CHAPTER 7

Kidney Transplantation

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

Contents

Executive Summary

During 2019, there were 1,104 kidney transplants performed in Australia and 221 performed in New Zealand, with live donor transplants contributing 22% and 41% of total transplants, respectively. The 21% growth in kidney transplants between 2014 and 2019 in Australia parallels the increase in the number of deceased donors, whereas the number of live donors has remained similar. In New Zealand, there has been a 60% growth over the same period, with corresponding increases of 97% and 26% in deceased and live donor transplants, respectively. There is a substantial geographical variation in the transplantation rate in Australia, with Tasmania and Victoria having the highest transplant rate of dialysed patients in 2019.

The number of prevalent patients with functioning kidney transplants has grown in the last decade, increasing by 51% between 2010 and 2019 (from 8,510 to 12,815 recipients) in Australia, and by 45% (from 1,447 to 2,098 recipients) in New Zealand. At the end of 2019, 10% 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 were the two most common causes of allograft failure, accounting for 46% and 24% of all allograft failures in Australia, respectively; and 59% and 18% in New Zealand, respectively (2019 data). Cancer was the most common cause of death with a functioning graft in Australia, whereas cardiovascular disease remained the most common in New Zealand.

The proportion of first kidney transplant recipients who had experienced acute rejection in the first 6 months has remained similar over the last 5 years, with respective rejection rates of 14.7% and 14.6% for patients who have received primary live and deceased donor kidney transplants during 2018, respectively. There has been considerable improvement in short and intermediate-term allograft and patient survival 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 96% (95%, 97%), respectively; and 98% (94%, 100%) and 93% (88%, 96%) in New Zealand, respectively (2018-2019 data).

Suggested Citation

ANZDATA Registry. 43rd Report, Chapter 7: Kidney Transplantation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2020. 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 1104 transplants performed in Australia in 2019 was slightly below the peak of 1149 in 2018. This general trend of increased transplant numbers over the last decade is predominantly driven by large growth in deceased donor kidney transplants (figure 7.1); after a peak in 2008, living donor numbers have returned to pre-2008 levels. In New Zealand in 2019, 221 transplants were performed; this represents the highest number ever undertaken. The increase in New Zealand transplant activity has been driven by strong growth in both living and deceased donor transplants.

Table 7.1 Number of Grafts Performed by Country 2000-2019

Country	Year	Graft 1	Graft 2	Graft 3	Graft 4	Graft 5	Total Transplants	Living Donor Transplants
Australia	**2000**	476	47	7	1	0	531	181
	2001	487	45	6	2	0	540	213
	2002	538	60	5	2	0	605	231
	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	791	85	7	2	0	885	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
	2017	951	136	20	2	0	1109	271
	2018	1027	102	19	1	0	1149	238
	2019	**987**	**92**	**23**	**2**	**0**	**1104**	**238**
New Zealand	**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
	2017	174	13	0	0	0	187	69
	2018	170	11	0	1	0	182	84
	2019	**196**	**24**	**1**	**0**	**0**	**221**	**91**

Figure 7.1.1 - Deceased and Living Donor Transplants - Australia 2010-2019

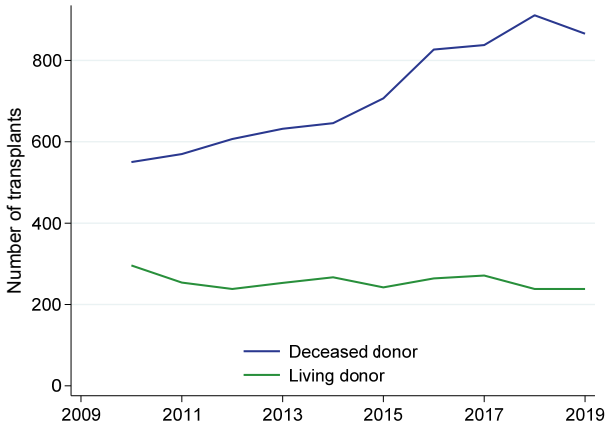
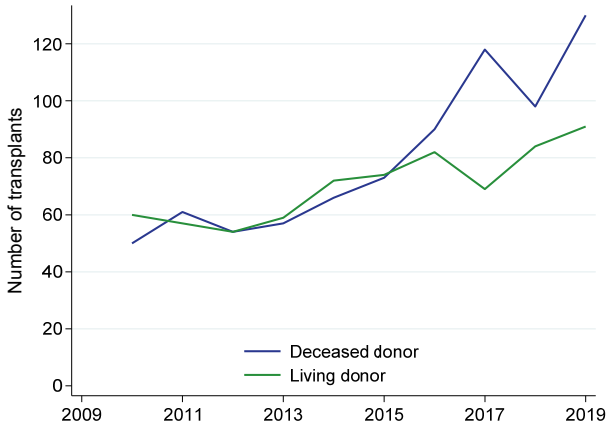


Figure 7.1.2 - Deceased and Living Donor Transplants - New Zealand 2010-2019



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 years). Note that the denominator for these rates is dialysis-years. Differences in the rates between states and countries depend on a number of factors including the case mix of the dialysis patients and the local deceased donation rate. These rates are presented by age in figure 7.4, and by ethnicity* in patients aged 15-64 years in figure 7.5. In Australia and New Zealand, the transplant rates of Indigenous and Māori patients respectively are lower than for other ethnic groups; see also chapters 10 and 11.

*Note that collection of ethnicity data in ANZDATA has evolved to align with Australian Bureau of Statistics Australian Standard Classification of Cultural and Ethnic Groups[1] and data collection now allows for a patient to nominate more than one ethnicity group, however, consultation regarding reporting of ethnicity data is currently ongoing and reporting guidelines have not been finalised at the time of publication. As a result, ethnicity data thorough this report includes only the first ethnicity category entered for each patient and uses the legacy term 'Caucasian' which includes data recorded as 'Caucasoid', 'Oceanian – Australian', 'Oceanian – New Zealand European', 'North American' and a number of European ethnicities.

Figure 7.2 - Transplant Rate of Dialysed Patients 2019 - All Dialysis Patients

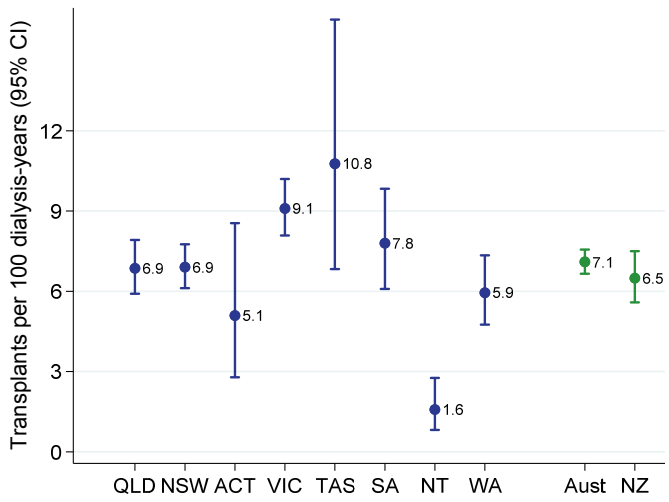


Figure 7.3 - Transplant Rate of Dialysed Patients 2019 - Patients Aged 15-64

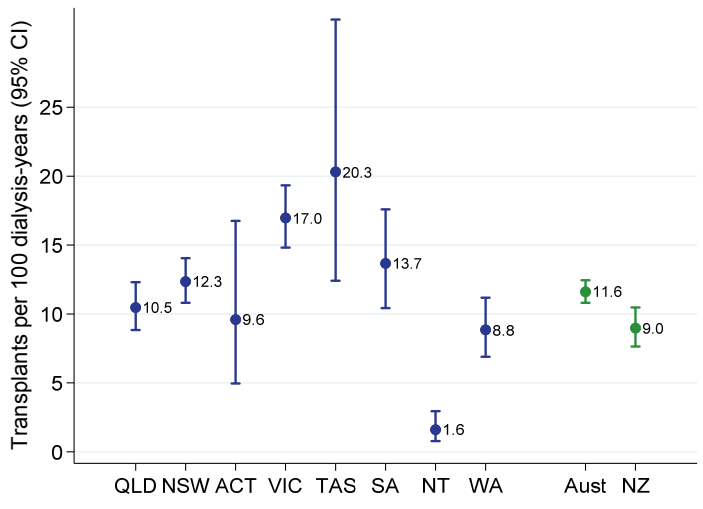


Figure 7.4.1 - Transplant Rate of Dialysed Patients By Age 2019 - Australia

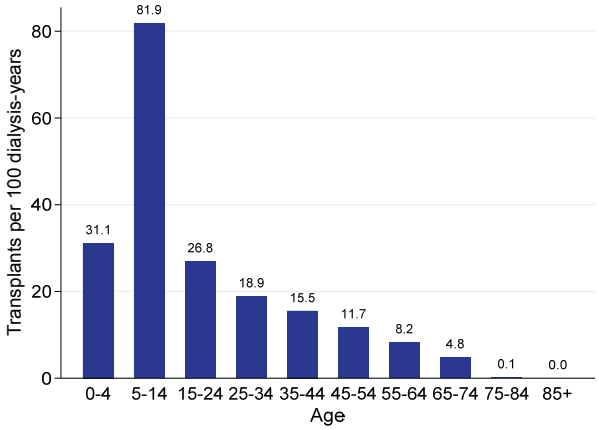


Figure 7.4.2 - Transplant Rate of Dialysed Patients By Age 2019 - New Zealand

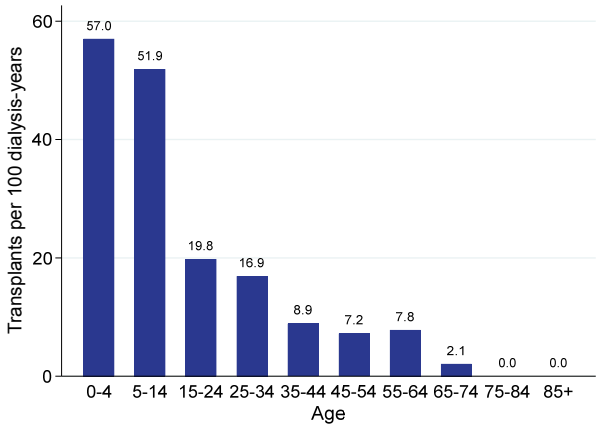


Figure 7.5.1 - Transplant Rate of Dialysed Patients By Ethnicity 2010-2019 - Australia, Patients Aged 15-64

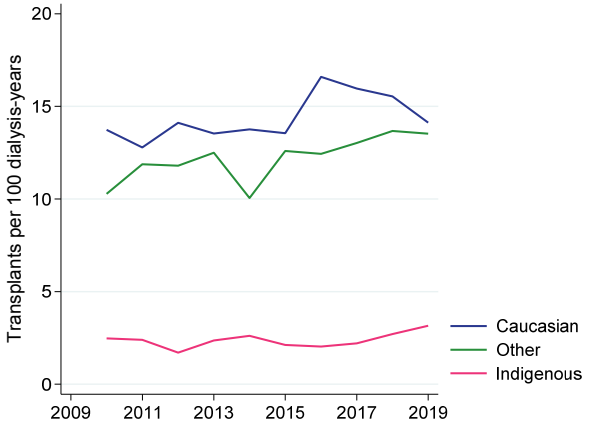


Figure 7.5.2 - Transplant Rate of Dialysed Patients By Ethnicity 2010-2019 - New Zealand, Patients Aged 15-64

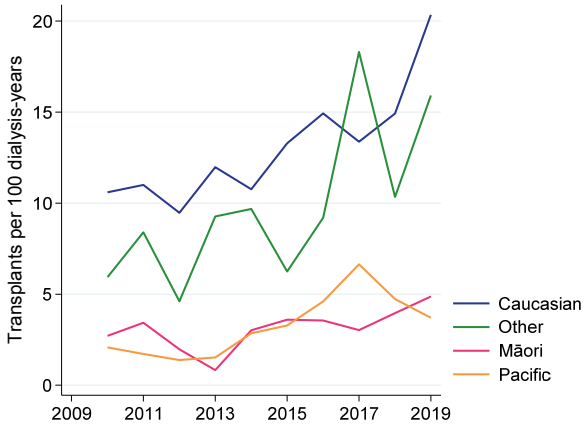


Table 7.2 shows the number of grafts performed according to donor type, graft number and recipient age in 2019. Transplant rates by age, per million population, are presented in figure 7.6.

