

TRANSPLANTATION

AUSTRALIA

RENAL TRANSPLANTS PERFORMED IN 1996

See Table 73.

The 475 operations performed in 1996 is a small increase over the last few years (a rise of 8% over 1995). This represents a transplant rate of 26 per million of population (24 per million in 1995).

The proportion of patients receiving dialysis who were transplanted in 1996 was 7.8% compared to 7.9% in 1995. See Figure 92. For dialysing patients in the 15-59 year age group the respective percentages were 12.6% and 12.2%. See Figure 93.

Of the kidneys transplanted, 88% were for primary recipients and 24% were from living donors. The increase in proportion of living donors seen over the last decade is being maintained.

AGE OF RECIPIENTS See Table 74.

The median age of transplanted recipients in 1996 was 41 years compared to 42 years for 1995. Forty six percent of recipients fell into the 35-54 year age group. Twenty percent of recipients in 1996 were over 54 years of age which is the same as 1995.

The transplantation rate per million for each age group and as a percentage of dialysed patients for each age group is shown in Figure 94 and 95.

RACE OF TRANSPLANT RECIPIENTS

See Table 75 and Figure 98.

In the 15-59 year age group, in 1996 14.6% of dialysed caucasoid patients were transplanted. This figure is stable over the last four years. For Australian Aborigines, the corresponding transplant rate for 1996 was 2.2% which represents a continuation of the decline in the rate seen over a number of years. This fall has been due to the rapid continuing increase in the

number of Australian Aborigines in this age group entering dialysis programs without a concomitant increase in numbers of transplant operations.

STATE TRANSPLANTATION ACTIVITY 1996

The population related rate of transplantation for each state is shown in Table 77 and Figure 96. Those transplants performed in Tasmania and Northern Territory patients have been included in figures for Victoria and South Australia respectively.

Again for 1996, South Australia/Northern Territory has the highest transplant rate which has been consistent for the last three years. The recent decline in the transplant rate in Queensland has been reversed in 1996 largely by doubling of living donors. There has been a consistent fall in the transplant rate in Western Australia since 1993.

The transplant rate, both population related and as a percentage of patients on dialysis, has been calculated for each state and Northern Territory and is shown in Figure 92, 93 and 97. The latter is shown for all patients and for the 15-59 year age group. The relatively very low rate for Northern Territory patients is the same as previously. The jump in rate for Tasmanian patients is wholly related to a larger number of living donor transplants. The already high rate for South Australia has increased further in 1996.

TRANSPLANT SURVIVAL – PRIMARY CADAVERIC GRAFTS

The patient and graft survivals for primary cadaveric grafts for each year since 1983 are shown in Table 78. Graphical representation of some years is shown in Figure 99 and 100. For grafts performed in 1995, the 12 month patient and graft survival was 96% and 90% respectively. These figures demonstrate that the dramatic improvement in graft survival seen for primary grafts in 1994 compared to previous years has been maintained.

The five year graft survival for transplants performed in primary recipients in 1991 is 72% with 85% of these recipients still being alive at five years. This survival rate has been constant for grafts performed in the years 1989-91 and represents an annual graft failure rate after the first year of approximately 3%. For grafts performed in 1983-85, the annual failure rate from 12 months to five years was approximately 4%. The equivalent annual patient death rate for each of the two periods was 2% and 3% respectively showing that the majority of grafts lost are due to patient death.

TRANSPLANT SURVIVAL – SUBSEQUENT CADAVERIC GRAFTS

Patient and graft survivals for second or subsequent cadaveric grafts are examined for the three year cohorts 1994-96, 1991-93, 1988-90, 1985-87 and 1982-84. See Table 80 and Figure 103 and 104.

NEW ZEALAND

RENAL TRANSPLANTS PERFORMED IN 1996

See Table 73.

The number of operations (96) performed in 1996 is essentially the same as in 1995 and represents a transplant rate of 26 per million.

The percentage of living donors was also the same at 27% of all operations. These figures are very similar to those seen in Australia for that year.

The number of operations represents 8.3% of all dialysed patients and 9.2% of dialysed patients in the age group 15-59 years. Of the grafts performed in 1996, 92% were to primary recipients.

AGE OF RECIPIENTS See Table 74.

The median age of transplant recipients in 1996 was 40 years compared with 39 years in 1995. Recipients aged between 35 and 54 years comprised 46% of the total. Seventeen per cent of recipients in 1996 were over 54 years of age.

RACE OF TRANSPLANT RECIPIENTS

See Table 76 and Figure 98.

In the 15-59 year age group, 1996 has seen a continuation of the rapid increase in number of Maori and Pacific Islanders being accepted onto dialysis programs. The proportion of Maori and to a lesser extent Pacific Islanders in this age group who have received a renal transplant has fallen and in 1996 was 2.6% and 5.4% for these groups respectively, compared with 16.8% for caucasoid dialysis patients.

TRANSPLANT SURVIVAL – PRIMARY CADAVERIC GRAFTS

For recipients of primary cadaveric grafts performed in 1995, the 12 month patient and graft survivals were 94% and 84% respectively. See Table 79 and Figure 101 and 102.

The five year patient and graft survivals for primary cadaveric grafts performed in 1991 were 78% and 62% respectively.

Table 72

Australia and New Zealand

Summary of Renal Transplantation

Transplants		Australia 1963 - 1996		New Zealand 1965 - 1996	
		Performed	Functioning ★	Performed	Functioning
Cadaver	First	7769	3165	1412	529
	Second	1267	454	304	76
	Third	192	65	58	16
	Fourth	28	13	6	2
	Fifth	2	2	-	-
Living Donor	First	992	640	277	182
	Second	103	66	28	17
	Third	15	11	3	3
	Fourth	1	1	-	-
	Fifth	1	1	-	-
Total		10370	4418	2088	825

★ Lost to follow up not included

Table 73

Australia and New Zealand

**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	-	-	-	6 (1)	-	-	-	-	-
1964	2	-	-	-	-	2 (-)	-	-	-	-	-
1965	12	1	1	-	-	14 (3)	1	-	-	-	1 (1)
1966	18	2	-	-	-	20 (5)	10	3	-	-	13 (-)
1967	69	2	-	-	-	71 (2)	18	4	1	-	23 (1)
1968	97	10	-	-	-	107 (-)	17	4	-	-	21 (2)
1969	149	12	-	-	-	161 (-)	39	5	-	-	44 (-)
1970	168	12	2	-	-	182 (1)	21	3	1	-	25 (-)
1971	207	22	1	-	-	230 (1)	26	6	-	-	32 (1)
1972	183	16	-	-	-	199 (2)	43	8	-	-	51 (1)
1973	213	30	1	-	-	244 (7)	50	10	2	-	62 (-)
1974	224	35	4	-	-	263 (6)	35	5	1	-	41 (3)
1975	271	29	3	1	-	304 (7)	61	13	-	-	74 (2)
1976	223	41	4	-	-	268 (10)	38	13	1	-	52 (1)
1977	265	57	4	-	-	326 (16)	46	10	2	-	58 (4)
1978	269	43	2	-	-	314 (17)	43	11	3	-	57 (11)
1979	293	35	5	-	-	333 (34)	61	13	3	2	79 (16)
1980	287	63	9	-	-	359 (36)	57	13	4	-	74 (18)
1981	306	58	9	1	-	374 (35)	51	8	1	-	60 (10)
1982	321	72	6	-	-	399 (53)	48	17	-	-	65 (8)
1983	272	63	10	2	-	347 (48)	69	25	4	-	98 (11)
1984	362	72	10	1	-	445 (48)	63	11	-	-	74 (16)
1985	318	79	17	1	-	415 (36)	60	25	3	-	88 (6)
1986	366	63	7	2	-	438 (32)	79	19	6	1	105 (13)
1987	309	58	21	3	-	391 (39)	57	17	4	1	79 (20)
1988	391	62	10	2	1	466 (46)	61	11	6	-	78 (8)
1989	433	46	10	2	-	491 (48)	71	11	1	-	83 (12)
1990	387	45	9	2	-	443 (59)	86	14	2	-	102 (23)
1991	385	70	11	3	-	469 (77)	62	10	4	1	77 (13)
1992	403	57	13	3	-	476 (69)	105	5	5	-	115 (17)
1993	383	63	6	4	1	457 (64)	69	13	2	-	84 (20)
1994	384	41	12	2	1	440 (103)	70	11	1	1	83 (20)
1995	370	60	11	-	-	441 (93)	84	7	3	-	94 (24)
1996	416	50	9	-	-	475 (115)	88	7	1	-	96 (26)

Figure 92 and 93

Transplantation Rate 1996

Related to Patients Dialysed

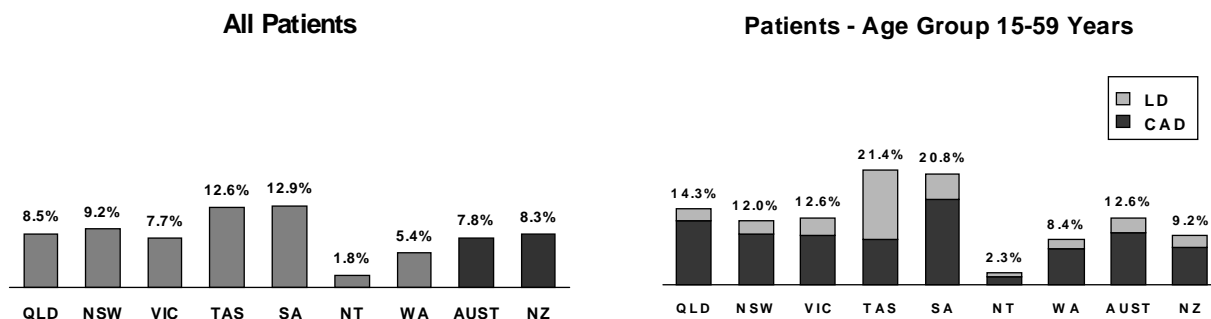


Table 74

Australia and New Zealand

**Graft Number and Age of Patients Transplanted
1-Jan-96 to 31-Dec-96**

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											
Cadaver	1	4	10	16	46	68	90	64	13	-	311
	2	-	1	7	13	8	8	2	1	-	40
	3	-	-	2	4	1	1	1	-	-	9
Living Donor	1	4	11	13	28	25	12	10	2	-	105
	2	-	-	1	2	4	2	-	1	-	10
Total		8	22	39	93	106	113	77	17	-	475
NEW ZEALAND											
Cadaver	1	-	1	2	9	17	19	12	3	-	63
	2	-	-	-	4	1	1	1	-	-	7
Living Donor	1	-	7	2	9	6	1	-	-	-	25
	3	-	-	-	1	-	-	-	-	-	1
Total		-	8	4	23	24	21	13	3	-	96

Figure 94

Transplant Operations (Per Million) 1996

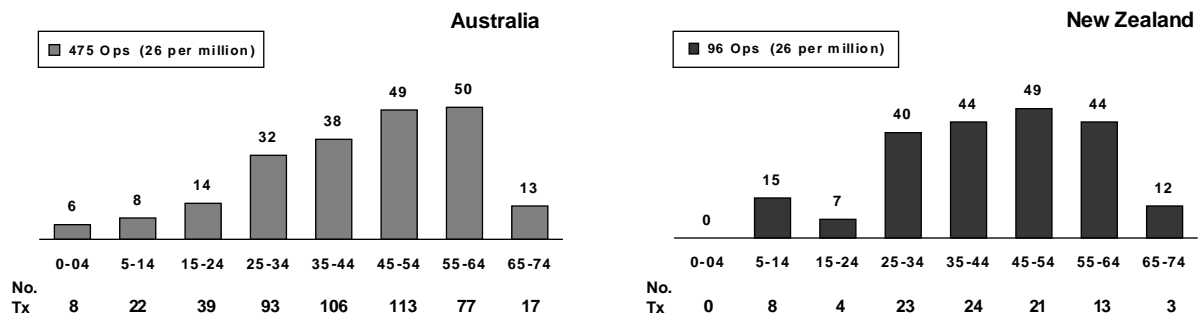


Figure 95

Transplantation Rate 1996

Related to Patients Dialysed

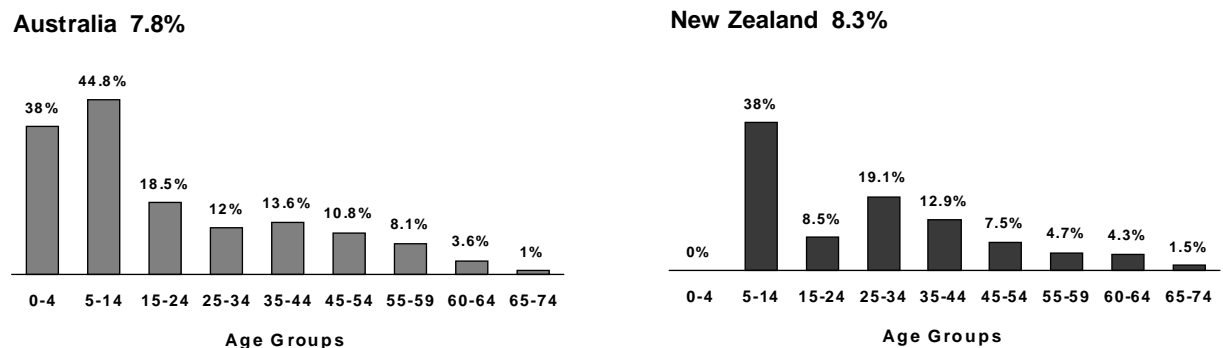


Table 75**Australia****Transplantation Rate - Age Group 15-59 years
1984 - 1996**

Year	Caucasoid			Aboriginal			All Patients		
	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate
1984	1883	369	19.5%	38	6	15.7%	2011	394	19.5%
1985	1839	333	18.1%	59	10	16.9%	2011	363	18.0%
1986	1876	352	18.7%	68	13	19.1%	2069	391	18.8%
1987	1871	318	16.9%	88	15	17.0%	2101	346	16.4%
1988	1898	356	18.7%	93	19	20.4%	2173	407	18.7%
1989	1887	365	19.3%	124	18	14.5%	2214	422	19.0%
1990	1906	316	16.6%	147	18	12.2%	2265	373	16.4%
1991	1946	361	18.5%	161	12	7.4%	2328	401	17.2%
1992	1983	344	17.3%	185	17	9.1%	2446	402	16.4%
1993	2055	326	15.8%	224	10	4.4%	2575	375	14.5%
1994	2204	331	15.0%	273	12	4.3%	2805	369	13.1%
1995	2296	317	13.8%	322	13	4.0%	2996	365	12.2%
1996	2416	355	14.6%	357	8	2.2%	3180	402	12.6%

Note: Caucasoid figures differ as Lebanese/Maltese are now classed as Caucasoid from 1-Oct-96.

