CHAPTER 7

Transplant

Reporting the incidence and prevalence of renal transplantation in Australia and New Zealand; summarizing immunosuppression regimens, rejection episodes and graft and patient survival.

Contents

Executive Summary

During 2016, there were 1091 kidney transplants performed in Australia and 172 performed in New Zealand, with live donor transplants contributing 24% and 48% of total transplants, respectively. The 45% growth in kidney transplants between 2011 and 2016 in Australia parallels the increase in the number of deceased donors, whereas the number of live donors has remained unchanged. In New Zealand, there has been a 46% growth over the same period, with corresponding increases of 48% and 44% in deceased and live donor transplants, respectively. There is a substantial geographical variation in the transplantation rate in Australia, with South Australia and Victoria having the highest transplant rate of dialysed patients in 2016. Even though the number of kidney transplants in every ethnic group has increased over time, Caucasian patients contribute to 74% and 55% of total patients transplanted in Australia and New Zealand, respectively; whereas Aboriginal/Torres Strait Islander and Māori patients contribute 3% and 15%, respectively (2016 data).

The number of prevalent patients with functioning kidney transplants has grown in the last decade, increasing by 54% between 2007 and 2016 (from 7252 to 11,134 recipients) in Australia, and by 37% (from 1302 to 1782 recipients) in New Zealand. At the end of 2016, 9% and 12% of prevalent transplants had functioned for at least 20 years in Australia and New Zealand, respectively. Death with a functioning graft and chronic allograft nephropathy are the two most common causes of allograft failure, accounting for 46% and 37% of all allograft failures in Australia, respectively; and 51% and 31% in New Zealand, respectively (2016 data). Cancer is the most common cause of death with a functioning graft in Australia, whereas cardiovascular disease remains the most common in New Zealand.

The proportion of kidney transplant recipients who had experienced acute rejection has remained unchanged over the last 5 years, with respective rejection rates of 17% and 18% for patients who have received primary live and deceased donor kidney transplants in Australia, compared to 4% and 6% reported in New Zealand. There has been considerable improvement in short and intermediate-term allograft and patient survivals following live and deceased donor kidney transplants since 1990, with 1-year (95% confidence interval) allograft survival in Australia for primary live and deceased donor kidney transplants of 98% (96%, 99%) and 94% (92%, 95%), respectively; and 99% (95%, 100%) and 96% (92%, 98%) in New Zealand, respectively (2015-2016 data).

Suggested citation

ANZDATA Registry. 40th Report, Chapter 7: Transplantation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at: http://www.anzdata.org.au

New transplants

Table 7.1 shows the number of transplants performed in each country over the last 20 years. The 1091 transplants performed in Australia in 2016 represent the highest number ever performed. This is predominantly driven by large growth in deceased donor numbers (figure 7.1); after a peak in 2008 living donor numbers have returned to pre-2008 levels. In New Zealand total transplant activity has increased in the last four years, driven by growth in the numbers of both deceased and living donor transplants.

Table 7.1 Number of Grafts Performed by Country 1997-2016

Country	Year	Graft 1	Graft 2	Graft 3	Graft 4	Graft 5	Total Transplants	Living donor transplants
Australia	**1997**	447	51	6	1	0	505	147
	1998	443	62	10	2	0	517	161
	1999	403	43	9	0	0	455	169
	2000	476	47	7	1	0	531	181
	2001	487	45	6	2	0	540	213
	2002	537	60	5	2	0	604	230
	2003	472	60	10	1	0	543	218
	2004	583	53	11	3	0	650	244
	2005	539	67	15	2	0	623	246
	2006	549	70	17	5	0	641	273
	2007	527	75	11	0	2	615	271
	2008	708	84	16	5	0	813	354
	2009	674	88	11	0	0	773	327
	2010	744	83	18	1	0	846	296
	2011	744	68	9	3	0	824	254
	2012	746	81	15	1	2	845	238
	2013	789	85	7	2	0	883	253
	2014	805	100	5	3	0	913	267
	2015	842	93	12	2	0	949	242
	2016	**932**	**138**	**19**	**2**	**0**	**1091**	**264**
New Zealand	**1997**	101	10	1	0	0	112	31
	1998	95	10	1	0	0	106	31
	1999	97	11	4	0	0	112	42
	2000	91	13	2	0	0	106	31
	2001	101	9	0	0	0	110	43
	2002	103	12	2	0	0	117	48
	2003	94	13	4	0	0	111	44
	2004	98	7	0	0	0	105	48
	2005	87	5	0	1	0	93	46
	2006	80	8	2	0	0	90	49
	2007	112	9	2	0	0	123	58
	2008	111	10	1	0	0	122	69
	2009	109	12	0	0	0	121	67
	2010	104	5	1	0	0	110	60
	2011	110	7	1	0	0	118	57
	2012	99	9	0	0	0	108	54
	2013	111	5	0	0	0	116	59
	2014	126	12	0	0	0	138	72
	2015	133	10	3	1	0	147	74
	2016	**155**	**17**	**0**	**0**	**0**	**172**	**82**

Figure 7.1.1 - Deceased and Living Donor Transplants - Australia 2007-2016

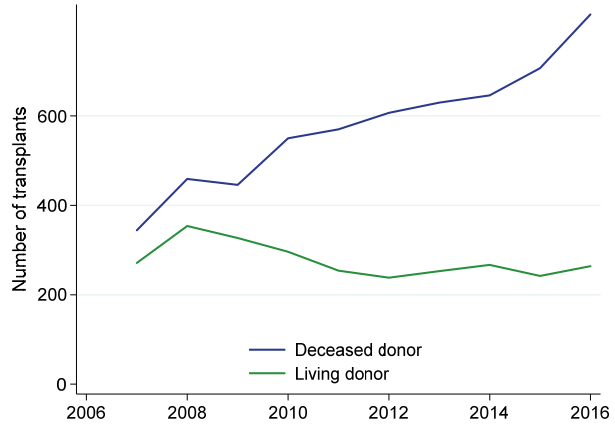
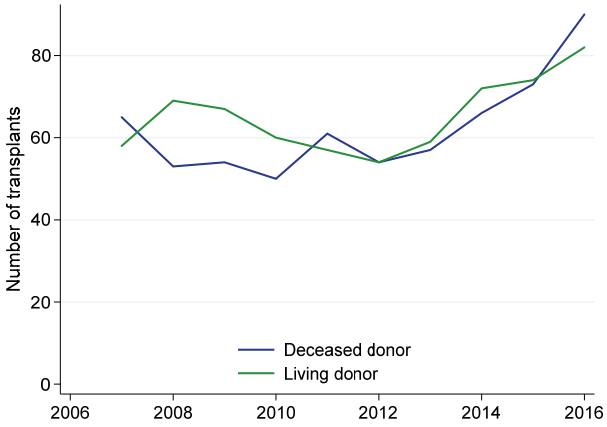


Figure 7.1.2 - Deceased and Living Donor Transplants - New Zealand 2007-2016



The transplant rate of dialysed patients is presented in figure 7.2 (for all dialysis patients) and figure 7.3 (for patients aged 15-64). Note that the denominator for these rates is dialysis-years. Differences in rates between states and countries depend on a number of factors including the casemix of the dialysis patients and the local deceased donor rate. These rates are presented by age in figure 7.4, and by ethnicity in patients aged 15-64 in figure 7.5. In both countries the transplant rate of indigenous patients is lower than in other ethnic groups; see also chapter 10.

Figure 7.2 - Transplant rate of dialysed patients 2016 - All dialysis patients

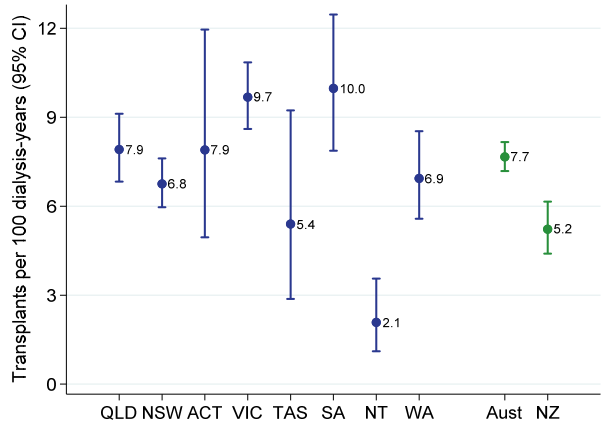


Figure 7.3 - Transplant rate of dialysed patients 2016 - Patients aged 15-64

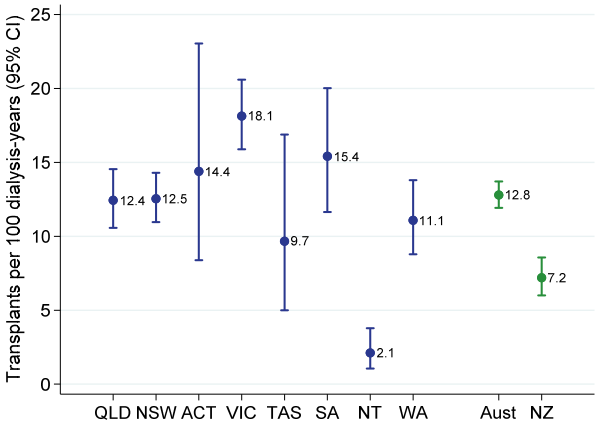


Figure 7.4.1 - Transplant rate of dialysed patients 2016 – Australia

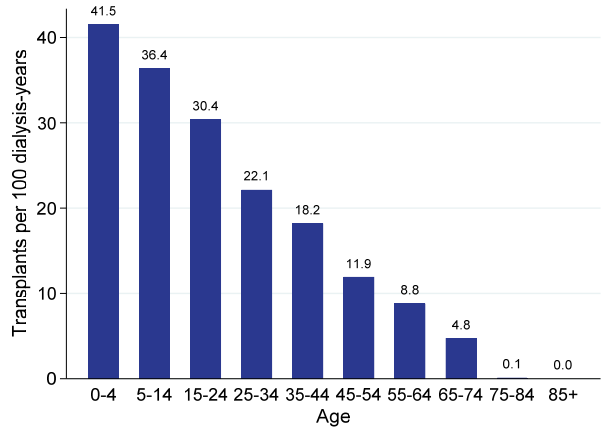


Figure 7.4.2 - Transplant rate of dialysed patients 2016 - New Zealand

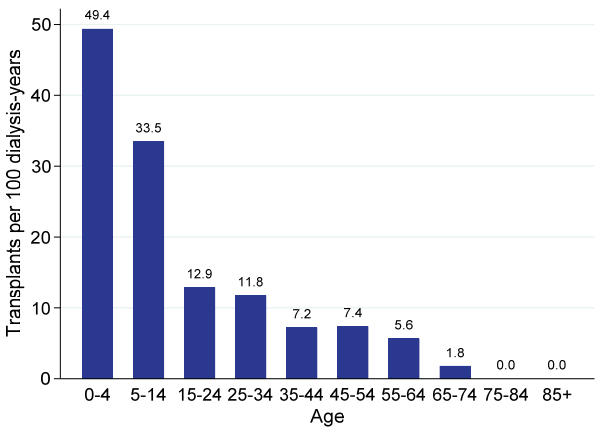


Figure 7.5.1 - Transplant rate of dialysed patients 2007-2016 - Australia, patients aged 15-64

