CHAPTER 8

TRANSPLANTATION

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TRANSPLANTS PERFORMED IN 2000

Figure 8.1

Number of Renal Transplant Operations
(Living 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 (34)**	61	13	3	2	**79 (16)**
1980	287	63	9	0	0	**359 (36)**	57	13	4	0	**74 (18)**
1981	306	588	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	309	58	21	3	0	**391 (39)**	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	385	70	11	3	0	**469 (77)**	62	10	4	1	**77 (13)**
1992	403	57	13	3	0	**476 (69)**	105	5	5	0	**115 (17)**
1993	383	63	6	4	1	**457 (64)**	69	13	2	0	**84 (20)**
1994	384	41	12	2	1	**440 (103)**	70	11	1	1	**83 (20)**
1995	370	60	11	0	0	**441 (93)**	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	**502 (144)**	101	10	1	0	**112 (31)**
1998	443	62	11	2	0	**518 (161)**	95	10	1	0	**106 (31)**
1999	402	42	9	0	0	**453 (167)**	97	11	4	0	**112 (42)**
2000	475	47	7	1	0	**530 (180)**	91	13	2	0	**106 (31)**

AUSTRALIA

The 530 operations performed in 2000 is an increase of 17% compared to 1999 (453 operations). This represents a transplant rate of 28 per million of population (24 per million in 1999 and 28 per million in 1998).

The living donor transplant rate was 34% (180 grafts) in 2000, compared to 37% (167 grafts) in 1999.

Of the kidneys transplanted, 90% were for primary recipients compared to 89% in 1999.

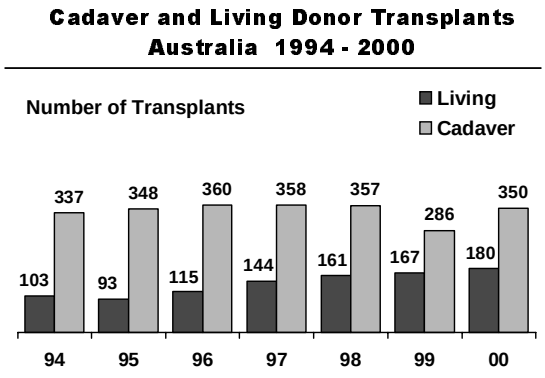
NEW ZEALAND

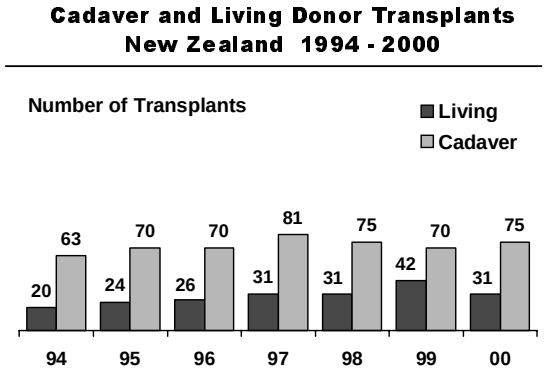
The number of operations (106) performed in 2000 represents a transplant rate of 28 per million (a decrease of 5% from 1999).

The percentage of living donors was 29% of all operations compared to 38% in 1999.

Of the grafts performed in 2000, 86% were to primary recipients.

Figure 8.2





Transplant Rate of Patients Dialysed

In Australia the proportion of patients receiving dialysis who were transplanted in 2000 was 6.7% compared to 6.1% in 1999. For dialysing patients in the 15-59 year age group, the percentage was 11.4% in 2000 and 10.5% in 1999.

In New Zealand the number of operations represents 6.3% of all dialysed patients and 8.8% of dialysed patients in the age group 15-59 years (fig 8.3 and 8.4).

Figure 8.3

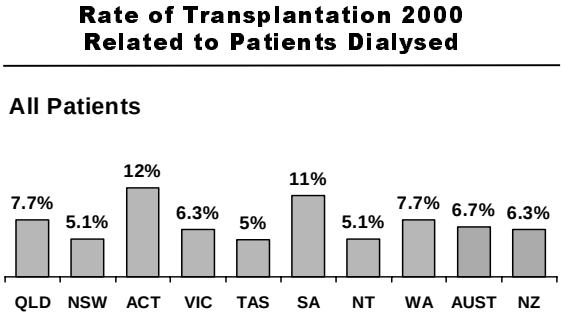
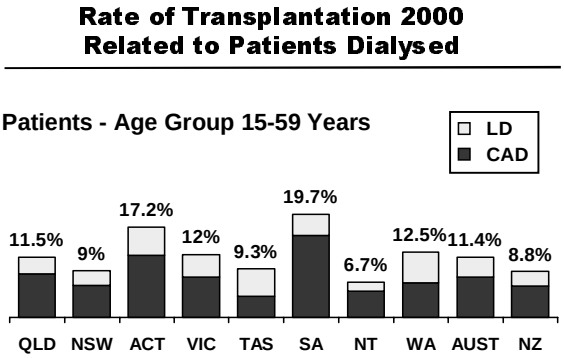


Figure 8.4



In both countries the rate of transplantation related to the patients dialysed was greatest in the age group less than 14 years and decreased with age to the lowest percentage in dialysed patients greater than 65 years (fig 8.5 and 8.6).

Figure 8.5

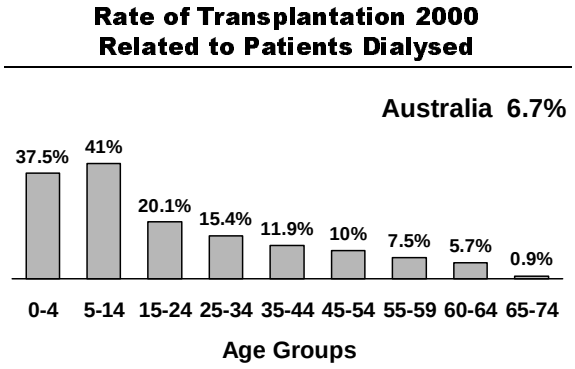
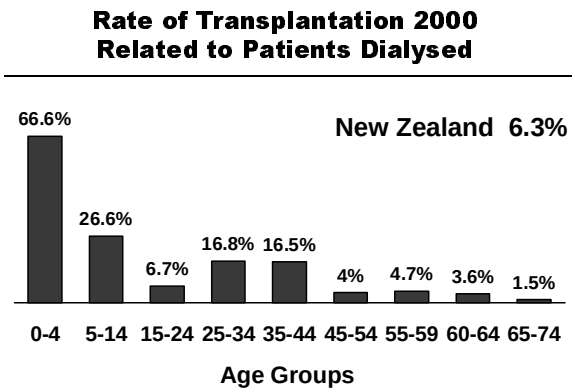


Figure 8.6



AGE OF RECIPIENTS TRANSPLANTED IN 2000

Figure 8.7

Graft Number and Age of Patients Transplanted 1-Jan-2000 to 31-Dec-2000

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											
Cadaver	1	1	5	14	50	58	92	77	14	0	**311**
	2	0	0	1	6	12	10	4	1	0	**34**
	3	0	1	0	1	2	1	0	0	0	**5**
Living Donor	1	5	9	28	31	31	34	23	3	0	**164**
	2	0	1	0	4	4	1	1	2	0	**13**
	3	0	0	0	0	2	0	0	0	0	**2**
	4	0	0	0	0	1	0	0	0	0	**1**
Total		**6**	**16**	**43**	**92**	**110**	**138**	**105**	**20**	**0**	**530**
New Zealand											
Cadaver	1	0	3	2	12	19	8	15	4	0	**63**
	2	0	1	0	1	6	2	0	0	0	**10**
	3	0	0	0	0	2	0	0	0	0	**2**
Living Donor	1	2	0	2	7	9	3	4	1	0	**28**
	2	0	0	0	1	1	1	0	0	0	**3**
Total		**2**	**4**	**4**	**21**	**37**	**14**	**19**	**5**	**0**	**106**

AUSTRALIA

The median age of transplanted recipients in 2000 was 44.4 years compared to 43.8 years in 1999. Forty seven percent of recipients fell into the 35-54 year age group. Twenty four percent of recipients in 2000 were over 54 years of age compared to 22% in 1999. The age range was 2.6 to 73.4 years (fig 8.7 and 8.8).

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 8.8.