Table 76**New Zealand****Transplantation Rate - Age Group 15-59 years
1984 - 1996**

Year	Caucasoid			Maori			Pacific Islander			All Patients		
	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate
1984	261	49	18.7%	111	11	9.9%	17	3	17.6%	393	64	16.2%
1985	284	62	21.8%	120	14	11.6%	26	4	15.3%	438	82	18.7%
1986	295	61	20.6%	123	26	21.1%	35	5	14.2%	460	94	20.4%
1987	299	53	17.7%	128	13	10.1%	33	5	15.1%	466	72	15.4%
1988	299	53	17.7%	134	13	9.7%	44	7	15.9%	488	74	15.1%
1989	309	48	15.5%	151	12	7.9%	53	9	16.9%	527	72	13.6%
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%	626	104	16.6%
1993	318	53	16.6%	211	4	1.8%	88	3	3.4%	642	63	9.8%
1994	317	52	16.4%	229	11	4.8%	96	5	5.2%	674	71	10.5%
1995	332	54	16.3%	241	11	4.5%	113	6	5.3%	727	78	10.7%
1996	345	58	16.8%	260	7	2.6%	128	7	5.4%	780	79	10.1%

Note: Caucasoid figures differ as Lebanese/Maltese are now classed as Caucasoid from 1-Oct-96.

**Transplants in each State 1988 - 1996
Number of Operations (Per Million Population)**

State	1988	1989	1990	1991	1992	1993	1994	1995	1996
Qld	100 (36)	79 (28)	77 (26)	84 (28)	114 (38)	102 (33)	88 (28)	69 (21)	80 (24)
NSW/ACT	168 (28)	180 (30)	153 (25)	174 (28)	166 (26)	136 (22)	158 (25)	161 (25)	171 (26)
Vic./Tas. ★	119 (25)	141 (30)	116 (24)	116 (24)	120 (24)	129 (26)	94 (19)	116 (23)	134 (27)
SA/NT ★	49 (31)	45 (28)	68 (43)	49 (30)	47 (29)	44 (27)	57 (35)	58 (35)	60 (36)
WA	30 (19)	46 (29)	29 (18)	46 (28)	29 (17)	46 (27)	43 (25)	37 (21)	30 (17)
Aust.	466 (28)	491 (29)	443 (26)	469 (27)	476 (27)	457 (26)	440 (25)	441 (24)	475 (26)

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

Figure 96

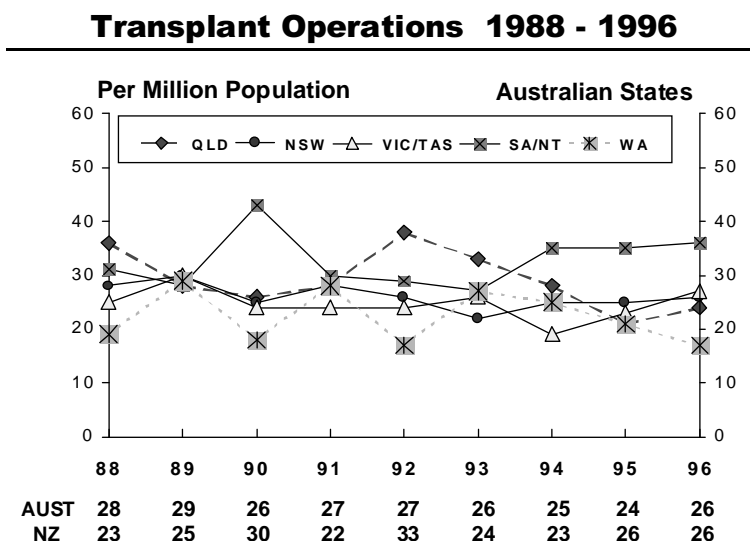


Figure 97

**Rate of Transplantation 1996
Related to Population (Per Million)**

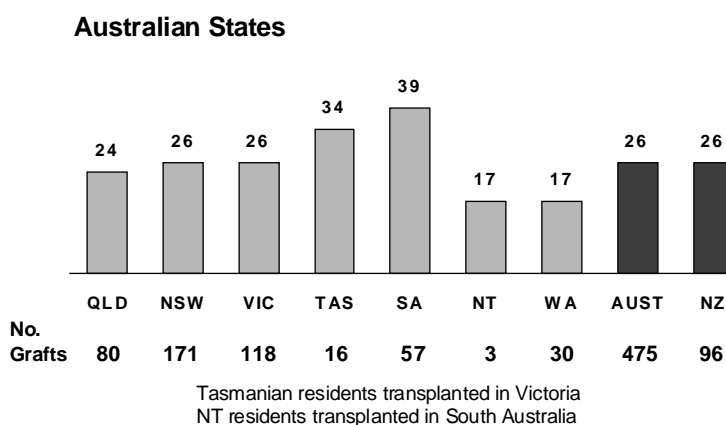
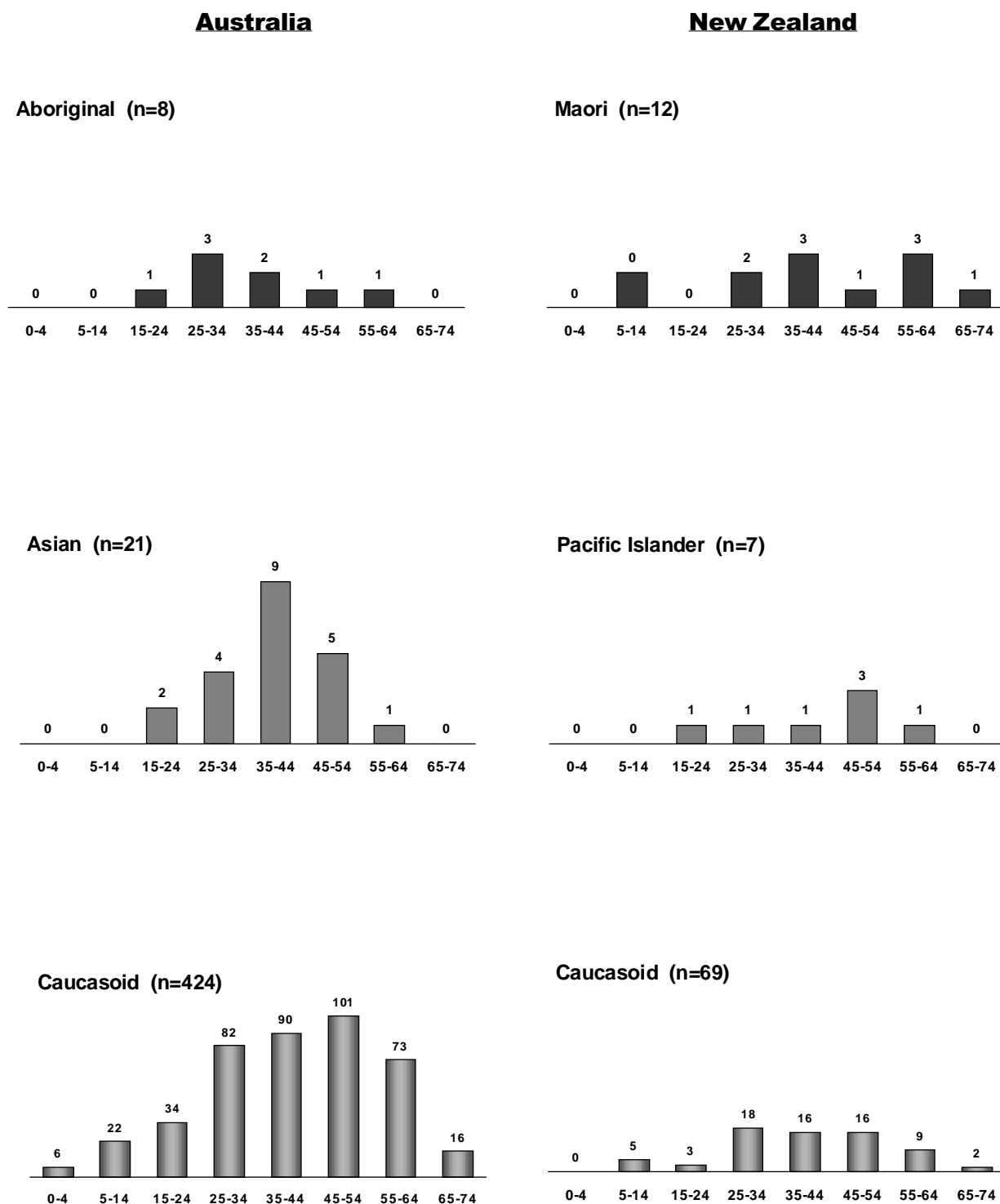


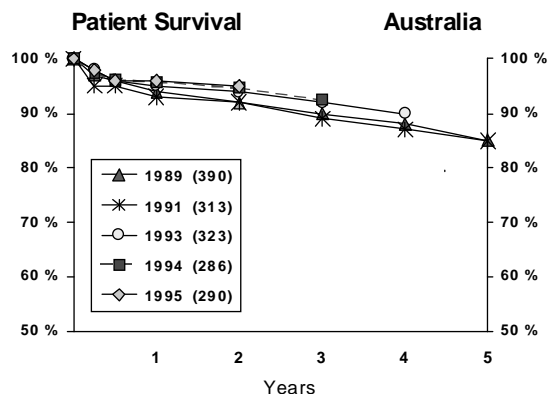
Figure 98

**New Transplanted Patients 1996
Related to Race and Age Group**



Figures 99 and 100

Primary Cadaver Patient Survival 1989 - 1995 Related to Year of Transplant



Primary Cadaver Graft Survival 1989 - 1995 Related to Year of Transplant

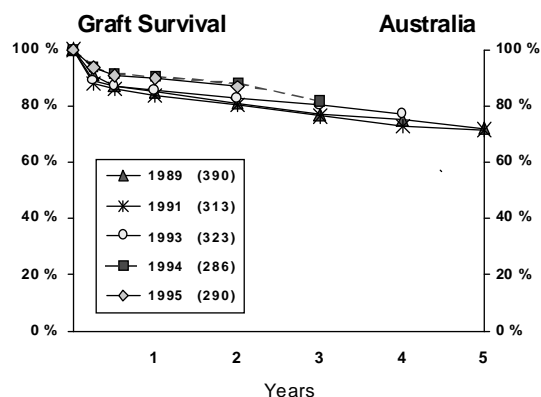


Table 78

Australia

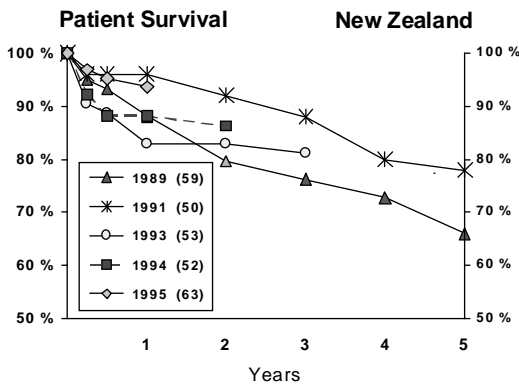
Primary Cadaver Patient and Graft Survival 1983 - 1996

Year of Transplant	n	Survival					
		1 month	3 months	6 months	1 year	3 years	5 years
Patient Survival							
1983	n=231	97 ± 1.1 225	96 ± 1.3 221	94 ± 1.6 216	91 ± 1.9 209	86 ± 2.3 197	81 ± 2.6 185
1984	n=321	98 ± 0.7 316	95 ± 1.2 305	94 ± 1.4 301	91 ± 1.6 292	84 ± 2.0 271	77 ± 2.4 247
1985	n=289	99 ± 0.7 285	96 ± 1.2 276	94 ± 1.4 271	92 ± 1.6 265	87 ± 2.0 250	79 ± 2.4 228
1986	n=337	99 ± 0.6 333	96 ± 1.1 322	93 ± 1.4 315	92 ± 1.5 311	88 ± 1.8 297	80 ± 2.2 270
1987	n=273	98 ± 0.9 267	93 ± 1.5 254	92 ± 1.6 252	90 ± 1.8 247	88 ± 2.0 239	82 ± 2.3 225
1988	n=353	98 ± 0.7 347	97 ± 1.0 341	95 ± 1.2 334	93 ± 1.4 327	87 ± 1.8 307	82 ± 2.1 288
1989	n=390	99 ± 0.4 388	97 ± 0.8 380	96 ± 1.0 373	94 ± 1.2 368	90 ± 1.5 350	85 ± 1.8 330
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	-
1993	n=323	98 ± 0.7 318	98 ± 0.9 315	96 ± 1.1 309	95 ± 1.2 306	92 ± 1.5 297	-
1994	n=286	99 ± 0.6 283	98 ± 0.9 279	96 ± 1.1 274	96 ± 1.2 273	-	-
1995	n=290	100 ± 0.3 289	98 ± 0.8 285	96 ± 1.1 279	96 ± 1.2 278	-	-
1996	n=311	99 ± 0.6 307	96 ± 1.1 299	95 ± 1.3 222	-	-	-
Graft Survival							
1983	n=231	87 ± 2.2 200	81 ± 2.6 186	77 ± 2.8 179	74 ± 2.9 170	64 ± 3.2 148	58 ± 3.3 132
1984	n=321	86 ± 1.9 277	79 ± 2.3 254	76 ± 2.4 243	72 ± 2.5 230	60 ± 2.7 194	54 ± 2.8 173
1985	n=289	89 ± 1.9 256	83 ± 2.2 241	82 ± 2.3 237	79 ± 2.4 227	70 ± 2.7 200	62 ± 2.9 179
1986	n=337	91 ± 1.6 307	86 ± 1.9 290	83 ± 2.0 280	81 ± 2.1 273	74 ± 2.4 250	65 ± 2.6 220
1987	n=273	91 ± 1.8 248	87 ± 2.0 238	85 ± 2.2 232	83 ± 2.3 226	77 ± 2.5 211	70 ± 2.8 191
1988	n=353	91 ± 1.5 321	87 ± 1.8 308	85 ± 1.9 301	82 ± 2.0 291	76 ± 2.3 268	67 ± 2.5 237
1989	n=390	94 ± 1.2 366	91 ± 1.5 355	87 ± 1.7 341	85 ± 1.8 333	77 ± 2.1 301	72 ± 2.3 280
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	-
1993	n=323	92 ± 1.5 296	89 ± 1.7 288	87 ± 1.9 281	85 ± 2.0 276	81 ± 2.2 260	-
1994	n=286	95 ± 1.3 271	94 ± 1.4 267	92 ± 1.6 261	91 ± 1.7 258	-	-
1995	n=290	96 ± 1.2 277	94 ± 1.4 272	91 ± 1.7 263	90 ± 1.8 260	-	-
1996	n=311	94 ± 1.4 291	91 ± 1.6 284	89 ± 1.8 207	-	-	-