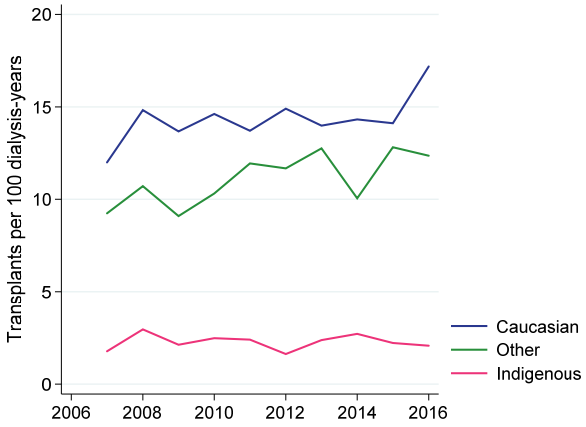


Figure 7.5.2 - Transplant rate of dialysed patients 2007-2016 - New Zealand, patients aged 15-64

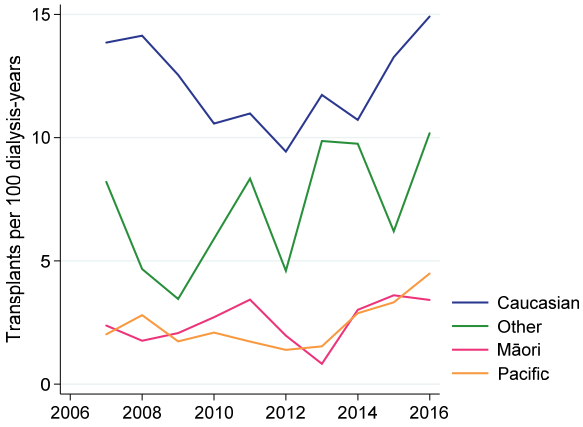


Table 7.2 shows the number of grafts performed according to graft number and recipient age in 2016. Transplant rates by age, per million population, are presented in figure 7.6.

Table 7.2 Age of Recipients Transplanted in 2016

Country	Donor type	Graft number	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84
Australia	Deceased	1	6	4	26	54	108	167	202	127	3
	Deceased	2	0	1	8	17	29	27	21	10	0
	Deceased	3	0	0	0	0	10	3	2	0	0
	Deceased	4	0	0	0	0	0	2	0	0	0
	Living	1	6	3	16	31	46	50	46	34	3
	Living	2	0	0	5	6	4	7	2	1	0
	Living	3	0	0	0	1	1	2	0	0	0
New Zealand	Deceased	1	0	1	2	7	6	27	29	8	0
	Deceased	2	0	0	0	4	0	4	1	1	0
	Living	1	3	2	5	10	16	16	17	6	0
	Living	2	0	0	0	2	2	2	1	0	0

Figure 7.6.1 - Transplant Operations (per million) 2016 – Australia

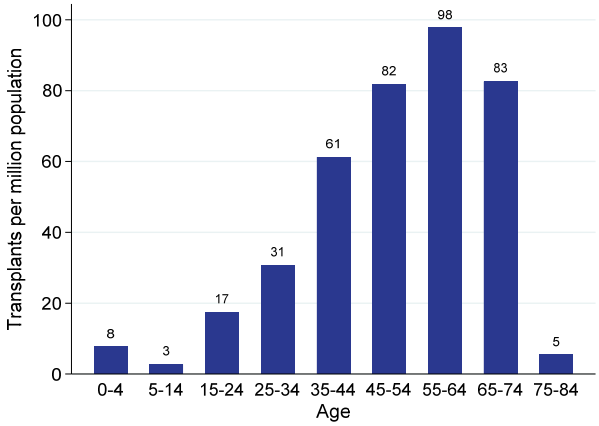


Figure 7.6.2 - Transplant Operations (per million) 2016 - New Zealand

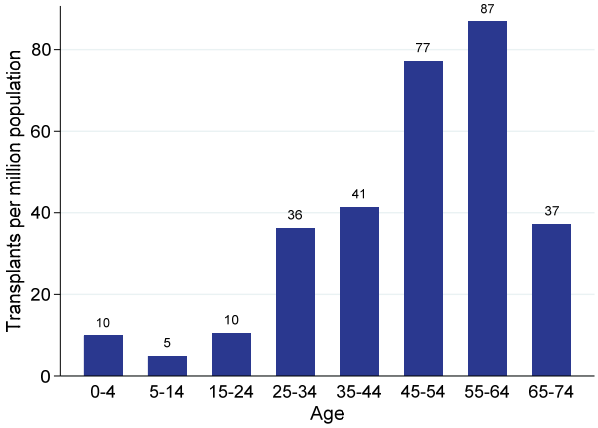


Table 7.3 shows the number of transplants performed by ethnicity over 2012-2016. In both countries the majority of recipients were Caucasian.

Table 7.3 Ethnicity of Recipients Transplanted 2012-2016

Country	Ethnicity	2012	2013	2014	2015	2016
Australia	**Total**	**845 (100.0%)**	**883 (100.0%)**	**913 (100.0%)**	**949 (100.0%)**	**1091 (100.0%)**
	Caucasian	677 (80.1%)	682 (77.2%)	697 (76.3%)	692 (72.9%)	802 (73.5%)
	Aboriginal/Torres Strait Islander	20 (2.4%)	31 (3.5%)	41 (4.5%)	36 (3.8%)	34 (3.1%)
	Asian	89 (10.5%)	109 (12.3%)	95 (10.4%)	126 (13.3%)	123 (11.3%)
	Māori	11 (1.3%)	8 (0.9%)	7 (0.8%)	8 (0.8%)	9 (0.8%)
	Pacific	15 (1.8%)	26 (2.9%)	27 (3.0%)	22 (2.3%)	15 (1.4%)
	Other	27 (3.2%)	22 (2.5%)	31 (3.4%)	38 (4.0%)	52 (4.8%)
	Not reported	6 (0.7%)	5 (0.6%)	15 (1.6%)	27 (2.8%)	56 (5.1%)
New Zealand	**Total**	**108 (100.0%)**	**116 (100.0%)**	**138 (100.0%)**	**147 (100.0%)**	**172 (100.0%)**
	Caucasian	75 (69.4%)	81 (69.8%)	81 (58.7%)	84 (57.1%)	94 (54.7%)
	Asian	11 (10.2%)	16 (13.8%)	16 (11.6%)	12 (8.2%)	12 (7.0%)
	Māori	15 (13.9%)	9 (7.8%)	22 (15.9%)	28 (19.0%)	25 (14.5%)
	Pacific	7 (6.5%)	8 (6.9%)	16 (11.6%)	21 (14.3%)	28 (16.3%)
	Other	-	1 (0.9%)	3 (2.2%)	2 (1.4%)	7 (4.1%)
	Not reported	-	1 (0.9%)	-	-	6 (3.5%)

Table 7.4 shows the number of transplants (per million population) performed by transplanting region over 2012-2016. Transplants performed for people resident in Tasmania and the Northern Territory patients are included in figures for Victoria and South Australia regions respectively. These regions share common waiting lists and allocation protocols.

Table 7.4 Transplants (pmp) by Transplanting Region 2012-2016

State	2012	2013	2014	2015	2016
NSW/ACT	247 (32)	288 (37)	300 (38)	331 (41)	348 (43)
Vic/Tas	268 (44)	267 (43)	306 (48)	303 (47)	352 (53)
QLD	159 (35)	149 (32)	145 (31)	139 (29)	199 (41)
SA/NT	88 (47)	81 (42)	85 (44)	89 (46)	95 (49)
WA	83 (34)	98 (39)	77 (30)	87 (34)	97 (37)
Australia	**845 (37)**	**883 (38)**	**913 (39)**	**949 (40)**	**1091 (45)**

Each year a small number of Australian and New Zealand dialysis patients travel overseas to receive a kidney transplant. The numbers of such procedures over 2007-2016 are presented in table 7.5. It is possible that these numbers are an underestimate of the true number, since some patients may not return to Australia/New Zealand and hence be reported to ANZDATA as lost to follow-up.

Table 7.5 Transplant Operations Performed Overseas on Australian/NZ Dialysis Patients 2007-2016

Year	Australia	New Zealand
2007	11	1
2008	4	0
2009	8	1
2010	4	1
2011	7	2
2012	4	1
2013	3	1
2014	3	0
2015	6	1
2016	**2**	**1**

Prevalent transplants

This section presents the number of prevalent (functioning) transplants according to various categories.

Table 7.6 presents the total number of transplants performed (in Australia and New Zealand, categorised by country of transplant) and functioning at the end of 2016 (categorised by country of residence). The patients with transplants of “unknown” source were transplanted outside Australia/New Zealand.

Table 7.6 Total Number of Transplants Performed and Functioning at End of 2016

Country	Donor type	Graft number	Performed	Functioning
Australia	Living	1	5368	3519
		2	516	310
		3	69	49
		4	10	7
		5	1	0
	Deceased	1	15843	6354
		2	2305	754
		3	357	105
		4	57	15
		5	6	2
	Unknown	1	0	17
		2	0	2
New Zealand	Living	1	1265	790
		2	100	59
		3	7	4
		4	1	1
	Deceased	1	2540	823
		2	426	86
		3	78	15
		4	7	0
	Unknown	1	0	4

Table 7.7 presents the number of functioning transplants at the end of 2007-2016 by transplant region. In Australia SA/NT has the highest prevalence of transplant patients per million population (598 pmp) and WA the lowest (403 pmp). These data are shown graphically in figures 7.7 and 7.8.

