	12 (3%)	9 (3%)	319 (92%)	346

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

IMMUNOSUPPRESSION

NEW ZEALAND

In New Zealand in 2010, 71% of new primary deceased donor transplant recipients received Cyclosporine and 29% received Tacrolimus (Figure 8.46). No transplant recipients commenced Azathioprine at the time of transplantation.

There are very few patients in New Zealand receiving TOR-inhibitors (Sirolimus or Everolimus). There has been a dramatic increase in the use of Mycophenolate preparations two years after transplantation. Whereas only 7% of the 2003 cohort remained on Mycophenolate two years post transplant, 88% of the 2008 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 8.46 **New Zealand**

Immunosuppressive Therapy - Primary Deceased Donor Graft 2003 - 2010

	Year	Aza	CyA	Tacrol	MMF	MPA	Sirol	Everolimus	Pred	Number of Deceased Donor Grafts
Initial treatment	2003	-	47 (87%)	7 (13%)	46 (85%)	3 (6%)	-	-	52 (96%)	54
	2004	-	47 (94%)	3 (6%)	49 (98%)	-	-	-	50 (100%)	50
	2005	-	32 (76%)	8 (19%)	41 (98%)	-	-	-	41 (98%)	42
	2006	-	26 (68%)	11 (30%)	34 (92%)	-	-	3 (8%)	37 (100%)	37
	2007	-	43 (74%)	15 (26%)	57 (98%)	-	-	1 (2%)	58 (100%)	58
	2008	-	30 (67%)	15 (33%)	42 (93%)	3 (7%)	-	-	45 (100%)	45
	2009	-	39 (78%)	10 (20%)	49 (98%)	-	-	-	49 (98%)	50
	2010	-	32 (71%)	13 (29%)	45 (100%)	-	-	-	45 (100%)	45
Treatment at 12 months	2003	15 (33%)	24 (53%)	21 (47%)	22 (49%)	3 (7%)	1 (2%)	-	42 (93%)	45
	2004	9 (19%)	30 (64%)	17 (36%)	37 (79%)	-	-	-	45 (96%)	47
	2005	2 (5%)	21 (55%)	16 (42%)	33 (87%)	1 (3%)	2 (5%)	1 (3%)	35 (92%)	38
	2006	-	18 (53%)	15 (45%)	29 (88%)	-	-	3 (9%)	32 (97%)	33
	2007	3 (6%)	31 (60%)	20 (38%)	43 (83%)	-	2 (4%)	1 (2%)	48 (92%)	52
	2008	2 (5%)	21 (48%)	23 (52%)	39 (89%)	1 (2%)	-	-	41 (93%)	44
	2009	-	24 (50%)	23 (48%)	48 (100%)	-	1 (2%)	-	45 (94%)	48
Treatment at 24 months	2003	34 (79%)	22 (51%)	21 (49%)	3 (7%)	2 (5%)	1 (2%)	-	40 (93%)	43
	2004	12 (27%)	27 (60%)	18 (40%)	30 (67%)	-	-	-	41 (91%)	45
	2005	2 (6%)	18 (50%)	17 (47%)	30 (83%)	1 (3%)	2 (6%)	1 (3%)	29 (81%)	36
	2006	-	16 (50%)	16 (50%)	28 (88%)	-	-	2 (6%)	30 (94%)	32
	2007	3 (6%)	29 (58%)	20 (40%)	41 (82%)	-	2 (4%)	1 (2%)	45 (90%)	50
	2008	2 (5%)	20 (48%)	21 (50%)	37 (88%)	-	1 (2%)	-	40 (95%)	42

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

USE OF ANTIBODY THERAPY FOR INDUCTION IMMUNOSUPPRESSION

AUSTRALIA AND NEW ZEALAND

The use of mono and polyclonal antibody agents for induction immunosuppression has changed through time and use and differs among centres and between Australia and New Zealand. The changes in use of these agents in recent years are reported here. Readers should note that differences between Australia and New Zealand are likely to reflect case mix and also drug availability. For this Report induction therapy is defined as treatment given pre-transplant or up to two weeks post transplant in the absence of rejection.

Figure 8.47 shows the use of induction agents over the last five years.

In Australia in 2010 12% of recipients received an alternative agent either in addition to, or instead of Basiliximab and Daclizumab. There has been a small recent increase in the use of Intravenous Immunoglobulin and a larger increase in the use of T cell depleting polyclonal Ab, probably reflecting an increase in desensitisation regimens and ABO incompatible transplants. In addition to the agents listed in Figure 8.47, there was one Australian recipient who received Eculizumab for induction in 2010.

In New Zealand, agents other than the interleukin 2 receptor antagonists Basiliximab and Daclizumab are very uncommon.