% Survival ± S.E. / Number at Risk

Figures 101 and 102

Primary Cadaver Patient Survival 1989 - 1995 Related to Year of Transplant



Primary Cadaver Graft Survival 1989 - 1995 Related to Year of Transplant

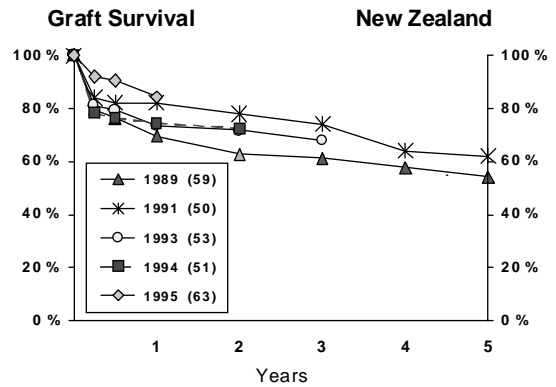


Table 79

New Zealand

Primary Cadaver Patient and Graft Survival 1983 - 1996

Year of Transplant	n	Survival					
		1 month	3 months	6 months	1 year	3 years	5 years
Patient Survival							
1983	n=59	100 ± 0.0 59	98 ± 1.7 58	95 ± 2.9 56	93 ± 3.3 55	92 ± 3.6 54	85 ± 4.7 50
1984	n=48	100 ± 0.0 48	98 ± 2.1 47	98 ± 2.1 47	94 ± 3.5 45	81 ± 5.6 39	63 ± 7.0 30
1985	n=56	100 ± 0.0 56	89 ± 4.1 50	88 ± 4.4 49	86 ± 4.7 48	77 ± 5.6 43	70 ± 6.1 39
1986	n=66	95 ± 2.6 63	95 ± 2.6 63	94 ± 2.9 61	91 ± 3.6 59	80 ± 5.0 52	68 ± 5.8 44
1987	n=40	98 ± 2.5 39	95 ± 3.5 38	95 ± 3.5 38	93 ± 4.2 37	88 ± 5.2 35	78 ± 6.6 31
1988	n=53	100 ± 0.0 53	96 ± 2.6 51	96 ± 2.6 51	93 ± 3.2 50	87 ± 4.7 46	81 ± 5.4 42
1989	n=59	100 ± 0.0 59	95 ± 2.9 56	93 ± 3.3 55	88 ± 4.2 52	76 ± 5.5 45	66 ± 6.2 39
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	-
1993	n=53	96 ± 2.6 51	91 ± 4.0 48	89 ± 4.4 47	83 ± 5.2 44	81 ± 5.4 43	-
1994	n=51	96 ± 2.7 49	92 ± 3.8 47	88 ± 4.5 45	88 ± 4.5 45	-	-
1995	n=63	98 ± 1.6 62	97 ± 2.2 61	95 ± 2.7 60	94 ± 3.1 59	-	-
1996	n=63	98 ± 1.6 61	95 ± 2.8 57	95 ± 2.8 37	-	-	-
Graft Survival							
1983	n=59	81 ± 5.1 48	73 ± 5.8 43	69 ± 6.0 41	68 ± 4.9 40	58 ± 6.4 34	51 ± 6.5 30
1984	n=48	73 ± 6.4 35	67 ± 6.8 32	60 ± 7.1 29	54 ± 7.2 26	46 ± 7.2 22	33 ± 6.8 16
1985	n=56	79 ± 5.5 55	68 ± 6.2 38	63 ± 6.5 35	61 ± 6.5 34	52 ± 6.7 29	43 ± 6.6 24
1986	n=66	85 ± 4.4 56	85 ± 4.4 56	83 ± 4.6 55	79 ± 5.0 52	67 ± 5.8 44	58 ± 6.1 38
1987	n=40	85 ± 5.7 34	83 ± 6.0 33	80 ± 6.3 32	80 ± 6.3 32	73 ± 7.1 29	68 ± 7.4 27
1988	n=53	87 ± 4.7 46	79 ± 5.6 42	77 ± 5.8 41	75 ± 5.9 40	68 ± 6.4 36	58 ± 6.8 30
1989	n=59	92 ± 3.6 54	80 ± 5.2 47	76 ± 5.5 45	69 ± 6.0 41	61 ± 6.4 36	54 ± 6.5 32
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	-
1993	n=53	85 ± 4.9 45	81 ± 5.4 43	79 ± 5.6 42	74 ± 6.1 39	68 ± 6.4 36	-
1994	n=51	80 ± 5.6 41	78 ± 5.8 40	76 ± 5.9 39	75 ± 6.1 38	-	-
1995	n=63	94 ± 3.1 59	92 ± 3.4 58	90 ± 3.7 57	84 ± 4.6 53	-	-
1996	n=63	89 ± 4.0 56	87 ± 4.2 53	87 ± 4.2 35	-	-	-

% Survival ± S.E. / Number at Risk

Second and Subsequent Cadaver Patient and Graft Survival 1982 - 1996

Years	Survival												
	1 month		3 months		6 months		1 year		3 years		5 years		
Patient Survival													
1982-84	n=213	99 ± 0.8	210	96 ± 1.3	205	93 ± 1.8	198	92 ± 1.9	195	84 ± 2.5	178	80 ± 1.8	170
1985-87	n=238	99 ± 0.4	237	97 ± 1.1	231	96 ± 1.2	229	95 ± 1.4	226	88 ± 2.1	208	80 ± 2.6	190
1988-90	n=170	99 ± 0.8	168	97 ± 1.3	165	94 ± 1.8	160	92 ± 2.0	157	87 ± 2.6	148	81 ± 3.0	138
1991-93	n=214	99 ± 0.4	213	98 ± 1.0	209	97 ± 1.2	207	95 ± 1.5	203	91 ± 3.0	195	87 ± 2.4	79
1994-96	n=158	99 ± 0.8	156	97 ± 1.3	154	97 ± 1.3	147	96 ± 1.6	119	93 ± 2.1	10	-	-
Graft Survival													
1982-84	n=213	70 ± 3.1	150	64 ± 3.3	136	56 ± 3.4	119	52 ± 3.4	111	45 ± 3.4	95	41 ± 3.4	88
1985-87	n=238	83 ± 2.4	198	78 ± 2.7	186	76 ± 2.8	180	72 ± 2.9	172	59 ± 3.2	139	52 ± 3.2	122
1988-90	n=170	86 ± 2.6	146	84 ± 2.8	142	80 ± 3.1	136	78 ± 3.2	132	66 ± 3.6	112	61 ± 3.8	103
1991-93	n=214	83 ± 2.6	178	80 ± 2.7	172	79 ± 2.8	170	78 ± 2.8	167	73 ± 3.0	157	66 ± 3.5	59
1994-96	n=158	87 ± 2.7	137	84 ± 3.0	132	82 ± 3.0	123	81 ± 3.2	102	74 ± 4.2	10	-	-

Figure 103

Second and Subsequent Cadaver Patient Survival Related to Years of Transplant 1982 - 1996

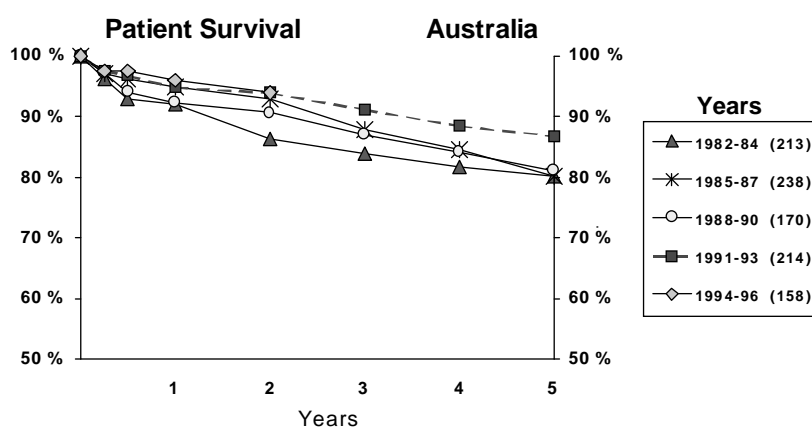
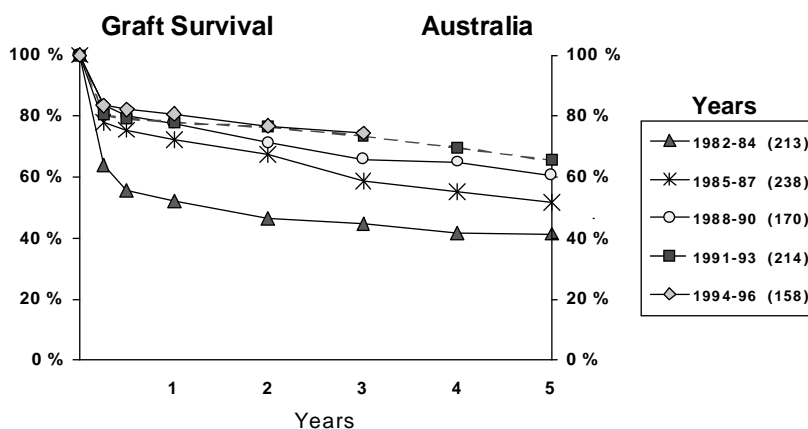


Figure 104

Second and Subsequent Cadaver Graft Survival Related to Years of Transplant 1982 - 1996



LIVING DONOR TRANSPLANTS

AUSTRALIA

The year 1996 saw the largest number and proportion of living donor transplants being performed in Australia representing 24% of all transplant operations.

A marked increase in the number of living donor transplants occurred in 1994 and this has been maintained. See Table 81 and Figure 105. Whereas the rise seen in 1994 was due predominantly to an increase in the number of living related donors, for 1996 this number has remained constant but the number of living unrelated donors has increased significantly. See Table 82. In 1996 these represented 17% of all living donors compared with 6% in 1995.

A breakdown of the source of unrelated living donors is shown in Table 82. Of the 19 living unrelated donors in 1996, 15 were from spouses or partners and five of these were to recipients aged 55 years or more.

Where traditionally living donors have comprised a significant proportion of transplants performed in recipients aged less than 25 years

of age, there has been a marked increase in the proportion of living donors in older recipients. See Table 81 and Figure 106. In 1996, 18% of transplants performed in the 65-74 year age group were from living donors, the largest proportion ever.

The proportion of living donor transplants by each State and for New Zealand is shown in Figure 107 for the years 1989-92 and 1993-96. The greatest increase has been seen in Victoria/Tasmania with smaller increases in South Australia/Northern Territory and Western Australia.

NEW ZEALAND

Twenty seven percent of grafts were from a living donor (26% in 1995 and 24% in 1994). There have been five living unrelated donor transplants since 1990 (one in 1996). Table 83.