Table 7.7 Functioning Transplants (pmp) by Transplanting Region 2007-2016

Year	NSW/ACT	Vic/Tas	QLD	SA/NT	WA	Australia	New Zealand
2007	2281 (318)	1968 (349)	1424 (346)	868 (486)	711 (338)	7252 (348)	1302 (308)
2008	2388 (327)	2104 (366)	1506 (357)	911 (504)	751 (346)	7660 (361)	1353 (318)
2009	2491 (336)	2260 (385)	1576 (364)	935 (510)	789 (352)	8051 (371)	1405 (327)
2010	2641 (352)	2425 (406)	1650 (375)	974 (524)	820 (358)	8510 (386)	1443 (332)
2011	2720 (359)	2584 (427)	1719 (384)	989 (529)	860 (365)	8872 (397)	1483 (338)
2012	2829 (368)	2724 (443)	1797 (393)	1032 (545)	889 (365)	9271 (408)	1521 (345)
2013	2940 (378)	2871 (460)	1863 (401)	1053 (550)	938 (373)	9665 (418)	1571 (354)
2014	3085 (391)	3050 (480)	1917 (406)	1075 (557)	958 (375)	10085 (430)	1623 (360)
2015	3245 (405)	3192 (494)	1967 (412)	1110 (571)	994 (384)	10508 (442)	1698 (369)
2016	3437 (423)	3389 (514)	2087 (431)	1167 (598)	1054 (403)	11134 (462)	1782 (380)

Figure 7.7 - Functioning Transplants by Region - Australia 2007-2016

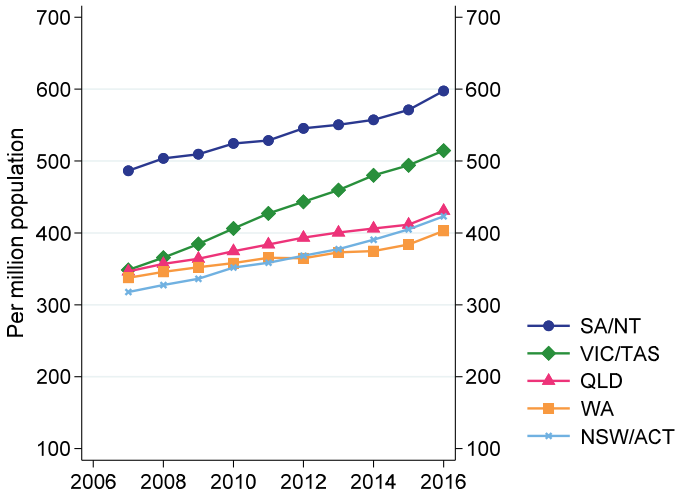
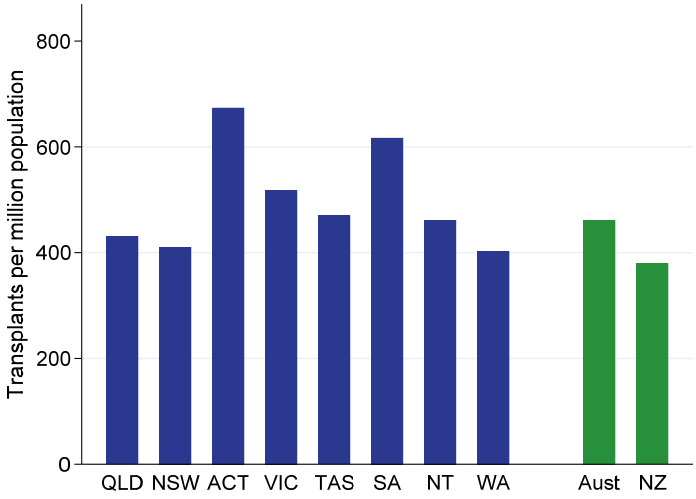


Figure 7.8 - Prevalence of Functioning Transplants 31 Dec 2016 - Per million population



The age distribution of prevalent transplant patients as a proportion of patients on renal replacement therapy is shown in figure 7.9. The proportion depending on living donor grafts is greater in the younger age groups. The number of prevalent transplant patients by age and donor source is shown in table 7.8. Finally, the age distribution, and distribution per million population, are shown in figures 7.10 and 7.11 for Australia and New Zealand respectively.

Figure 7.9.1 - Prevalence of Functioning Transplants – As mode of RRT, Australia 2016

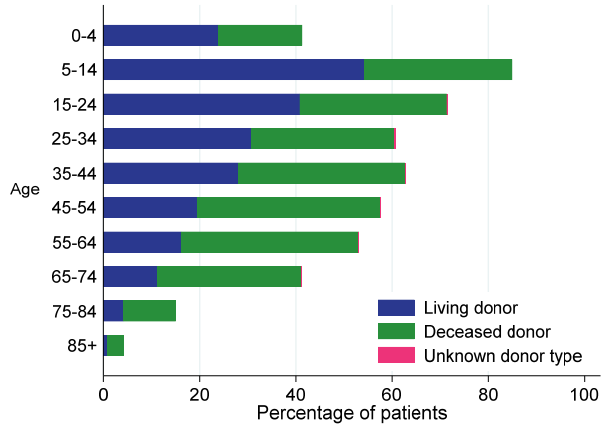


Figure 7.9.2 - Prevalence of Functioning Transplants - As mode of RRT, New Zealand 2016

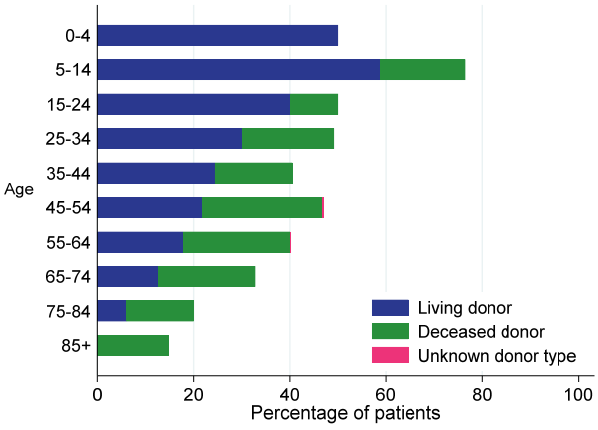


Table 7.8 Age Distribution of Functioning Transplant Patients - 31 Dec 2016

Country	Donor source	Graft number	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Australia	All	All	19	141	347	698	1559	2553	3034	2270	487	26	11134
	Unknown	1	-	-	1	3	4	2	5	2	-	-	17
		2	-	-	-	1	-	1	-	-	-	-	2
		All	-	-	1	4	4	3	5	2	-	-	19
	Deceased	1	8	47	127	284	714	1428	1865	1528	335	18	6354
		2	-	4	19	48	118	214	215	117	16	3	754
		3	-	-	2	8	26	37	23	8	1	-	105
		4	-	-	-	1	2	8	4	-	-	-	15
		5	-	-	-	-	-	1	1	-	-	-	2
		All	8	51	148	341	860	1688	2108	1653	352	21	7230
	Living	1	11	90	175	321	616	765	829	577	131	4	3519
		2	-	-	22	28	67	79	77	32	4	1	310
		3	-	-	1	4	11	15	13	5	-	-	49
		4	-	-	-	-	1	3	2	1	-	-	7
		All	11	90	198	353	695	862	921	615	135	5	3885
New Zealand	All	All	4	26	51	147	194	448	491	348	69	4	1782
	Unknown	1	-	-	-	-	-	3	1	-	-	-	4
		All	-	-	-	-	-	3	1	-	-	-	4
	Deceased	1	-	6	10	50	69	190	248	199	47	4	823
		2	-	-	-	7	6	41	18	13	1	-	86
		3	-	-	-	-	2	6	6	1	-	-	15
		All	-	6	10	57	77	237	272	213	48	4	924
	Living	1	4	20	40	84	105	182	201	133	21	-	790
		2	-	-	1	6	12	23	15	2	-	-	59
		3	-	-	-	-	-	2	2	-	-	-	4
		4	-	-	-	-	-	1	-	-	-	-	1
		All	4	20	41	90	117	208	218	135	21	-	854

Figure 7.10.1 - Age Distribution of Functioning Transplants - Australia 2016 (n=11134)

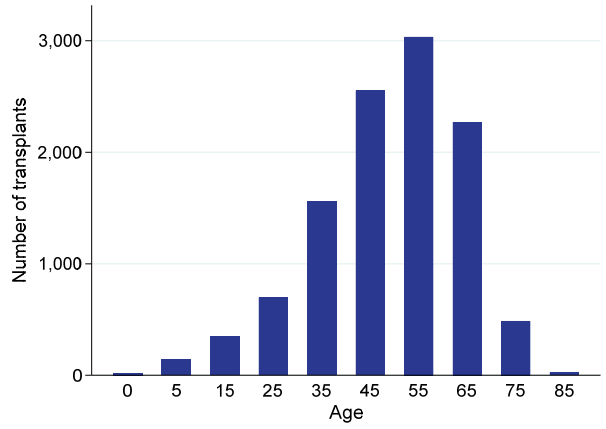


Figure 7.10.2 - Age Distribution of Functioning Transplants - Per million population, Australia 2016

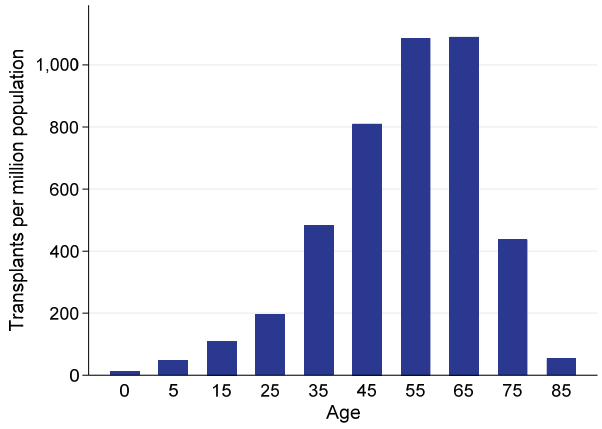


Figure 7.11.1 - Age Distribution of Functioning Transplants - New Zealand 2016 (n=1782)