Figure 8.47

Antibody Use for Induction Immunosuppression
Australia and New Zealand 2006 - 2010

Number of Kidney Transplant Recipients
Receiving Each Agent by Year
(% Total New Transplants)

	2006	2007	2008	2009	2010
Australia					
T cell depleting polyclonal Ab	30 (4.7%)	17 (2.8%)	22 (2.7%)	40 (5.2%)	52 (6.1%)
Anti-CD25	507 (79.1%)	532 (86.5%)	740 (91.0%)	714 (92.4%)	795 (94.0%)
Rituximab	7 (1.1%)	7 (1.1%)	21 (2.6%)	17 (2.2%)	9 (1.1%)
Intravenous Immunoglobulin	8 (1.2%)	14 (2.3%)	25 (3.1%)	28 (3.6%)	39 (4.6%)
Muromonab-CD3	-	2 (0.3%)	-	1 (0.1%)	-
Total New Transplants	**641**	**615**	**813**	**773**	**846**
New Zealand					
T cell depleting polyclonal Ab	-	-	-	-	1 (0.9%)
Anti-CD25	18 (20.0%)	47 (38.2%)	74 (60.7%)	63 (52.1%)	65 (59.1%)
Rituximab	-	-	1 (0.8%)	2 (1.7%)	1 (0.9%)
Intravenous Immunoglobulin	-	-	-	-	-
Muromonab-CD3	-	-	-	-	-
Total New Transplants	**90**	**123**	**122**	**121**	**110**

USE OF ANTIBODY THERAPY FOR TREATMENT OF REJECTION

AUSTRALIA AND NEW ZEALAND

Figure 8.48 shows the number of people who received antibody agents for treating acute rejection by calendar year. The number is also reported as a proportion of new transplant recipients in each calendar year, but readers should be aware that although the large majority of people experiencing acute rejection do so within the first six months of transplantation, some experience rejection after this time (when they would not necessarily be counted as a new transplant). For this reason the total number of transplant recipients treated during the year is also reported.

Muromonab-CD3 use has begun to fall in New Zealand. In Australia, use of Muromonab-CD3 has fallen, and this will continue following the withdrawal from sale, but use of Rituximab and Intravenous Immunoglobulin has increased recently.

Figure 8.48

Antibody Use as Treatment for Acute Rejection
Australia and New Zealand 2006 - 2010

Number of Kidney Transplant Recipients Receiving Each Agent by Year (% Total New Transplants)

	2006	2007	2008	2009	2010
Australia					
T cell depleting polyclonal Ab	13 (2.0%)	14 (2.3%)	19 (2.3%)	27 (3.5%)	41 (4.8%)
Anti-CD25	-	-	1 (0.1%)	1 (0.1%)	-
Rituximab	11 (1.7%)	16 (2.6%)	24 (3.0%)	26 (3.4%)	15 (1.8%)
Intravenous Immunoglobulin	42 (6.6%)	70 (11.4%)	89 (10.9%)	105 (13.6%)	90 (10.6%)
Muromonab-CD3	11 (1.7%)	9 (1.5%)	10 (1.2%)	12 (1.6%)	2 (0.2%)
Total New Transplants	**641**	**615**	**813**	**773**	**846**
Total Transplants at Risk	**7186**	**7475**	**7926**	**8273**	**8738**
New Zealand					
T cell depleting polyclonal Ab	-	3 (2.4%)	3 (2.5%)	2 (1.7%)	11 (10.0%)
Anti-CD25	1 (1.1%)	1 (0.8%)	1 (0.8%)	-	-
Rituximab	-	-	-	3 (2.5%)	-
Intravenous Immunoglobulin	3 (3.3%)	3 (2.4%)	2 (1.6%)	7 (5.8%)	3 (2.7%)
Muromonab-CD3	10 (11.1%)	10 (8.1%)	10 (8.2%)	8 (6.6%)	4 (3.6%)
Total New Transplants	**90**	**123**	**122**	**121**	**110**
Total Transplants at Risk	**1329**	**1370**	**1405**	**1469**	**1510**

REJECTION RATES

AUSTRALIA AND NEW ZEALAND

Figure 4.89 shows the proportion of patients experiencing rejection in the first six months after transplant. For both living and deceased donor primary grafts, the six month incidence of rejection has fallen over the last decade.

Rejection rates in subsequent grafts are more variable due to the lower number of recipients, but do not appear to have fallen in either living or deceased donors.

Figure 8.49

Australia and New Zealand
Rejection Rates at Six Months Post Transplant

Donor Source	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Living Donor										
First graft	26.1%	27.5%	27.7%	21.6%	19.6%	19.6%	21.1%	17.0%	16.8%	16.0%
Second and subsequent grafts	27.8%	13.0%	33.3%	34.8%	18.5%	33.3%	34.3%	30.0%	21.6%	12.9%
Deceased Donor										
First graft	25.1%	22.9%	26.8%	22.8%	18.6%	16.3%	17.7%	22.0%	20.9%	16.4%
Second and subsequent grafts	25.0%	24.1%	25.0%	27.5%	31.7%	36.4%	32.8%	30.3%	36.5%	26.0%