Table 81

Australia

Living Donor Operations as Proportion (%) of Annual Transplantation

Age Groups	Year of Transplantation								
	1988	1989	1990	1991	1992	1993	1994	1995	1996
00-04 years	20%	33%	33%	100%	43%	60%	67%	83%	50%
05-14 years	55%	25%	47%	50%	73%	55%	73%	65%	50%
15-24 years	20%	19%	32%	34%	31%	22%	44%	36%	36%
25-34 years	16%	19%	15%	22%	15%	23%	24%	26%	32%
35-44 years	8%	8%	13%	12%	19%	13%	24%	21%	27%
45-54 years	5%	4%	6%	10%	4%	7%	17%	12%	12%
55-64 years	3%	3%	4%	4%	2%	5%	13%	5%	13%
65-74 years	-	-	-	-	-	5%	8%	-	18%
All	10%	10%	13%	16%	14%	14%	23%	21%	24%

Figure 105

**Cadaver and Living Donor Transplants
Australia 1990 - 1996**

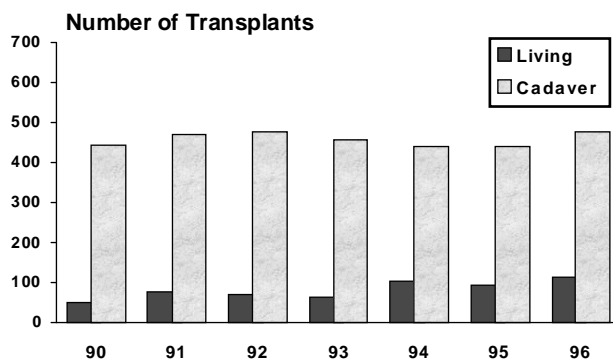


Figure 106

**Age Related Proportion of Operations
Living Donor Grafts Australia 1992/1996**

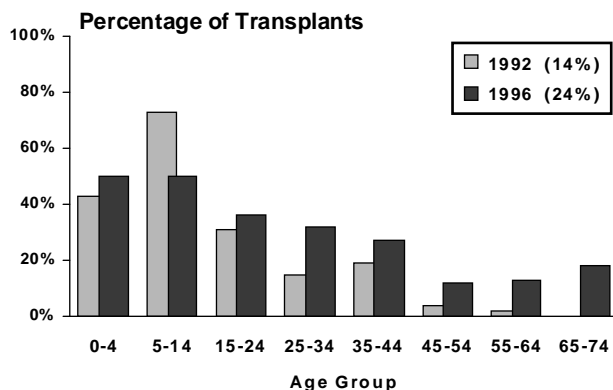


Figure 107

**Proportion of Operations - Living Donor Grafts
States: Australia and New Zealand**

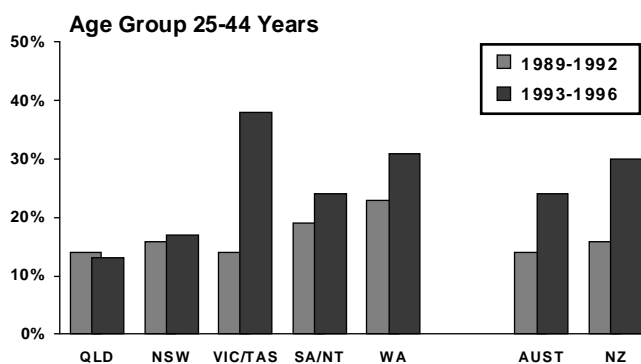


Table 82

Australia

Source of Living Donor Kidney 1988 - 1996

	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
Living Donors	46	48	59	77	69	64	103	93	115	674
Related	(44)	(47)	(57)	(72)	(68)	(60)	(94)	(87)	(96)	(625)
Mother	15	12	17	21	25	19	27	34	26	196
Father	8	11	10	14	10	9	14	16	24	116
Brother	9	13	9	14	12	17	19	8	17	118
Sister	7+	8	15x+	17	14x	7	28	15	18x	129
Offspring	3	2	3	3	2	5	4	6	6	34
Grandfather	-	-	-	1	-	-	-	1	-	2
Grandmother	-	-	-	-	-	1	-	2	2	5
Cousin	2	1	1	1	3	-	1	2	1	12
Nephew	-	-	-	-	2	1	-	-	-	3
Niece	-	-	-	-	-	-	-	1	-	1
Uncle	-	-	-	-	-	1	1	2	1	5
Aunt	-	-	2	1	-	-	-	-	1	4
Unrelated	(2)	(1)	(2)	(5)	(1)	(4)	(9)	(6)	(19)	(49)
Wife	1	1	-	2	1	1	2	1	10	19
Husband	-	-	2	2	-	2	4	3	3	16
Mother in Law	-	-	-	-	-	1	-	-	-	1
Stepmother	-	-	-	-	-	-	1	1	-	2
Adoptive Mother	-	-	-	1	-	-	-	-	1	2
Sister in Law	-	-	-	-	-	-	-	1	2	3
Partner	-	-	-	-	-	-	-	-	2	2
Uncle	-	-	-	-	-	-	-	-	1	1
Unrelated	1	-	-	-	-	-	2	-	-	3

+ Twin (non identical) x Twin (identical)

Table 83

New Zealand

Source of Living Donor Kidney 1988 - 1996

	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
Living Donors	8	12	23	13	17	20	20	24	26	163
Related	(8)	(12)	(22)	(12)	(17)	(19)	(20)	(23)	(25)	(158)
Mother	2	1	6	4	2	6	9	3	11	44
Father	2	4	5	1	4	3	5	4	5	33
Brother	2	3	5	3	2	6	2	5	3	31
Sister	2	3	4	2	7x	2	3	8x	5	36
Offspring	-	1	1	2	2	1	1	3	-	11
Uncle	-	-	-	-	-	1	-	-	-	1
Aunt	-	-	-	-	-	-	-	-	1	1
Nephew	-	-	1	-	-	-	-	-	-	1
Unrelated	-	-	(1)	(1)	-	(1)	-	(1)	(1)	(5)
Wife	-	-	-	1	-	-	-	1	-	2
Husband	-	-	-	-	-	-	-	-	1	1
Mother in Law	-	-	1	-	-	-	-	-	-	1
Sister in Law	-	-	-	-	-	1	-	-	-	1

x Twin (identical)

OUTCOME OF LIVING DONOR TRANSPLANTS

The graft survival of all primary grafts from living related donors in Australia and New Zealand is shown in Figure 108 for the two periods 1989-92 and 1993-96. There has been an improvement in outcome at four years in the later period but the difference between the curves does not reach statistical significance.

Graft survivals for different types of primary living donor grafts are shown in Figures 109-111 for the two periods. For zero HLA mismatched sibling donors (Figure 109) and sibling donor with any degree of HLA mismatch (Figure 110), there has been an improved outcome in the 1993-96 period, al-

though for neither is significance reached. One haplotype mismatched living donor grafts are represented in Figure 111 by parent to child and child to parent grafts. There is no difference in outcome between 1989-92 and 1993-96.

The numbers of living unrelated grafts performed in Australia and New Zealand from 1986 is small (total 57, primary 48). The graft survival for these grafts is shown in Figure 112, and although no direct comparison is made, does not appear to be as good as for other living grafts.

Figure 108

Graft Survival of Primary Living Donor Grafts 1989 - 1992 and 1993 - 1996

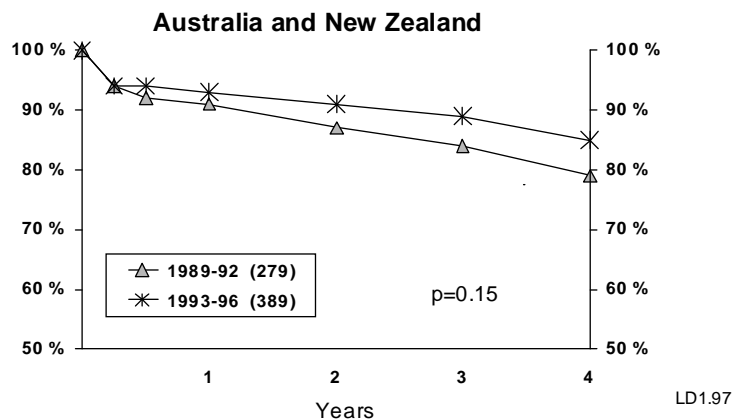


Figure 109

Graft Survival of Primary Zero HLA Mismatched Sibling Donors 1989 - 1992 and 1993 - 1996

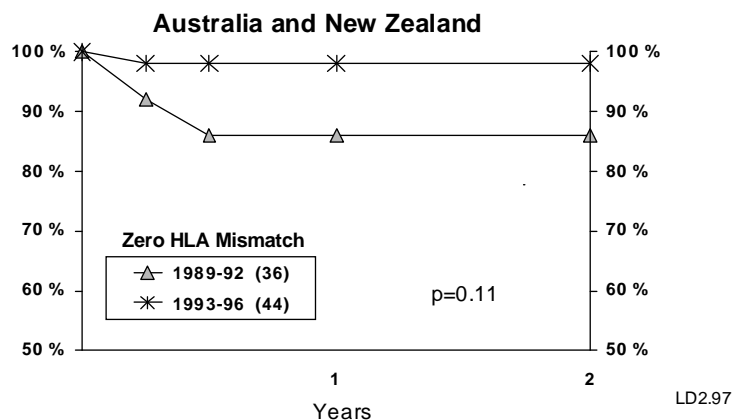


Figure 110

Graft Survival of Primary ≥ 1 HLA Mismatched Sibling Donors 1989 - 1992 and 1993 - 1996

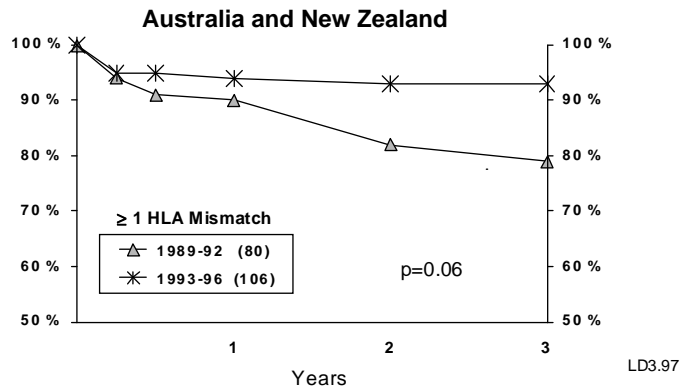


Figure 111

Graft Survival of Primary Parent or Offspring Donor Grafts 1989 - 1992 and 1993 - 1996

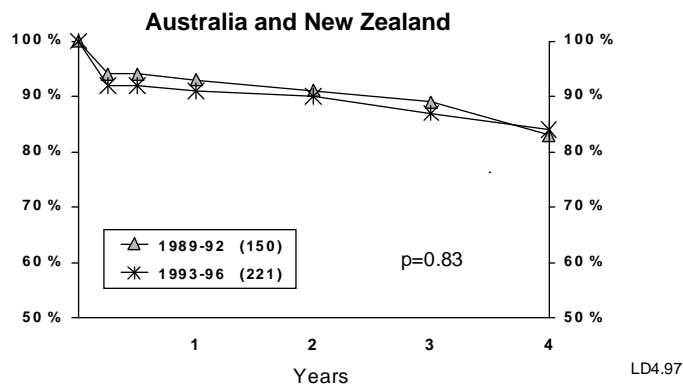
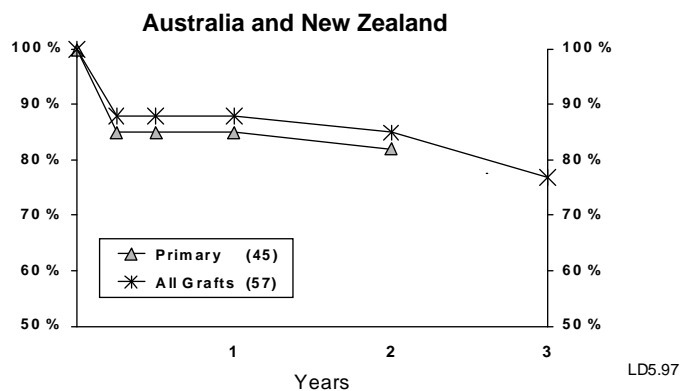


Figure 112

Living Unrelated Donor 1986 - 1996 Primary and All Grafts



FUNCTIONING TRANSPLANTS AT 31-DEC-96

TRANSPLANT OPERATIONS 1963 - 1996

AUSTRALIA

There have been 10370 operations performed on 8761 patients since 1963. Of these, 4418 were functioning at 31st December 1996, which represents 242 patients per million of population. See Table 72. Sixteen percent of operations and 14% of functioning grafts were regrafts. Living donor transplants accounted for 11% of operations and 16% of functioning grafts. The number of operations performed by each hospital during this period is shown in Appendix II.

The number of functioning grafts at the end of 1996 represents a 5% increase over the previous year, an annual rate of increase which has remained steady. See Table 84 and Figure 113. Eighty six percent of the functioning grafts were primary and 84% were from cadaveric donors. The number of functioning grafts from living donors increased by 13% from 635 to 719 patients.

The prevalence of functioning grafts in each state is shown in Table 84 and Figure 114. South Australia/Northern Territory has the highest prevalence of functioning renal transplants at 310 per million and also the largest increase in prevalence of 19 per million.

The lowest prevalence was recorded in Western Australia (205 per million) which represents a decrease from 207 per million at the end of 1995. This was the first fall in prevalence of functioning transplants seen for any state in Australia this decade.

Patients with functioning grafts were in excess of those dependent on dialysis in South Australia and Queensland, once again reflecting the higher transplant rate in these regions over the last few years. See Figure 115.

The age dependence on a functioning transplant as a proportion of patients on renal replacement therapy is shown in Figure 116. 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. Table 85.

The modal age group for transplant dependent patients was 45-54 years and the mean and median ages were 47 and 48 years respectively. See Table 85 and Figure 117. The modal age group for living donor recipients was 35-44

years and 74% of recipients dependent on living donor grafts were less than 45 years of age.

The racial distribution of recipients with functioning grafts was Caucasoid 91%, Asian 4%, Aboriginal 2% and others 3%. See Figure 120.

The 4418 grafts functioning at the end of 1996 represent 43% of all kidneys transplanted since 1963. Twenty three per cent of grafts were functioning more than 10 years, 4% more than 20 years and now there are three recipients with grafts functioning 30 years or longer. Sixteen per cent of functioning grafts were from living donors. See Figure 118.

NEW ZEALAND

There have been 2088 operations performed on 1689 patients since 1965 with 825 grafts (226 per million) still functioning at 31st December 1996. See Table 84 and Figure 113. This represents a 5% increase from the previous year. Nineteen percent of operations and 14% of functioning grafts were regrafts. Kidneys from living donors accounted for 15% of operations and 24% of functioning grafts. The number of operations performed by individual hospitals is shown in Appendix III.

For the sixth consecutive year, the number of transplant patients was less than those dependent on dialysis. The age related dependence on a transplant and the living or cadaveric donor source are shown in Figure 116.

The majority were male (58%) and the racial distribution was Caucasoid 80%, Maori 10%, Pacific Islander 5%, Asian 3% and other 2%. See Figure 120.

The majority (69%) of functioning grafts were in the 25-54 year age group. The modal age group for living donors was 25-34 years. See Table 85.

The 825 grafts functioning at the end of 1996 represent 40% of all kidneys transplanted since 1965. The longest surviving grafts have reached 29 years. Twenty two grafts have been functioning for more than 10 years. Twenty five per cent of functioning grafts were from living donors. See Figure 119.