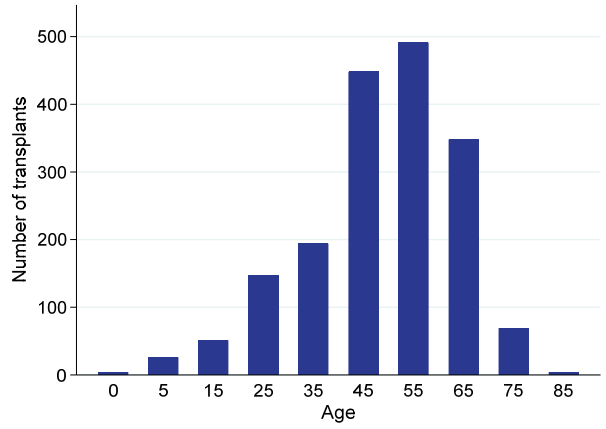


Figure 7.11.2 - Age Distribution of Functioning Transplants - Per million population, New Zealand 2016

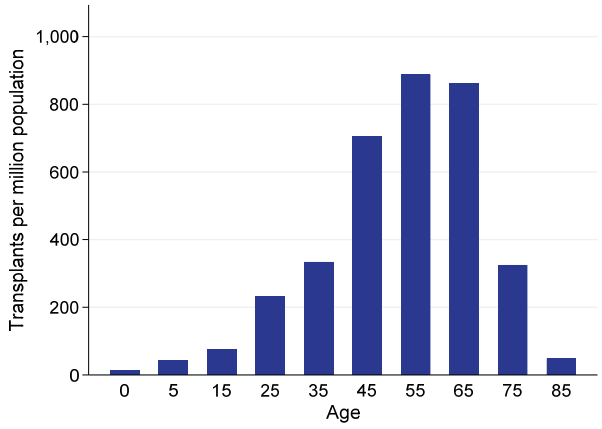


Table 7.9 presents the number of prevalent patients by sex, ethnicity and age; the great majority of prevalent transplant patients in both countries are Caucasian.

Table 7.9 Functioning Transplant Patients Related to Ethnicity and Age Group - 31 Dec 2016

Country	Gender	Ethnicity	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Aus	**All**	**Total**	**19**	**141**	**347**	**698**	**1559**	**2553**	**3034**	**2270**	**487**	**26**	**11134**
	Female	Caucasian	3	42	95	224	498	768	909	706	185	11	3441
		Aboriginal/Torres Strait Islander	-	1	6	8	24	41	20	9	-	-	109
		Asian	-	2	13	24	81	130	174	89	12	-	525
		Other	-	12	10	26	27	37	37	18	3	1	171
		Not reported	-	-	4	7	6	7	10	8	-	-	42
		Total	**3**	**57**	**128**	**289**	**636**	**983**	**1150**	**830**	**200**	**12**	**4288**
	Male	Caucasian	16	61	174	325	730	1303	1549	1235	259	13	5665
		Aboriginal/Torres Strait Islander	-	3	6	13	23	36	46	22	2	-	151
		Asian	-	8	19	41	103	149	207	132	19	1	679
		Other	-	12	14	25	53	57	68	43	7	-	279
		Not reported	-	-	6	5	14	25	14	8	-	-	72
		Total	**16**	**84**	**219**	**409**	**923**	**1570**	**1884**	**1440**	**287**	**14**	**6846**
NZ	**All**	**Total**	**4**	**26**	**51**	**147**	**194**	**448**	**491**	**348**	**69**	**4**	**1782**
	Female	Caucasian	-	5	16	34	60	120	124	117	21	2	499
		Asian	-	1	5	3	7	12	15	11	1	-	55
		Māori	1	3	4	9	12	13	16	5	5	-	68
		Pacific	1	1	1	10	7	16	15	3	1	-	55
		Other	-	-	1	-	-	2	-	-	-	-	3
		Not reported	-	-	-	1	-	1	2	1	-	-	5
		Total	**2**	**10**	**27**	**57**	**86**	**164**	**172**	**137**	**28**	**2**	**685**
	Male	Caucasian	1	13	19	62	76	221	202	153	33	2	782
		Asian	-	1	-	9	11	20	32	21	2	-	96
		Māori	1	2	2	9	9	23	48	24	5	-	123
		Pacific	-	-	3	8	11	13	29	9	1	-	74
		Other	-	-	-	2	1	5	5	4	-	-	17
		Not reported	-	-	-	-	-	2	3	-	-	-	5
		Total	**2**	**16**	**24**	**90**	**108**	**284**	**319**	**211**	**41**	**2**	**1097**

Figure 7.12 shows the duration of function of prevalent transplants at the end of 2016. In Australia there were 3892 grafts that had functioned for ≥10 years, 1057 ≥20 years and 248 ≥30 years. In New Zealand there were 694 grafts that had functioned for ≥10 years, 211 ≥20 years and 45 ≥30 years.

Figure 7.12.1 - Number and Duration of Functioning Grafts - Australia 2016 (n=11134)

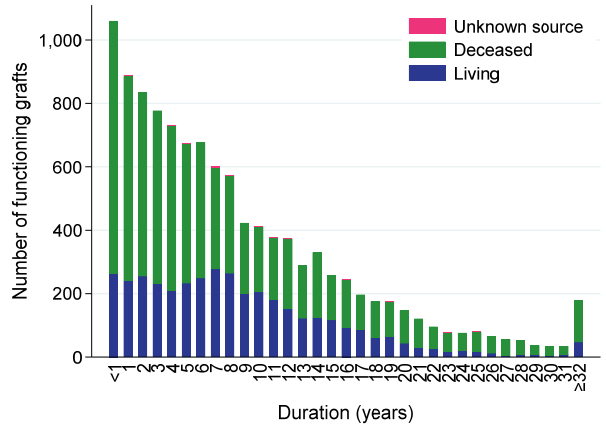
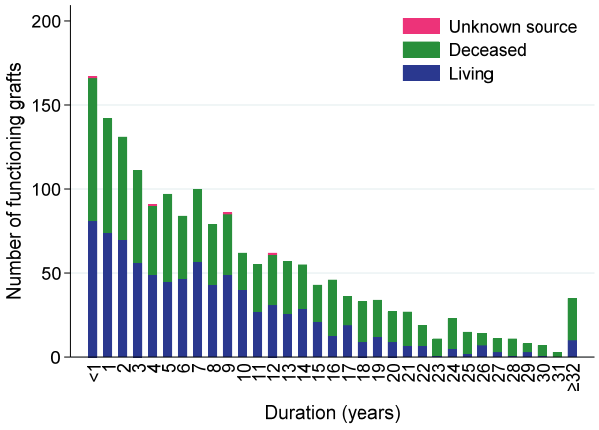


Figure 7.12.2 - Number and Duration of Functioning Grafts - New Zealand 2016 (n=1782)



Graft loss

Table 7.10 presents the overall graft loss rate in 2007-2016 by country, stratified into graft failure and death with a functioning graft. These rates are expressed as graft losses per 100 graft-years. In general, around half of grafts are lost due to graft failure and half due to patient death.

Table 7.10 Graft Loss Rate 2007-2016

Country	Outcome	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Australia	**Graft failure**	2.9	3.4	3.3	2.8	2.9	3.1	2.7	2.8	3.2	2.6
	Death with function	2.5	2.5	2.1	2.4	2.8	2.1	2.8	2.5	2.6	2.4
	All losses	5.4	6.0	5.3	5.1	5.7	5.3	5.5	5.3	5.7	5.0
New Zealand	**Graft failure**	3.5	2.4	2.8	2.4	2.3	2.6	2.4	3.0	2.1	2.8
	Death with function	3.7	2.1	2.7	2.5	3.1	2.2	2.1	3.0	2.8	3.0
	All losses	7.2	4.5	5.5	4.9	5.4	4.8	4.6	6.0	4.9	5.7

The causes of graft loss over 2007-2016 are presented in table 7.11. Chronic allograft nephropathy dominates the causes of graft failure, whilst graft failure due to acute rejection is an uncommon event. These data are further categorised by timing post-transplant (first year versus later years) for 2012-2016 in table 7.12. Cancer and cardiovascular disease are the most common causes of death with a functioning graft in both Australia and New Zealand

Table 7.11 Causes of Graft Loss 2007-2016

Country	Cause of graft loss	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Australia	**Death with function**	165	175	149	178	222	174	232	213	226	220	1954
	Acute rejection	11	10	16	8	10	10	13	11	16	14	119
	Chronic allograft nephropathy	132	174	153	147	156	174	156	164	189	152	1597
	Hyperacute rejection	-	2	-	-	-	-	-	1	-	1	4
	Vascular	8	14	17	11	6	10	9	7	13	9	104
	Technical	2	4	3	4	5	2	-	6	4	6	36
	Glomerulonephritis	15	10	15	16	15	18	16	12	20	18	155
	Non-compliance	7	6	14	6	6	8	9	14	3	7	80
	Other	17	16	15	17	27	30	22	28	35	34	241
	Total	**357**	**411**	**382**	**387**	**447**	**426**	**457**	**456**	**506**	**461**	**4290**
New Zealand	**Death with function**	44	26	34	33	41	30	30	43	42	46	369
	Acute rejection	1	1	1	-	3	1	2	3	1	2	15
	Chronic allograft nephropathy	20	20	29	17	15	26	21	28	22	27	225
	Hyperacute rejection	-	-	-	-	-	-	-	-	-	-	0
	Vascular	3	1	2	3	2	1	2	1	-	3	18
	Technical	1	-	-	-	-	-	-	1	1	2	5
	Glomerulonephritis	5	5	-	4	4	5	1	2	2	2	30
	Non-compliance	6	1	1	5	3	-	4	6	-	-	26
	Other	5	1	3	2	4	3	4	2	5	7	36
	Total	**85**	**55**	**70**	**64**	**72**	**66**	**64**	**86**	**73**	**89**	**724**

Table 7.12 Graft Losses 2012-2016

Country	Outcome	Cause of death	Cause of graft failure	First year	Beyond first year	Total
Australia	Death with function	Cardiovascular		34 (43%)	234 (24%)	268 (25%)
		Withdrawal		2 (3%)	66 (7%)	68 (6%)
		Cancer		2 (3%)	300 (30%)	302 (28%)
		Infection		21 (26%)	128 (13%)	149 (14%)
		Other		21 (26%)	257 (26%)	278 (26%)
		Total		80 (100%)	985 (100%)	1065 (100%)
	Graft Failure		Acute rejection	28 (21%)	36 (3%)	64 (5%)
			Chronic allograft nephropathy	6 (5%)	829 (75%)	835 (67%)
			Hyperacute rejection	2 (2%)	-	2 (<1%)
			Vascular	36 (27%)	12 (1%)	48 (4%)
			Technical	16 (12%)	2 (<1%)	18 (1%)
			Glomerulonephritis	4 (3%)	80 (7%)	84 (7%)
			Non-compliance	-	41 (4%)	41 (3%)
			Other	41 (31%)	108 (10%)	149 (12%)
			Total	**133 (100%)**	**1108 (100%)**	**1241 (100%)**
New Zealand	Death with function	Cardiovascular		6 (67%)	61 (34%)	67 (35%)
		Withdrawal		-	6 (3%)	6 (3%)
		Cancer		-	60 (33%)	60 (31%)
		Infection		-	24 (13%)	24 (13%)
		Other		3 (33%)	31 (17%)	34 (18%)
		Total		**9 (100%)**	**182 (100%)**	**191 (100%)**
	Graft Failure		Acute rejection	2 (15%)	7 (4%)	9 (5%)
			Chronic allograft nephropathy	-	124 (71%)	124 (66%)
			Vascular	4 (31%)	3 (2%)	7 (4%)
			Technical	3 (23%)	1 (1%)	4 (2%)
			Glomerulonephritis	-	12 (7%)	12 (6%)
			Non-compliance	-	10 (6%)	10 (5%)
			Other	4 (31%)	17 (10%)	21 (11%)
			Total	**13 (100%)**	**174 (100%)**	**187 (100%)**

Immunosuppression

The use of antibodies for induction immunosuppression is shown in table 7.13. The vast majority of “other” agents used in Australia in 2016 were not specified, and ANZDATA is seeking to clarify these data.