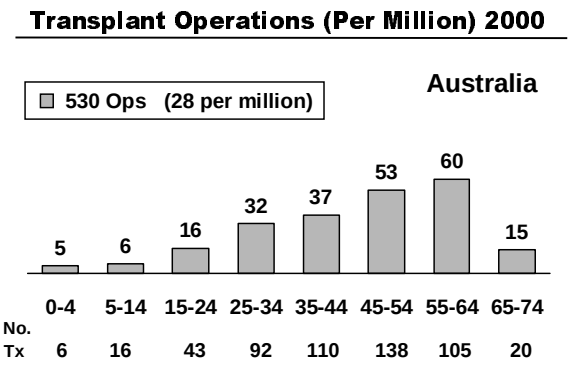
NEW ZEALAND

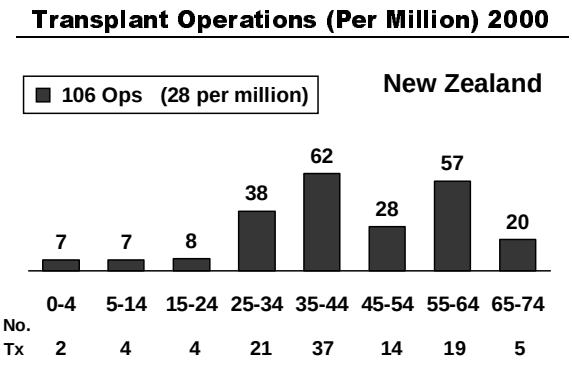
The median age of transplant recipients in 2000 was 41.6 years.

Recipients aged between 35 and 54 years comprised 48% of the total. Twenty three percent of recipients in 2000 were over 54 years of age.

The age range was 1.9 to 68 years (fig 8.5 and 8.8).

Figure 8.8





Race of Transplant Recipients

Australia

Figures 8.9 and 8.11.

In the 15-59 year age group in 2000, 13.5% of dialysed Caucasoid patients were transplanted. This figure has fallen slowly over the last six years. For Australian Aboriginals, the corresponding transplant rate for 2000 was 3.1%. The absolute number (16) is a decrease from the absolute high (26) of 1998.

Figure 8.9 **Australia**

Transplantation Rate - Age Group 15-59 years 1990 - 2000

Year	Caucasoid			Aboriginal			All Patients		
	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate
1990	1921	318	16.5%	146	18	12.3%	2264	373	16.4%
1991	1964	363	18.4%	160	12	7.5%	2327	401	17.2%
1992	2005	349	17.4%	184	17	9.2%	2443	402	16.4%
1993	2075	328	15.8%	222	10	4.5%	2568	375	14.6%
1994	2224	334	15.0%	272	11	4.0%	2802	369	13.1%
1995	2320	317	13.6%	324	13	4.0%	2994	365	12.1%
1996	2448	358	14.6%	364	8	2.1%	3187	402	12.6%
1997	2525	359	14.2%	415	18	4.3%	3362	426	12.6%
1998	2652	357	13.4%	451	26	5.7%	3554	436	12.2%
1999	2739	322	11.7%	484	20	4.1%	3690	387	10.4%
2000	2844	386	13.5%	505	16	3.1%	3859	440	11.4%

New Zealand

Figures 8.10 and 8.11

In the 15-59 year age group, 2000 has seen a continuing increase in the number of all ethnic groups, especially Pacific Islander patients accepted onto the dialysis programme. The proportion of Maori and Pacific Islanders in this age group who have received a renal transplant in 2000 was 3% and 2.2% respectively, compared to 17% for Caucasoid dialysis patients.

Figure 8.10 **New Zealand**

Transplantation Rate - Age Group 15-59 years 1990 - 2000

Year	Caucasoid			Maori			Pacific Islander			All Patients		
	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate
1990	318	68	21.3%	156	9	5.7%	62	8	12.9%	553	89	16.0%
1991	314	44	14.0%	188	15	7.9%	61	5	8.1%	579	67	11.5%
1992	336	80	23.8%	203	11	5.4%	64	3	4.7%	625	104	16.6%
1993	316	53	16.7%	211	4	1.8%	88	3	3.4%	639	63	9.8%
1994	317	52	16.4%	228	11	4.8%	96	5	5.2%	673	71	10.5%
1995	332	54	16.2%	240	11	4.5%	113	6	5.3%	725	78	10.7%
1996	349	58	16.6%	261	7	2.6%	130	7	5.3%	786	79	10.0%
1997	371	73	19.6%	279	9	3.2%	134	3	2.2%	828	91	10.9%
1998	372	60	16.1%	321	14	4.3%	151	7	4.6%	898	86	9.5%
1999	388	67	17.2%	317	16	5.0%	159	8	5.0%	928	98	10.5%
2000	398	68	17.0%	327	10	3.0%	181	4	2.2%	969	86	8.8%

Figure 8.11

New Transplanted Patients 1996 - 2000 Related to Race

Race	1996	1997	1998	1999	2000
Australia	(475)	(502)	(518)	(453)	(530)
Caucasoid	427 (90%)	425 (85%)	434 (84%)	379 (84%)	463 (88%)
Aboriginal	8 (2%)	20 (4%)	28 (5%)	23 (5%)	17 (3%)
Asian	25 (5%)	44 (9%)	37 (7%)	39 (9%)	38 (7%)
Other	15 (3%)	13 (2%)	19 (4%)	12 (2%)	12 (2%)
New Zealand	(96)	(112)	(106)	(112)	(106)
Caucasoid	69 (72%)	91 (81%)	77 (73%)	78 (70%)	81 (76%)
Maori	12 (13%)	11 (10%)	17 (16%)	17 (15%)	13 (12%)
Pacific Islander	7 (7%)	4 (4%)	7 (7%)	8 (7%)	4 (4%)
Asian	7 (7%)	6 (5%)	4 (4%)	9 (8%)	8 (8%)
Other	1 (1%)	0	1 (<1%)	0	0

AUSTRALIAN STATE TRANSPLANTATION ACTIVITY 2000

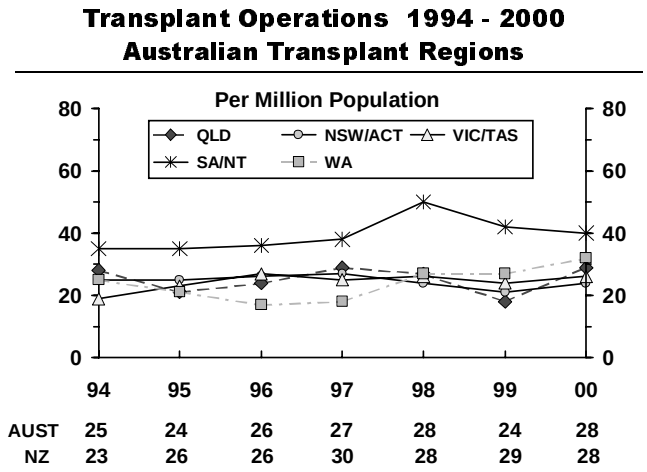
Figure 8.12

Transplants in each Region 1996 - 2000
Number of Operations
(per Million Population)

State	1996	1997	1998	1999	2000
Queensland	80 (24)	98 (29)	93 (27)	64 (18)	105 (29)
New South Wales/ACT ★	171 (26)	179 (27)	160 (24)	142 (21)	161 (24)
Victoria/Tasmania ★	134 (27)	128 (25)	131 (26)	126 (24)	136 (26)
South Australia/NT ★	60 (36)	64 (38)	84 (50)	70 (42)	68 (40)
Western Australia	30 (17)	33 (18)	50 (27)	51 (27)	60 (32)
Australia	**475 (26)**	**502 (27)**	**518 (28)**	**453 (24)**	**530 (28)**

★ For calculation of population related totals, the populations of these States were amalgamated

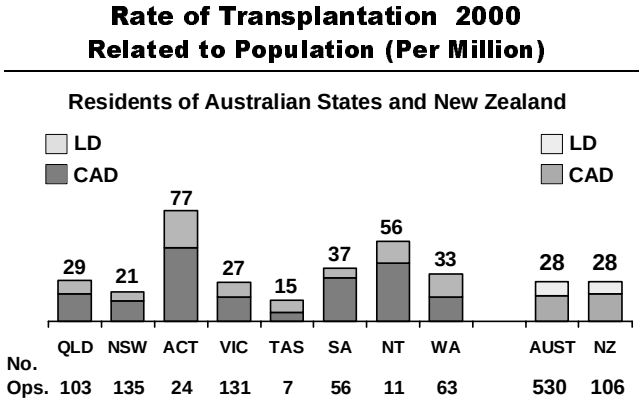
Figure 8.13



The population related rate of transplantation for each transplant region is shown in Figures 8.12 and 8.13. Those transplants performed for Tasmania and Northern Territory patients have been included in figures for Victoria and South Australia respectively.