Table 84

Australia and New Zealand

**Functioning Transplants
By Transplanting State, Australia and New Zealand 1986 - 1996
() Per Million Population**

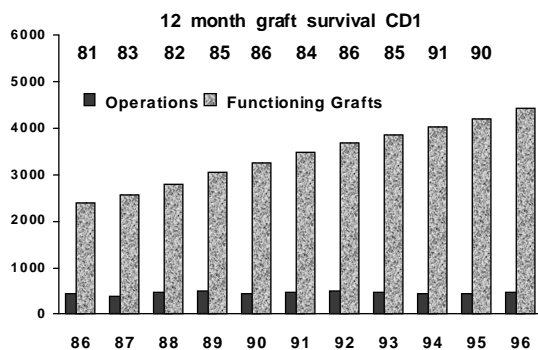
Year	Qld	NSW/ACT	Vic.Tas. ★	SA/NT ★	WA	Aust.	N.Z.
1986	380 (147)	909 (157)	618 (134)	271 (178)	211 (146)	2389 (149)	426 (128)
1987	417 (156)	942 (161)	694 (149)	291 (187)	226 (151)	2570 (158)	452 (135)
1988	476 (174)	1020 (171)	742 (158)	319 (204)	235 (152)	2792 (169)	484 (144)
1989	519 (183)	1109 (184)	813 (171)	340 (215)	267 (168)	3048 (181)	530 (157)
1990	558 (192)	1171 (192)	870 (180)	387 (242)	273 (167)	3259 (191)	577 (168)
1991	607 (204)	1254 (202)	926 (189)	408 (252)	287 (172)	3482 (201)	605 (175)
1992	688 (227)	1314 (210)	964 (196)	427 (262)	291 (175)	3684 (210)	674 (193)
1993	737 (237)	1345 (213)	1028 (208)	423 (260)	315 (188)	3848 (218)	705 (200)
1994	782 (245)	1407 (221)	1052 (213)	458 (279)	341 (200)	4040 (226)	730 (204)
1995	804 (245)	1470 (229)	1093 (220)	476 (289)	357 (206)	4200 (233)	782 (215)
1996	839 (250)	1545 (238)	1158 (231)	514 (310)	362 (205)	4418 (242)	825 (226)

★ For calculation of Population Related Totals, the populations of these States were amalgamated.
Patients lost to follow up are not included.

Vic./Tas. includes patients transplanted in Tasmania prior to 1975 (1 only functioning transplant since 1990).

Figure 113

Australian Transplantation 1986 - 1996



New Zealand Transplantation 1986 - 1996

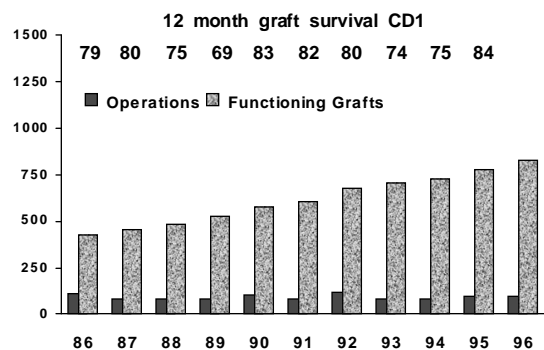


Figure 114

**Functioning Transplants Per Million 1990 - 1996
Transplanting States: Australia and New Zealand**

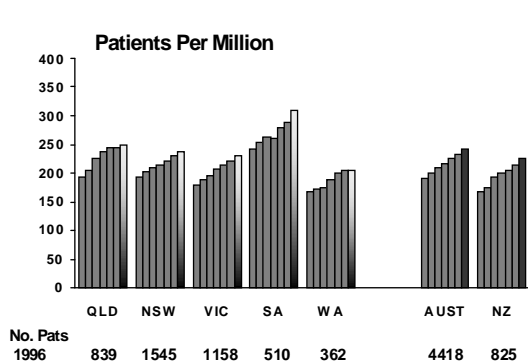


Figure 115

Functioning Transplants 1988 - 1996

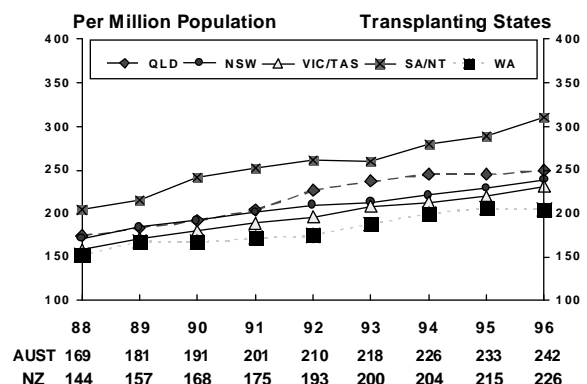


Table 85

**Age of All Functioning Transplant Patients
(31-Dec-1996)**

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		9	82	240	642	906	1088	985	443	23	4418
Cadaver	1	5	31	104	365	595	825	828	389	23	3165
	2	-	3	17	80	103	130	85	36	-	454
	3	-	-	6	15	17	16	10	1	-	65
	4	-	-	-	2	6	3	2	-	-	13
	5	-	-	-	-	1	1	-	-	-	2
Total		5	34	127	462	722	975	925	426	23	3699
Living Donor	1	4	45	105	158	158	97	57	16	-	640
	2	-	3	8	19	22	11	2	1	-	66
	3	-	-	-	3	2	5	1	-	-	11
	4	-	-	-	-	1	-	-	-	-	1
	5	-	-	-	-	1	-	-	-	-	1
Total		4	48	113	180	184	113	60	17	-	719
NEW ZEALAND		1	19	42	166	199	202	130	59	7	825
Cadaver	1	-	5	13	69	119	152	110	55	6	529
	2	-	-	1	26	24	18	5	2	-	76
	3	-	-	-	4	6	6	-	-	-	16
	4	-	-	-	-	1	1	-	-	-	2
Total		-	5	14	99	150	177	115	57	6	623
Living Donor	1	1	14	27	60	40	23	14	2	1	182
	2	-	-	1	6	7	2	1	-	-	17
	3	-	-	-	1	2	-	-	-	-	3
Total		1	14	28	67	49	25	15	2	1	202

Figure 116

Age Group Dependence on Functioning Transplants 1996

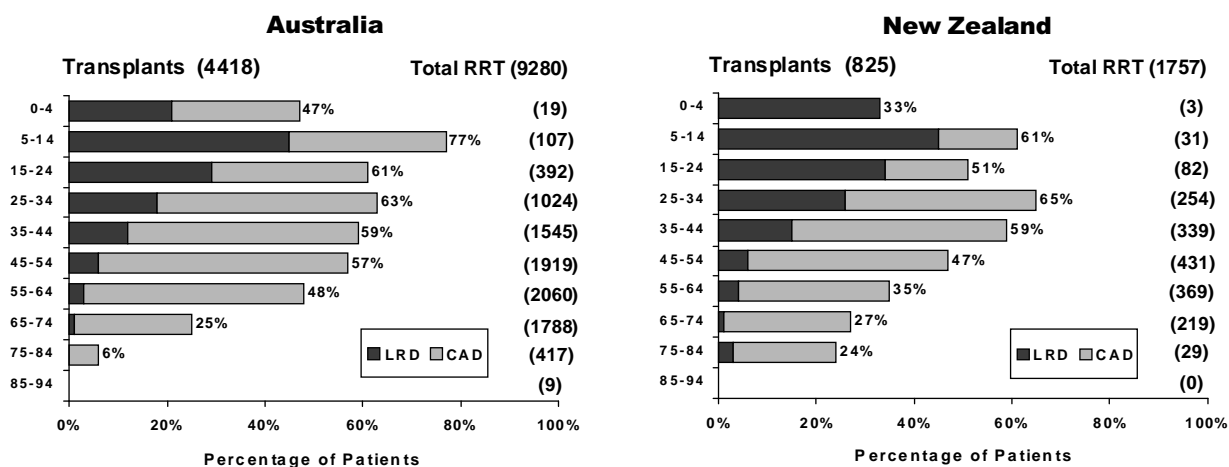
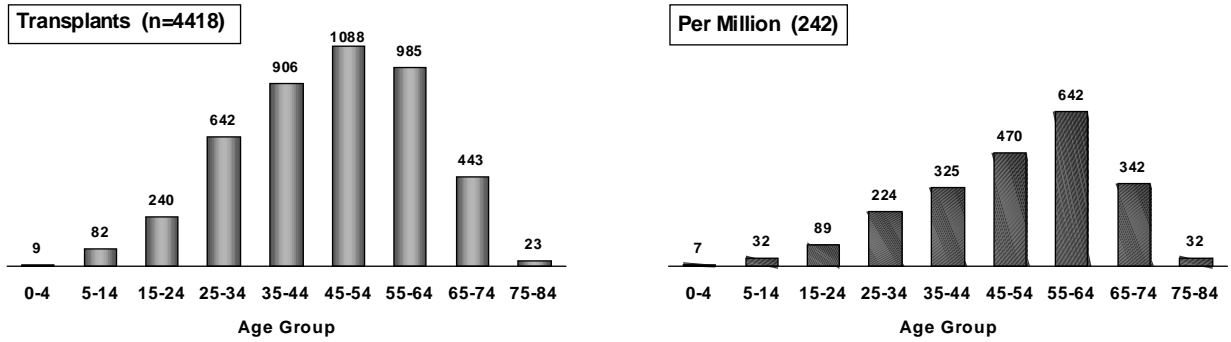


Figure 117

Age Distribution of Functioning Transplants

Australia 1996



New Zealand 1996

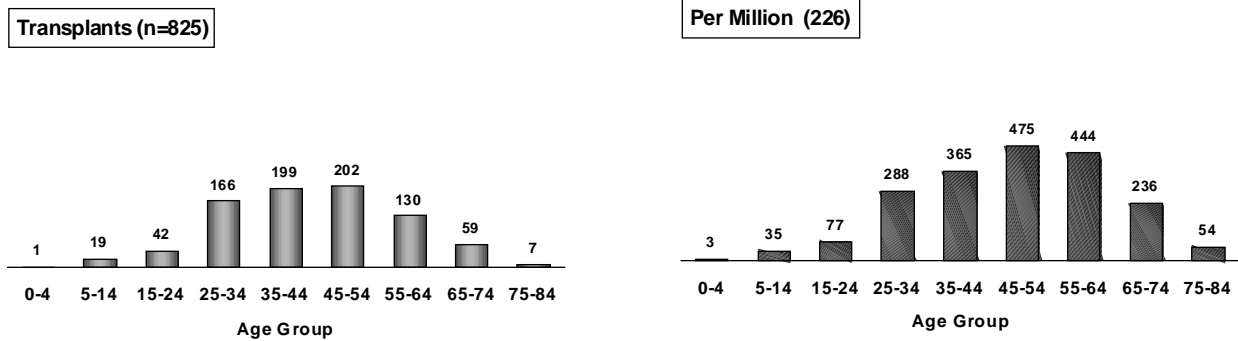


Figure 118

**Number and Duration of Functioning Grafts
Caring Country - Australia 1996**

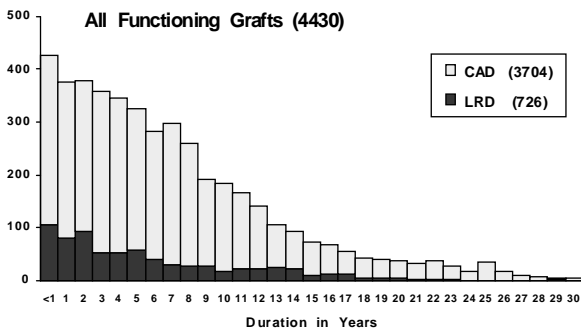


Figure 119

**Number and Duration of Functioning Grafts
Caring Country - New Zealand 1996**

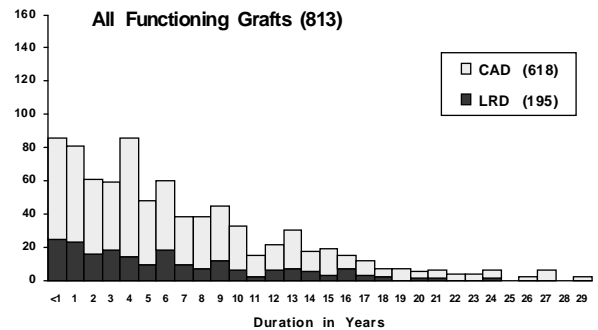
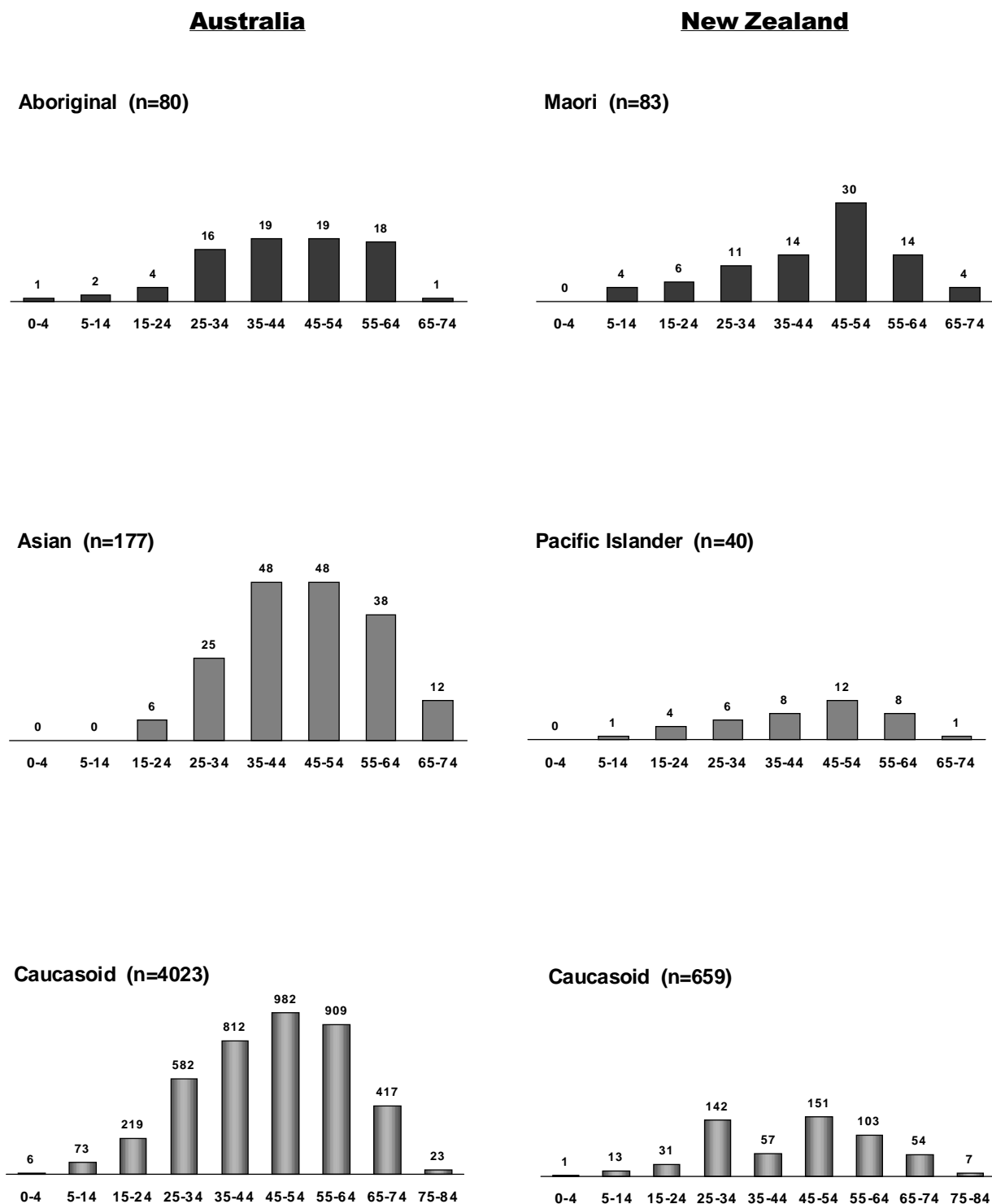