Table 7.13 Antibody Use for Induction Immunosuppression 2012-2016; Number of Kidney Transplant Recipients Receiving Each Agent by Year (% Total New Transplants)

Country	Type of agent	2012	2013	2014	2015	2016
Australia	Intravenous immunoglobulin	28 (3.3%)	44 (5.0%)	27 (3.0%)	14 (1.5%)	14 (1.3%)
	Anti-CD25	724 (85.7%)	792 (89.7%)	787 (86.2%)	759 (80.0%)	793 (72.7%)
	Rituximab	7 (0.8%)	3 (0.3%)	2 (0.2%)	6 (0.6%)	4 (0.4%)
	T cell depleting polyclonal Ab	33 (3.9%)	36 (4.1%)	43 (4.7%)	59 (6.2%)	66 (6.0%)
	Other	8 (0.9%)	3 (0.3%)	9 (1.0%)	4 (0.4%)	227 (20.8%)
	Total new transplants	**845**	**883**	**913**	**949**	**1091**
New Zealand	Intravenous immunoglobulin	1 (0.9%)	-	-	1 (0.7%)	-
	Anti-CD25	101 (93.5%)	115 (99.1%)	133 (96.4%)	142 (96.6%)	166 (96.5%)
	Rituximab	4 (3.7%)	6 (5.2%)	9 (6.5%)	9 (6.1%)	5 (2.9%)
	T cell depleting polyclonal Ab	-	2 (1.7%)	2 (1.4%)	1 (0.7%)	6 (3.5%)
	Other	-	-	-	1 (0.7%)	2 (1.2%)
	Total new transplants	**108**	**116**	**138**	**147**	**172**

Immunosuppressive therapy at baseline, 1 and 2 years post-transplant for primary deceased donor grafts over 2009-2016 is presented in table 7.14. Tacrolimus is the most commonly prescribed calcineurin inhibitor in Australia, whereas in New Zealand cyclosporin predominates. Caution is advised when interpreting these data for 2015-2016 as late reporting may lead to underestimates of immunosuppressive use in the most recent years.

Table 7.14.1 Immunosuppressive Therapy - Primary Deceased Donor Grafts Australia 2009-2016

Time	Year Transplanted	AZA	CYC	TAC	MMF	MPA	SIR	EVE	PRE	Number of deceased donor grafts
Initial treatment	**2009**	4 (1%)	62 (16%)	310 (82%)	356 (95%)	13 (3%)	-	3 (1%)	375 (100%)	376
	2010	-	66 (14%)	409 (86%)	426 (89%)	37 (8%)	1 (<1%)	3 (1%)	477 (100%)	478
	2011	1 (<1%)	57 (11%)	447 (87%)	299 (59%)	209 (41%)	-	-	509 (100%)	511
	2012	1 (<1%)	27 (5%)	480 (90%)	293 (55%)	227 (43%)	2 (<1%)	-	519 (97%)	533
	2013	4 (1%)	11 (2%)	537 (95%)	344 (61%)	207 (37%)	-	-	553 (98%)	565
	2014	2 (<1%)	11 (2%)	532 (94%)	366 (64%)	172 (30%)	1 (<1%)	11 (2%)	546 (96%)	568
	2015	3 (<1%)	5 (1%)	578 (92%)	378 (60%)	199 (32%)	1 (<1%)	9 (1%)	585 (93%)	630
	2016	-	4 (1%)	560 (80%)	420 (60%)	154 (22%)	-	2 (<1%)	571 (82%)	697
at 1 year treatment	**2009**	18 (5%)	40 (11%)	283 (80%)	281 (79%)	40 (11%)	18 (5%)	9 (3%)	341 (96%)	354
	2010	24 (5%)	53 (12%)	371 (82%)	322 (71%)	85 (19%)	16 (4%)	11 (2%)	442 (97%)	455
	2011	26 (5%)	35 (7%)	421 (87%)	224 (46%)	212 (44%)	8 (2%)	13 (3%)	471 (98%)	482
	2012	21 (4%)	25 (5%)	437 (87%)	214 (43%)	233 (46%)	12 (2%)	17 (3%)	480 (96%)	502
	2013	18 (3%)	22 (4%)	473 (88%)	267 (50%)	199 (37%)	11 (2%)	3 (1%)	502 (94%)	535
	2014	23 (4%)	9 (2%)	478 (90%)	278 (52%)	158 (30%)	4 (1%)	22 (4%)	495 (93%)	531
	2015	19 (3%)	11 (2%)	467 (81%)	268 (46%)	167 (29%)	2 (<1%)	15 (3%)	482 (83%)	579
at 2 years treatment	**2009**	24 (7%)	40 (12%)	272 (79%)	252 (73%)	55 (16%)	20 (6%)	11 (3%)	329 (96%)	344
	2010	25 (6%)	46 (11%)	344 (79%)	305 (70%)	80 (18%)	21 (5%)	15 (3%)	411 (94%)	435
	2011	31 (7%)	34 (7%)	396 (84%)	199 (42%)	209 (44%)	8 (2%)	20 (4%)	444 (94%)	470
	2012	26 (5%)	23 (5%)	414 (84%)	202 (41%)	220 (45%)	11 (2%)	20 (4%)	455 (93%)	490
	2013	20 (4%)	20 (4%)	441 (85%)	257 (49%)	191 (37%)	13 (2%)	7 (1%)	478 (92%)	521
	2014	26 (5%)	12 (2%)	414 (80%)	254 (49%)	135 (26%)	7 (1%)	21 (4%)	437 (85%)	516

Table 7.14.2 Immunosuppressive Therapy - Primary Deceased Donor Grafts New Zealand 2009-2016

Time	Year transplanted	AZA	CYC	TAC	MMF	MPA	SIR	EVE	PRE	Number of deceased donor grafts
Initial	**2009**	-	39 (78%)	10 (20%)	49 (98%)	-	-	-	49 (98%)	50
	2010	-	32 (71%)	13 (29%)	45 (100%)	-	-	-	45 (100%)	45
	2011	-	41 (71%)	17 (29%)	58 (100%)	-	-	-	58 (100%)	58
	2012	-	36 (72%)	13 (26%)	49 (98%)	-	-	-	49 (98%)	50
	2013	-	45 (83%)	9 (17%)	53 (98%)	-	-	-	53 (98%)	54
	2014	-	44 (75%)	13 (22%)	58 (98%)	-	-	-	58 (98%)	59
	2015	-	51 (77%)	16 (25%)	64 (98%)	-	-	-	64 (98%)	65
	2016	1 (1%)	54 (68%)	21 (26%)	78 (98%)	-	-	-	78 (98%)	80
at 1 year	**2009**	-	24 (50%)	23 (48%)	48 (100%)	-	1 (2%)	-	45 (94%)	48
	2010	2 (5%)	16 (37%)	27 (63%)	41 (95%)	-	-	-	42 (98%)	43
	2011	2 (4%)	25 (46%)	29 (54%)	50 (93%)	-	-	-	52 (96%)	54
	2012	2 (4%)	27 (56%)	21 (44%)	45 (94%)	-	-	-	47 (98%)	48
	2013	2 (4%)	34 (65%)	18 (35%)	50 (96%)	-	-	-	52 (100%)	52
	2014	2 (4%)	32 (56%)	25 (44%)	55 (96%)	-	-	-	57 (100%)	57
	2015	1 (2%)	27 (41%)	27 (42%)	51 (80%)	-	-	-	56 (88%)	64
at 2 years	**2009**	-	21 (46%)	24 (52%)	45 (98%)	-	1 (2%)	-	42 (91%)	46
	2010	2 (5%)	17 (40%)	25 (60%)	39 (93%)	-	-	-	39 (93%)	42
	2011	4 (7%)	25 (46%)	29 (54%)	45 (83%)	-	-	-	51 (94%)	54
	2012	1 (2%)	24 (52%)	20 (43%)	42 (91%)	-	1 (2%)	-	43 (93%)	46
	2013	2 (4%)	34 (65%)	18 (35%)	48 (92%)	-	-	-	52 (100%)	52
	2014	2 (4%)	29 (52%)	25 (45%)	53 (95%)	-	-	-	55 (98%)	56

Rejection

The proportion of patients experiencing any rejection episode by 6 months post-transplant, stratified by donor type and graft number, is presented in table 7.15. Antibody-mediated rejection rates are presented in table 7.16; rates are notably higher in re-grafts. Years shown are those in which the transplants took place.