SHORT TERM SURVIVAL - PRIMARY DECEASED DONOR GRAFTS

AUSTRALIA

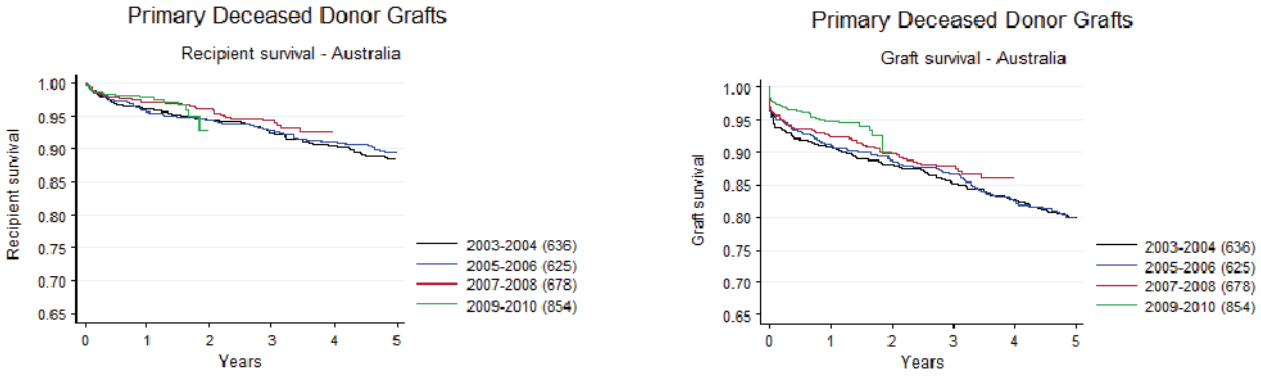
Graft and patient survival for primary deceased donor grafts performed in Australia, calculated by the Kaplan-Meier method, is shown in Figure 8.50. The figures include graft losses or deaths on the day of transplant, and graft survival is not censored for death. Unadjusted one year patient and graft survival for primary deceased donor grafts in Australia have stabilised in the past ten years. Kaplan-Meier graphs illustrating this are shown in Figure 8.51.

Figure 8.50

Primary Deceased Donor - Australia
Recipient and Graft Survival 1991 - 2010
% [95% Confidence Interval]

Year of Transplant	Survival			
	1 month	6 months	1 year	5 years
Recipient Survival				
1991-1992 (n=655)	99 (98, 99)	95 (93, 96)	93 (91, 95)	84 (81, 87)
1993-1994 (n=609)	99 (97, 99)	96 (94, 97)	95 (93, 97)	85 (82, 88)
1995-1996 (n=601)	99 (98, 100)	96 (94, 97)	95 (93, 97)	88 (85, 90)
1997-1998 (n=606)	99 (97, 99)	97 (95, 98)	96 (94, 97)	87 (84, 89)
1999-2000 (n=559)	99 (98, 100)	97 (96, 98)	96 (94, 97)	87 (84, 90)
2001-2002 (n=615)	99 (98, 100)	97 (96, 98)	96 (94, 97)	90 (88, 92)
2003-2004 (n=636)	99 (98, 100)	97 (95, 98)	96 (94, 97)	88 (85, 90)
2005-2006 (n=625)	99 (98, 100)	97 (96, 98)	96 (94, 97)	89 (87, 92)
2007-2008 (n=678)	99 (98, 100)	98 (97, 99)	97 (96, 98)	-
2009-2010 (n=854)	99 (98, 100)	98 (97, 99)	98 (96, 99)	-
Graft Survival				
1991-1992 (n=655)	91 (89, 93)	87 (84, 89)	85 (82, 87)	72 (68, 75)
1993-1994 (n=609)	93 (91, 95)	89 (86, 91)	88 (85, 90)	73 (69, 76)
1995-1996 (n=601)	95 (92, 96)	90 (88, 92)	89 (86, 91)	78 (74, 81)
1997-1998 (n=606)	95 (93, 97)	92 (90, 94)	90 (88, 92)	77 (74, 80)
1999-2000 (n=559)	96 (95, 98)	93 (91, 95)	92 (89, 94)	80 (76, 83)
2001-2002 (n=615)	96 (94, 97)	94 (92, 96)	92 (90, 94)	82 (79, 85)
2003-2004 (n=636)	94 (92, 96)	92 (90, 94)	91 (88, 93)	80 (76, 83)
2005-2006 (n=625)	95 (93, 97)	93 (91, 95)	91 (89, 93)	80 (77, 83)
2007-2008 (n=678)	96 (94, 97)	94 (92, 95)	92 (90, 94)	-
2009-2010 (n=854)	98 (97, 99)	96 (95, 97)	95 (93, 96)	-

Figure 8.51



Short Term Survival - Primary Deceased Donor Grafts

New Zealand

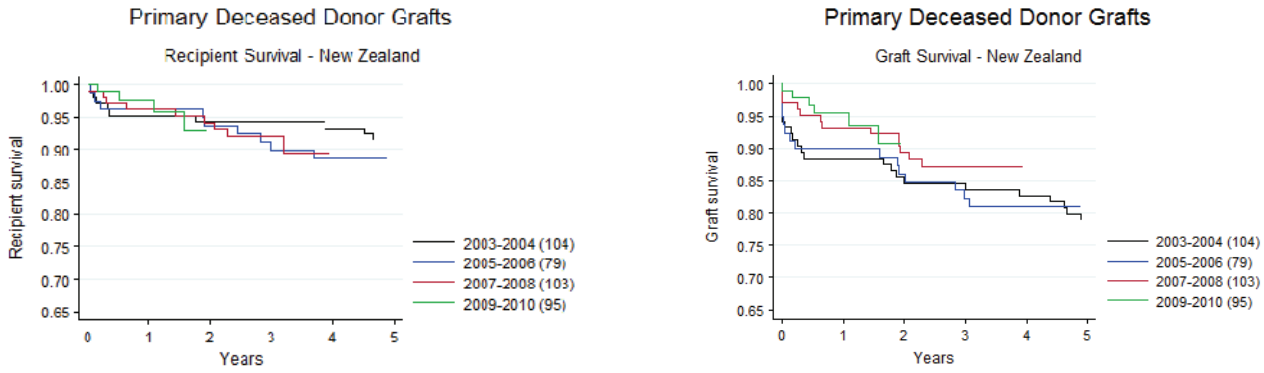
Graft and patient survival for primary deceased donor grafts performed in New Zealand, calculated by the Kaplan-Meier method, is shown in Figure 8.52. Like Australia, the improvement in unadjusted one year patient and graft survival have stabilised in the past ten years, although there is greater random variation due to smaller overall numbers. Figure 8.53 presents these data as Kaplan-Meier curves.