Population estimates for Australia and New Zealand used for the calculation of prevalence per million population were sourced from the Australian Bureau of Statistics (2019)[2] and Stats NZ (2019)[3].

Table 7.2 Age of Recipients Transplanted in 2019

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	2	11	18	60	111	190	213	163	6
		2	0	1	4	6	16	19	18	8	0
		3	0	0	0	2	6	4	4	2	0
		4	0	0	0	0	1	1	0	0	0
	Living	1	6	3	28	29	42	45	44	16	0
		2	0	0	3	4	3	7	2	1	0
		3	0	0	1	0	2	2	0	0	0
New Zealand	Deceased	1	1	2	4	17	10	23	42	16	0
		2	0	0	2	1	4	4	3	0	0
		3	0	0	0	0	1	0	0	0	0
	Living	1	2	5	5	10	11	18	25	4	1
		2	0	0	0	2	3	4	1	0	0

Figure 7.6.1 - Transplant Operations (Per Million Population) 2019 - Australia

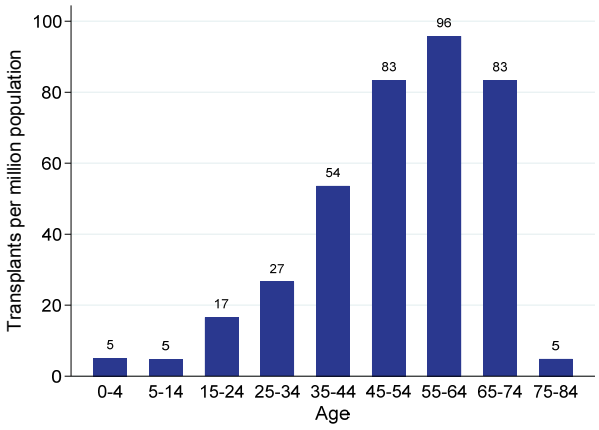


Figure 7.6.2 - Transplant Operations (Per Million Population) 2019 - New Zealand

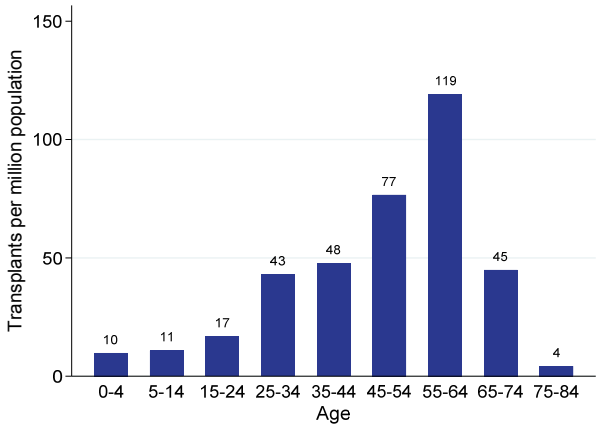


Table 7.3 shows the ethnicity of the recipients transplanted between 2015 and 2019.

Table 7.3 Ethnicity* of Recipients Transplanted 2015-2019

Country	Ethnicity	2015	2016	2017	2018	2019
Australia	**Caucasian**	653 (68.8%)	764 (70.0%)	751 (67.7%)	737 (64.1%)	695 (63.0%)
	Aboriginal/Torres Strait Islander	35 (3.7%)	34 (3.1%)	34 (3.1%)	49 (4.3%)	55 (5.0%)
	Asian	132 (13.9%)	127 (11.6%)	168 (15.1%)	159 (13.8%)	164 (14.9%)
	Māori	8 (0.8%)	9 (0.8%)	9 (0.8%)	12 (1.0%)	6 (0.5%)
	Pacific	22 (2.3%)	15 (1.4%)	31 (2.8%)	42 (3.7%)	48 (4.3%)
	Other	30 (3.2%)	47 (4.3%)	42 (3.8%)	49 (4.3%)	58 (5.3%)
	Not reported	69 (7.3%)	95 (8.7%)	74 (6.7%)	101 (8.8%)	78 (7.1%)
	Total	**949**	**1091**	**1109**	**1149**	**1104**
New Zealand	**Caucasian**	84 (57.1%)	97 (56.4%)	86 (46.0%)	100 (54.9%)	121 (54.8%)
	Asian	14 (9.5%)	13 (7.6%)	33 (17.6%)	16 (8.8%)	32 (14.5%)
	Māori	28 (19.0%)	26 (15.1%)	23 (12.3%)	29 (15.9%)	35 (15.8%)
	Pacific	21 (14.3%)	29 (16.9%)	41 (21.9%)	29 (15.9%)	29 (13.1%)
	Other	-	5 (2.9%)	2 (1.1%)	5 (2.7%)	3 (1.4%)
	Not reported	-	2 (1.2%)	2 (1.1%)	3 (1.6%)	1 (0.5%)
	Total	**147**	**172**	**187**	**182**	**221**

*Note that collection of ethnicity data in ANZDATA has evolved to align with Australian Bureau of Statistics Australian Standard Classification of Cultural and Ethnic Groups[1] and data collection now allows for a patient to nominate more than one ethnicity group, however, consultation regarding reporting of ethnicity data is currently ongoing and reporting guidelines have not been finalised at the time of publication. As a result, ethnicity data thorough this report includes only the first ethnicity category entered for each patient and uses the legacy term 'Caucasian' which includes data recorded as 'Caucasoid', 'Oceanian – Australian', 'Oceanian – New Zealand European', 'North American' and a number of European ethnicities.

Table 7.4 shows the number of transplants (per million population) performed by transplanting region over 2015-2019. Transplants performed for patients residing in Tasmania and the Northern Territory are included in the figures for Victoria and South Australia, respectively. These regions share common waiting lists and allocation protocols.

Table 7.4 Transplants (pmp) by Transplanting Region and Country 2015-2019

State	2015	2016	2017	2018	2019
NSW/ACT	331 (41)	348 (43)	367 (44)	393 (47)	350 (41)
VIC/TAS	303 (46)	352 (53)	364 (53)	418 (60)	351 (49)
QLD	139 (29)	199 (41)	190 (39)	177 (35)	207 (41)
SA/NT	89 (46)	95 (49)	70 (36)	69 (35)	93 (47)
WA	87 (34)	97 (38)	118 (46)	92 (35)	103 (39)
Australia	**949 (40)**	**1091 (45)**	**1109 (45)**	**1149 (46)**	**1104 (44)**
New Zealand	**147 (32)**	**172 (37)**	**187 (39)**	**182 (38)**	**221 (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 2010-2019 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 the ANZDATA Registry as lost to follow-up, and not all cases may have been reported to the registry by Renal Units, especially those that occur as the first renal replacement therapy.

Table 7.5 Transplant Operations Performed Overseas on Australian/NZ Dialysis Patients 2010-2019

Year	Australia	New Zealand
2010	4	1
2011	7	2
2012	4	1
2013	3	1
2014	3	0
2015	6	1
2016	3	1
2017	1	1
2018	3	1
2019	**2**	**0**

Prevalent Transplants

This section presents the number of prevalent (functioning) transplants as of 31st December 2019, according to various categories.

Table 7.6 presents the total number of transplants ever performed in Australia and New Zealand (categorised by country of transplant) and the number of prevalent functioning grafts at the end of 2019 (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 2019

Country	Donor type	Graft number	Performed	Functioning
Australia	Living	1	6041	3797
		2	576	329
		3	83	51
		4	11	6
		5	1	0
	Deceased	1	18138	7571
		2	2575	878
		3	405	129
		4	61	15
		5	6	0
	Unknown	1	-	35
		2	-	4
New Zealand	Living	1	1489	918
		2	120	71
		3	7	4
		4	1	1
	Deceased	1	2856	978
		2	454	105
		3	79	13
		4	8	1
	Unknown	1	-	7

Table 7.7 presents the number of functioning transplants at the end of 2010-2019 by transplant region. In Australia, SA/NT has the highest prevalence of transplant patients per million population (614 pmp) and NSW/ACT the lowest (462 pmp). These data are shown graphically in figures 7.7 and 7.8.

Table 7.7 Functioning Transplants (pmp) by Transplanting Region 2010-2019

Year	NSW/ACT	VIC/TAS	QLD	SA/NT	WA	Australia	New Zealand
2010	2640 (352)	2425 (406)	1650 (375)	974 (524)	821 (358)	8510 (386)	1447 (333)
2011	2720 (359)	2584 (427)	1718 (384)	989 (529)	861 (366)	8872 (397)	1488 (339)
2012	2827 (368)	2723 (442)	1797 (393)	1033 (546)	891 (367)	9271 (408)	1526 (346)
2013	2944 (378)	2869 (456)	1864 (401)	1053 (550)	940 (378)	9670 (418)	1577 (355)
2014	3087 (391)	3045 (475)	1915 (406)	1074 (557)	956 (380)	10077 (429)	1630 (362)
2015	3238 (404)	3179 (486)	1964 (411)	1104 (568)	994 (391)	10479 (440)	1707 (372)
2016	3402 (418)	3365 (503)	2080 (429)	1155 (590)	1051 (411)	11053 (457)	1786 (382)
2017	3585 (433)	3576 (523)	2180 (442)	1165 (591)	1113 (432)	11619 (472)	1892 (397)
2018	3781 (450)	3816 (546)	2277 (455)	1178 (594)	1163 (448)	12215 (489)	1973 (408)
2019	3938 (462)	4012 (563)	2407 (472)	1227 (614)	1231 (470)	12815 (505)	2098 (426)

Figure 7.7 - Functioning Transplants Per Million Population by Transplanting Region - Australia 2010-2019