Table 7.15 Rejection Rates at Six Months Post Transplant 2006-2015

Donor type	Graft number	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Living donor	First	19.6%	21.4%	17.0%	16.8%	17.8%	17.5%	14.1%	19.2%	22.4%	17.1%
	Second and subsequent	33.3%	34.3%	30.0%	24.3%	12.9%	19.2%	10.0%	16.1%	28.6%	11.1%
Deceased donor	First	16.3%	17.7%	22.0%	21.1%	19.1%	20.0%	16.8%	18.4%	19.8%	17.7%
	Second and subsequent	36.4%	32.8%	32.9%	37.8%	28.6%	19.4%	24.4%	25.0%	25.9%	24.7%

Table 7.16 Antibody-Mediated Rejection Rates at Six Months Post Transplant 2006-2015

Donor type	Graft number	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Living donor	First	1.4%	3.4%	3.1%	4.5%	3.7%	4.9%	2.3%	5.0%	4.6%	3.9%
	Second and subsequent	5.6%	20.0%	12.5%	13.5%	3.2%	11.5%	6.7%	3.2%	5.7%	5.6%
Deceased donor	First	2.9%	5.8%	4.8%	5.6%	5.4%	5.6%	3.9%	5.0%	5.1%	6.0%
	Second and subsequent	15.2%	10.9%	15.8%	24.3%	13.0%	11.3%	10.3%	10.3%	12.9%	17.6%

Table 7.17 shows the number of people who received antibody agents for treating acute rejection by calendar year. The number is also reported as a proportion of new transplant recipients in each calendar year, but readers should be aware that although the large majority of people experiencing acute rejection do so within the first six months of transplantation, some experience rejection after this time (when they would not necessarily be counted as a new transplant). For this reason the total number of transplant recipients treated during the year is also reported.

Table 7.17 Antibody Therapy for Acute Rejection 2012-2016

Country	Type of agent	2012	2013	2014	2015	2016
Australia	Intravenous immunoglobulin	69 (8.2%)	104 (11.8%)	96 (10.5%)	162 (17.1%)	118 (10.8%)
	Anti-CD25	-	1 (0.1%)	1 (0.1%)	2 (0.2%)	1 (0.1%)
	Rituximab	8 (0.9%)	11 (1.2%)	12 (1.3%)	12 (1.3%)	4 (0.4%)
	T cell depleting polyclonal Ab	39 (4.6%)	51 (5.8%)	37 (4.1%)	30 (3.2%)	23 (2.1%)
	Not specified	11 (1.3%)	14 (1.6%)	28 (3.1%)	24 (2.5%)	22 (2.0%)
	Total new transplants	845	883	913	949	1091
	Total transplants at risk	9717	10154	10578	11034	11599
NZ	Intravenous immunoglobulin	3 (2.8%)	2 (1.7%)	8 (5.8%)	1 (0.7%)	6 (3.5%)
	Anti-CD25	-	1 (0.9%)	-	-	-
	Rituximab	1 (0.9%)	1 (0.9%)	7 (5.1%)	-	2 (1.2%)
	T cell depleting polyclonal Ab	4 (3.7%)	4 (3.4%)	7 (5.1%)	3 (2.0%)	15 (8.7%)
	Not specified	1 (0.9%)	1 (0.9%)	3 (2.2%)	4 (2.7%)	-
	Total new transplants	108	116	138	147	172
	Total transplants at risk	1591	1637	1709	1770	1870

Patient and graft survival

The remainder of the chapter presents patient and graft survival by transplant era and within a number of different categories combining country, graft number and donor type. Each page shows the patient and graft survival graphically, and in tabular form (with 95% confidence intervals) at selected time-points post-transplant. In each case the survivor function is calculated using the Kaplan-Meier method. Graft survival is not censored for death. All of these survival statistics are unadjusted. Note that in the survival graphs out to 5 years, the y axis ranges from 0.60 to 1.00 in order to show the differences between the eras more clearly, whereas in the long-term graphs (out to 30 years) the y axis starts at 0.

Figure 7.13 - Primary deceased donor grafts - Patient survival – Australia

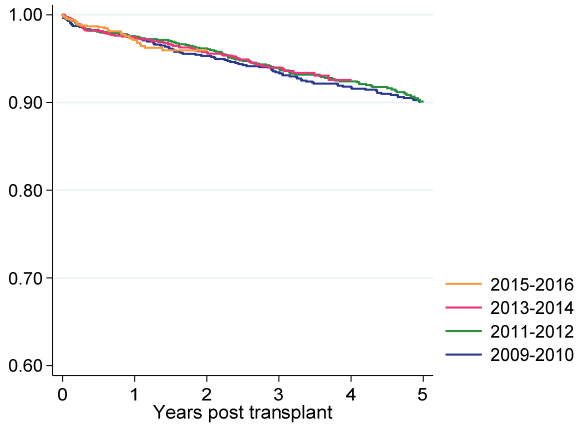


Figure 7.14 - Primary deceased donor grafts - Graft survival – Australia

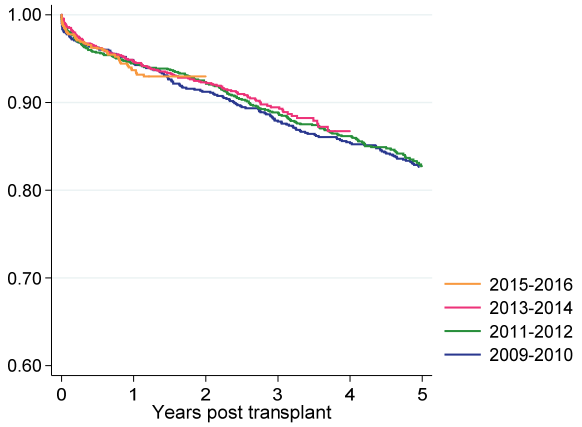


Table 7.18 Primary Deceased Donor Grafts - Australia 2009-2016

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	**2009-2010 (n=854)**	99 (98, 100)	98 (97, 99)	98 (96, 98)	90 (88, 92)
	2011-2012 (n=1044)	100 (99, 100)	98 (97, 99)	98 (96, 98)	90 (88, 92)
	2013-2014 (n=1133)	100 (99, 100)	98 (97, 99)	97 (96, 98)	-
	2015-2016 (n=1327)	100 (99, 100)	99 (98, 99)	97 (96, 98)	-
Graft survival	**2009-2010 (n=854)**	98 (97, 99)	96 (95, 97)	95 (93, 96)	83 (80, 85)
	2011-2012 (n=1044)	98 (97, 99)	96 (94, 97)	94 (93, 96)	83 (80, 85)
	2013-2014 (n=1133)	99 (98, 99)	96 (95, 97)	95 (93, 96)	-
	2015-2016 (n=1327)	98 (97, 99)	96 (95, 97)	94 (92, 95)	-

Figure 7.15 - Primary deceased donor grafts - Patient survival - New Zealand

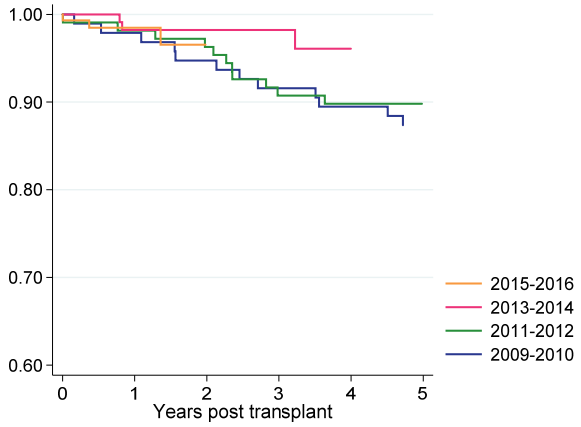


Figure 7.16 - Primary deceased donor grafts - Graft survival - New Zealand

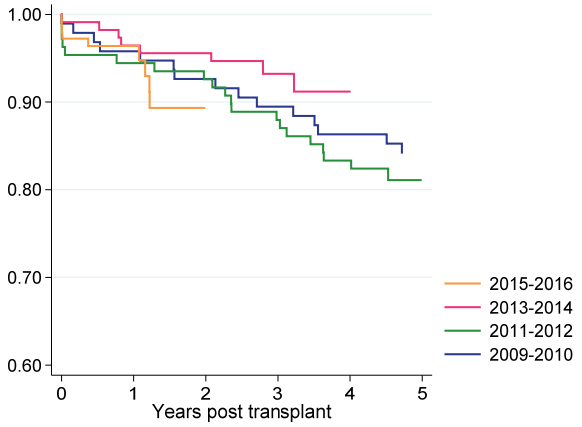


Table 7.19 Primary Deceased Donor Grafts - New Zealand 2009-2016

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2009-2010 (n=95)	100	99 (93, 100)	98 (92, 99)	87 (79, 93)
	2011-2012 (n=108)	99 (94, 100)	99 (94, 100)	98 (93, 100)	90 (82, 94)
	2013-2014 (n=113)	100	100	98 (93, 100)	-
	2015-2016 (n=145)	99 (95, 100)	98 (94, 100)	98 (94, 100)	-
Graft survival	2009-2010 (n=95)	99 (93, 100)	97 (91, 99)	96 (89, 98)	84 (75, 90)
	2011-2012 (n=108)	95 (89, 98)	95 (89, 98)	94 (88, 97)	81 (72, 87)
	2013-2014 (n=113)	99 (94, 100)	99 (94, 100)	96 (91, 99)	-
	2015-2016 (n=145)	97 (93, 99)	96 (92, 98)	96 (92, 98)	-

Figure 7.17 - Primary deceased donor grafts - Patient survival - Australia and New Zealand

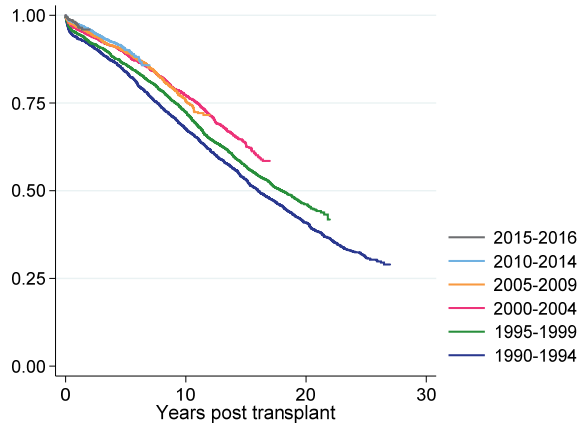


Figure 7.18 - Primary deceased donor grafts - Graft survival - Australia and New Zealand