South Australia/Northern Territory continued to have the highest transplant rate (40 per million) in 2000. The rate in the other States was between 24 and 32 per million.

Figure 8.14



The population related transplant rate has been calculated for residents of each State and the Northern Territory and is shown in Figure 8.14.

There was a rise in all States except Tasmania and the Northern Territory. New South Wales remained the same. The lowest (15 per million) was in Tasmania, the highest (77 per million) in the ACT.

TRANSPLANT SURVIVAL - PRIMARY CADAVERIC GRAFTS

AUSTRALIA

Figure 8.15

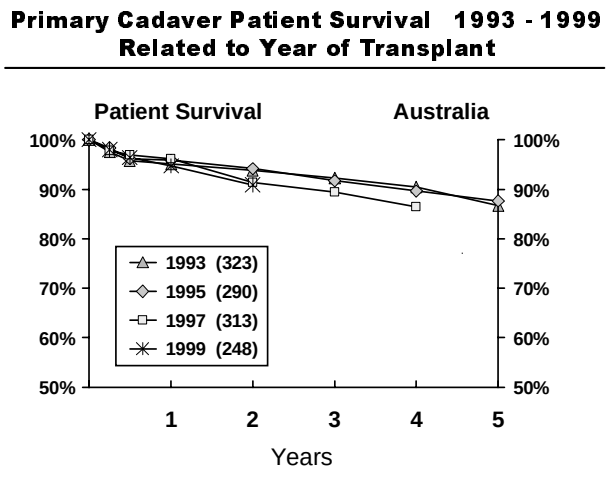
Primary Cadaver Patient and Graft Survival 1990 - 2000

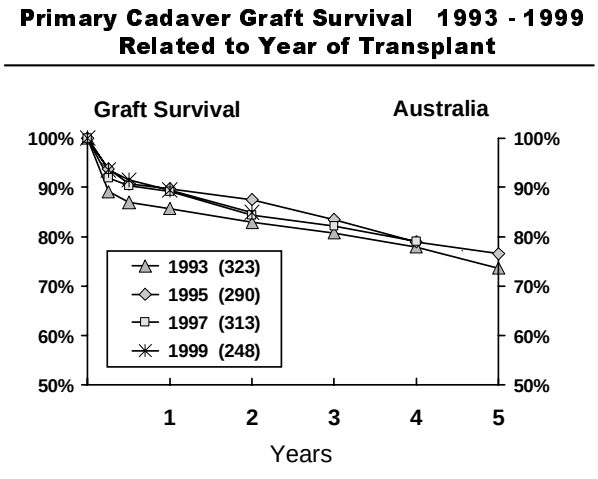
% Survival ± S.E. / Number at Risk

n = Number of Patients

Year of Transplant		Survival											
		1 month		3 months		6 months		1 year		3 years		5 years	
Patient Survival													
1990	n=334	99 ± 0.7	329	96 ± 1.1	320	94 ± 1.3	315	93 ± 1.4	311	88 ± 1.8	294	85 ± 2.0	284
1991	n=313	99 ± 0.6	309	95 ± 1.2	298	95 ± 1.3	296	93 ± 1.4	292	89 ± 1.8	278	85 ± 2.0	267
1992	n=342	99 ± 0.5	339	97 ± 0.9	333	95 ± 1.1	326	93 ± 1.4	319	89 ± 1.7	305	83 ± 2.0	284
1993	n=323	98 ± 0.7	318	98 ± 0.9	315	96 ± 1.1	309	95 ± 1.2	307	92 ± 1.5	298	87 ± 1.9	280
1994	n=286	99 ± 0.6	283	98 ± 0.9	279	96 ± 1.1	275	96 ± 1.2	274	92 ± 1.6	262	84 ± 2.2	239
1995	n=290	100 ± 0.3	289	98 ± 0.8	285	96 ± 1.1	279	96 ± 1.2	278	92 ± 1.6	266	88 ± 1.9	254
1996	n=311	99 ± 0.6	307	96 ± 1.1	299	95 ± 1.2	296	95 ± 1.3	294	93 ± 1.5	288	-	
1997	n=313	98 ± 0.7	308	98 ± 0.8	306	97 ± 1.0	303	96 ± 1.1	300	89 ± 1.7	279	-	
1998	n=293	99 ± 0.6	290	98 ± 0.9	286	97 ± 1.0	284	95 ± 1.3	277	-		-	
1999	n=248	99 ± 0.6	246	98 ± 0.9	243	96 ± 1.2	239	95 ± 1.4	235	-		-	
2000	n=311	100 ± 0.3	310	99 ± 0.4	309	98 ± 0.8	238	-		-		-	
Graft Survival													
1990	n=334	92 ± 1.5	308	89 ± 1.7	297	87 ± 1.8	291	86 ± 1.9	287	78 ± 2.3	260	72 ± 2.5	240
1991	n=313	91 ± 1.6	286	88 ± 1.9	275	86 ± 2.0	269	84 ± 2.1	262	76 ± 2.4	239	72 ± 2.6	224
1992	n=342	91 ± 1.5	312	90 ± 1.6	307	88 ± 1.8	300	86 ± 1.9	293	79 ± 2.2	269	72 ± 2.4	247
1993	n=323	92 ± 1.5	296	89 ± 1.7	288	87 ± 1.9	281	85 ± 2.0	276	81 ± 2.2	260	74 ± 2.4	237
1994	n=286	95 ± 1.3	271	94 ± 1.4	268	92 ± 1.6	262	91 ± 1.7	259	83 ± 2.2	236	72 ± 2.7	204
1995	n=290	96 ± 1.2	277	94 ± 1.4	272	91 ± 1.7	263	90 ± 1.8	260	83 ± 2.2	242	77 ± 2.5	222
1996	n=311	94 ± 1.4	291	91 ± 1.6	284	90 ± 1.7	279	89 ± 1.8	276	84 ± 2.1	261	-	
1997	n=313	94 ± 1.4	293	92 ± 1.5	288	90 ± 1.7	283	89 ± 1.8	279	82 ± 2.2	257	-	
1998	n=293	97 ± 1.1	283	95 ± 1.3	278	94 ± 1.4	276	91 ± 1.6	267	-		-	
1999	n=248	95 ± 1.4	236	94 ± 1.6	232	92 ± 1.8	227	90 ± 2.0	222	-		-	
2000	n=311	97 ± 0.9	303	96 ± 1.0	300	94 ± 1.4	229	-		-		-	