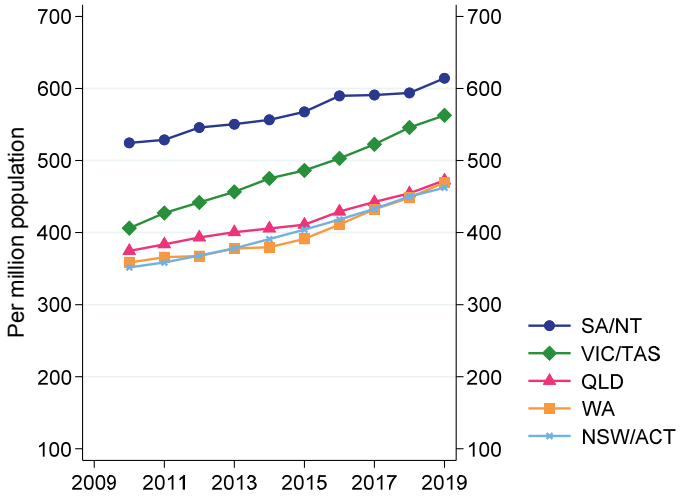
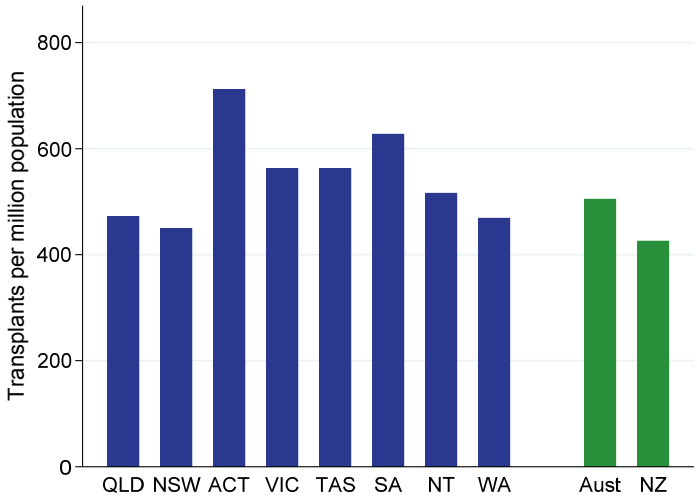


Figure 7.8 - Prevalence of Functioning Transplants 31 Dec 2019 - Per Million Population



The percentage of prevalent renal replacement therapy patients with a functioning transplant is shown in figure 7.9 by age group. There is a greater proportion of functioning live-donor grafts in younger patients. 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 – Percentage of RRT Patients with a Functioning Transplant by Age, Australia 2019

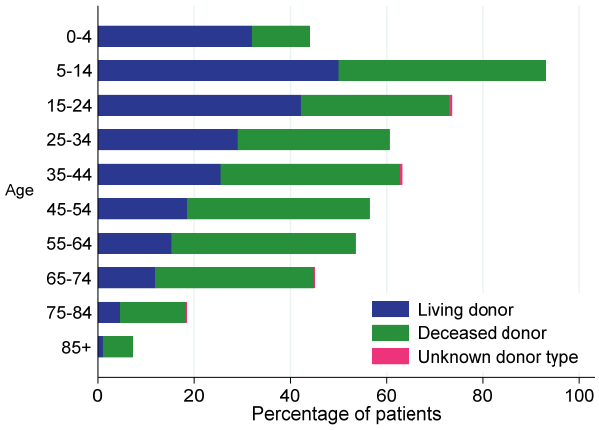


Figure 7.9.2 - Percentage of RRT Patients with a Functioning Transplant by Age, New Zealand 2019

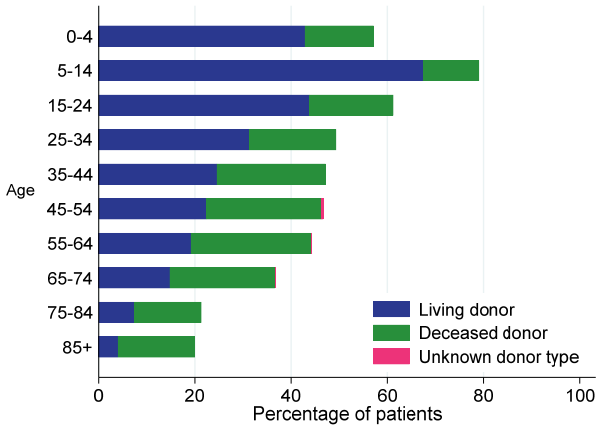


Table 7.8 Age Distribution of Functioning Transplant Patients - 31 Dec 2019

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**	**11**	**173**	**382**	**766**	**1607**	**2709**	**3505**	**2929**	**684**	**49**	**12815**
	Unknown	**1**	-	-	3	1	7	7	10	6	1	-	35
		2	-	-	-	-	3	1	-	-	-	-	4
		All	**-**	**-**	**3**	**1**	**10**	**8**	**10**	**6**	**1**	**-**	**39**
	Deceased	**1**	3	75	137	318	802	1526	2201	1980	488	41	7571
		2	-	5	21	69	127	231	252	152	20	1	878
		3	-	-	2	11	18	45	39	13	1	-	129
		4	-	-	-	-	3	7	5	-	-	-	15
		All	**3**	**80**	**160**	**398**	**950**	**1809**	**2497**	**2145**	**509**	**42**	**8593**
	Living	**1**	8	93	198	336	575	781	912	721	166	7	3797
		2	-	-	20	28	60	87	74	52	8	-	329
		3	-	-	1	3	11	21	11	4	-	-	51
		4	-	-	-	-	1	3	1	1	-	-	6
		All	**8**	**93**	**219**	**367**	**647**	**892**	**998**	**778**	**174**	**7**	**4183**
New Zealand	**All**	**All**	**4**	**34**	**60**	**153**	**257**	**459**	**612**	**425**	**89**	**5**	**2098**
	Unknown	**1**	-	-	-	-	-	4	1	2	-	-	7
		All	**-**	**-**	**-**	**-**	**-**	**4**	**1**	**2**	**-**	**-**	**7**
	Deceased	**1**	1	5	13	49	110	199	308	234	55	4	978
		2	-	-	4	7	13	29	33	17	2	-	105
		3	-	-	-	-	-	7	4	1	1	-	13
		4	-	-	-	-	-	-	1	-	-	-	1
		All	**1**	**5**	**17**	**56**	**123**	**235**	**346**	**252**	**58**	**4**	**1097**
	Living	**1**	3	29	43	88	119	189	252	163	31	1	918
		2	-	-	-	9	15	28	11	8	-	-	71
		3	-	-	-	-	-	2	2	-	-	-	4
		4	-	-	-	-	-	1	-	-	-	-	1
		All	**3**	**29**	**43**	**97**	**134**	**220**	**265**	**171**	**31**	**1**	**994**

Figure 7.10.1 - Age Distribution of Functioning Transplants - Australia 2019 (n=12815)

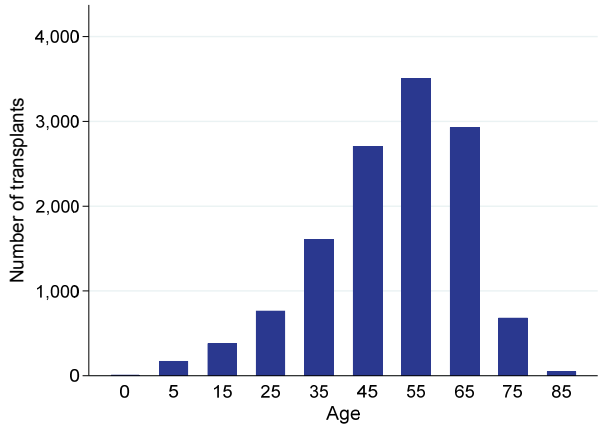


Figure 7.10.2 - Age Distribution of Functioning Transplants - Per Million Population, Australia 2019

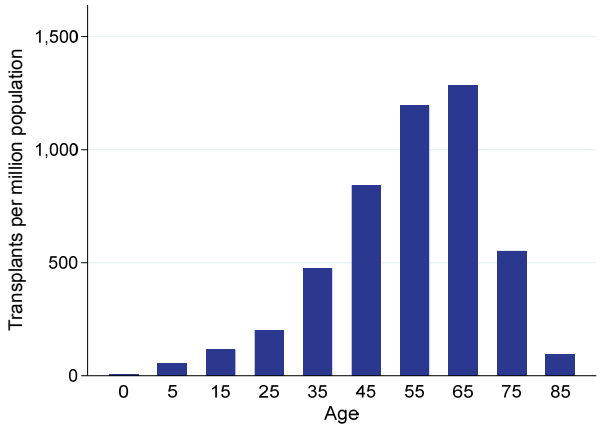


Figure 7.11.1 - Age Distribution of Functioning Transplants - New Zealand 2019 (n=2098)

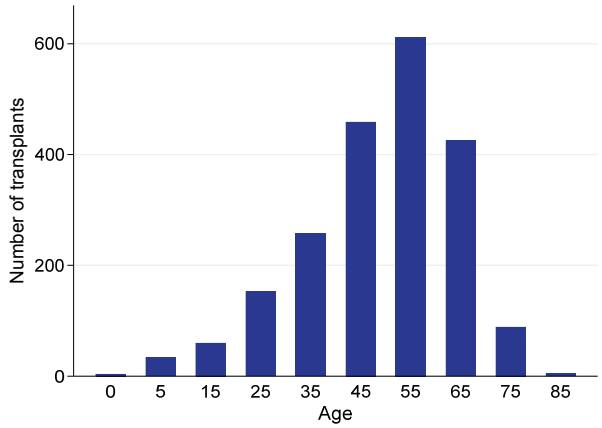


Figure 7.11.2 - Age Distribution of Functioning Transplants - Per Million Population, New Zealand 2019

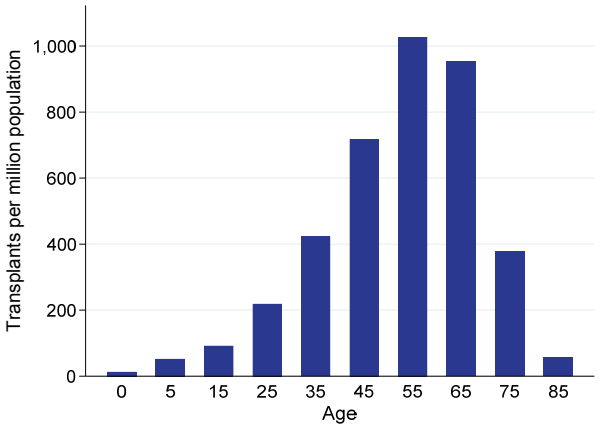


Table 7.9 presents the number of prevalent patients by gender, ethnicity and age.