Figure 8.52

Primary Deceased Donor - New Zealand
Recipient and Graft Survival 1991 - 2010
% [95% Confidence Interval]

Year of Transplant	Survival			
	1 month	6 months	1 year	5 years
Recipient Survival				
1991-1992 (n=140)	99 (95, 100)	96 (91, 98)	94 (88, 97)	81 (74, 87)
1993-1994 (n=103)	96 (90, 99)	88 (80, 93)	85 (77, 91)	78 (68, 85)
1995-1996 (n=126)	98 (94, 100)	94 (89, 97)	93 (87, 96)	86 (78, 91)
1997-1998 (n=139)	99 (94, 100)	94 (88, 97)	94 (88, 97)	84 (77, 89)
1999-2000 (n=122)	97 (92, 99)	95 (89, 98)	93 (87, 97)	82 (74, 88)
2001-2002 (n=121)	99 (94, 100)	95 (89, 98)	95 (89, 98)	86 (78, 91)
2003-2004 (n=104)	99 (93, 100)	95 (89, 98)	95 (89, 98)	91 (84, 95)
2005-2006 (n=79)	99 (91, 100)	96 (89, 99)	96 (89, 99)	89 (79, 94)
2007-2008 (n=103)	99 (93, 100)	97 (91, 99)	96 (90, 99)	-
2009-2010 (n=95)	100	99 (93, 100)	98 (91, 99)	-
Graft Survival				
1991-1992 (n=140)	90 (84, 94)	83 (76, 88)	81 (73, 86)	69 (61, 76)
1993-1994 (n=103)	83 (74, 89)	78 (68, 85)	74 (64, 81)	59 (49, 68)
1995-1996 (n=126)	91 (85, 95)	88 (81, 93)	84 (76, 89)	72 (64, 79)
1997-1998 (n=139)	93 (87, 96)	87 (80, 92)	86 (79, 90)	73 (65, 80)
1999-2000 (n=122)	89 (82, 94)	87 (79, 92)	84 (76, 89)	72 (63, 79)
2001-2002 (n=121)	95 (89, 98)	92 (85, 95)	92 (85, 95)	79 (71, 86)
2003-2004 (n=104)	93 (86, 97)	88 (81, 93)	88 (81, 93)	79 (70, 86)
2005-2006 (n=79)	92 (84, 97)	90 (81, 95)	90 (81, 95)	81 (70, 88)
2007-2008 (n=103)	97 (91, 99)	95 (89, 98)	93 (86, 97)	-
2009-2010 (n=95)	99 (93, 100)	97 (90, 99)	96 (89, 98)	-

Figure 8.53



Long Term Survival - Primary Deceased Donor Grafts
Australia and New Zealand

The aim of this section is to summarise the longer term outcomes of kidney transplants in a survival metric rather than as rates - that is, to describe the proportion of grafts surviving at particular time points.

As can be seen from the tables and figures, the graft survival advantage of living over deceased donor recipients and first over subsequent grafts is consistent over time. The considerable jump in survival from the 1980-84 cohort to 1985-89 coincides with the introduction of Cyclosporin into routine clinical practice in Australia. Since that time there have been lesser but consistent improvements in graft survival.

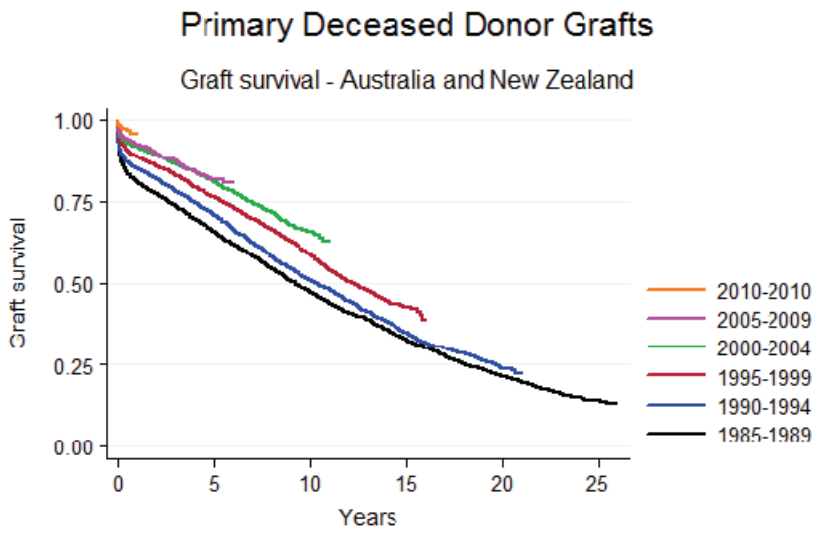
Figure 8.54

Graft and Patient Survival of Primary Grafts Deceased Donors - Australia and New Zealand