Figure 8.16





TRANSPLANT SURVIVAL - PRIMARY CADAVERIC GRAFTS

NEW ZEALAND

Figure 8.17

Primary Cadaver Patient and Graft Survival 1990 - 2000

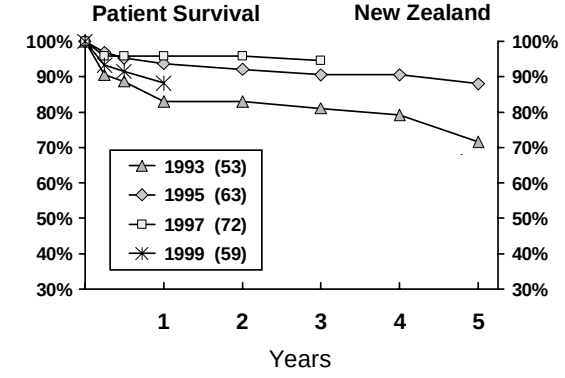
% Survival ± S.E. / Number at Risk

n = Number of Patients

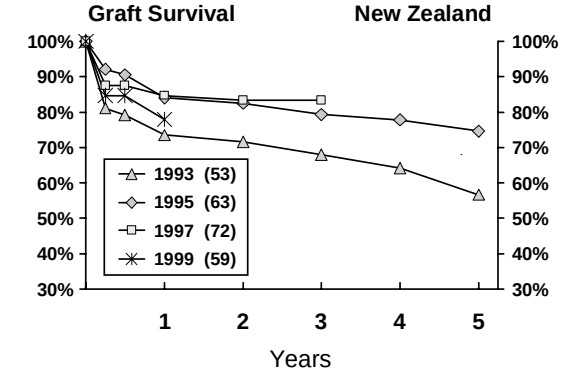
Year of Transplant		Survival											
		1 month		3 months		6 months		1 year		3 years		5 years	
Patient Survival													
1990	n=65	94 ± 3.0	61	91 ± 3.6	59	91 ± 3.6	59	89 ± 3.8	58	83 ± 4.7	54	77 ± 5.2	50
1991	n=50	100 ± 0.0	50	96 ± 2.8	48	96 ± 2.8	48	96 ± 2.8	48	88 ± 4.6	44	78 ± 5.9	39
1992	n=90	99 ± 1.1	89	97 ± 1.9	87	96 ± 2.2	86	92 ± 2.8	83	86 ± 3.7	77	83 ± 3.9	74
1993	n=53	96 ± 2.6	51	91 ± 4.0	48	89 ± 4.4	47	83 ± 5.2	44	81 ± 5.4	43	72 ± 6.2	38
1994	n=51	96 ± 2.7	49	92 ± 3.8	47	88 ± 4.5	45	88 ± 4.5	45	86 ± 4.8	44	84 ± 5.1	43
1995	n=63	98 ± 1.6	62	97 ± 2.2	61	95 ± 2.7	60	94 ± 3.1	59	90 ± 3.7	57	90 ± 3.7	57
1996	n=63	98 ± 1.6	62	95 ± 2.7	60	94 ± 3.1	59	92 ± 3.4	58	86 ± 4.4	54	-	
1997	n=72	99 ± 1.4	71	96 ± 2.4	69	96 ± 2.4	69	96 ± 2.4	69	94 ± 2.7	68	-	
1998	n=67	99 ± 1.5	66	97 ± 2.1	65	91 ± 3.5	61	91 ± 3.5	61	-		-	
1999	n=59	93 ± 3.3	55	92 ± 3.6	54	92 ± 3.6	54	88 ± 4.2	52	-		-	
2000	n=63	100 ± 0.0	63	98 ± 1.6	62	98 ± 1.6	37	-		-		-	
Graft Survival													
1990	n=65	92 ± 3.3	60	86 ± 4.3	56	86 ± 4.3	56	83 ± 4.7	54	72 ± 5.5	47	63 ± 6.0	41
1991	n=50	88 ± 4.6	44	84 ± 5.2	42	82 ± 5.4	41	82 ± 5.4	41	74 ± 6.2	37	62 ± 6.9	31
1992	n=90	91 ± 3.0	82	87 ± 3.6	78	83 ± 3.9	75	80 ± 4.2	72	76 ± 4.5	68	73 ± 4.7	65
1993	n=53	85 ± 4.9	45	81 ± 5.4	43	79 ± 5.6	42	74 ± 6.1	39	68 ± 6.4	36	57 ± 6.8	30
1994	n=51	80 ± 5.6	41	78 ± 5.8	40	76 ± 5.9	39	75 ± 6.1	38	71 ± 6.4	36	63 ± 6.8	32
1995	n=63	94 ± 3.1	59	92 ± 3.4	58	90 ± 3.7	57	84 ± 4.6	53	79 ± 5.1	50	75 ± 5.5	47
1996	n=63	89 ± 4.0	56	87 ± 4.2	55	86 ± 4.4	54	84 ± 4.6	53	76 ± 5.4	48	-	
1997	n=72	90 ± 3.5	65	88 ± 3.9	63	88 ± 3.9	63	85 ± 4.2	61	83 ± 4.4	60	-	
1998	n=67	96 ± 2.5	64	93 ± 3.2	62	87 ± 4.2	58	87 ± 4.2	58	-		-	
1999	n=59	86 ± 4.5	51	85 ± 4.7	50	85 ± 4.7	50	78 ± 5.4	46	-		-	
2000	n=63	92 ± 3.4	58	90 ± 3.7	57	90 ± 3.7	34	-		-		-	

Figure 8.18

Primary Cadaver Patient Survival 1993 - 1999
Related to Year of Transplant



Primary Cadaver Graft Survival 1993 - 1999
Related to Year of Transplant



Australian Transplant Survival
Subsequent Cadaveric Grafts

Patient and graft survivals for second or subsequent cadaveric grafts are examined in three year cohorts, 1998-2000; 1995-97; 1992-94; 1989-91 and 1986-88.

Figure 8.19

Second and Subsequent Cadaver Patient and Graft Survival 1986 - 2000

% Survival ± S.E. / Number at Risk

n = Number of Patients

Year of Transplant		Survival					
		1 month	3 months	6 months	1 year	3 years	5 years
Patient Survival							
1986-88	n=215	100 ± 0.0 215	98 ± 0.9 211	97 ± 1.2 208	95 ± 1.4 205	89 ± 2.2 190	81 ± 2.7 174
1989-91	n=182	99 ± 0.8 180	97 ± 1.3 176	95 ± 1.7 172	92 ± 2.0 168	86 ± 2.6 157	81 ± 2.9 147
1992-94	n=186	99 ± 0.8 184	97 ± 1.2 181	97 ± 1.3 180	95 ± 1.7 176	91 ± 2.1 170	84 ± 2.7 157
1995-97	n=152	99 ± 0.7 151	98 ± 1.1 149	97 ± 1.3 148	97 ± 1.3 148	92 ± 2.2 139	-
1998-2000	n=141	99 ± 0.7 140	97 ± 1.4 137	97 ± 1.4 129	95 ± 2.0 101	-	-
Graft Survival							
1986-88	n=215	85 ± 2.5 182	80 ± 2.8 171	77 ± 2.9 166	74 ± 3.0 160	63 ± 3.3 135	55 ± 3.4 118
1989-91	n=182	85 ± 2.7 154	83 ± 2.8 151	80 ± 3.0 145	77 ± 3.1 141	68 ± 3.5 123	60 ± 3.6 109
1992-94	n=186	86 ± 2.5 160	83 ± 2.7 155	83 ± 2.7 154	81 ± 2.9 151	75 ± 3.2 140	68 ± 3.4 126
1995-97	n=152	86 ± 2.8 131	83 ± 3.1 126	82 ± 3.1 125	81 ± 3.2 123	72 ± 3.6 109	-
1998-2000	n=141	92 ± 2.3 130	90 ± 2.7 125	88 ± 2.8 117	84 ± 3.2 88	-	-

Figure 8.20

Second and Subsequent Cadaver Patient Survival Related to Years of Transplant 1986 - 2000

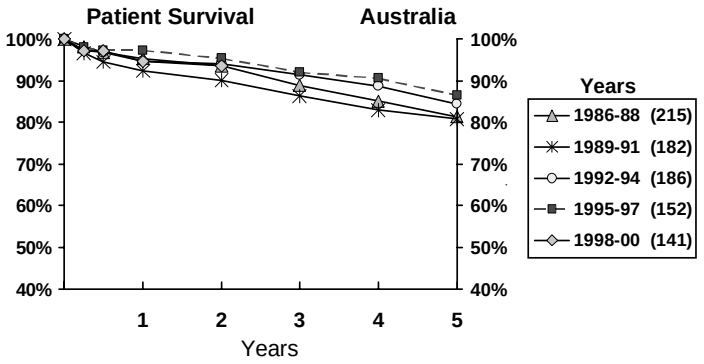
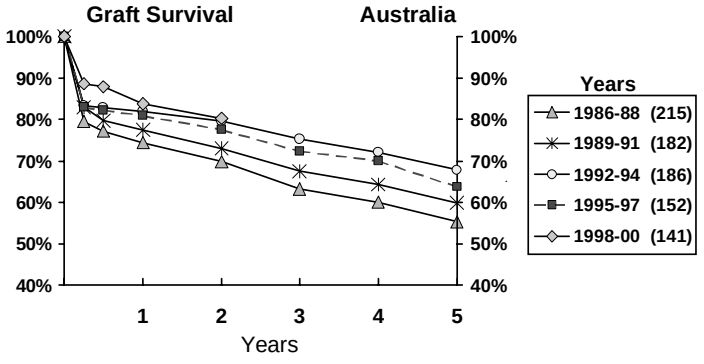


Figure 8.21

Second and Subsequent Cadaver Graft Survival Related to Years of Transplant 1986 - 2000