Table 7.9 Functioning Transplant Patients Related to Ethnicity and Age Group - 31 Dec 2019*

Country	Gender	Ethnicity	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Australia	**All**	**Total**	**11**	**173**	**382**	**766**	**1607**	**2709**	**3505**	**2929**	**684**	**49**	**12815**
	Female	**Caucasian**	2	37	91	229	424	725	914	751	226	21	3420
		Aboriginal/Torres Strait Islander	-	-	11	14	19	45	39	12	1	-	141
		Asian	1	9	19	26	104	145	215	148	19	-	686
		Other	-	8	10	29	41	50	61	26	6	-	231
		Not reported	-	-	12	23	68	89	105	107	25	2	431
		Total	**3**	**54**	**143**	**321**	**656**	**1054**	**1334**	**1044**	**277**	**23**	**4909**
	Male	**Caucasian**	7	87	173	319	658	1175	1585	1402	328	21	5755
		Aboriginal/Torres Strait Islander	-	4	7	14	26	57	48	32	5	-	193
		Asian	-	9	23	49	136	181	259	225	29	2	913
		Other	1	19	11	30	47	80	100	74	9	1	372
		Not reported	-	-	25	33	84	162	179	152	36	2	673
		Total	**8**	**119**	**239**	**445**	**951**	**1655**	**2171**	**1885**	**407**	**26**	**7906**
New Zealand	**All**	**Total**	**4**	**34**	**60**	**153**	**257**	**459**	**612**	**425**	**89**	**5**	**2098**
	Female	**Caucasian**	-	8	8	46	59	125	153	126	27	3	555
		Asian	1	-	6	5	12	17	27	18	2	-	88
		Māori	-	5	5	13	19	18	23	10	2	-	95
		Pacific	-	2	3	9	17	16	33	13	-	-	93
		Other	-	-	-	-	2	2	2	-	-	-	6
		Not reported	-	-	-	-	-	2	2	-	-	-	4
		Total	**1**	**15**	**22**	**73**	**109**	**180**	**240**	**167**	**31**	**3**	**841**
	Male	**Caucasian**	-	13	26	52	87	191	235	175	44	2	825
		Asian	2	2	2	7	19	30	33	35	5	-	135
		Māori	-	4	4	8	22	25	56	27	6	-	152
		Pacific	1	-	4	12	16	25	42	14	2	-	116
		Other	-	-	-	1	3	6	4	7	1	-	22
		Not reported	-	-	2	-	1	2	2	-	-	-	7
		Total	**3**	**19**	**38**	**80**	**148**	**279**	**372**	**258**	**58**	**2**	**1257**

*Note that collection of ethnicity data in ANZDATA has evolved to align with Australian Bureau of Statistics Australian Standard Classification of Cultural and Ethnic Groups[1] and data collection now allows for a patient to nominate more than one ethnicity group, however, consultation regarding reporting of ethnicity data is currently ongoing and reporting guidelines have not been finalised at the time of publication. As a result, ethnicity data thorough this report includes only the first ethnicity category entered for each patient and uses the legacy term 'Caucasian' which includes data recorded as 'Caucasoid', 'Oceanian – Australian', 'Oceanian – New Zealand European', 'North American' and a number of European ethnicities.

Figure 7.12 shows the duration of function of prevalent transplants at the end of 2019. In Australia there were 4604 grafts that had functioned for ≥10 years, 1281 ≥20 years and 309 ≥30 years. In New Zealand there were 776 grafts that had functioned for ≥10 years, 242 ≥20 years and 57 ≥30 years.

Figure 7.12.1 - Number of Functioning Grafts by Graft Duration - Australia 2019 (n=12815)

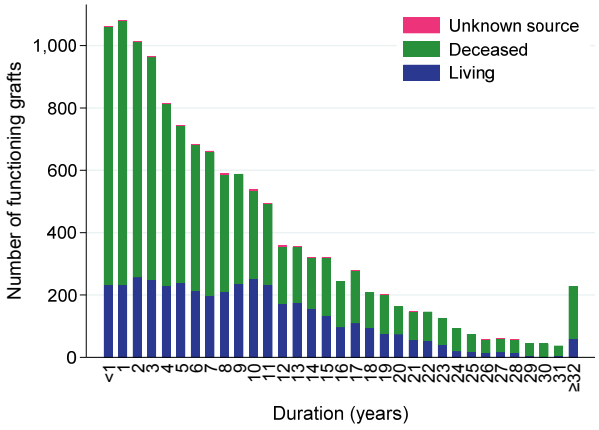
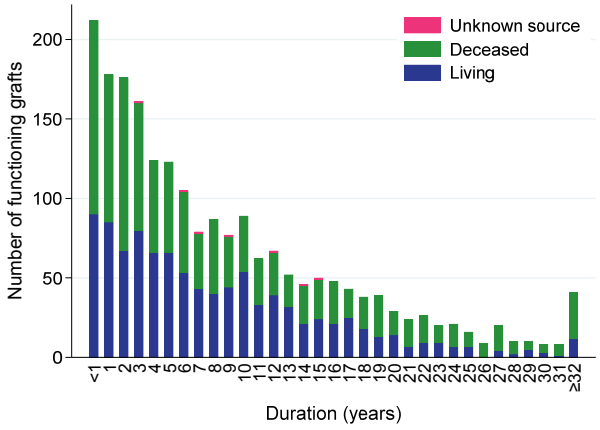


Figure 7.12.2 - Number of Functioning Grafts by Graft Duration - New Zealand 2019 (n=2098)



Graft Loss

Table 7.10 presents the overall graft loss rate in 2010-2019 by country, stratified into graft failure and death with a functioning graft. These rates are expressed as graft losses per 100 graft-years.

Table 7.10 Graft Loss Rate (per 100 graft years) 2010-2019

Country	Outcome	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	Graft failure	2.8	2.8	3.0	2.6	2.8	3.1	2.7	2.9	3.1	2.6
	Death with function	2.3	2.8	2.1	2.7	2.4	2.5	2.6	2.5	2.4	2.2
	All losses	**5.1**	**5.6**	**5.1**	**5.3**	**5.2**	**5.6**	**5.2**	**5.3**	**5.5**	**4.7**
New Zealand	Graft failure	2.2	2.3	2.6	2.4	2.9	2.0	2.7	2.1	2.8	2.2
	Death with function	2.4	2.9	2.1	2.1	2.9	2.7	3.1	3.0	2.9	3.2
	All losses	**4.7**	**5.2**	**4.8**	**4.4**	**5.8**	**4.8**	**5.8**	**5.1**	**5.8**	**5.4**

The causes of graft loss over 2010-2019 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. The Registry is in the process of revising the reportable causes of graft loss and the historical term ‘chronic allograft nephropathy’ will be replaced with more specific terminology in future data collection. These data are further categorised by timing post-transplant (first year versus later years) for 2015-2019 in table 7.12.

Table 7.11 Causes of Graft Loss 2010-2019

Country	Cause of graft loss	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Australia	Death with function	178	223	174	233	215	230	241	241	240	228	2203
	Acute rejection	8	10	10	13	11	16	14	13	19	11	125
	Chronic allograft nephropathy	147	156	177	155	167	189	155	147	177	121	1591
	Hyperacute rejection	-	-	-	-	1	-	1	1	-	1	4
	Vascular	13	6	10	9	7	12	9	4	16	12	98
	Technical	4	5	2	-	6	2	6	6	3	4	38
	Glomerulonephritis	17	15	17	16	12	20	19	18	13	14	161
	Non-compliance	6	6	8	9	14	3	8	16	17	8	95
	Other	17	27	29	22	29	37	34	43	45	47	330
	Not reported	-	-	-	-	-	-	5	33	24	48	110
	Total	**390**	**448**	**427**	**457**	**462**	**509**	**492**	**522**	**554**	**494**	**4755**
New Zealand	Death with function	33	40	30	30	43	42	50	50	50	58	426
	Acute rejection	-	3	1	2	3	1	2	2	4	4	22
	Chronic allograft nephropathy	17	15	26	21	28	22	26	17	31	18	221
	Hyperacute rejection	-	-	-	-	-	-	-	-	-	-	0
	Vascular	2	2	2	2	1	-	3	1	-	2	15
	Technical	-	-	-	-	1	1	2	-	-	1	5
	Glomerulonephritis	4	4	5	1	2	2	2	5	1	3	29
	Non-compliance	5	3	-	4	6	-	-	1	3	4	26
	Other	2	4	3	4	2	5	6	4	8	2	40
	Not reported	-	-	-	-	-	-	2	5	2	6	15
	Total	**63**	**71**	**67**	**64**	**86**	**73**	**93**	**85**	**99**	**98**	**799**

Table 7.12 Graft Losses 2015-2019

Country	Outcome	Cause of death or graft failure	First year	Beyond first year	Total
Australia	Death with function	Cardiovascular	28 (31%)	248 (23%)	276 (23%)
		Withdrawal	4 (4%)	67 (6%)	71 (6%)
		Cancer	6 (7%)	316 (29%)	322 (27%)
		Infection	28 (31%)	136 (12%)	164 (14%)
		Other	22 (24%)	310 (28%)	332 (28%)
		Not reported	2 (2%)	13 (1%)	15 (1%)
		Total	**90 (100%)**	**1090 (100%)**	**1180 (100%)**
	Graft Failure	Acute rejection	24 (17%)	49 (4%)	73 (5%)
		Chronic allograft nephropathy	9 (6%)	780 (63%)	789 (57%)
		Hyperacute rejection	3 (2%)	-	3 (<1%)
		Vascular	37 (26%)	16 (1%)	53 (4%)
		Technical	17 (12%)	4 (<1%)	21 (2%)
		Glomerulonephritis	5 (3%)	79 (6%)	84 (6%)
		Non-compliance	3 (2%)	49 (4%)	52 (4%)
		Other	41 (29%)	165 (13%)	206 (15%)
		Not reported	4 (3%)	106 (8%)	110 (8%)
		Total	**143 (100%)**	**1248 (100%)**	**1391 (100%)**
New Zealand	Death with function	Cardiovascular	8 (53%)	73 (31%)	81 (32%)
		Withdrawal	1 (7%)	8 (3%)	9 (4%)
		Cancer	1 (7%)	69 (29%)	70 (28%)
		Infection	3 (20%)	31 (13%)	34 (14%)
		Other	2 (13%)	48 (20%)	50 (20%)
		Not reported	-	6 (3%)	6 (2%)
		Total	**15 (100%)**	**235 (100%)**	**250 (100%)**
	Graft Failure	Acute rejection	1 (5%)	12 (7%)	13 (7%)
		Chronic allograft nephropathy	1 (5%)	113 (63%)	114 (58%)
		Vascular	5 (25%)	1 (1%)	6 (3%)
		Technical	3 (15%)	1 (1%)	4 (2%)
		Glomerulonephritis	3 (15%)	10 (6%)	13 (7%)
		Non-compliance	-	8 (4%)	8 (4%)
		Other	6 (30%)	19 (11%)	25 (13%)
		Not reported	1 (5%)	14 (8%)	15 (8%)
		Total	**20 (100%)**	**178 (100%)**	**198 (100%)**

Immunosuppression

The use of antibodies for induction immunosuppression is shown in table 7.13.