	Graft Survival					Patient Survival				
Time Period	1 year	5 yrs	10 yrs	15 yrs	20 yrs	1 year	5 yrs	10 yrs	15 yrs	20 yrs
1970-1974 (n=1149)	58.2%	41.9%	30.3%	22.8%	14.6%	77.0%	57.4%	44.4%	34.2%	25.1%
1975-1979 (n=1463)	51.7%	36.0%	25.6%	17.7%	12.6%	81.0%	63.6%	49.4%	35.5%	26.2%
1980-1984 (n=1595)	63.3%	45.4%	32.1%	23.0%	16.2%	91.4%	75.1%	59.4%	45.9%	34.7%
1985-1989 (n=1916)	80.8%	65.8%	47.2%	32.9%	21.4%	92.1%	80.3%	64.5%	51.2%	39.6%
1990-1994 (n=1906)	85.0%	70.9%	50.7%	34.7%	23.9%	93.4%	83.9%	67.8%	53.3%	40.8%
1995-1999 (n=1779)	88.6%	76.2%	58.6%	42.6%	-	94.7%	86.0%	72.5%	58.3%	-
2000-2004 (n=1850)	91.6%	80.9%	65.7%	-	-	96.0%	89.1%	78.1%	-	-
2005-2009 (n=1911)	92.3%	81.6%	-	-	-	96.7%	89.8%	-	-	-
	-	-	-	-	-	-	-	-	-	-

Note: Survival rates for 2010 grafts cannot yet be calculated.

Figure 8.55



Short Term Survival - Second and Subsequent Deceased Donor Grafts

Australia and New Zealand

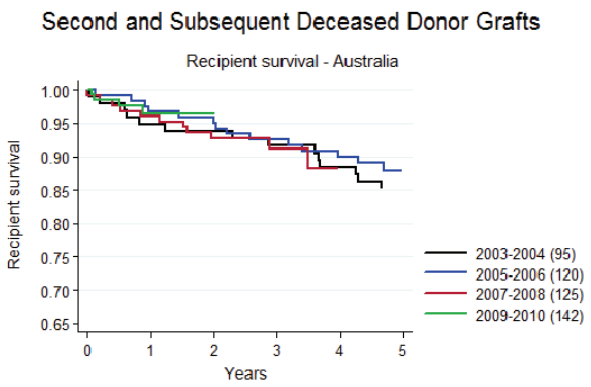
Patient and graft survival for second or subsequent deceased donor grafts in Australia, calculated by the Kaplan-Meier method, is shown in Figures 8.56 and 8.57.

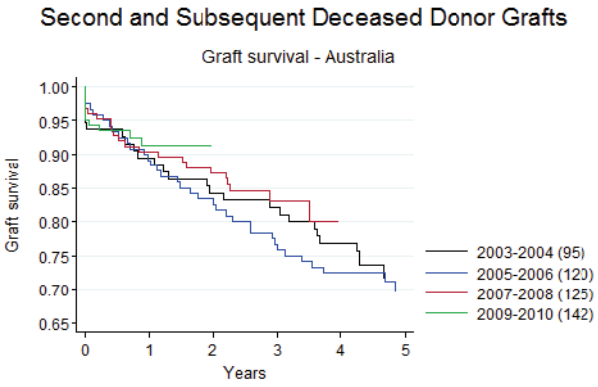
Figure 8.56

Second and Subsequent Deceased Donor - Australia
Recipient and Graft Survival 1991 - 2010
% [95% Confidence Interval]

Year of Transplant	Survival			
	1 month	6 months	1 year	5 years
Recipient Survival				
1991-1992 (n=144)	100	97 (92, 99)	95 (90, 98)	85 (78, 90)
1993-1994 (n=121)	98 (94, 100)	98 (93, 99)	94 (88, 97)	86 (78, 91)
1995-1996 (n=107)	99 (94, 100)	97 (92, 99)	97 (92, 99)	86 (78, 91)
1997-1998 (n=109)	100	97 (92, 99)	95 (89, 98)	86 (78, 91)
1999-2000 (n=78)	99 (91, 100)	96 (89, 99)	95 (87, 98)	86 (76, 92)
2001-2002 (n=87)	99 (92, 100)	94 (87, 98)	92 (84, 96)	87 (78, 93)
2003-2004 (n=95)	99 (93, 100)	98 (92, 99)	95 (88, 98)	85 (76, 91)
2005-2006 (n=120)	100	99 (94, 100)	97 (91, 99)	88 (80, 93)
2007-2008 (n=125)	99 (94, 100)	98 (93, 99)	96 (91, 98)	-
2009-2010 (n=142)	99 (95, 100)	99 (94, 100)	96 (91, 99)	-
Graft Survival				
1991-1992 (n=144)	84 (77, 89)	79 (72, 85)	78 (70, 84)	63 (55, 70)
1993-1994 (n=121)	87 (79, 92)	85 (77, 90)	83 (76, 89)	70 (61, 78)
1995-1996 (n=107)	83 (75, 89)	78 (68, 84)	77 (67, 84)	61 (51, 69)
1997-1998 (n=109)	93 (86, 96)	89 (81, 94)	84 (76, 90)	73 (64, 81)
1999-2000 (n=78)	92 (84, 96)	88 (79, 94)	87 (77, 93)	67 (55, 76)
2001-2002 (n=87)	92 (84, 96)	85 (76, 91)	82 (72, 88)	67 (56, 75)
2003-2004 (n=95)	94 (86, 97)	94 (86, 97)	89 (81, 94)	72 (61, 80)
2005-2006 (n=120)	97 (91, 99)	93 (87, 97)	89 (82, 94)	70 (60, 77)
2007-2008 (n=125)	96 (91, 98)	93 (87, 96)	90 (84, 94)	-
2009-2010 (n=142)	94 (89, 97)	94 (88, 97)	91 (85, 95)	-

Figure 8.57





Long Term Survival - Second and Subsequent Deceased Donor Grafts

Australia and New Zealand

The long-term graft and patient survival of second and subsequent grafts is shown in Figures 8.58 and 8.59. There has been a steady improvement in both graft and patient survival, such that survival of subsequent grafts is now similar to primary grafts (Figures 8.54-8.55).