LIVING DONOR TRANSPLANTS

Figure 8.22 **Australia**

Living Donor Operations as Proportion (%) of Annual Transplantation 1996 - 2000

Recipient Age Groups	Year of Transplantation				
	1996	1997	1998	1999	2000
00-04 years	50%	100%	67%	100%	83%
05-14 years	50%	60%	47%	58%	63%
15-24 years	36%	57%	54%	61%	65%
25-34 years	32%	44%	37%	39%	38%
35-44 years	27%	27%	32%	41%	35%
45-54 years	12%	18%	21%	26%	25%
55-64 years	13%	10%	21%	27%	23%
65-74 years	18%	0%	19%	0%	25%
All Recipients	**24%**	**29%**	**31%**	**37%**	**34%**

AUSTRALIA

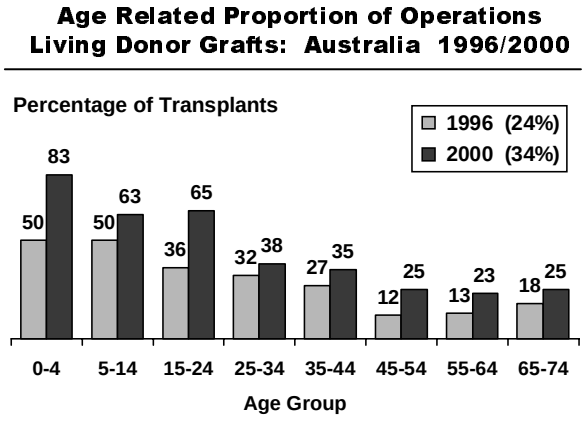
The year 2000 saw the largest absolute number of living donor transplants being performed in Australia representing 34% of all transplant operations. This ongoing increase has continued each year since 1994 (fig 8.22 and 8.26).

Figure 8.23 shows the age-related proportion of living donor transplants for the years 1996 and 2000. The overall proportion of living donor transplants continued to rise between these years. The proportion of living donors increased in all age groups, the largest increase was in the 15-24 year age group.

The proportion of living donor transplants for each State and New Zealand for recipients aged 25-44 years is shown in Figure 8.24 for the years 1993-96 and 1997-2000. There have been increases in all regions.

The proportion of unrelated donors has risen over the last few years and in 2000 was 31%. Eighty percent of living unrelated donors were spouses, with wives out numbering husbands 2:1. The number of related donors has not changed since 1997 (fig 8.26).

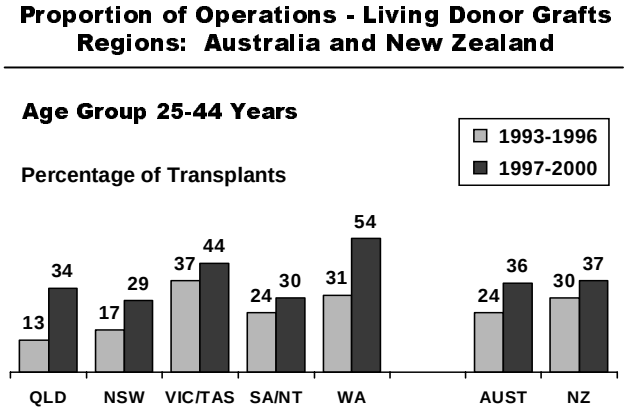
Figure 8.23



NEW ZEALAND

Twenty nine percent of grafts were from a living donor (38% in 1999 and 29% in 1998). There were ten living unrelated donors. Sixty five percent of living donors were female (fig 8.26). As in Australia there has been a significant increase in the proportion of living donors for recipients aged 25-44 years comparing 1993-96 and 1997-2000 (fig 8.24).

Figure 8.24



Timing of Living Donor Transplants

The timing of living donor transplants is shown in Figure 8.25. New Zealand has over this period had a higher proportion of living transplants performed before dialysis commencement.

For the years 1997-2000, the proportion of predialysis living donor transplants was greatest in South Australia/Northern Territory (24%) and least in Western Australia (9%).

Figure 8.25

Timing of Living Donor Transplantation in Relation to Date of Dialysis Start by Year 1996 - 2000

		1996	1997	1998	1999	2000
Aust.	Pre-dialysis	16%	19%	17%	19%	21%
	<1 month post dialysis	6%	5%	4%	4%	7%
	1-5.9 months post dialysis	15%	21%	23%	15%	17%
	6-11.9 months post dialysis	15%	15%	20%	18%	15%
	≥12 months post dialysis	48%	40%	35%	45%	40%
N.Z.	Pre-dialysis	32%	21%	32%	24%	50%
	<1 month post dialysis	4%	0%	0%	0%	0%
	1-5.9 months post dialysis	12%	17%	21%	21%	18%
	6-11.9 months post dialysis	8%	10%	4%	8%	14%
	≥12 months post dialysis	44%	52%	43%	47%	18%

Figure 8.26

Source of Living Donor Kidney 1996 - 2000

Source	Australia					New Zealand				
	1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
Total Living Donors	**115**	**144**	**161**	**167**	**180**	**26**	**31**	**31**	**42**	**31**
Related	**(96)**	**(125)**	**(126)**	**(124)**	**(124)**	**(25)**	**(23)**	**(19)**	**(33)**	**(21)**
Mother	26	39	27	32	40	11	6	4	9	4
Father	24	22	25	28	35	5	6	5	5	1
Brother	17	29+	28+	17	15 x	3	3	6	9	6 x
Sister	18x	23+	32	28	22	5	5	2	6	10
Offspring	6	3	5	8	8	0	3	2	2	0
Grandfather	0	1	0	1	1	0	0	0	0	0
Grandmother	2	0	4	3	0	0	0	0	0	0
Cousin	1	4	1	5	2	0	0	0	1	0
Nephew	0	0	0	0	0	0	0	0	0	0
Niece	0	1	0	0	0	0	0	0	0	0
Uncle	1	1	0	1	0	0	0	0	0	0
Aunt	1	2	4	1	1	1	0	0	1	0
Unrelated	**(19)**	**(19)**	**(35)**	**(43)**	**(56)**	**(1)**	**(8)**	**(12)**	**(9)**	**(10)**
Wife	10	10	17	23	30	0	4	7	4	5
Husband	3	8	13	10	15	1	1	2	3	3
Mother in Law	0	0	0	0	1	0	1	0	0	0
Stepmother	0	0	0	0	0	0	0	0	0	0
Adoptive Mother	1	0	0	0	0	0	0	0	0	0
Sister in Law	2	0	1	1	0	0	1	0	0	0
Brother in Law	0	0	0	0	0	0	0	0	1	0
Partner	2	0	1	0	1	0	0	0	0	0
Uncle	1	0	0	0	0	0	0	0	0	0
Other	0	1	3	9	8	0	1	3	1	2
Aunt	0	0	0	0	1	0	0	0	0	0

\+ Twin (non identical) x Twin (identical)

FUNCTIONING TRANSPLANTS AT 31-DEC-2000
TRANSPLANT OPERATIONS 1963 - 2000

Figure 8.27

Summary of Renal Transplantation Australia 1963 - 2000

		Performed	Functioning ★
Cadaver	First	8934	3473
	Second	1424	479
	Third	220	70
	Fourth	29	12
	Fifth	2	2
Living Donor	First	1591	1085
	Second	148	96
	Third	20	15
	Fourth	4	3
	Fifth	1	0
Total		12373	5235

★ Lost to follow up not included

AUSTRALIA

There have been 12,373 operations performed on 10,525 patients since 1963. Of these, 5,235 were functioning at 31st December 2000 (273 patients per million population). Fifteen percent of operations and 13% of functioning grafts were regrafts. Living donor transplants accounted for 14% of operations and 23% of functioning grafts (fig 8.27). 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 2000 represents a 4% increase over the previous year, an annual rate of increase which has remained steady (fig 8.29 and 8.30). Eighty seven percent of the functioning grafts were primary and 77% were from cadaveric donors. The number of functioning grafts from living donors increased by 12% from 1,075 to 1,199 patients.

The prevalence of functioning grafts in each State is shown in Figures 8.29 and 8.31. South Australia/Northern Territory has the highest prevalence of functioning renal transplants at 379 per million. The lowest prevalence was Western Australia (248 per million an increase from 232 in 1999). Patients with functioning grafts were in excess of those dependent on dialysis in South Australia and Tasmania (Appendix I).

The age dependence on a functioning transplant as a proportion of patients on renal replacement therapy is shown in Figure 8.32. The proportion drops with age and the proportion of patients depending on living donor grafts is greater in the younger age groups, particularly those aged 5-14 years (fig 8.33).

The modal age group for transplant dependent patients was 45-54 years and the mean and median ages were 49.1 and 48.1 years respectively (fig 8.33 and 8.34). The modal age group for living donor recipients was 35-44 years and 64% of recipients dependent on living donor grafts were less than 45 years of age.