Table 7.13 Antibody Use for Induction Immunosuppression 2015-2019; Number of Kidney Transplant Recipients Receiving Each Agent by Year (% Total New Transplants)

Country	Type of agent	2015	2016	2017	2018	2019
Australia	**Intravenous immunoglobulin**	14 (1.5%)	16 (1.5%)	39 (3.5%)	34 (3.0%)	32 (2.9%)
	Anti-CD25	772 (81.3%)	838 (76.8%)	925 (83.4%)	1043 (90.8%)	850 (77.0%)
	Rituximab	6 (0.6%)	4 (0.4%)	9 (0.8%)	2 (0.2%)	6 (0.5%)
	T cell depleting polyclonal Ab	60 (6.3%)	72 (6.6%)	58 (5.2%)	73 (6.4%)	139 (12.6%)
	Other	-	-	3 (0.3%)	4 (0.3%)	3 (0.3%)
	Not reported	3 (0.3%)	173 (15.9%)	104 (9.4%)	35 (3.0%)	126 (11.4%)
	Total new transplants	**949**	**1091**	**1109**	**1149**	**1104**
New Zealand	**Intravenous immunoglobulin**	1 (0.7%)	-	-	-	-
	Anti-CD25	142 (96.6%)	167 (97.1%)	185 (98.9%)	182 (100.0%)	214 (96.8%)
	Rituximab	9 (6.1%)	5 (2.9%)	11 (5.9%)	10 (5.5%)	12 (5.4%)
	T cell depleting polyclonal Ab	1 (0.7%)	6 (3.5%)	7 (3.7%)	2 (1.1%)	9 (4.1%)
	Other	1 (0.7%)	-	-	1 (0.5%)	-
	Not reported	-	1 (0.6%)	-	-	7 (3.2%)
	Total new transplants	**147**	**172**	**187**	**182**	**221**

Immunosuppressive therapy at baseline, 1- and 2-years post-transplant for primary grafts over 2012-2019 is presented for deceased and living donors in tables 7.14 and 7.15, respectively. Tacrolimus is the most commonly prescribed calcineurin inhibitor in Australia, whereas in New Zealand cyclosporin predominates as initial therapy.

Table 7.14.1 Immunosuppressive Therapy - Primary Deceased Donor Grafts Australia 2012-2019

Time	Year transplanted	AZA	CYC	TAC	MMF	MPA	SIR	EVE	PRE	Number of deceased donor grafts
Initial treatment	**2012**	1 (<1%)	27 (5%)	480 (86%)	278 (52%)	243 (46%)	-	-	519 (97%)	533
	2013	4 (1%)	11 (2%)	539 (91%)	347 (61%)	207 (37%)	-	-	555 (98%)	567
	2014	2 (<1%)	11 (2%)	534 (91%)	358 (63%)	180 (32%)	1 (<1%)	11 (2%)	548 (96%)	568
	2015	3 (<1%)	5 (1%)	585 (91%)	377 (60%)	209 (33%)	-	9 (1%)	593 (94%)	630
	2016	-	3 (<1%)	611 (84%)	424 (61%)	200 (29%)	-	2 (<1%)	623 (89%)	697
	2017	-	2 (<1%)	677 (91%)	485 (68%)	196 (28%)	-	1 (<1%)	679 (96%)	710
	2018	3 (<1%)	3 (<1%)	756 (90%)	535 (66%)	228 (28%)	1 (<1%)	5 (1%)	771 (95%)	809
	2019	-	3 (<1%)	742 (89%)	504 (65%)	236 (30%)	1 (<1%)	3 (<1%)	734 (95%)	774
Treatment at 1 year	**2012**	21 (4%)	25 (5%)	437 (83%)	196 (39%)	251 (50%)	12 (2%)	17 (3%)	480 (96%)	502
	2013	18 (3%)	22 (4%)	473 (85%)	267 (50%)	199 (37%)	11 (2%)	3 (1%)	502 (94%)	535
	2014	23 (4%)	10 (2%)	481 (87%)	273 (52%)	168 (32%)	4 (1%)	22 (4%)	498 (94%)	530
	2015	22 (4%)	11 (2%)	496 (84%)	275 (47%)	188 (32%)	2 (<1%)	16 (3%)	511 (88%)	580
	2016	27 (4%)	19 (3%)	580 (84%)	353 (54%)	207 (32%)	5 (1%)	23 (4%)	603 (92%)	654
	2017	18 (3%)	11 (2%)	582 (81%)	337 (50%)	208 (31%)	7 (1%)	29 (4%)	607 (90%)	678
	2018	32 (4%)	9 (1%)	661 (78%)	402 (52%)	208 (27%)	9 (1%)	30 (4%)	676 (87%)	777
Treatment at 2 years	**2012**	26 (5%)	23 (5%)	416 (81%)	184 (38%)	241 (49%)	11 (2%)	19 (4%)	458 (93%)	490
	2013	21 (4%)	20 (4%)	444 (82%)	255 (49%)	192 (37%)	13 (2%)	7 (1%)	481 (92%)	521
	2014	28 (5%)	13 (3%)	439 (82%)	255 (50%)	155 (30%)	8 (2%)	21 (4%)	461 (90%)	514
	2015	35 (6%)	15 (3%)	488 (85%)	263 (47%)	184 (33%)	8 (1%)	20 (4%)	499 (88%)	565
	2016	31 (5%)	16 (3%)	531 (77%)	316 (50%)	184 (29%)	3 (<1%)	29 (5%)	552 (87%)	631
	2017	24 (4%)	12 (2%)	532 (74%)	294 (45%)	195 (30%)	11 (2%)	27 (4%)	562 (86%)	652

Table 7.14.2 Immunosuppressive Therapy - Primary Deceased Donor Grafts New Zealand 2012-2019

Time	Year transplanted	AZA	CYC	TAC	MMF	MPA	SIR	EVE	PRE	Number of deceased donor grafts
Initial treatment	**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%)	22 (28%)	79 (99%)	-	-	-	79 (99%)	80
	2017	-	81 (72%)	31 (28%)	111 (99%)	-	-	-	111 (99%)	112
	2018	-	58 (65%)	31 (35%)	89 (100%)	-	-	-	89 (100%)	89
	2019	1 (1%)	66 (57%)	47 (38%)	112 (97%)	-	-	-	113 (98%)	115
Treatment at 1 year	**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%)	31 (48%)	55 (86%)	-	-	-	60 (94%)	64
	2016	3 (4%)	38 (51%)	35 (47%)	69 (92%)	1 (1%)	-	-	74 (99%)	75
	2017	4 (4%)	41 (38%)	64 (60%)	101 (94%)	-	-	-	105 (98%)	107
	2018	-	37 (44%)	42 (50%)	77 (92%)	-	-	-	79 (94%)	84
Treatment at 2 years	**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
	2015	3 (5%)	24 (40%)	34 (58%)	52 (88%)	-	-	-	59 (100%)	59
	2016	5 (7%)	35 (48%)	37 (51%)	64 (88%)	1 (1%)	-	-	72 (99%)	73
	2017	6 (6%)	32 (31%)	63 (61%)	88 (85%)	-	-	-	94 (90%)	104

Table 7.15.1 Immunosuppressive Therapy - Primary Living Donor Grafts Australia 2012-2019

Time	Year transplanted	AZA	CYC	TAC	MMF	MPA	SIR	EVE	PRE	Number of living donor grafts
Initial treatment	**2012**	4 (2%)	11 (5%)	193 (86%)	120 (56%)	82 (38%)	1 (<1%)	-	205 (96%)	213
	2013	1 (<1%)	10 (4%)	209 (92%)	139 (62%)	78 (35%)	-	-	221 (99%)	224
	2014	-	4 (2%)	216 (87%)	147 (62%)	74 (31%)	-	1 (<1%)	219 (92%)	237
	2015	1 (<1%)	3 (1%)	199 (90%)	122 (58%)	69 (33%)	-	10 (5%)	200 (94%)	212
	2016	-	6 (3%)	212 (85%)	161 (69%)	54 (23%)	-	-	216 (92%)	235
	2017	3 (1%)	1 (<1%)	227 (89%)	173 (72%)	53 (22%)	-	-	224 (93%)	241
	2018	-	2 (1%)	199 (86%)	146 (67%)	54 (25%)	-	1 (<1%)	202 (93%)	218
	2019	-	-	193 (80%)	134 (63%)	64 (30%)	-	1 (<1%)	199 (93%)	213
Treatment at 1 year	**2012**	7 (3%)	9 (4%)	186 (86%)	96 (47%)	86 (42%)	3 (1%)	4 (2%)	195 (95%)	205
	2013	9 (4%)	9 (4%)	189 (87%)	113 (53%)	77 (36%)	6 (3%)	2 (1%)	198 (92%)	215
	2014	11 (5%)	10 (4%)	198 (82%)	119 (52%)	69 (30%)	1 (<1%)	8 (4%)	209 (92%)	228
	2015	5 (2%)	3 (1%)	176 (82%)	93 (45%)	66 (32%)	2 (1%)	7 (3%)	172 (84%)	205
	2016	10 (4%)	9 (4%)	203 (82%)	141 (60%)	56 (24%)	3 (1%)	-	208 (89%)	235
	2017	11 (5%)	7 (3%)	191 (76%)	135 (58%)	50 (21%)	3 (1%)	8 (3%)	202 (86%)	234
	2018	11 (5%)	5 (2%)	171 (73%)	109 (51%)	53 (25%)	1 (<1%)	9 (4%)	181 (85%)	213
Treatment at 2 years	**2012**	8 (4%)	5 (3%)	177 (84%)	88 (44%)	82 (41%)	4 (2%)	9 (5%)	181 (91%)	200
	2013	18 (8%)	9 (4%)	181 (84%)	99 (46%)	69 (32%)	7 (3%)	4 (2%)	186 (87%)	213
	2014	13 (6%)	7 (3%)	182 (77%)	111 (49%)	60 (27%)	1 (<1%)	13 (6%)	194 (86%)	225
	2015	6 (3%)	5 (2%)	171 (81%)	91 (45%)	68 (34%)	4 (2%)	9 (4%)	170 (85%)	201
	2016	13 (6%)	8 (4%)	185 (74%)	127 (56%)	47 (21%)	3 (1%)	4 (2%)	194 (85%)	228
	2017	18 (8%)	7 (3%)	183 (70%)	126 (54%)	50 (22%)	2 (1%)	9 (4%)	193 (83%)	232

Table 7.15.2 Immunosuppressive Therapy - Primary Living Donor Grafts New Zealand 2012-2019

Time	Year transplanted	AZA	CYC	TAC	MMF	MPA	SIR	EVE	PRE	Number of living donor grafts
Initial treatment	**2012**	1 (2%)	26 (51%)	21 (43%)	47 (96%)	-	-	-	47 (96%)	49
	2013	1 (2%)	30 (53%)	26 (46%)	55 (96%)	1 (2%)	-	-	57 (100%)	57
	2014	-	42 (63%)	24 (36%)	66 (99%)	-	-	-	66 (99%)	67
	2015	1 (1%)	41 (60%)	27 (40%)	67 (99%)	-	1 (1%)	-	67 (99%)	68
	2016	-	47 (63%)	27 (36%)	74 (99%)	-	-	-	74 (99%)	75
	2017	3 (5%)	27 (44%)	35 (56%)	58 (94%)	1 (2%)	-	-	62 (100%)	62
	2018	1 (1%)	44 (54%)	37 (44%)	79 (98%)	1 (1%)	-	-	81 (100%)	81
	2019	-	25 (31%)	56 (69%)	81 (100%)	-	-	-	81 (100%)	81
Treatment at 1 year	**2012**	2 (4%)	18 (37%)	28 (60%)	44 (94%)	-	-	-	46 (98%)	47
	2013	2 (4%)	25 (45%)	31 (55%)	51 (91%)	1 (2%)	-	-	56 (100%)	56
	2014	3 (5%)	23 (35%)	37 (57%)	61 (94%)	-	-	-	64 (98%)	65
	2015	2 (3%)	29 (43%)	34 (51%)	61 (91%)	-	1 (1%)	-	63 (94%)	67
	2016	1 (1%)	33 (45%)	39 (53%)	71 (97%)	-	-	-	72 (99%)	73
	2017	4 (7%)	15 (26%)	42 (72%)	52 (90%)	-	-	-	58 (100%)	58
	2018	1 (1%)	28 (35%)	47 (54%)	71 (89%)	-	2 (3%)	-	77 (96%)	80
Treatment at 2 years	**2012**	2 (4%)	18 (37%)	28 (60%)	41 (87%)	-	-	-	45 (96%)	47
	2013	6 (11%)	23 (43%)	29 (55%)	44 (83%)	1 (2%)	-	-	52 (98%)	53
	2014	3 (5%)	24 (38%)	37 (58%)	59 (92%)	-	-	-	63 (98%)	64
	2015	4 (6%)	28 (42%)	37 (56%)	60 (91%)	-	-	-	65 (98%)	66
	2016	3 (4%)	32 (44%)	39 (54%)	67 (93%)	-	-	-	71 (99%)	72
	2017	8 (14%)	15 (26%)	41 (71%)	45 (78%)	-	-	-	56 (97%)	58

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 7.16. Antibody-mediated rejection rates are presented in table 7.17; rates are notably higher in re-grafts. Years shown are those in which the transplants were performed.