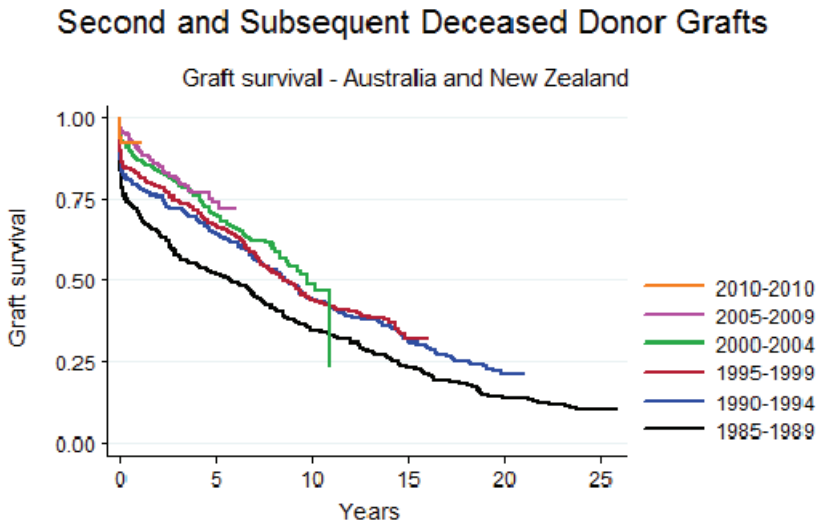
Figure 8.58

Graft and Patient Survival of Second and Subsequent Grafts
Deceased Donors
Australia and New Zealand

	Graft Survival					Patient Survival				
Time Period	1 year	5 yrs	10 yrs	15 yrs	20 yrs	1 year	5 yrs	10 yrs	15 yrs	20 yrs
1970-1974 (n=158)	58.9%	37.3%	27.2%	21.5%	14.6%	79.1%	55.7%	42.4%	33.5%	26.6%
1975-1979 (n=284)	44.0%	28.2%	20.4%	15.0%	8.1%	78.2%	57.4%	44.7%	31.3%	20.0%
1980-1984 (n=417)	48.9%	36.0%	25.6%	20.3%	14.2%	90.6%	74.8%	59.0%	46.8%	37.1%
1985-1989 (n=458)	70.1%	51.7%	34.4%	23.2%	13.9%	93.7%	79.2%	62.8%	47.3%	35.1%
1990-1994 (n=374)	78.3%	64.2%	44.1%	31.2%	20.8%	93.0%	82.6%	67.9%	54.0%	39.4%
1995-1999 (n=297)	81.8%	66.3%	44.1%	31.9%	-	96.0%	86.2%	73.4%	62.3%	-
2000-2004 (n=268)	86.6%	70.1%	48.5%	-	-	93.7%	86.2%	76.8%	-	-
2005-2009 (n=343)	89.5%	73.9%	-	-	-	96.2%	87.5%	-	-	-

Note: Survival rates for 2010 grafts cannot yet be calculated.

Figure 8.59



SHORT TERM SURVIVAL - PRIMARY LIVING DONOR GRAFTS

AUSTRALIA AND NEW ZEALAND

For primary living donor graft recipients, excellent patient and graft survival rates have been maintained despite the increased rates of living donor transplantation and corresponding increase in performing less ideal living donor transplants, particularly from older donors and unrelated donor transplants.

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

Figure 8.60 **Australia**

Primary Living Donor Grafts 1991 - 2010
Recipient and Graft Survival
% [95% Confidence Interval]

Year of Transplant	1 month	6 months	1 year	5 years
Recipient Survival				
1991-1992 (n=135)	99 (95, 100)	99 (94, 100)	99 (94, 100)	86 (79, 91)
1993-1994 (n=160)	100	99 (95, 100)	98 (94, 99)	94 (89, 97)
1995-1996 (n=186)	100	98 (95, 99)	97 (94, 99)	95 (90, 97)
1997-1998 (n=284)	100	99 (96, 99)	98 (96, 99)	96 (93, 98)
1999-2000 (n=320)	99 (98, 100)	98 (96, 99)	98 (96, 99)	94 (91, 96)
2001-2002 (n=410)	100 (98, 100)	99 (97, 100)	99 (97, 99)	95 (92, 97)
2003-2004 (n=419)	100 (98, 100)	99 (97, 100)	99 (97, 100)	94 (92, 96)
2005-2006 (n=463)	100 (98, 100)	100 (98, 100)	99 (98, 100)	98 (96, 99)
2007-2008 (n=557)	100 (99, 100)	99 (97, 99)	99 (97, 99)	-
2009-2010 (n=564)	100 (99, 100)	99 (98, 100)	99 (97, 99)	-
Graft Survival				
1991-1992 (n=135)	96 (90, 98)	93 (88, 96)	92 (86, 95)	76 (68, 83)
1993-1994 (n=160)	97 (93, 99)	96 (91, 98)	95 (90, 97)	85 (78, 90)
1995-1996 (n=186)	93 (88, 96)	91 (86, 94)	90 (84, 93)	84 (78, 89)
1997-1998 (n=284)	98 (96, 99)	97 (94, 98)	96 (94, 98)	87 (82, 90)
1999-2000 (n=320)	97 (94, 98)	95 (92, 97)	94 (91, 96)	86 (82, 90)
2001-2002 (n=410)	98 (96, 99)	96 (94, 98)	96 (93, 97)	88 (85, 91)
2003-2004 (n=419)	99 (97, 100)	98 (96, 99)	97 (95, 98)	88 (84, 91)
2005-2006 (n=463)	98 (97, 99)	98 (96, 99)	97 (95, 98)	91 (88, 93)
2007-2008 (n=557)	98 (96, 99)	97 (95, 98)	97 (95, 98)	-
2009-2010 (n=564)	99 (98, 100)	98 (97, 99)	97 (95, 99)	-