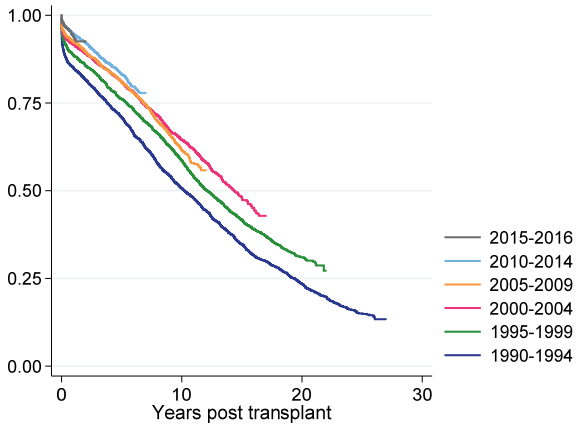


Table 7.20 Primary Deceased Donor Grafts - Australia and New Zealand 1990-2016

Outcome	Era	1 year	5 years	10 years	15 years	20 years
Patient survival	1990-1994 (n=1906)	93 (92, 94)	84 (82, 85)	68 (66, 70)	53 (51, 55)	41 (39, 43)
	1995-1999 (n=1779)	95 (94, 96)	86 (84, 88)	72 (70, 74)	57 (55, 59)	46 (44, 49)
	2000-2004 (n=1849)	96 (95, 97)	89 (88, 90)	77 (75, 79)	63 (61, 66)	-
	2005-2009 (n=1911)	97 (96, 97)	90 (88, 91)	76 (73, 78)	-	-
	2010-2014 (n=2921)	98 (97, 98)	90 (89, 91)	-	-	-
	2015-2016 (n=1472)	97 (96, 98)	-	-	-	-
Graft survival	1990-1994 (n=1906)	85 (83, 87)	71 (69, 73)	51 (48, 53)	35 (33, 37)	23 (22, 25)
	1995-1999 (n=1779)	89 (87, 90)	76 (74, 78)	59 (56, 61)	42 (39, 44)	31 (29, 33)
	2000-2004 (n=1849)	92 (90, 93)	81 (79, 83)	65 (62, 67)	48 (46, 51)	-
	2005-2009 (n=1911)	92 (91, 93)	81 (79, 83)	62 (59, 64)	-	-
	2010-2014 (n=2921)	95 (94, 96)	83 (81, 85)	-	-	-
	2015-2016 (n=1472)	94 (92, 95)	-	-	-	-

Figure 7.19 - Second and subsequent deceased donor grafts - Patient survival - Australia and New Zealand

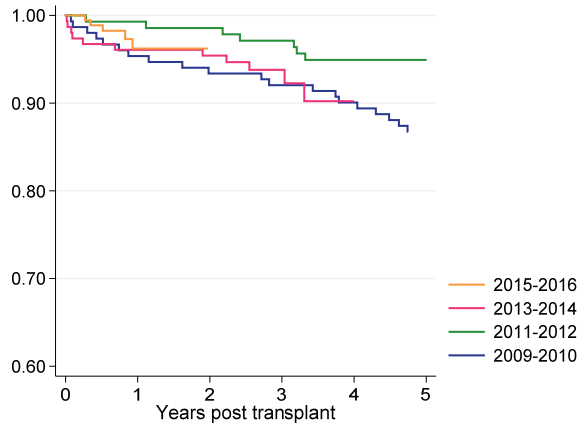


Figure 7.20 - Second and subsequent deceased donor grafts - Graft survival - Australia and New Zealand

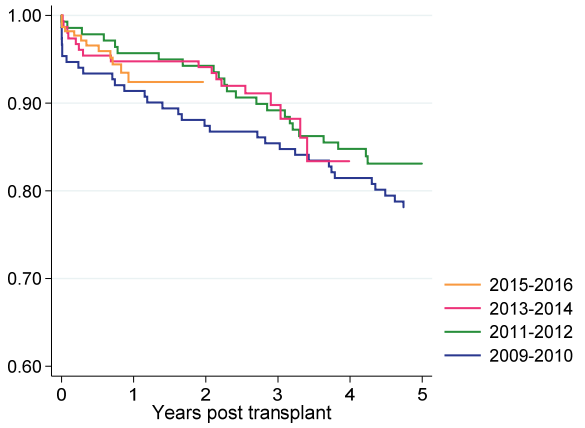


Table 7.21 Second and Subsequent Deceased Donor Grafts - Australia and New Zealand 2009-2016

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2009-2010 (n=151)	99 (95, 100)	97 (93, 99)	95 (91, 98)	87 (80, 91)
	2011-2012 (n=140)	100	99 (95, 100)	99 (95, 100)	95 (90, 98)
	2013-2014 (n=153)	98 (94, 99)	97 (92, 99)	96 (91, 98)	-
	2015-2016 (n=225)	100	99 (96, 100)	96 (91, 98)	-
Graft survival	2009-2010 (n=151)	95 (90, 97)	93 (88, 96)	91 (86, 95)	78 (71, 84)
	2011-2012 (n=140)	99 (94, 100)	98 (94, 99)	96 (91, 98)	83 (76, 88)
	2013-2014 (n=153)	98 (94, 99)	95 (91, 98)	95 (90, 97)	-
	2015-2016 (n=225)	98 (95, 99)	97 (93, 98)	92 (87, 96)	-

Figure 7.21 - Second and subsequent deceased donor grafts - Patient survival - Australia and New Zealand

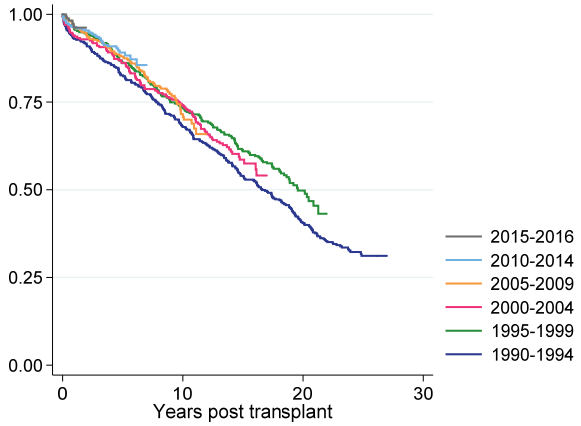


Figure 7.22 - Second and subsequent deceased donor grafts - Graft survival - Australia and New Zealand

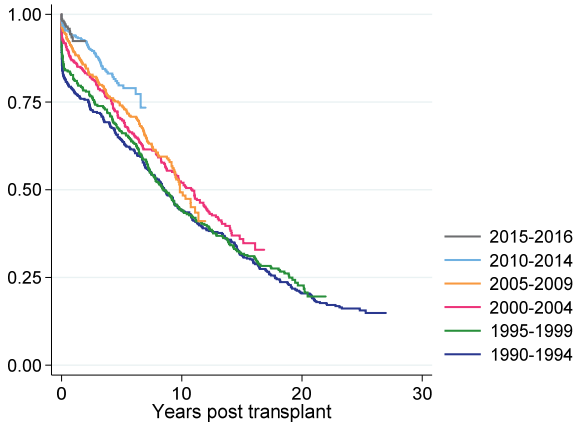


Table 7.22 Second and Subsequent Deceased Donor Grafts - Australia and New Zealand 1990-2016

Outcome	Era	1 year	5 years	10 years	15 years	20 years
Patient survival	1990-1994 (n=374)	93 (90, 95)	83 (78, 86)	68 (63, 72)	54 (49, 59)	41 (36, 45)
	1995-1999 (n=295)	96 (93, 98)	86 (82, 90)	73 (68, 78)	61 (55, 66)	50 (43, 56)
	2000-2004 (n=268)	94 (90, 96)	86 (81, 90)	74 (68, 79)	59 (52, 65)	-
	2005-2009 (n=343)	96 (94, 98)	88 (84, 91)	72 (66, 77)	-	-
	2010-2014 (n=370)	96 (94, 98)	89 (85, 92)	-	-	-
	2015-2016 (n=225)	96 (91, 98)	-	-	-	-
Graft survival	1990-1994 (n=374)	78 (74, 82)	64 (59, 69)	44 (39, 49)	31 (27, 36)	20 (17, 25)
	1995-1999 (n=295)	82 (77, 86)	66 (61, 72)	44 (38, 50)	32 (27, 37)	23 (18, 28)
	2000-2004 (n=268)	87 (82, 90)	70 (64, 75)	52 (46, 58)	36 (30, 42)	-
	2005-2009 (n=343)	90 (86, 92)	74 (69, 78)	49 (43, 55)	-	-
	2010-2014 (n=370)	94 (91, 96)	80 (74, 84)	-	-	-
	2015-2016 (n=225)	92 (87, 96)	-	-	-	-

Figure 7.23 - Primary living donor grafts - Patient survival – Australia

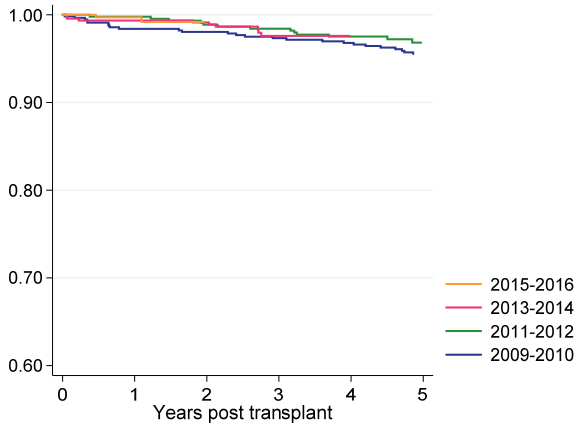


Figure 7.24 - Primary living donor grafts - Graft survival – Australia

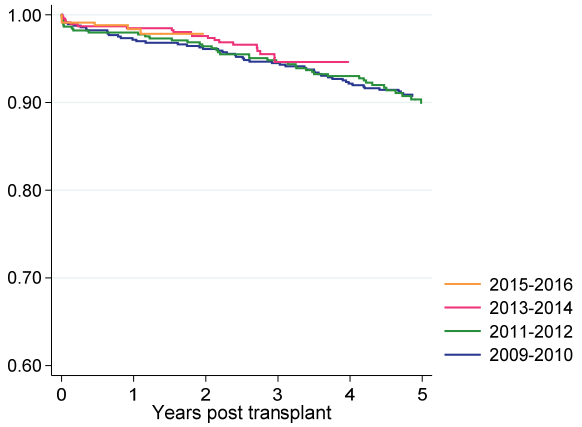


Table 7.23 Primary Living Donor Grafts - Australia 2009-2016

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	**2009-2010 (n=564)**	100 (99, 100)	99 (98, 100)	98 (97, 99)	96 (93, 97)
	2011-2012 (n=446)	100	100 (98, 100)	100 (98, 100)	97 (95, 98)
	2013-2014 (n=461)	100 (98, 100)	99 (98, 100)	99 (98, 100)	-
	2015-2016 (n=447)	100	100 (98, 100)	100 (98, 100)	-
Graft survival	**2009-2010 (n=564)**	99 (98, 100)	98 (97, 99)	97 (95, 98)	91 (88, 93)
	2011-2012 (n=446)	99 (97, 99)	98 (96, 99)	98 (96, 99)	90 (86, 93)
	2013-2014 (n=461)	99 (98, 100)	99 (97, 99)	98 (97, 99)	-
	2015-2016 (n=447)	99 (98, 100)	99 (97, 100)	98 (96, 99)	-