Figure 120

**Functioning Transplant Patients 1996
Related to Race and Age Group**



FACTORS AFFECTING GRAFT OUTCOME

CYCLOSPORIN A SPARING AGENTS

The use of Cyclosporin A (CyA) sparing agents is now widespread with more than 50% of first cadaveric recipients using these agents since 1993. See Table 86. By far the great majority of these patients have been prescribed Diltiazem.

For primary cadaveric grafts performed in the period 1993-96, patient and graft survival are superior in patients who have a functioning transplant at one month and who are receiving CyA sparing agents. See Figure 121. In addition, cadaveric graft recipients who receive CyA sparing drugs throughout the first six months post-transplant have a significantly lower use of anti-lymphocyte antibodies (ALG, ATG or OKT3) for rejection treatment. This is so for primary grafts (see Figure 122) and more particularly for regrafts (see Figure 123).

The incidence of delayed graft function is reduced by the use of CyA sparing agents at the time of transplantation. Figure 124 shows

the incidence of delayed graft function (excluding grafts which never functioned) for primary cadaveric grafts performed in Australia from 1989 to 1996 according to the use of CyA sparing agents. A significant difference is seen with donors both aged less than and greater than 50 years of age. See Figure 125 and 126.

The effect of later use of CyA sparing agents on long term graft and patient survival is shown in Figures 127-129. For primary cadaveric grafts still functioning at 12 months, the effect of the use of sparing agents at one year is shown for recipients with serum creatinine <135 µmol/L, 135-200 µmol/L and >200 µmol/L.

In all groups the graft survival was greater if sparing agents were used but this difference reached statistical significance only in those graft recipients with the highest creatinine levels.

Table 86

Australia

**Cyclosporin Sparing Drug Use at One Month
Primary Grafts Surviving > 1 Month**

Year of Transplant	Cya Sparing Drug		No Cya Sparing Drug	Unknown
	Diltiazem	Other		
1989	21	0	240	105
1990	26	3	212	67
1991	63	4	169	50
1992	134	0	135	43
1993	161	1	113	21
1994	154	4	113	0
1995	137	6	134	0
1996	150	8	131	2

Figure 121

**Patient and Graft Survival According to Cyclosporin A Sparing Agents at One Month
Primary Cadaver 1993 - 1996**

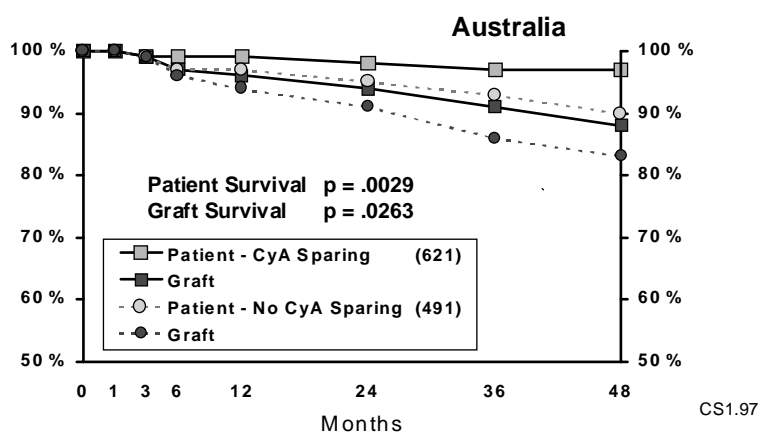


Figure 122

**CyA Sparing Agent Use During the First Six Months 1989 - 1996
Primary Cadaver Grafts**

ATG/ALG/OKT3 used for Rejection

Australia		No ATG etc	ATG etc
No CyA Sparing	n=1063	79%	21%
CyA Sparing	n=717	87%	13%

Chi-square p = 0.00004

TABLE CS2.97

Figure 123

**CyA Sparing Agent Use During the First Six Months 1989 - 1996
Subsequent Cadaver Grafts**

ATG/ALG/OKT3 used for Rejection

Australia		No ATG etc	ATG etc
No CyA Sparing	n=128	64%	36%
CyA Sparing	n=122	85%	15%

Chi-square p = 0.0001

TABLE CS3.97

Figure 124

**Use of CyA Sparing Agents at Transplant
Incidence of Delayed Graft Function
(excludes grafts which never functioned)**

Primary Cadaver Grafts 1989 - 1996

Australia		DGF	Immediate Function
Sparing at Tx	n=873	15%	85%
No Sparing at Tx	n=1256	23%	77%

Chi-square p = 0.00002 TABLE CS4.97

Figure 125

**CyA Sparing Agents and Delayed Graft Function
According to Donor Age 0-49 Years
(excludes grafts which never functioned)**

Primary Cadaver Grafts 1989 - 1996

Australia		DGF	Immediate Function
Sparing at Tx	n=654	13%	87%
No Sparing at Tx	n=1090	19%	81%

Chi-square p = 0.0004 TABLE CS5.97

Figure 126

**CyA Sparing Agents and Delayed Graft Function
According to Donor Age ≥ 50 Years
(excludes grafts which never functioned)**

Primary Cadaver Grafts 1989 - 1996

Australia		DGF	Immediate Function
Sparing at Tx	n=178	24%	76%
No Sparing at Tx	n=249	33%	67%

Chi-square p = 0.04 TABLE CS6.97

Figure 127

Patient and Graft Survival According to Cyclosporin A Sparing Agents at One Year Primary Cadaver 1989 - 1996

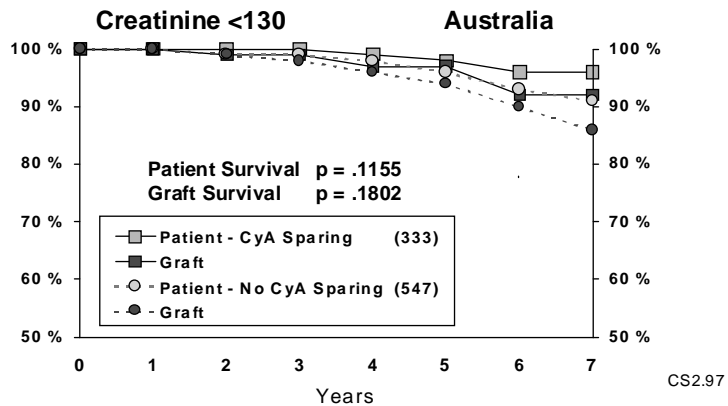


Figure 128

Patient and Graft Survival According to Cyclosporin A Sparing Agents at One Year Primary Cadaver 1989 - 1996

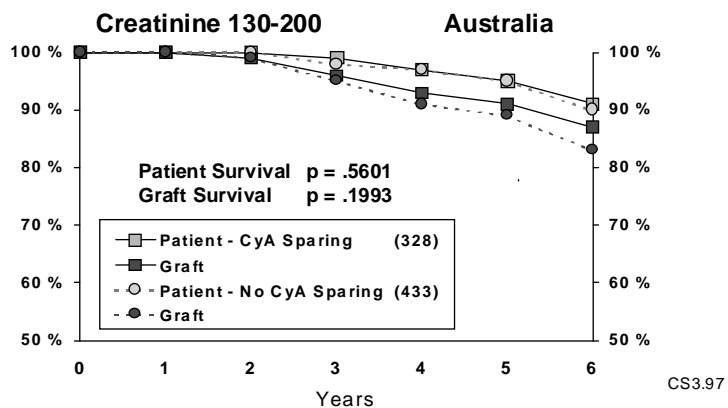
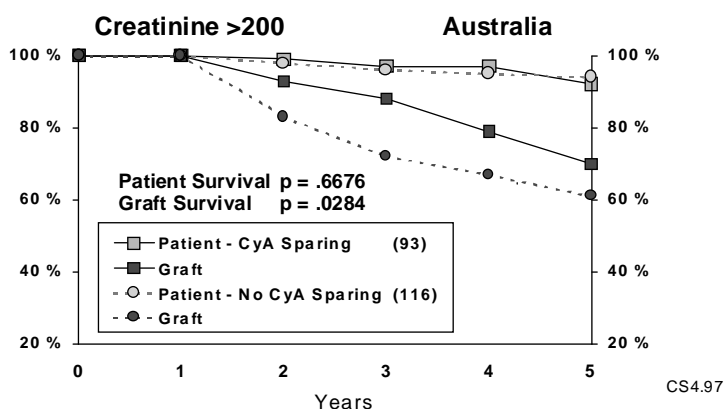


Figure 129

Patient and Graft Survival According to Cyclosporin A Sparing Agents at One Year Primary Cadaver 1989 - 1996



LATE GRAFT SURVIVAL AND CYCLOSPORIN A DOSAGE

The effect of the dose of CyA after one year on late graft survival has been examined. For first cadaveric grafts performed from 1986-96, patients have been divided into those who were receiving CyA sparing agents or not. Without CyA sparing agents, there was no difference in patient or graft survival up to ten years whether

patients were receiving more or less than 5 mg/Kg/day of CyA at 12 months post transplant. See Figure 130. Similarly, for patients receiving CyA sparing agents, there is no difference up to six years between patients on more or less than 3.5 mg/Kg/day of CyA at 12 months. See Figure 131.

Figure 130

Primary Cadaver Grafts Surviving at One Year Graft Survival According to Cyclosporin Dose No Sparing Agents Used 1986 - 1996

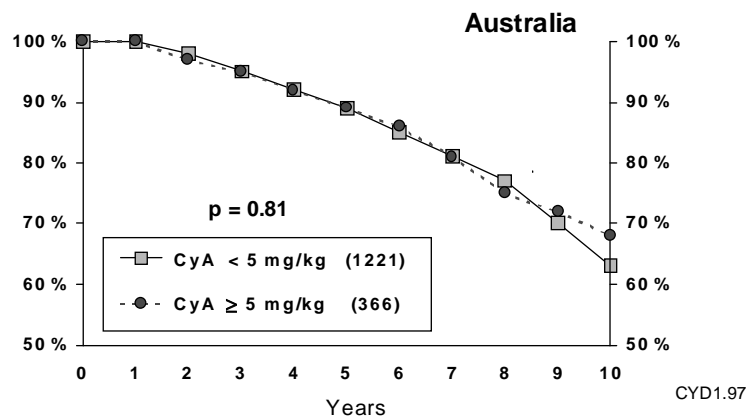
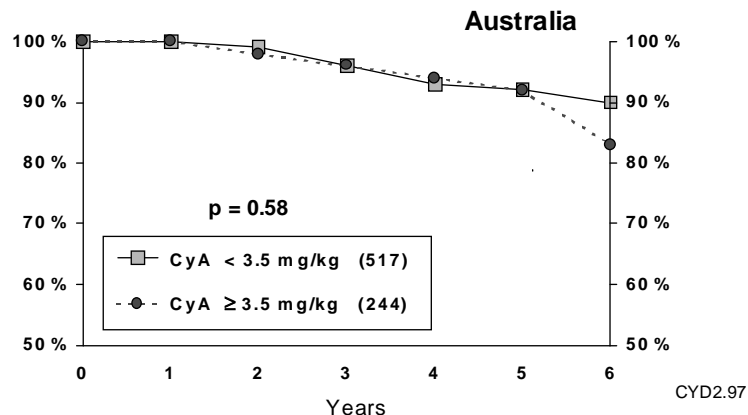


Figure 131

Primary Cadaver Grafts Surviving at One Year Graft Survival According to Cyclosporin Dose Used with Sparing Agents 1986 - 1996



PREDNISOLONE USAGE AND LATE SURVIVAL

The use of Prednisolone at one year post transplant and its effect on late graft and patient survival is shown in Figure 132-135.

For primary cadaveric grafts functioning at 12 months, the avoidance of prednisolone is associated with a highly significant patient and graft survival advantage. See Figure 132. A similar difference is seen for regrafts (Figure 133) and living related donor grafts (Figure 134).