Figure 8.61 **New Zealand**

Primary Living Donor Grafts 1991 - 2010
Recipient and Graft Survival
% [95% Confidence Interval]

Year of Transplant	1 month	6 months	1 year	5 years
Recipient Survival				
1991-1992 (n=27)	100	96 (76, 99)	96 (76, 99)	96 (76, 99)
1993-1994 (n=35)	100	100	97 (81, 100)	88 (72, 96)
1995-1996 (n=46)	100	100	100	91 (78, 97)
1997-1998 (n=57)	100	100	100	89 (78, 95)
1999-2000 (n=66)	100	100	100	95 (86, 98)
2001-2002 (n=83)	100	99 (92, 100)	99 (92, 100)	94 (86, 97)
2003-2004 (n=88)	99 (92, 100)	99 (92, 100)	98 (91, 99)	93 (85, 97)
2005-2006 (n=88)	100	98 (91, 99)	97 (90, 99)	93 (85, 97)
2007-2008 (n=120)	99 (94, 100)	99 (94, 100)	98 (94, 100)	-
2009-2010 (n=118)	100	98 (93, 100)	96 (89, 99)	-
Graft Survival				
1991-1992 (n=27)	96 (76, 99)	93 (74, 98)	93 (74, 98)	81 (61, 92)
1993-1994 (n=35)	91 (76, 97)	89 (72, 96)	89 (72, 96)	74 (56, 86)
1995-1996 (n=46)	98 (86, 100)	98 (86, 100)	98 (86, 100)	76 (61, 86)
1997-1998 (n=57)	96 (87, 99)	96 (87, 99)	95 (85, 98)	72 (58, 82)
1999-2000 (n=66)	95 (87, 99)	94 (85, 98)	94 (85, 98)	82 (70, 89)
2001-2002 (n=83)	100	99 (92, 100)	99 (92, 100)	88 (79, 93)
2003-2004 (n=88)	97 (90, 99)	95 (88, 98)	95 (88, 98)	86 (77, 92)
2005-2006 (n=88)	99 (92, 100)	97 (90, 99)	95 (88, 98)	90 (82, 95)
2007-2008 (n=120)	98 (94, 100)	98 (92, 99)	97 (91, 99)	-
2009-2010 (n=118)	99 (94, 100)	97 (92, 99)	96 (88, 98)	-