Figure 7.25 - Primary living donor grafts - Patient survival - New Zealand

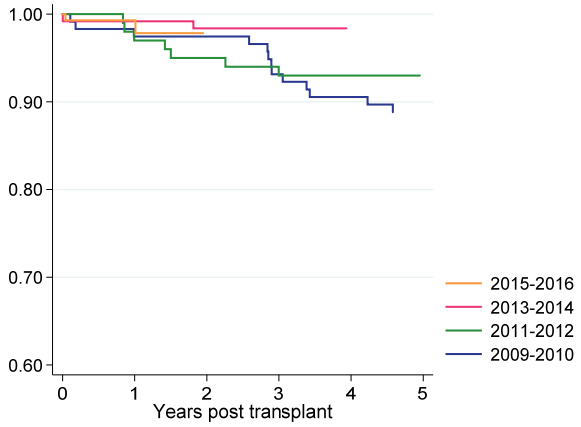


Figure 7.26 - Primary living donor grafts - Graft survival - New Zealand

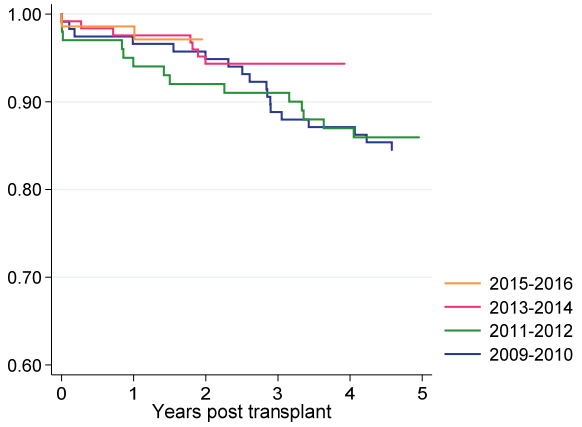


Table 7.24 Primary Living Donor Grafts - New Zealand 2009-2016

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	**2009-2010 (n=118)**	100	98 (93, 100)	97 (92, 99)	89 (82, 93)
	2011-2012 (n=101)	100	100	97 (91, 99)	93 (86, 97)
	2013-2014 (n=124)	99 (94, 100)	99 (94, 100)	99 (94, 100)	-
	2015-2016 (n=143)	99 (95, 100)	99 (95, 100)	99 (95, 100)	-
Graft survival	**2009-2010 (n=118)**	99 (94, 100)	97 (92, 99)	97 (91, 99)	85 (77, 90)
	2011-2012 (n=101)	97 (91, 99)	97 (91, 99)	94 (87, 97)	86 (77, 91)
	2013-2014 (n=124)	99 (94, 100)	98 (94, 100)	98 (93, 99)	-
	2015-2016 (n=143)	99 (95, 100)	99 (95, 100)	99 (95, 100)	-

Figure 7.27 - Primary living donor grafts - Patient survival - Australia and New Zealand

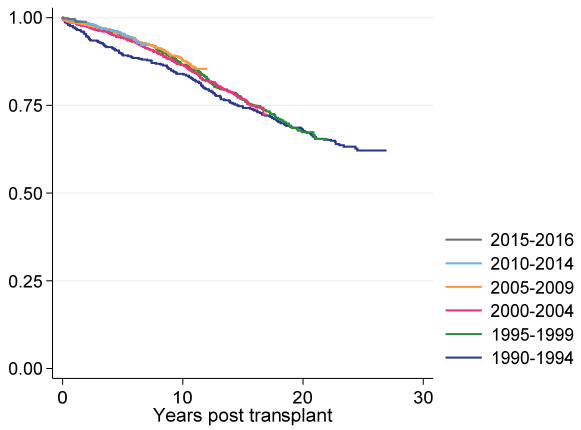


Figure 7.28 - Primary living donor grafts - Graft survival - Australia and New Zealand

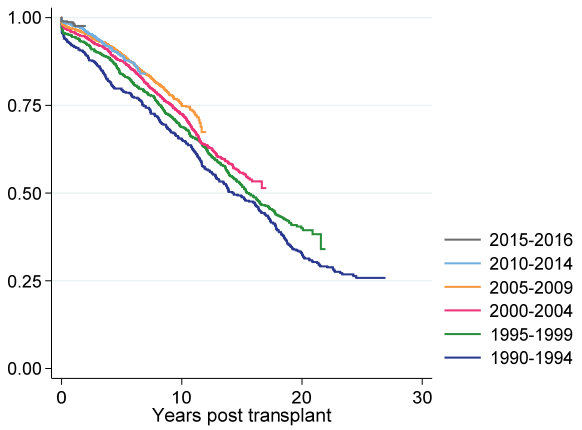


Table 7.25 Primary Living Donor Grafts - Australia and New Zealand 1990-2016

Outcome	Era	1 year	5 years	10 years	15 years	20 years
Patient survival	1990-1994 (n=431)	97 (95, 98)	89 (86, 92)	84 (80, 87)	75 (70, 78)	68 (63, 72)
	1995-1999 (n=766)	99 (97, 99)	95 (93, 96)	87 (84, 89)	77 (73, 80)	67 (63, 71)
	2000-2004 (n=1193)	98 (98, 99)	94 (93, 95)	86 (84, 88)	77 (74, 79)	-
	2005-2009 (n=1585)	99 (98, 99)	95 (94, 96)	88 (86, 90)	-	-
	2010-2014 (n=1457)	99 (98, 99)	95 (94, 97)	-	-	-
	2015-2016 (n=590)	100 (98, 100)	-	-	-	-
Graft survival	1990-1994 (n=431)	92 (89, 94)	80 (75, 83)	65 (61, 70)	49 (44, 54)	33 (28, 37)
	1995-1999 (n=766)	95 (93, 96)	84 (81, 86)	69 (65, 72)	52 (49, 56)	40 (36, 44)
	2000-2004 (n=1193)	96 (95, 97)	88 (86, 89)	73 (70, 75)	56 (53, 59)	-
	2005-2009 (n=1585)	97 (96, 97)	90 (88, 91)	75 (73, 78)	-	-
	2010-2014 (n=1457)	98 (97, 98)	89 (87, 91)	-	-	-
	2015-2016 (n=590)	98 (97, 99)	-	-	-	-

Figure 7.29 - Second and subsequent living donor grafts - Patient survival - Australia and New Zealand

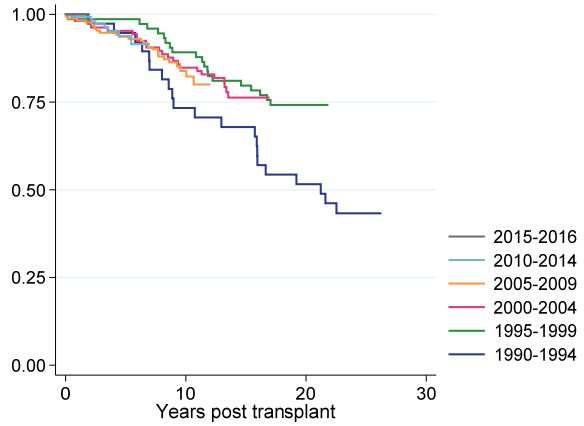


Figure 7.30 - Second and subsequent living donor grafts - Graft survival - Australia and New Zealand

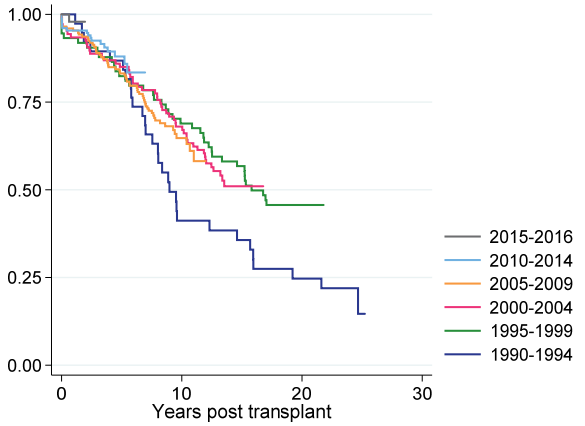


Table 7.26 Second and Subsequent Living Donor Grafts - Australia and New Zealand 1990-2016

Outcome	Era	1 year	5 years	10 years	15 years	20 years
Patient survival	1990-1994 (n=38)	100	95 (81, 99)	73 (56, 85)	68 (50, 80)	52 (35, 66)
	1995-1999 (n=74)	99 (91, 100)	99 (91, 100)	89 (80, 94)	80 (69, 87)	74 (63, 83)
	2000-2004 (n=107)	98 (93, 100)	95 (89, 98)	85 (76, 90)	76 (66, 84)	-
	2005-2009 (n=175)	98 (95, 99)	94 (89, 96)	84 (77, 89)	-	-
	2010-2014 (n=153)	99 (95, 100)	94 (87, 97)	-	-	-
	2015-2016 (n=72)	100	-	-	-	-
Graft survival	1990-1994 (n=38)	100	87 (71, 94)	41 (25, 56)	36 (21, 51)	25 (12, 39)
	1995-1999 (n=74)	93 (85, 97)	82 (72, 89)	69 (57, 78)	57 (45, 67)	46 (34, 57)
	2000-2004 (n=107)	93 (87, 97)	85 (77, 91)	68 (58, 76)	51 (41, 60)	-
	1990-1994 (n=38)	100	95 (81, 99)	73 (56, 85)	68 (50, 80)	52 (35, 66)
	1995-1999 (n=74)	99 (91, 100)	99 (91, 100)	89 (80, 94)	80 (69, 87)	74 (63, 83)
	2000-2004 (n=107)	98 (93, 100)	95 (89, 98)	85 (76, 90)	76 (66, 84)	-