For primary cadaveric grafts which are surviving at 12 months with a serum creatinine under 130 $\mu\text{mol/L}$, a significant advantage in patient survival is seen for recipients in whom prednisolone is not being used at one year. See Figure 135.

Survival differences between centres may contribute to the above observations as different centres have variable prednisolone withdrawal/avoidance policies.

Figure 132

**Primary Cadaver Grafts Surviving at One Year
Patient and Graft Survival 1986 - 1996
According to Prednisolone Use at One Year**

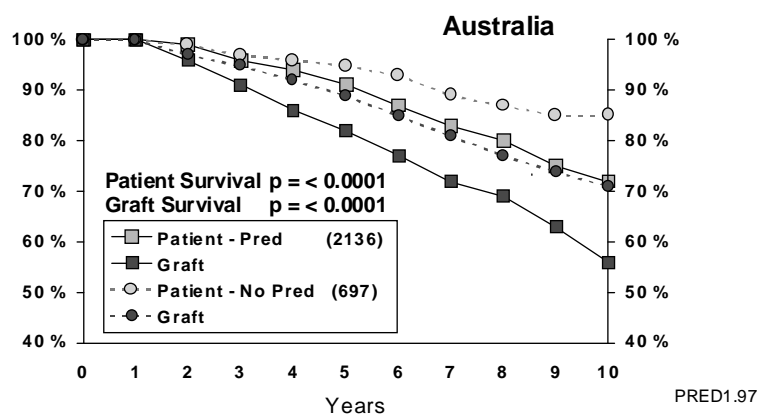


Figure 133

**Subsequent Cadaver Grafts Surviving at One Year
Patient and Graft Survival 1986 - 1996
According to Prednisolone Use at One Year**

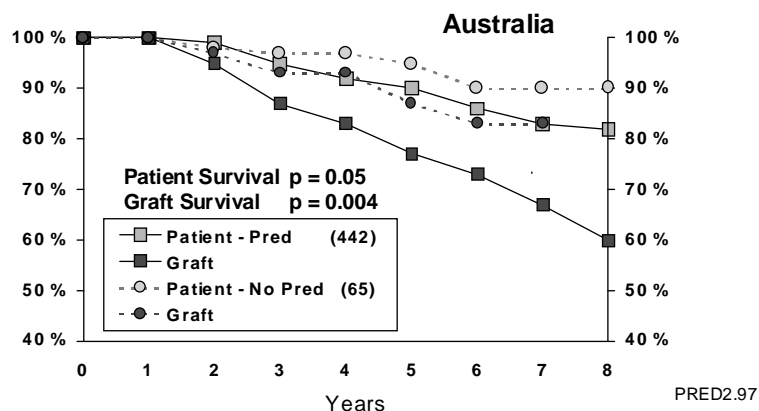


Figure 134

**Living Related Donor Grafts Surviving at One Year
Patient and Graft Survival 1986 - 1996
According to Prednisolone Use at One Year**

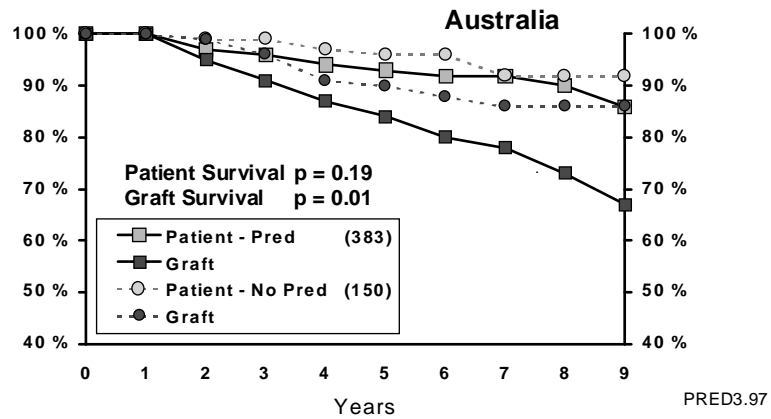
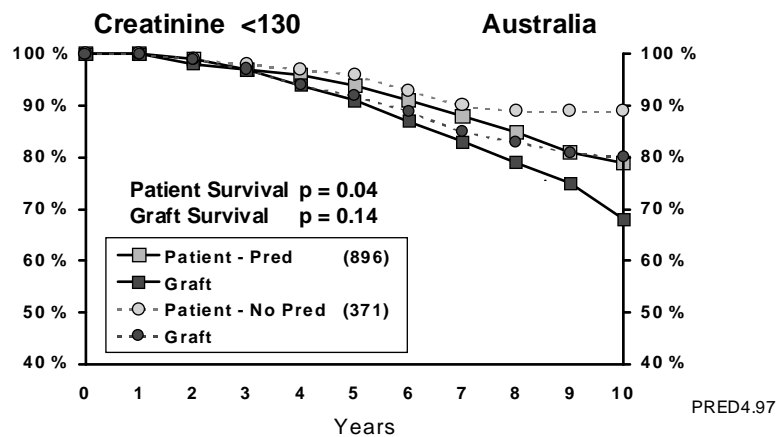


Figure 135

**Primary Cadaver Grafts Surviving at One Year
Patient and Graft Survival 1986 - 1996
According to Prednisolone Use at One Year**



ORGAN DONOR PROCUREMENT

ORGAN DONORS IN AUSTRALIA AND NEW ZEALAND 1993 - 1996

(Summarised from the Australia and New Zealand Organ Donation Registry Report 1997)

(Editors K.Herbertt, G. Russ)

The Australia and New Zealand organ donation rate over the last three years has remained unchanged at 10-11 donors per million of population. The number and rate of organ donors for each Australian State and New Zealand is shown in Table 87 for 1993-96.

The number of donors per thousand deaths in Australia from 1989-95 and in New Zealand from 1993-96 are shown in Table 88.

DONOR PROFILE

AGE AND GENDER DISTRIBUTION

The mean age for organ donors in Australia has increased slightly over the last three years from 36.4 to 38.3 years. In 1996 there were nine donors (4.6%) over the age of 65 years. The oldest donor in 1996 was 74 years.

In New Zealand in 1996, the mean age of organ donors was 36.6 years which represents a decrease since 1994. In 1996 there was one donor over the age of 60 years. See Table 89.

The gender distribution of donors from 1993-96 is shown in Table 90 for Australia by each State and New Zealand. Again for each region there is a predominance of male donors. The age and gender distribution of donors for Australia and New Zealand is diagrammatically represented in Figures 136-141.

CAUSE OF DONOR DEATH

Figures 142 and 143 show the cause of death for all organ donors in Australia since 1989 and for New Zealand since 1993. A detailed breakdown of the cause of donor death in 1996 according to gender is shown in Table 91. The largest cause of donor death in each country was cerebrovascular accidents. This is the case for both male and female donors.

A breakdown of the cause of donor death

related to age group in 1996 for both Australia and New Zealand are shown in Table 92. For the older age groups, the main cause of death is cerebrovascular accident whereas for donors less than 34 years of age the majority of donors die from trauma.

NON HEART BEATING DONORS

In 1996 there were two non heart beating donors in Australia and one in New Zealand. See Table 93.

MEDICAL CONDITIONS OF DONORS

The following information relating to diabetes, hypertension, smoking and alcohol intake was added to the data collection of ANZOD in 1993.

DIABETES

There were two Type II diabetics (non-insulin dependent) accepted as donors in Australia in 1996. New Zealand had none.

HYPERTENSION

In 1996, 11% of Australian donors had a past history of chronic hypertension, 43% of this group had hypertension recorded between 5-10 years.

New Zealand recorded two donors (6%) with a past history of chronic hypertension.

SMOKING

In 1996, 35% of Australian organ donors were recorded as being current smokers, and 2% were recorded as being former smokers.

In New Zealand, 31% were reported as current smokers.

ALCOHOL

In Australia (1996), 35% of donors were recorded as having an alcohol intake of >40 grams per day.

However, for the same year in New Zealand it was 11%.

MULTIPLE ORGAN DONATION

For those Australian donors in which consent had been given, the specific organ retrieval rates in 1996 were: kidneys 99%, livers 67%, hearts 60%, lungs 43%, pancreas 27% and bone 48%.

For New Zealand in 1996, the corresponding figures were: kidneys 100%, livers 86%, hearts 45%, lungs 43%, pancreas 25% and bone 60%.

An increasing trend towards multiple organ retrieval seen in Australia from 1993-95 appears to have been reversed in 1996 with an increase in donors providing a single organ type compared to previous years. See Table 94.

CADAVERIC KIDNEY DONORS

A breakdown of the age of kidney donors from 1993-96 is shown for Australia and New Zealand in Table 95.

The outcome of requests for kidney donation in 1996 for Australia and New Zealand is shown in Figures 144 and 145 respectively.

Of the 385 kidneys retrieved, 21 were not transplanted. The reasons for these kidneys not being used is shown in Table 96 along with previous experience in 1993-95. The majority of kidneys not used were from donors aged more than 55 years of age. See Table 97.

KIDNEY PERFUSION METHODS

See Tables 98 and 99.

AUSTRALIA

In 1996, Ross solution was used predominantly (77%) as the single perfusion solution.

However, University of Wisconsin (UW) was used as the final perfusion solution in 57% of cases when more than one solution was used.

NEW ZEALAND

Collins and Ross solution was predominantly used as the single perfusion solution.

University of Wisconsin (UW) was the final perfusion solution in 72% of kidneys.

DONOR KIDNEY FUNCTION

See Tables 100 and 101.

TERMINAL LEVELS OF SERUM CREATININE AND UREA

In 1996 in Australia, 85% of donors had a serum creatinine of <125 µmol/L and 86% had a serum urea of <9 mmol/L.

New Zealand had 94% of donors with a serum creatinine of <125 µmol/L and 94% with a serum urea of <9 mmol/L.

Table 87

Australia and New Zealand

Number of Donors 1993 - 1996

	1993		1994		1995		1996	
AUSTRALIA	221	(13)	183	(10)	184	(10)	194	(11)
Queensland	44	(14)	38	(12)	34	(10)	35	(10)
New South Wales/ACT	74	(12)	73	(11)	67	(10)	69	(11)
Victoria	52	(12)	26	(6)	38	(8)	49	(11)
Tasmania	6	(13)	6	(13)	4	(8)	1	(2)
South Australia	23	(16)	23	(16)	23	(16)	25	(17)
Northern Territory	3	(18)	1	(6)	1	(6)	3	(17)
Western Australia	19	(11)	16	(9)	17	(10)	12	(7)
NEW ZEALAND	34	(10)	35	(10)	35	(10)	36	(10)

() Per Million

Table 88

Australia and New Zealand

Donors per Thousand Deaths 1989 - 1996

Year	Australia	New Zealand
1989	1.84	-
1990	1.71	-
1991	1.76	-
1992	1.76	-
1993	1.83	1.25
1994	1.44	1.29
1995	1.54	1.29
1996	n/a	1.27

Table 89

Australia and New Zealand

Age of Male and Female Donors 1993 - 1996

	Mean (years)			Median (years)			Range (years)
	All	Female	Male	All	Female	Male	
AUSTRALIA							
1993	37.2	37.2	37.2	36.6	39.0	35.9	1.5 - 72.4
1994	36.4	38.9	34.0	36.8	41.8	31.7	1.3 - 76.3
1995	37.7	40.0	36.4	38.1	41.7	35.2	3.0 - 72.1
1996	38.3	40.3	36.9	38.5	46.1	36.2	1.45 - 74.2
NEW ZEALAND							
1993	40.1	40.4	39.7	44.4	42.1	45.2	4.7 - 67.1
1994	40.6	44.9	38.3	40.6	47.3	37.3	2.5 - 70.1
1995	34.2	34.0	34.4	34.8	35.3	28.6	6.8 - 70.7
1996	36.6	37.9	35.1	35.2	42.7	29.9	9.6 - 72.5

Table 90

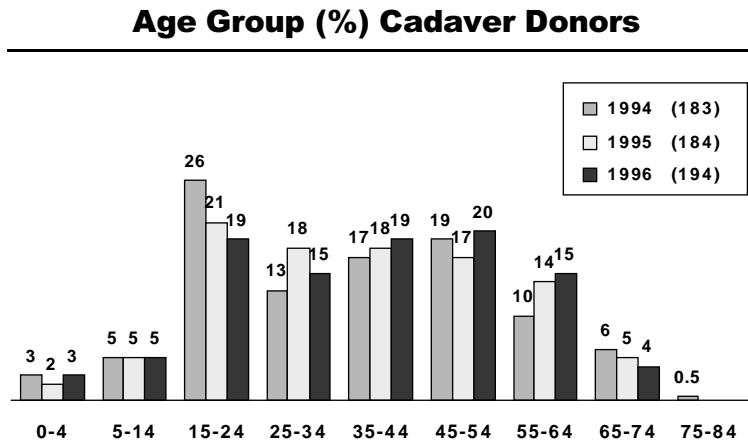
Australia and New Zealand

Gender of Donors 1993 - 1996

	Female		Male		Total	
AUSTRALIA	648	39%	993	61%	1641	100%
Queensland	112	33%	226	67%	338	100%
New South Wales/ACT	246	41%	351	59%	597	100%
Victoria	155	43%	207	57%	362	100%
Tasmania	9	33%	18	66%	27	100%
South Australia	69	39%	106	61%	175	100%
Northern Territory	1	8%	12	92%	13	100%
Western Australia	56	43%	73	57%	129	100%
NEW ZEALAND	61	44%	79	56%	140	100%