The racial origin of people with functioning grafts was Caucasoid 90%, Asian 6%, Aboriginal 2% and Others 2% (fig 8.35).

The 5,235 grafts functioning at the end of 2000 represent 42% of all kidneys transplanted since 1963. Thirty two percent of grafts were functioning 10 or more years and 6% 20 or more years, and now there are 31 recipients with grafts functioning 30 years or longer.

Figure 8.28

Summary of Renal Transplantation New Zealand 1965 - 2000

Transplant		Performed	Functioning ★
Cadaver	First	1673	630
	Second	337	84
	Third	65	21
	Fourth	6	1
	Fifth	0	0
Living Donor	First	400	255
	Second	39	20
	Third	4	3
	Fourth	0	0
	Fifth	0	0
Total		2524	1014

★ Lost to follow up not included

NEW ZEALAND

There have been 2,524 operations performed on 2,073 patients since 1965 with 1,014 grafts (265 per million) still functioning at 31st December 2000 (fig 8.28). This represents a 4% increase from the previous year. Eighteen percent of operations and 13% of functioning grafts were regrafts. Kidneys from living donors accounted for 18% of operations and 27% of functioning grafts. The number of operations performed by individual hospitals is shown in Appendix I at the end of this Report.

The age related dependence on a transplant and the living or cadaveric donor source are shown in Figure 8.32.

The majority were male (59%) and the racial distribution was Caucasoid 80%, Maori 10%, Pacific Islander 4% and Asian 6% (fig 8.35).

The majority (65%) of functioning grafts were in the 25-54 year age group and the mean and median ages were 46.5 and 46.6 years respectively. The modal age group for living donors was 25-34 years (fig 8.33).

The 1,014 grafts functioning at the end of 2000 represent 40% of all kidneys transplanted since 1965. The longest surviving graft has reached 33 years. Fifty five grafts have been functioning for 20 or more years and six for 30 or more years. Twenty seven percent of functioning grafts were from living donors (fig 8.36).

Figure 8.29

Functioning Transplants
Transplanting State, Australia and New Zealand 1992 - 2000
(per Million Population)

Year	Qld	NSW/ACT ★	Vic./Tas ★	SA/NT ★	WA	Aust.	N.Z.
1992	688 (227)	1317 (210)	963 (195)	429 (264)	292 (176)	**3689 (210)**	**676 (192)**
1993	738 (237)	1351 (214)	1028 (208)	425 (261)	316 (188)	**3858 (218)**	**705 (198)**
1994	784 (245)	1411 (222)	1051 (212)	459 (280)	342 (201)	**4047 (227)**	**730 (203)**
1995	810 (247)	1473 (229)	1094 (220)	477 (290)	359 (207)	**4213 (233)**	**782 (214)**
1996	844 (252)	1541 (237)	1153 (230)	514 (311)	363 (206)	**4415 (241)**	**822 (221)**
1997	897 (264)	1623 (246)	1217 (240)	538 (323)	377 (210)	**4652 (251)**	**878 (233)**
1998	940 (272)	1665 (250)	1285 (250)	582 (347)	396 (216)	**4868 (260)**	**931 (245)**
1999	953 (271)	1702 (253)	1325 (256)	620 (368)	432 (232)	**5032 (265)**	**976 (256)**
2000	999 (280)	1754 (259)	1372 (262)	642 (379)	468 (248)	**5235 (273)**	**1014 (265)**

★ For calculation of Population Related totals, the population of these States were amalgamated
Patients lost to follow up are not included
Vic/Tas includes patients transplanted in Tasmania prior to 1975 (one functioning transplant since 1990)

Figure 8.30

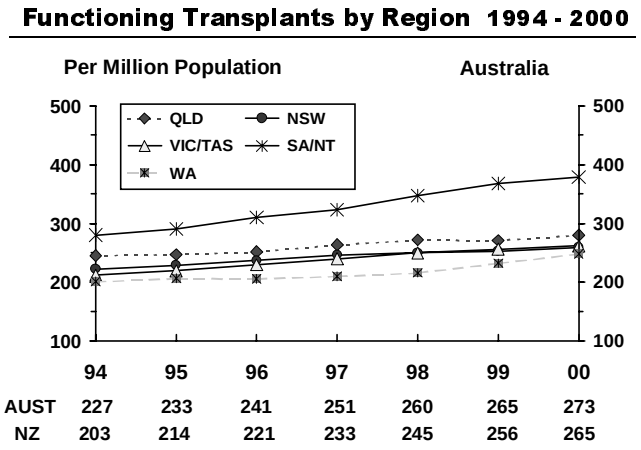


Figure 8.31

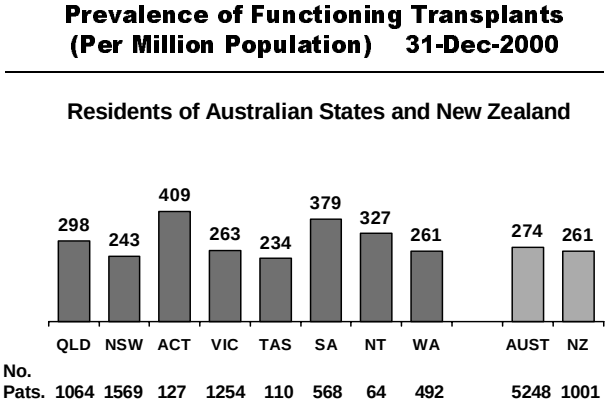
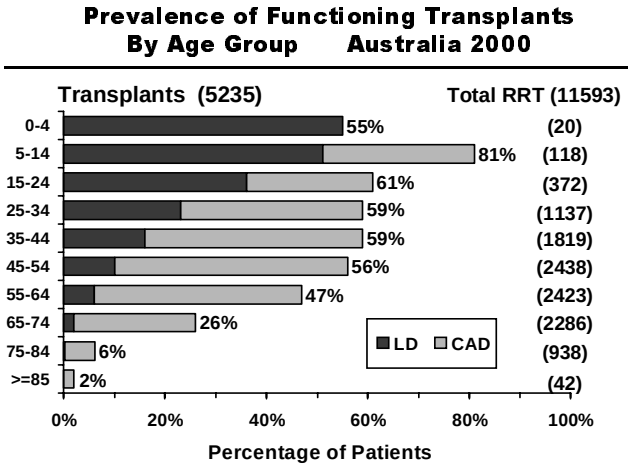


Figure 8.32



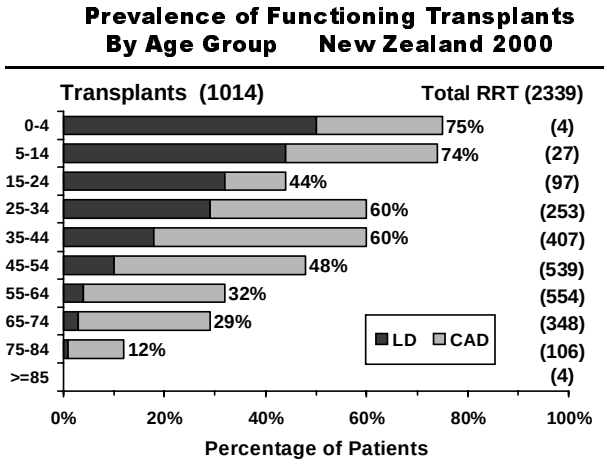
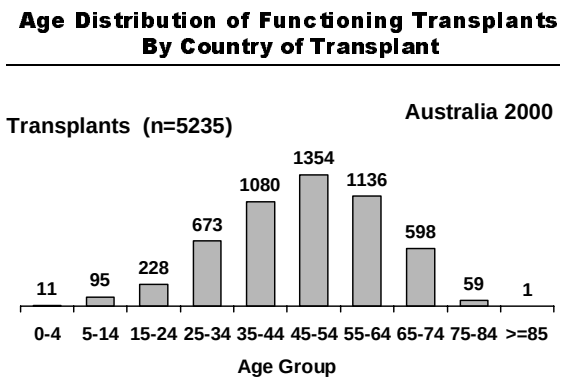