Figure 8.62

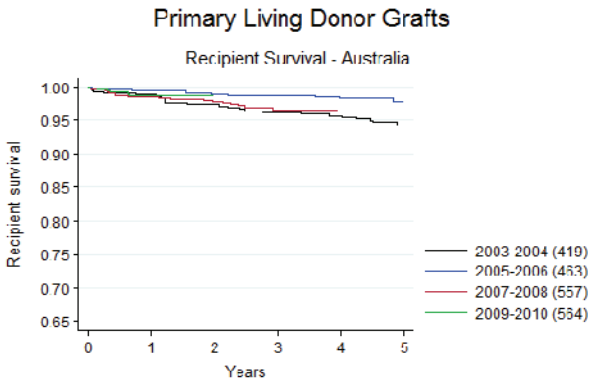


Figure 8.63

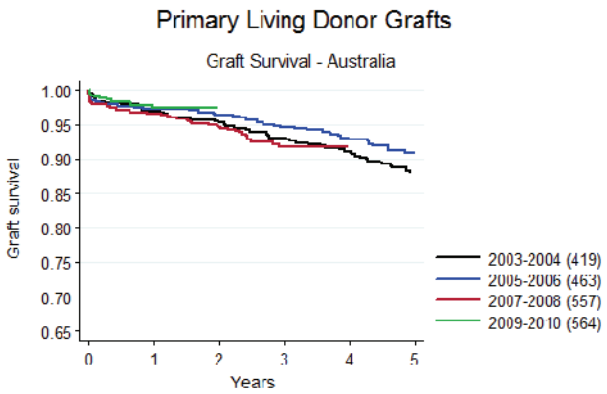


Figure 8.64

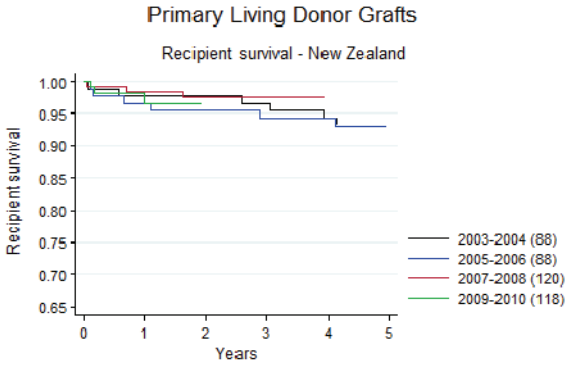
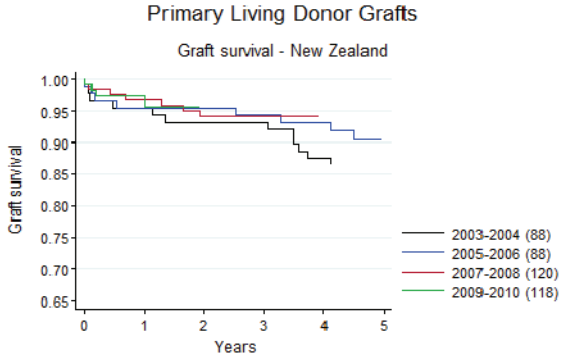


Figure 8.65



Long Term Survival - Primary Living Donor Grafts
Australia and New Zealand

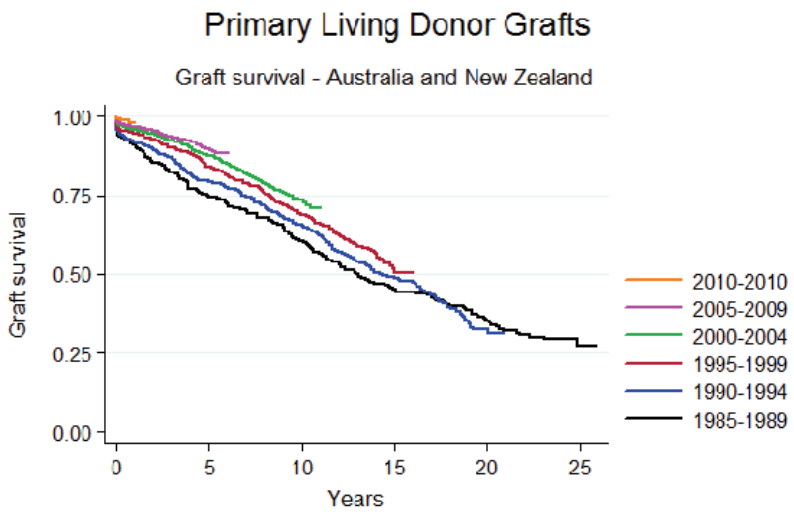
Figure 8.66

Graft and Patient Survival of Primary Grafts Living Donors - Australia and New Zealand

	Graft Survival					Patient Survival				
Time Period	1 year	5 yrs	10 yrs	15 yrs	20 yrs	1 year	5 yrs	10 yrs	15 yrs	20 yrs
1970-1974 (n=21)	85.7%	76.2%	61.5%	46.2%	20.5%	90.5%	81.0%	61.9%	52.4%	42.9%
1975-1979 (n=107)	81.2%	63.3%	49.9%	41.2%	31.1%	90.7%	78.5%	71.0%	61.7%	52.2%
1980-1984 (n=241)	82.8%	71.2%	59.3%	46.5%	35.9%	96.3%	85.4%	74.9%	64.8%	55.4%
1985-1989 (n=230)	90.8%	74.8%	60.5%	45.1%	35.1%	95.2%	87.8%	79.9%	71.1%	62.9%
1990-1994 (n=431)	91.8%	79.6%	65.3%	48.8%	32.3%	97.2%	89.2%	84.0%	74.5%	67.8%
1995-1999 (n=766)	94.5%	84.0%	68.8%	51.6%	-	98.6%	94.7%	86.6%	78.6%	-
2000-2004 (n=1193)	95.9%	87.7%	73.5%	-	-	98.5%	94.3%	87.7%	-	-
2005-2009 (n=1585)	96.7%	89.8%	-	-	-	98.5%	96.4%	-	-	-

Note: Survival rates for 2010 grafts cannot yet be calculated.

Figure 8.67



Long Term Survival - Second and Subsequent Living Donor Grafts

Australia and New Zealand

Figure 8.68

Graft and Patient Survival of Second and Subsequent Grafts Living Donors - Australia and New Zealand

	Graft Survival					Patient Survival				
Time Period	1 year	5 yrs	10 yrs	15 yrs	20 yrs	1 year	5 yrs	10 yrs	15 yrs	20 yrs
1970-1974 (n=1)	100.0%	100.0%	-	-	-	100.0%	100.0%	-	-	-
1975-1979 (n=11)	72.7%	45.5%	36.4%	36.4%	27.3%	100.0%	100.0%	81.8%	72.7%	63.6%
1980-1984 (n=42)	78.6%	64.3%	59.5%	50.0%	40.5%	97.6%	81.0%	78.6%	71.4%	51.9%
1985-1989 (n=31)	87.1%	74.2%	58.1%	45.2%	29.0%	96.8%	83.9%	71.0%	64.5%	47.5%
1990-1994 (n=38)	100.0%	86.8%	41.2%	35.7%	20.6%	100.0%	94.7%	73.3%	67.9%	45.2%
1995-1999 (n=73)	93.2%	83.6%	69.9%	58.2%	-	98.6%	98.6%	89.0%	79.1%	-
2000-2004 (n=107)	93.5%	86.0%	63.1%	-	-	98.1%	95.3%	86.7%	-	-
2005-2009 (n=175)	95.4%	83.6%	-	-	-	98.3%	92.1%	-	-	-

Note: 2010 cannot be calculated

Figure 8.69