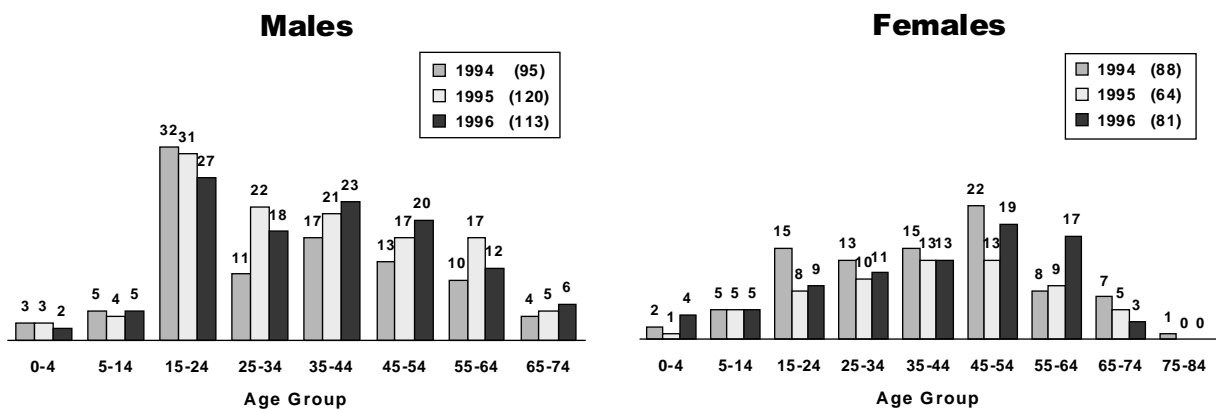
Australia 1994 - 1996

Figure 136



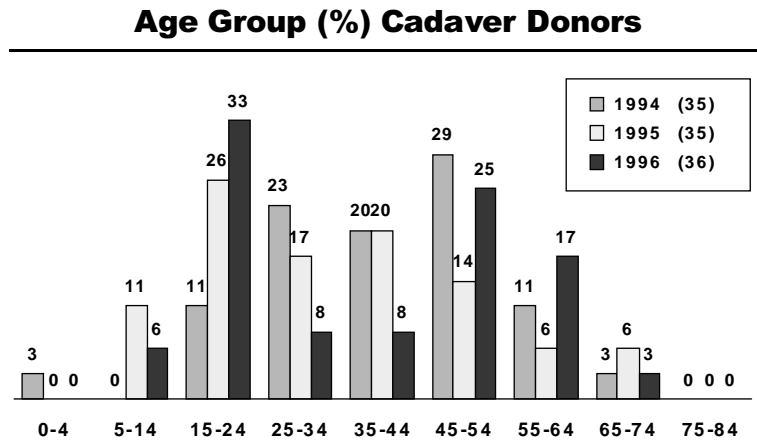
Figures 137 and 138

Age and Gender Distribution of Donors



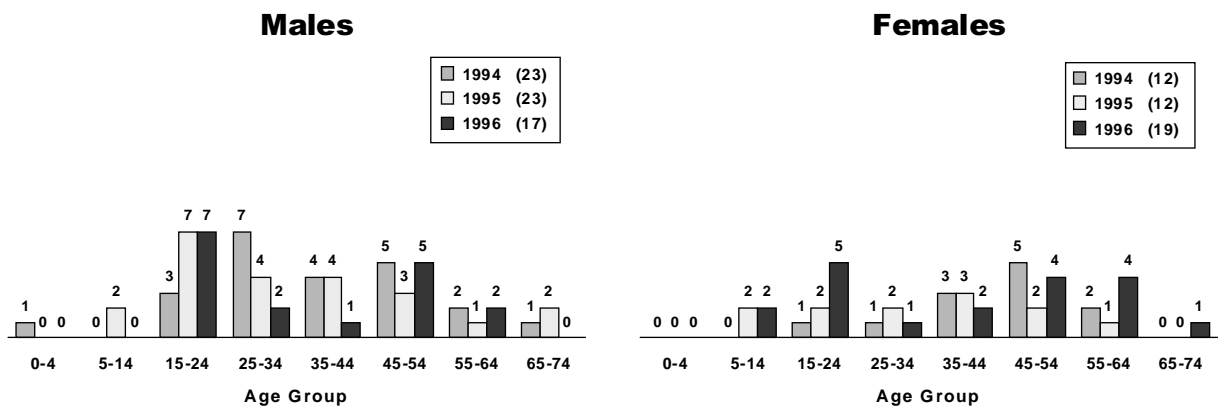
New Zealand 1994 - 1996

Figure 139



Figures 140 and 141

Age and Gender Distribution of Donors



Cause of Donor Death

Figures 142 and 143

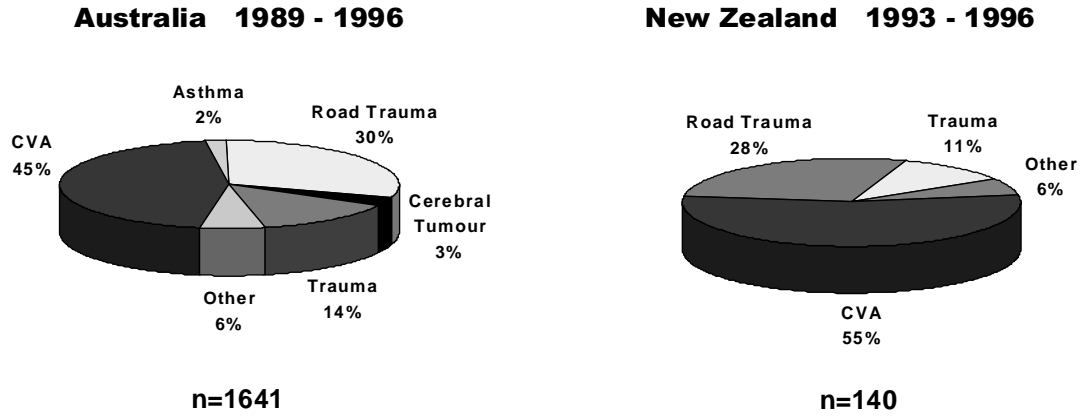


Table 91

Australia and New Zealand

Cause of Donor Death 1996

	Australia			New Zealand		
	Male	Female	Total	Male	Female	Total
Cerebrovascular Accidents (CVA)						
Intracranial haemorrhage	31	47	78	9	12	21
Infarct	4	1	5	-	-	-
Road Trauma						
Motor vehicle accident	17	10	27	5	3	8
Motor bike accident	6	-	6	-	1	1
Cyclist	8	-	8	1	-	1
Pedestrian	7	1	8	-	1	1
Other road accident	1	3	4	-	-	-
Trauma						
Drowning	3	1	4	-	-	-
Fall	19	5	24	1	1	2
Hanging	-	1	1	-	-	-
Gunshot	4	-	4	-	-	-
Assault	1	-	1	-	-	-
Other accident	1	1	2	-	-	-
Cerebral tumour	3	6	9	-	-	-
Asthma	-	2	2	-	-	-
Other						
Hypoxia (cardiac arrest)	5	1	6	1	-	1
Smoke inhalation	1	-	1	-	-	-
Meningitis - pneumococcal	-	1	1	-	-	-
Meningitis - meningococcus	-	1	1	-	-	-
Overdose	2	-	2	-	1	1
Total	113	81	194	17	19	36

Table 92

Australia and New Zealand

Cause of Death Related to Age Group 1996

Cause of Death	Australia					New Zealand				
	Age Groups					Age Groups				
	00-14	15-34	35-54	55 on	Total	00-14	15-34	35-54	55 on	Total
CVA	-	13	44	26	83	-	4	11	6	21
Road Trauma	8	33	11	2	54	2	8	-	1	11
Trauma (non road)	5	13	10	7	35	-	1	1	-	2
Other	3	6	10	3	22	-	2	-	-	2
Total	16	65	75	38	194	2	15	12	7	36

Table 93

Australia and New Zealand

Heart Beating Donors 1993 - 1996

	Australia					New Zealand				
	1993	1994	1995	1996	Total	1993	1994	1995	1996	Total
Yes	221	182	180	192	775	34	34	35	35	138
No	-	1	4	2	7	-	1	-	1	2
Total	221	183	184	194	782	34	35	35	36	140

Table 94

Australia and New Zealand

Trend to Multiple Organ Retrieval 1993 - 1996

No. of Organs	Australia				New Zealand			
	1993	1994	1995	1996	1993	1994	1995	1996
Single	30%	21%	18%	27%	41%	31%	29%	17%
Two	25%	27%	20%	24%	38%	43%	31%	44%
Three	24%	20%	33%	25%	21%	17%	20%	25%
Four	19%	26%	26%	18%	-	9%	20%	14%
Five	2%	6%	3%	6%	-	-	-	-

Table 95

Australia and New Zealand

Age of Kidney Donors 1993 - 1996

Year	Age Groups									Total
	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	
AUSTRALIA										
1993	3 (1)	17	46	34	33	39	26	7	-	205
1994	5 (3)	10	46	23	27	32	17	10	1	171
1995	4 (2)	9	39	31	33	29	23 (1)★	10	-	178
1996	5 (3)	10	36	29	36	39	25	8	-	188
Total	17 (9)	46	167	117	129	139	91 (1)	35	1	742
NEW ZEALAND										
1993	1	-	6	3	6	14	2	1	-	33
1994	1 (1)	-	4	8	7	10	4	1	-	35
1995	-	4	9	6	7	5	2	2	-	35
1996	-	2	12	3	3	9	6	1	-	36
Total	2 (1)	6	31	20	23	38	14	5	-	139

() "En-Bloc" Kidneys ★ Horseshoe Kidney (Adult)

Figures 144 and 145

Outcome of Requests for Kidney Donation 1996

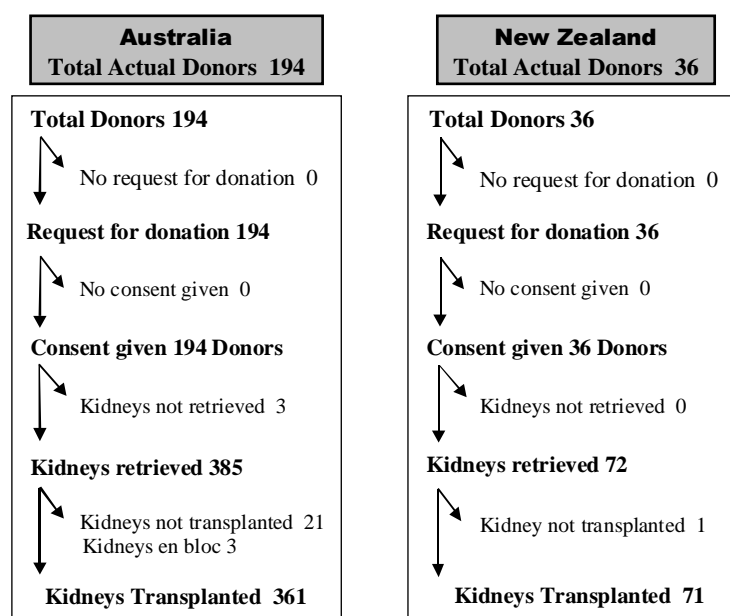


Table 96

Australia

Reason Kidneys were Unusable 1993 - 1996

	1993	1994	1995	1996	Total
Renal disease in donor	17	2	5	9	33
Infection in donor	2	2	-	3	7
Cancer in donor	-	2	2	-	4
Anatomical	1	-	-	6	7
Surgical	2	2	5	1	10
Trauma	2	-	-	-	2
No suitable recipient	1	-	-	1	2
Unknown	5	-	-	1	6
Total	30	8	12	21	71

Table 97

Australia and New Zealand

Donor Age for Unusable Kidneys 1993 - 1996

Year	Age Groups								Total
	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	
AUSTRALIA									
1993	-	1	2	-	1	7	10	9	30
1994	1	-	-	2	-	-	3	2	8
1995	-	-	-	-	4	-	8	-	12
1996	3	-	-	-	1	-	11	6	21
Total	4	1	2	2	6	7	32	17	71
NEW ZEALAND									
1993	-	-	1	2	1	-	-	-	4
1994	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-
Total	-	-	1	2	1	-	-	-	4

Table 98

Australia and New Zealand

Kidney Perfusion with Only One Solution 1993 - 1996

Solution	Australia				New Zealand			
	1993	1994	1995	1996	1993	1994	1995	1996
Ross	181	97	84	114	12	6	-	8
U.W.	104	103	22	22	40	24	12	2
Collins	26	16	6	10	-	4	16	8
Hartman	-	-	-	2	-	-	-	-
Total	311	216	112	148	52	34	28	18

Table 99

Australia and New Zealand

Final Perfusion Solution - Kidneys 1993 - 1996

Solution	Australia				New Zealand			
	1993	1994	1995	1996	1993	1994	1995	1996
Ross	223	125	130	130	14	10	2	12
U.W.	154	165	203	219	54	52	52	52
Collins	45	54	26	34	-	6	16	8
Hartman	-	-	-	2	-	-	-	-
Total	422	344	359	385	68	68	70	72

Table 100

Australia and New Zealand

Terminal Serum Creatinine Levels 1993 - 1996

Creatinine Level $\mu\text{mol/L}$	Australia				New Zealand			
	1993	1994	1995	1996	1993	1994	1995	1996
00-99	61%	72%	56%	63%	76%	78%	56%	85%
100-124	21%	17%	26%	22%	6%	11%	35%	9%
125-149	9%	4%	12%	7%	15%	4.5%	9%	3%
150-174	4%	3%	5%	5%	3%	2%	-	-
175-199	3%	2%	-	1%	-	-	-	3%
200-224	-	1%	1%	1%	-	-	-	-
225-249	<1%	1%	-	<1%	-	4.5%	-	-
>250	1%	-	<1%	-	-	-	-	-
Total	100%	100%	100%	100%	100%	100%	100%	100%

Table 101

Australia and New Zealand

Terminal Serum Urea Levels 1993 - 1996

Urea Level mmol/L	Australia				New Zealand			
	1993	1994	1995	1996	1993	1994	1995	1996
00-04	45%	50%	35%	48%	35%	43%	46%	47%
05-08	42%	40%	55%	38%	50%	48%	44%	47%
09-12	11%	10%	9%	10%	7.5%	3%	5%	3%
13-16	1%	<1%	-	2%	7.5%	6%	5%	3%
> 16	1%	-	1%	2%	-	-	-	-
Total	100%	100%	100%	100%	100%	100%	100%	100%