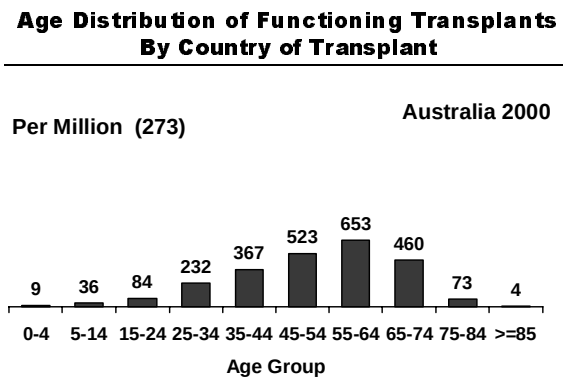
Figure 8.33

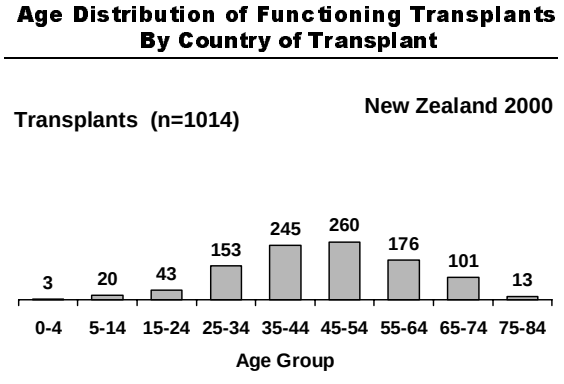
Age of All Functioning Transplant Patients
Resident Country at Transplant (31-Dec-2000)

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	
Australia		**11**	**95**	**228**	**673**	**1080**	**1354**	**1136**	**598**	**59**	**1**	**5235**
Cadaver	1	0	33	72	330	630	948	896	509	54	1	**3473**
	2	0	1	17	67	123	138	87	43	3	0	**479**
	3	0	1	3	12	20	23	8	3	0	0	**70**
	4	0	0	0	1	4	4	2	1	0	0	**12**
	5	0	0	0	0	0	2	0	0	0	0	**2**
	Total	**0**	**35**	**92**	**410**	**777**	**1115**	**993**	**556**	**57**	**1**	**4036**
Living Donor	1	11	54	131	237	266	212	134	38	2	0	**1085**
	2	0	6	5	23	29	23	6	4	0	0	**96**
	3	0	0	0	1	7	4	3	0	0	0	**15**
	4	0	0	0	2	1	0	0	0	0	0	**3**
	Total	**11**	**60**	**136**	**263**	**303**	**239**	**143**	**42**	**2**	**0**	**1199**
New Zealand		**3**	**20**	**43**	**153**	**245**	**260**	**176**	**101**	**13**	**0**	**1014**
Cadaver	1	1	7	11	61	136	172	142	88	12	0	**630**
	2	0	1	1	15	28	26	9	4	0	0	**84**
	3	0	0	0	3	8	9	1	0	0	0	**21**
	4	0	0	0	0	0	1	0	0	0	0	**1**
	Total	**1**	**8**	**12**	**79**	**172**	**208**	**152**	**92**	**12**	**0**	**736**
Living Donor	1	2	12	31	66	64	46	24	9	1	0	**255**
	2	0	0	0	6	8	6	0	0	0	0	**20**
	3	0	0	0	2	1	0	0	0	0	0	**3**
	Total	**2**	**12**	**31**	**74**	**73**	**52**	**24**	**9**	**1**	**0**	**278**

Figure 8.34







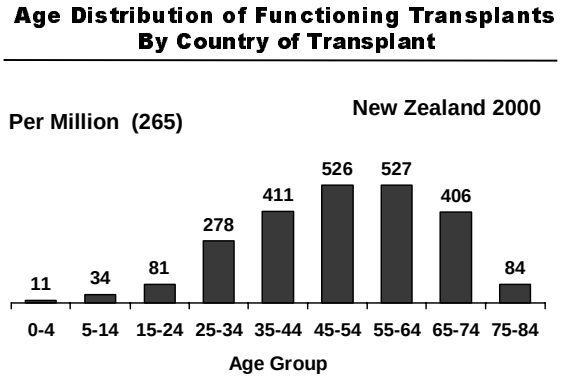
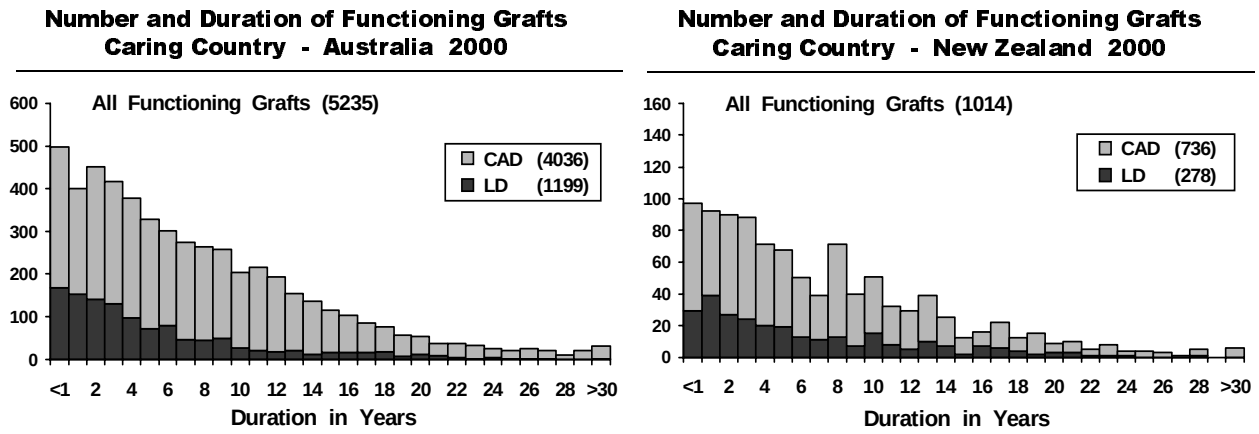


Figure 8.35

Functioning Transplant Patients
Related to Race and Age Group 31-Dec-2000

Sex	Racial Origin	Age Groups										Total
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	≥ 85	
Australia		**11**	**95**	**228**	**673**	**1080**	**1354**	**1136**	**598**	**59**	**1**	**5235**
Female	Caucasoid	3	31	74	255	387	423	421	296	28	0	**1918**
	Aboriginal	0	2	1	6	14	10	13	1	0	0	**47**
	Asian	0	1	8	15	35	51	22	8	1	0	**141**
	Other	0	6	3	5	8	10	7	1	0	0	**40**
	Total	**3**	**40**	**86**	**281**	**444**	**494**	**463**	**306**	**29**	**0**	**2146**
Male	Caucasoid	8	46	126	355	582	756	620	273	29	1	**2796**
	Aboriginal	0	3	3	8	9	30	11	2	0	0	**66**
	Asian	0	5	9	22	38	55	32	14	1	0	**176**
	Other	0	1	4	7	7	19	10	3	0	0	**51**
	Total	**8**	**55**	**142**	**392**	**636**	**860**	**673**	**292**	**30**	**1**	**3089**
New Zealand		**3**	**20**	**43**	**153**	**245**	**260**	**176**	**101**	**13**	**0**	**1014**
Female	Caucasoid	0	8	17	54	69	80	58	35	6	0	**327**
	Maori	0	2	3	8	12	10	6	4	0	0	**45**
	Pacific Isl.	0	0	0	2	5	7	4	1	0	0	**19**
	Asian	0	0	2	1	10	9	1	2	0	0	**25**
	Total	**0**	**10**	**22**	**65**	**96**	**106**	**69**	**42**	**6**	**0**	**416**
Male	Caucasoid	3	7	17	78	122	122	77	53	7	0	**486**
	Maori	0	1	2	5	12	16	15	4	0	0	**55**
	Pacific Isl.	0	1	0	5	5	6	5	1	0	0	**23**
	Asian	0	1	2	0	9	9	10	1	0	0	**32**
	Other	0	0	0	0	1	1	0	0	0	0	**2**
	Total	**3**	**10**	**21**	**88**	**149**	**154**	**107**	**59**	**7**	**0**	**598**

Figure 8.36



GRAFT LOSSES OF GRAFTS AT RISK

Figure 8.37

Graft Loss in Relation to Grafts at Risk 1996 - 2000
(Number of Grafts at Risk)

	1996	1997	1998	1999	2000
Australia	(4688)	(4917)	(5170)	(5321)	(5562)
Graft Failure	3.1%	2.9%	3.0%	3.0%	2.7%
Death	2.4%	2.2%	2.4%	2.1%	2.8%
All Losses	5.5%	5.1%	5.4%	5.1%	5.5%
New Zealand	(878)	(934)	(984)	(1043)	(1082)
Graft Failure	3.3%	2.6%	2.9%	3.9%	3.5%
Death	2.9%	2.9%	2.5%	2.1%	2.5%
All Losses	6.2%	5.4%	5.4%	6.0%	6.0%

The rate of failure of functioning transplants and death of graft recipients has been constant over the last five years in both Australia and New Zealand (fig 8.37).