Table 7.16 Rejection Rates at Six Months Post-Transplant 2009-2018

Donor Type	Graft Number	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Living donor	First	16.8%	17.8%	17.5%	14.1%	19.2%	22.4%	17.1%	17.4%	19.1%	14.7%
	Second and subsequent	24.3%	12.9%	19.2%	10.0%	16.1%	28.6%	11.1%	16.7%	21.6%	13.0%
Deceased donor	First	21.1%	19.1%	20.0%	16.8%	18.5%	19.8%	17.7%	15.3%	18.5%	14.6%
	Second and subsequent	37.8%	28.6%	19.4%	24.4%	25.0%	25.9%	24.7%	18.6%	20.1%	22.5%

Table 7.17 Antibody-Mediated Rejection Rates at Six Months Post-Transplant 2009-2018

Donor Type	Graft Number	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Living donor	First	4.5%	3.7%	4.9%	2.3%	5.3%	4.6%	3.9%	3.9%	4.0%	5.0%
	Second and subsequent	13.5%	3.2%	11.5%	6.7%	3.2%	5.7%	5.6%	2.8%	8.1%	0.0%
Deceased donor	First	5.6%	5.4%	5.6%	3.9%	5.0%	5.1%	6.0%	5.8%	4.6%	2.7%
	Second and subsequent	24.3%	13.0%	11.3%	10.3%	10.3%	12.9%	17.6%	8.6%	9.7%	11.7%

Table 7.18 shows the number of people who received antibody agents for treating acute rejection by calendar year. The total number of new and prevalent transplant recipients for each year is also reported to give context.

Table 7.18 Antibody Therapy for Acute Rejection 2015-2019

Country	Type of agent	2015	2016	2017	2018	2019
Australia	Intravenous immunoglobulin	163	123	128	86	63
	Anti-CD25	2	1	-	-	1
	Rituximab	12	4	7	15	8
	T cell depleting polyclonal Ab	30	23	41	30	31
	Not specified	24	43	31	42	18
	Total new transplants	949	1091	1109	1149	1104
	Total transplants at risk	11026	11570	12162	12768	13319
New Zealand	Intravenous immunoglobulin	1	6	3	3	-
	Rituximab	-	2	-	-	-
	T cell depleting polyclonal Ab	3	14	13	13	16
	Not specified	5	-	2	1	1
	Total new transplants	147	172	187	182	221
	Total transplants at risk	1777	1879	1973	2074	2194

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. Patient and graft survival are shown 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 and all 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

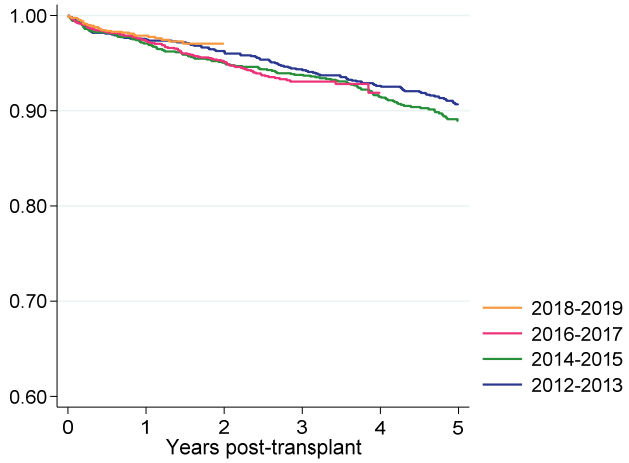


Figure 7.14 - Primary Deceased Donor Grafts - Graft Survival – Australia

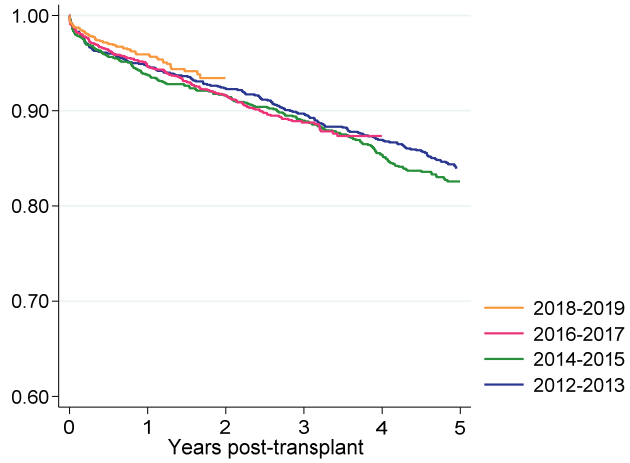


Table 7.19 Primary Deceased Donor Grafts - Australia 2012-2019

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	**2012-2013 (n=1100)**	100 (99, 100)	98 (97, 99)	97 (96, 98)	91 (89, 92)
	2014-2015 (n=1198)	99 (99, 100)	98 (97, 99)	97 (96, 98)	89 (87, 91)
	2016-2017 (n=1407)	99 (99, 100)	98 (97, 99)	97 (96, 98)	-
	2018-2019 (n=1583)	100 (99, 100)	98 (98, 99)	98 (97, 99)	-
Graft survival	**2012-2013 (n=1100)**	98 (97, 99)	96 (95, 97)	95 (93, 96)	84 (82, 86)
	2014-2015 (n=1198)	98 (97, 99)	96 (94, 97)	94 (92, 95)	83 (80, 85)
	2016-2017 (n=1407)	98 (97, 99)	96 (95, 97)	95 (93, 96)	-
	2018-2019 (n=1583)	99 (98, 99)	97 (96, 98)	96 (95, 97)	-

Figure 7.15 - Primary Deceased Donor Grafts - Patient Survival - New Zealand

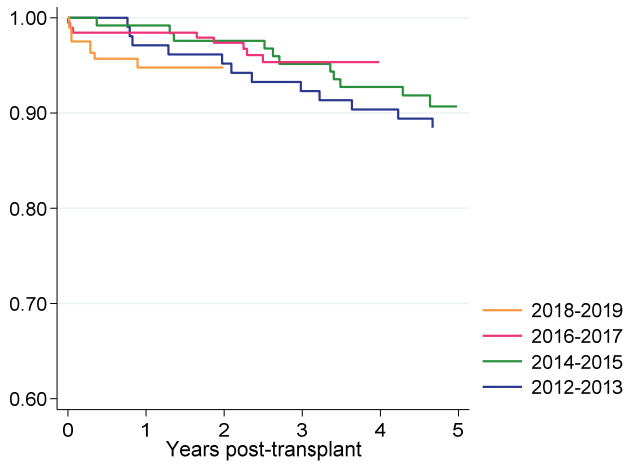


Figure 7.16 - Primary Deceased Donor Grafts - Graft Survival - New Zealand

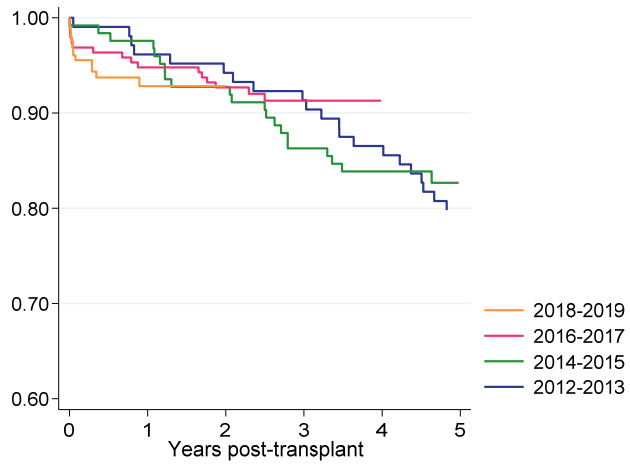


Table 7.20 Primary Deceased Donor Grafts - New Zealand 2012-2019

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2012-2013 (n=104)	100	100	97 (91, 99)	88 (81, 93)
	2014-2015 (n=124)	100	99 (94, 100)	99 (94, 100)	91 (84, 95)
	2016-2017 (n=192)	98 (95, 99)	98 (95, 99)	98 (95, 99)	-
	2018-2019 (n=204)	98 (94, 99)	96 (92, 98)	95 (90, 97)	-
Graft survival	2012-2013 (n=104)	99 (93, 100)	99 (93, 100)	96 (90, 99)	80 (71, 86)
	2014-2015 (n=124)	99 (94, 100)	98 (94, 100)	98 (93, 99)	83 (75, 88)
	2016-2017 (n=192)	97 (93, 99)	96 (93, 98)	95 (91, 97)	-
	2018-2019 (n=204)	96 (92, 98)	94 (89, 96)	93 (88, 96)	-

Figure 7.17 - Primary Deceased Donor Grafts - Patient Survival - Australia and New Zealand

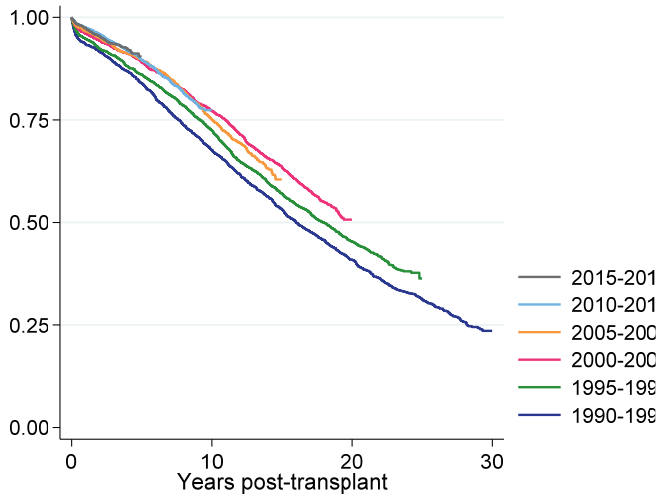


Figure 7.18 - Primary Deceased Donor Grafts - Graft Survival - Australia and New Zealand