The cause of graft failure from 1991 to 2000 is shown in Figure 8.38.

Acute and subacute rejection have decreased on a cause of graft failure in both both countries, whereas failure due to chronic rejection has increased.

Figure 8.38

Year of Graft Loss Due to Death or Failure 1991 - 2000

Loss	Cause of Failure	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
Australia												
Death		94	104	111	108	117	113	110	124	114	158	**1153**
	Rejection - Acute	26	20	15	9	15	16	6	7	5	6	**125**
	Rejection - Chronic	66	74	90	76	74	87	78	105	104	90	**844**
	Rejection - Hyperacute	5	4	4	0	4	2	1	0	2	1	**23**
	Rejection - Subacute	3	1	3	3	5	3	2	4	2	3	**29**
Failed	Vascular	21	17	24	14	16	13	15	9	15	7	**151**
	Technical Problems	7	4	5	3	4	1	3	0	3	4	**34**
	Recurrence Primary Disease	12	15	12	11	13	7	19	10	10	16	**125**
	Non Compliance	3	10	9	2	3	4	7	6	5	7	**56**
	Other	3	10	12	10	13	15	13	15	15	17	**123**
Total		**240**	**259**	**285**	**236**	**264**	**261**	**254**	**280**	**275**	**309**	**2663**
New Zealand												
Death		20	11	16	18	14	26	27	25	22	27	**206**
	Rejection - Acute	6	9	6	3	3	3	1	0	3	0	**34**
	Rejection - Chronic	15	16	17	18	11	12	15	19	24	20	**167**
	Rejection - Hyperacute	0	0	0	2	0	1	0	0	0	0	**3**
	Rejection - Subacute	0	4	2	2	2	0	0	1	1	0	**12**
Failed	Vascular	3	0	4	4	2	4	5	0	6	8	**36**
	Technical Problems	2	1	5	1	1	0	2	0	2	0	**14**
	Recurrence Primary Disease	0	1	1	3	4	2	0	3	4	3	**21**
	Non Compliance	2	2	1	1	0	1	0	3	0	5	**15**
	Other	1	1	2	5	5	6	2	3	1	2	**28**
Total		**49**	**45**	**54**	**57**	**42**	**55**	**52**	**54**	**63**	**65**	**536**

IMMUNOSUPPRESSION

In 2000 there was a reduction in the proportion of patients receiving steroid free initial treatment regimens. This was associated with a significant increase in patients starting on Tacrolimus combinations as well as an increase in those receiving triple therapy with Cyclosporin, Mycophenolate and Prednisolone.

There is an increasing proportion of patients receiving Tacrolimus combination immunotherapy at later time points post transplant.

Figure 8.39

Immunosuppressive Therapy - Primary Cadaver Graft 1993 - 2000

	Year	Cya / Aza/Pred	Cya/MMF/Pred	Cya/Aza	Cya/MMF	Tacrolimus Combination	Sirolimus Trial Combination	Other	Total
Initial treatment	1993	237 (73%)	51 (16%)	16 (5%)	0	0	0	19 (6%)	**323**
	1994	236 (83%)	0	38 (13%)	0	3 (1%)	0	9 (3%)	**286**
	1995	227 (78%)	0	13 (4%)	0	22 (8%)	0	28 (10%)	**290**
	1996	241 (77%)	5 (2%)	23 (7%)	1 (<1%)	0	18 (6%)	23 (7%)	**311**
	1997	125 (40%)	112 (36%)	2 (1%)	14 (4%)	1 (<1%)	36 (12%)	23 (7%)	**313**
	1998	33 (11%)	143 (49%)	1 (<1%)	20 (7%)	1 (<1%)	72 (25%)	23 (8%)	**293**
	1999	17 (7%)	106 (43%)	2 (1%)	36 (15%)	34 (14%)	23 (9%)	30 (12%)	**248**
	2000	20 (6%)	170 (55%)	0	13 (4%)	81 (26%)	5 (2%)	22 (7%)	**311**
Treatment at 1 month	1993	222 (69%)	46 (14%)	7 (2%)	0	0	0	48 (15%)	**323**
	1994	228 (80%)	0	21 (7%)	0	3 (1%)	0	34 (12%)	**286**
	1995	225 (78%)	1 (<1%)	3 (1%)	0	23 (8%)	0	38 (13%)	**290**
	1996	217 (70%)	20 (6%)	11 (4%)	3 (1%)	5 (2%)	15 (5%)	40 (13%)	**311**
	1997	99 (32%)	124 (40%)	0	9 (3%)	5 (2%)	35 (11%)	41 (13%)	**313**
	1998	26 (9%)	159 (54%)	0	10 (3%)	7 (2%)	67 (23%)	24 (8%)	**293**
	1999	13 (5%)	126 (51%)	0	9 (4%)	43 (17%)	26 (10%)	31 (13%)	**248**
	2000	19 (6%)	165 (53%)	0	5 (2%)	99 (32%)	6 (2%)	17 (5%)	**311**
Treatment at 3 months	1993	223 (77%)	45 (16%)	5 (2%)	0	0	0	15 (5%)	**288**
	1994	234 (87%)	0	12 (4%)	0	4 (1%)	0	18 (7%)	**268**
	1995	221 (81%)	3 (1%)	2 (1%)	0	23 (8%)	0	23 (8%)	**272**
	1996	211 (74%)	25 (9%)	7 (2%)	1 (<1%)	12 (4%)	15 (5%)	13 (5%)	**284**
	1997	87 (30%)	130 (45%)	2 (1%)	6 (2%)	6 (2%)	27 (9%)	30 (10%)	**288**
	1998	22 (8%)	161 (58%)	1 (<1%)	7 (3%)	12 (4%)	59 (21%)	16 (6%)	**278**
	1999	13 (6%)	120 (52%)	0	9 (4%)	49 (21%)	21 (9%)	20 90%)	**232**
	2000	19 (6%)	152 (51%)	0	6 (2%)	103 (34%)	6 (2%)	14 (5%)	**300**
Treatment at 6 months	1993	209 (74%)	44 (16%)	12 (4%)	0	0	0	16 (6%)	**281**
	1994	222 (85%)	0	18 (7%)	0	3 (1%)	0	19 (7%)	**262**
	1995	204 (78%)	3 (1%)	11 (4%)	0	18 (7%)	0	27 (10%)	**263**
	1996	199 (71%)	24 (9%)	13 (5%)	1 (<1%)	12 (4%)	14 (5%)	17 (6%)	**280**
	1997	90 (32%)	132 (47%)	3 (1%)	8 (3%)	6 (2%)	22 (8%)	22 (8%)	**283**
	1998	21 (8%)	152 (55%)	2 (1%)	14 (5%)	16 (6%)	53 (19%)	18 (7%)	**276**
	1999	15 (7%)	113 (50%)	0	12 (5%)	48 (21%)	17 (7%)	22 (10%)	**227**
	2000	16 (7%)	107 (46%)	0	10 (4%)	81 (35%)	5 (2%)	12 (5%)	**231**
Treatment at 12 months	1993	178 (64%)	33 (12%)	38 (14%)	5 (2%)	0	0	22 (8%)	**276**
	1994	192 (74%)	0	42 (16%)	0	3 (1%)	0	22 (8%)	**259**
	1995	175 (67%)	2 (1%)	36 (14%)	0	14 (5%)	0	33 (13%)	**260**
	1996	163 (59%)	27 (10%)	37 (13%)	5 (2%)	10 (4%)	12 (4%)	22 (8%)	**276**
	1997	92 (33%)	108 (39%)	14 (5%)	16 (6%)	7 (3%)	19 (7%)	23 (8%)	**279**
	1998	24 (9%)	127 (48%)	5 (2%)	31 (12%)	20 (7%)	45 (17%)	15 (6%)	**267**
	1999	13 (6%)	97 (44%)	3 (1%)	21 (9%)	46 (21%)	16 (7%)	26 (12%)	**222**
	2000	10 (12%)	28 (34%)	0	5 (6%)	32 (39%)	1 (1%)	7 (8%)	**83**