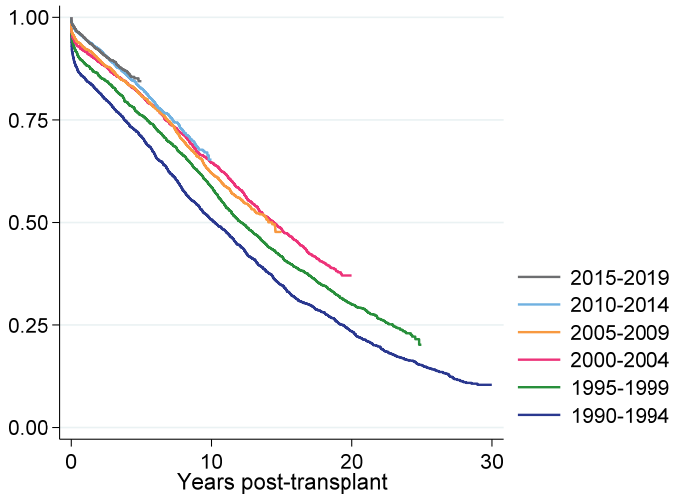


Table 7.21 Primary Deceased Donor Grafts - Australia and New Zealand 1990-2019

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)	45 (43, 48)
	2000-2004 (n=1849)	96 (95, 97)	89 (88, 90)	77 (75, 79)	64 (61, 66)	-
	2005-2009 (n=1911)	97 (96, 97)	90 (88, 91)	75 (73, 77)	-	-
	2010-2014 (n=2923)	98 (97, 98)	90 (88, 91)	-	-	-
	2015-2019 (n=4081)	97 (97, 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)	30 (28, 32)
	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 (60, 64)	-	-
	2010-2014 (n=2923)	95 (94, 96)	83 (81, 84)	-	-	-
	2015-2019 (n=4081)	95 (94, 95)	-	-	-	-

Figure 7.19 - Second and Subsequent Deceased Donor Grafts - Patient Survival - Australia and New Zealand

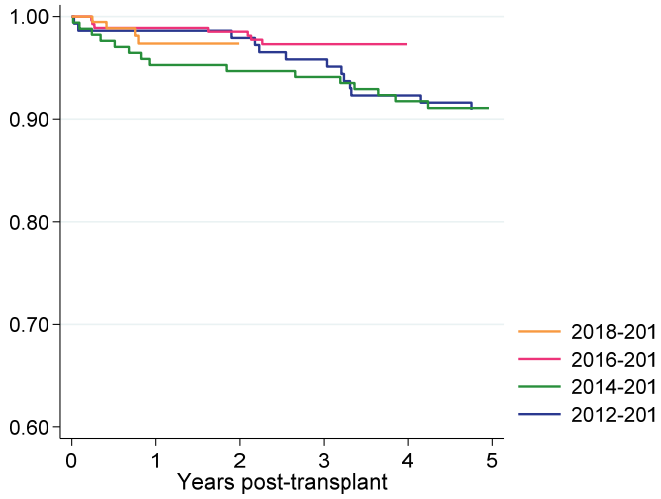


Figure 7.20 - Second and Subsequent Deceased Donor Grafts - Graft Survival - Australia and New Zealand

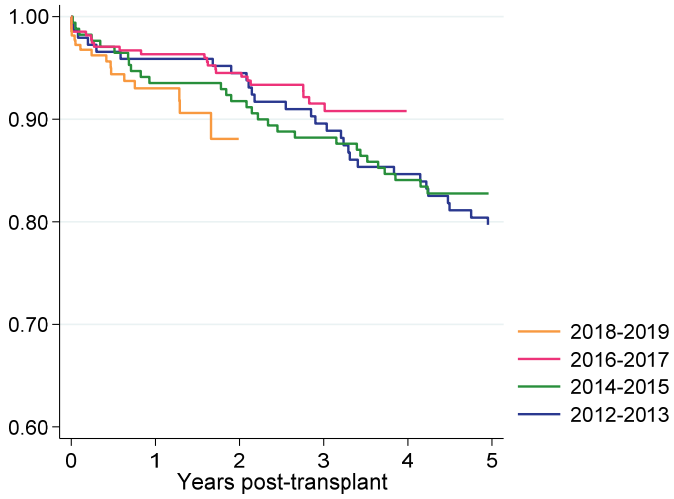


Table 7.22 Second and Subsequent Deceased Donor Grafts - Australia and New Zealand 2012-2019

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	**2012-2013 (n=146)**	99 (95, 100)	99 (95, 100)	99 (95, 100)	91 (85, 95)
	2014-2015 (n=170)	99 (96, 100)	98 (94, 99)	95 (91, 98)	91 (86, 95)
	2016-2017 (n=274)	100	99 (97, 100)	99 (97, 100)	-
	2018-2019 (n=218)	100	99 (96, 100)	97 (93, 99)	-
Graft survival	**2012-2013 (n=146)**	98 (94, 99)	97 (92, 99)	96 (91, 98)	80 (72, 85)
	2014-2015 (n=170)	99 (95, 100)	97 (93, 99)	94 (89, 96)	83 (76, 88)
	2016-2017 (n=274)	99 (96, 99)	97 (94, 99)	96 (93, 98)	-
	2018-2019 (n=218)	97 (94, 99)	94 (90, 97)	93 (88, 96)	-

Figure 7.21 - Second and Subsequent Deceased Donor Grafts - Patient Survival - Australia and New Zealand

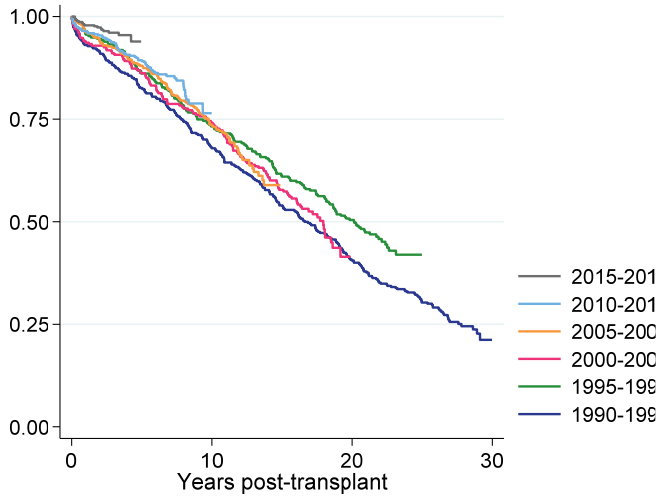


Figure 7.22 - Second and Subsequent Deceased Donor Grafts - Graft Survival - Australia and New Zealand

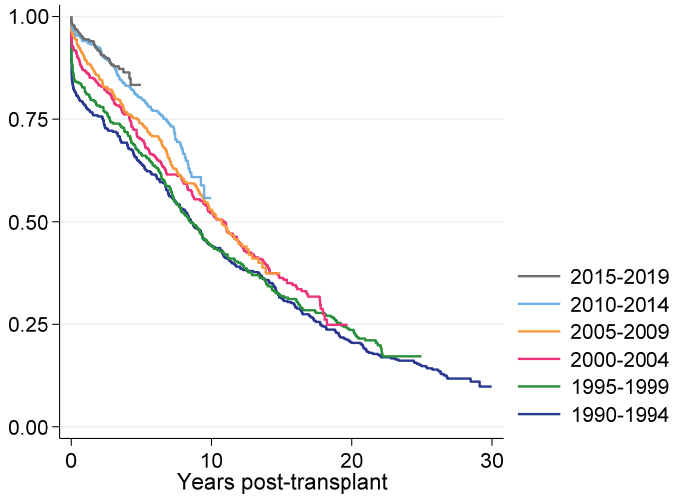


Table 7.23 Second and Subsequent Deceased Donor Grafts - Australia and New Zealand 1990-2019

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 (45, 56)
	2000-2004 (n=268)	94 (90, 96)	86 (81, 90)	74 (68, 79)	58 (52, 63)	-
	2005-2009 (n=343)	96 (94, 98)	88 (84, 91)	74 (69, 78)	-	-
	2010-2014 (n=370)	96 (94, 98)	89 (86, 92)	-	-	-
	2015-2019 (n=577)	98 (96, 99)	-	-	-	-
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)	24 (19, 29)
	2000-2004 (n=268)	87 (82, 90)	70 (64, 75)	52 (46, 58)	36 (31, 42)	-
	2005-2009 (n=343)	90 (86, 92)	74 (69, 78)	53 (47, 58)	-	-
	2010-2014 (n=370)	94 (91, 96)	80 (76, 84)	-	-	-
	2015-2019 (n=577)	94 (92, 96)	-	-	-	-

Figure 7.23 - Primary Living Donor Grafts - Patient Survival - Australia

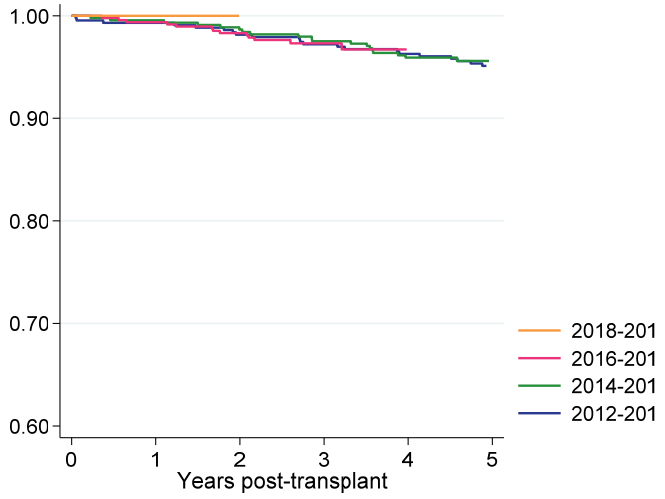


Figure 7.24 - Primary Living Donor Grafts - Graft Survival - Australia

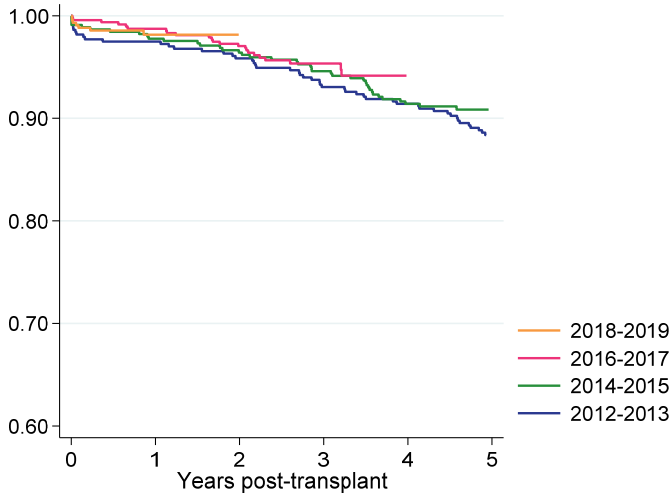


Table 7.24 Primary Living Donor Grafts - Australia 2012-2019

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2012-2013 (n=437)	100 (98, 100)	99 (98, 100)	99 (98, 100)	95 (93, 97)
	2014-2015 (n=449)	100	100 (98, 100)	100 (98, 100)	96 (93, 97)
	2016-2017 (n=476)	100	100 (99, 100)	99 (98, 100)	-
	2018-2019 (n=431)	100	100	100	-
Graft survival	2012-2013 (n=437)	98 (96, 99)	97 (95, 99)	97 (95, 99)	88 (85, 91)
	2014-2015 (n=449)	99 (98, 100)	98 (97, 99)	98 (96, 99)	91 (88, 93)
	2016-2017 (n=476)	100 (98, 100)	99 (98, 100)	99 (97, 99)	-
	2018-2019 (n=431)	99 (98, 100)	99 (97, 99)	98 (96, 99)	-

Figure 7.25 - Primary Living Donor Grafts - Patient Survival - New Zealand

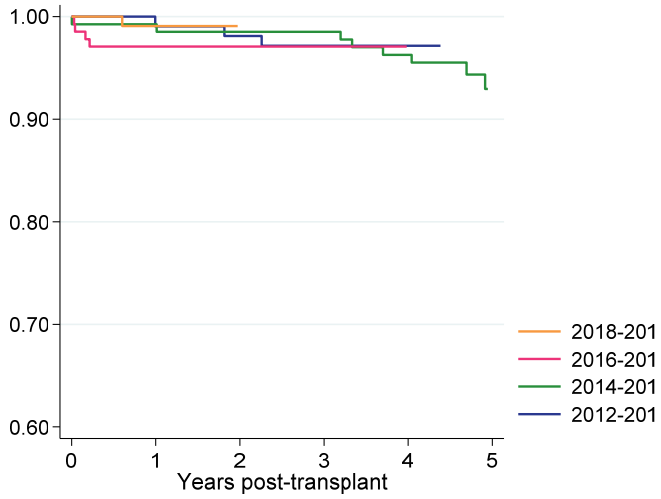


Figure 7.26 - Primary Living Donor Grafts - Graft Survival - New Zealand

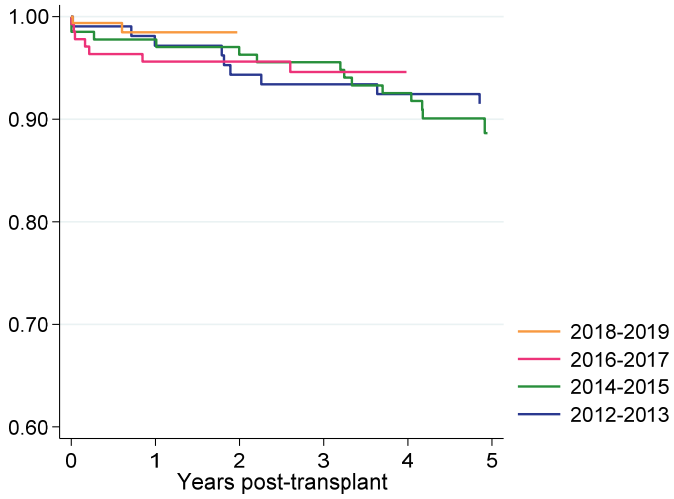


Table 7.25 Primary Living Donor Grafts - New Zealand 2012-2019

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2012-2013 (n=106)	100	100	99 (93, 100)	97 (91, 99)
	2014-2015 (n=135)	99 (95, 100)	99 (95, 100)	99 (95, 100)	93 (86, 97)
	2016-2017 (n=137)	99 (94, 100)	97 (92, 99)	97 (92, 99)	-
	2018-2019 (n=162)	100	100	99 (94, 100)	-
Graft survival	2012-2013 (n=106)	99 (93, 100)	99 (93, 100)	97 (91, 99)	91 (84, 95)
	2014-2015 (n=135)	99 (94, 100)	98 (93, 99)	98 (93, 99)	89 (81, 93)
	2016-2017 (n=137)	98 (93, 99)	96 (91, 98)	96 (91, 98)	-
	2018-2019 (n=162)	99 (96, 100)	99 (96, 100)	98 (94, 100)	-

Figure 7.27 - Primary Living Donor Grafts - Patient Survival - Australia and New Zealand

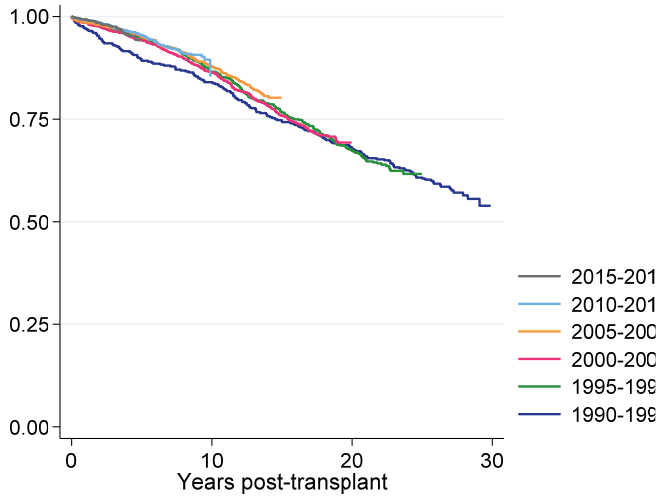


Figure 7.28 - Primary Living Donor Grafts - Graft Survival - Australia and New Zealand

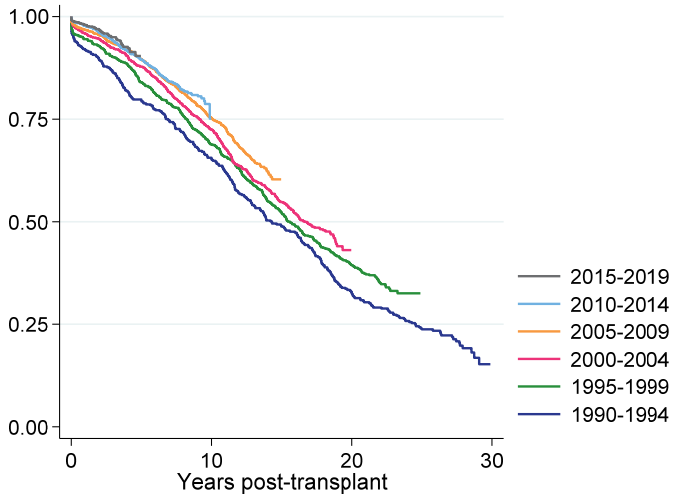


Table 7.26 Primary Living Donor Grafts - Australia and New Zealand 1990-2019

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 (74, 80)	67 (64, 71)
	2000-2004 (n=1194)	98 (98, 99)	94 (93, 95)	86 (84, 88)	76 (73, 78)	-
	2005-2009 (n=1585)	99 (98, 99)	95 (94, 96)	88 (86, 89)	-	-
	2010-2014 (n=1457)	99 (98, 99)	95 (94, 96)	-	-	-
	2015-2019 (n=1486)	99 (99, 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)	39 (36, 43)
	2000-2004 (n=1194)	96 (95, 97)	88 (86, 90)	72 (70, 75)	55 (52, 58)	-
	2005-2009 (n=1585)	97 (96, 97)	90 (88, 91)	75 (73, 77)	-	-
	2010-2014 (n=1457)	98 (97, 98)	89 (88, 91)	-	-	-
	2015-2019 (n=1486)	98 (97, 99)	-	-	-	-

Figure 7.29 - Second and Subsequent Living Donor Grafts - Patient Survival - Australia and New Zealand

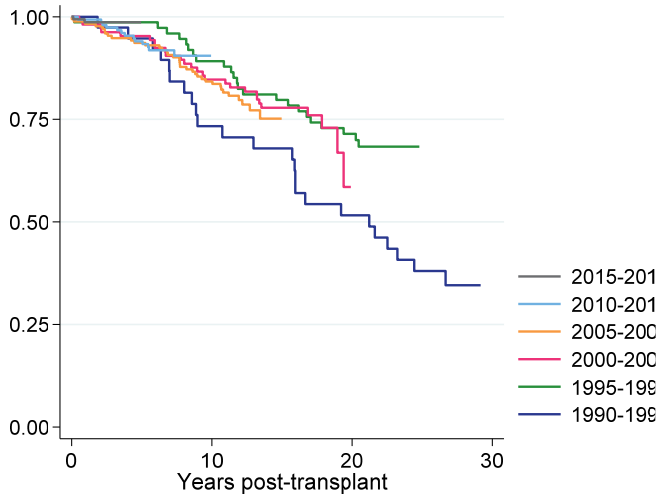


Figure 7.30 - Second and Subsequent Living Donor Grafts - Graft Survival - Australia and New Zealan

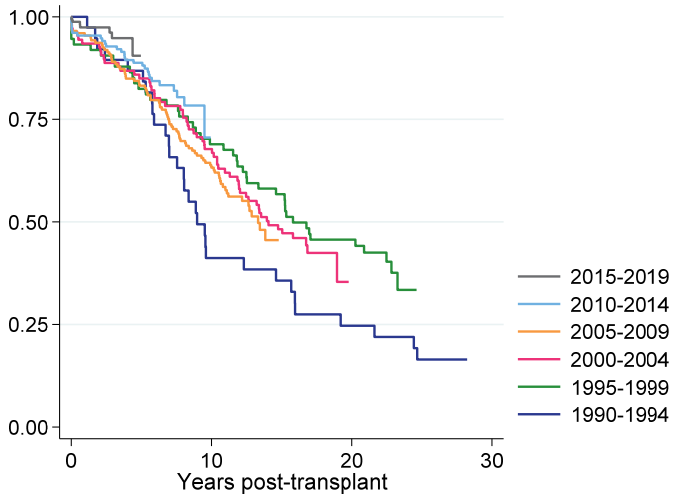


Table 7.27 Second and Subsequent Living Donor Grafts - Australia and New Zealand 1990-2019

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)	71 (60, 80)
	2000-2004 (n=107)	98 (93, 100)	95 (89, 98)	85 (76, 90)	78 (69, 85)	-
	2005-2009 (n=175)	98 (95, 99)	94 (89, 96)	84 (78, 89)	-	-
	2010-2014 (n=153)	99 (95, 100)	94 (89, 97)	-	-	-
	2015-2019 (n=167)	99 (95, 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, 90)	68 (58, 76)	48 (38, 57)	-
	2005-2009 (n=175)	95 (91, 98)	83 (77, 88)	63 (56, 70)	-	-
	2010-2014 (n=153)	95 (91, 98)	89 (83, 93)	-	-	-
	2015-2019 (n=167)	97 (93, 99)	-	-	-	-

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[1] Australian Bureau of Statistics, 2019, Australian Standard Classification of Cultural and Ethnic Groups (ASCCEG), December 2019, viewed 23 Oct 2020, https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1249.0Main+Features12019?OpenDocument

[2] *Australian Bureau of Statistics, 2019, Australian Demographic Statistics, Jun 2019, time series spreadsheets, cat. no. 3101.0, viewed 19 Dec 2019, http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3101.0Jun%202019?OpenDocument*

[3] *This work is based on/includes Stats NZ's data which are licensed by Stats NZ for re-use under the Creative Commons Attribution 4.0 International licence. Stats NZ, 2019, Estimated Resident Population by Age and Sex (1991+) (Annual-Jun), NZ Infoshare, viewed 19 Dec 2019, http://archive.stats.govt.nz/infoshare/*