

---

# CHAPTER 7

## Kidney Transplantation

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

# CONTENTS

Summary and Highlights	3
Suggested Citation	4
New Transplants	5
Prevalent Transplants	12
Graft Loss	20
Immunosuppression	23
Delayed Graft Function	28
Rejection	29
Patient and Graft Survival	32
References	47

## SUMMARY AND HIGHLIGHTS

Transplant numbers in Australia have continued to rise and eclipsed 1000 in 2023, the first time since 2020 but still below the pre-pandemic levels seen 2016-2019 (Table 7.1). The numbers in New Zealand have been relatively static during this period with 175 completed in 2023 (Table 7.1). Transplant rates amongst patients receiving dialysis in the 15-64 year age group, presented as transplants per 100 dialysis-years, differ between Australia (10.3) and New Zealand (6.7) and between Australian states, with Victoria having the highest rate (15.1) and the Northern Territory the lowest rate (3.1) (Figure 7.3). In New Zealand (Figure 7.5.2) and Australia (Figure 7.5.1) the rate of transplantation is substantially lower for First Nations compared with non-First Nations patients.

Since kidney transplantation commenced in Australia and New Zealand, a total of 31,668 and 5,737 respectively, had been performed by the end of 2023. Of those 13,648 (Australia) and 2,374 (New Zealand) were still functioning, which provides a prevalence of 512 per million population (pmp) and 453 pmp in the two countries respectively (Table 7.8 and 7.9). The prevalence has increased from 429 pmp (Australia) and 362 pmp (New Zealand) since the end of 2014 (Table 7.9). Within Australia, South Australia/Northern Territory have the highest prevalence (pmp) of patients with functioning transplants while Western Australia, Queensland and NSW/ACT are all at a very similar prevalence (Figure 7.9). The distribution of the age groups of prevalent patients has seen a relative increase in the older age groups (65-74 and 75-84 years) compared to the younger age groups (25-54 years particularly) (Figures 7.14.1 and 7.14.2).

Delayed graft function (DGF) was observed in a greater proportion of transplant recipients in Australia than New Zealand in 2023, at least in part reflecting differences in the proportion of deceased donors who were donation after circulatory determination of death (DCDD) donors between countries (Australia (35.1%) New Zealand (7.9%)) (Tables 7.2 and 7.18). In addition, New Zealand has a far higher proportion of living donor transplants (42.3%) compared to Australia (23.6%) in whom a very low rate of DGF was reported (Tables 7.2 and 7.18). Despite the high proportion of DGF in DCDD donor transplant recipients, graft and patient survival was equivalent to recipients of donation after neurological determination of death (DNDD) donor transplants (Figures 7.47, 7.48, 7.49 and 7.50 and Tables 7.36 and 7.37).

The increasing use of anti-thymocyte globulin as an induction agent has plateaued in 2023 in Australia (Table 7.15). In New Zealand, tacrolimus use for initial immunosuppression, has for the first time surpassed 80% of new transplants (Table 7.16.2).

Overall patient and graft survival has been similar for 2022-2023 relative to the previous 6 years. The finding of increased death and graft loss in Australia for second and subsequent living donor transplants (2020-2023) reported on last year, remains apparent (Figures 7.37 and 7.38). For recipients of a primary deceased donor transplant who are aged 70 or more years, the median patient and graft survivals are approximately equal at 8.5-9 years (Figures 7.39-7.42 and Tables 7.32 and 7.33). Patient survival at 10-years ranges from 42% in the >70-years age group to 91% in the <40 years age group (Table 7.32). The 10-year graft survival is 64-73% in the <60 years age groups, 51% in the 60-69 years age group and 40% in the >70-years age group, these differences largely reflect the expected differences in patient survival with increasing age.

In 2023, graft loss was reported to be due to death with function for 57.0% and 59.5% of cases in Australian and New Zealand respectively (Table 7.13). Death was most commonly due, in almost equal proportions, to cardiovascular disease, infections and malignancies (Table 7.14). Gradual graft failure without a diagnostic biopsy being performed was the most common cause in cases not due to death, followed by chronic antibody mediated rejection (Table 7.14). Of note, technical and vascular causes of graft failure predominate for grafts lost in the first 12-months post-transplant, constituting 39% and 55% of such graft losses for Australia and New Zealand respectively (Table 7.14).

## CHAPTER ADDITIONS FOR 2024

This year's report sees the addition of several new figures and tables. Figures 7.7.1 and 7.7.2 summarise the total ischaemic time by country and region and show the median to be similar, at less than 12 hours for DNDD and DCDD transplants. The range is quite wide though encompassing >24 hours in some cases. Table 7.6 details recipient body mass index (BMI) at transplant: 6% and 10% above 35 kg/m<sup>2</sup> in Australia and New Zealand respectively in 2023. The trends in BMI over the last 20 years are given in Figure 7.8. There has been a modest decline in the proportion in the "ideal" BMI bracket (18.5-24.9 kg/m<sup>2</sup>) over time.

The section on rejection has been enhanced this year. Figures displaying the dynamics of rejection have been added (Figures 7.17-7.20). Predictably, most rejection is reported within the first 12 months of transplant but there remains a steady incidence thereafter. New Zealand appears to report lower rates of rejection than Australia. The rejection incidence curve is a little steeper for second and subsequent transplants but the cumulative incidence by 8 years post-transplant is similar (Figure 7.19). A lower proportion of patients are reported to have rejection in the first 5 years post-transplant in the most recent era (2018-2023) compared to the previous era (2012-2017) (Figure 7.20). The composition of rejection type is detailed in Table 7.21 showing a predominance of cell-mediated rejection, particularly in the first 6-months post-transplant.

## SUGGESTED CITATION

W Mulley, C Davies, E Au, S Bateman, J Chen, P Clayton, K Hurst, F Kholmurodova, D Lee, H McCarthy, S McDonald, M Roberts, B Solomon, T Sun, G Irish. 47th Report, Chapter 7: Kidney Transplantation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2024. Available at: <http://www.anzdata.org.au>

[BACK TO CONTENTS](#)

# NEW TRANSPLANTS

Table 7.1 shows the number of transplants performed in each country over the last 20 years.

**Table 7.1**  
**Number of Grafts Performed by Country 2004-2023**

Country	Year	Graft 1	Graft 2	Graft 3	Graft 4	Graft 5	Total Transplants	Living Donor Transplants
Australia	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	675	88	11	0	0	774	328
	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	792	85	7	2	0	886	254
	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
	2020	804	70	10	1	0	885	181
	2021	737	106	12	2	0	857	202
	2022	827	94	15	2	0	938	225
	2023	975	96	14	2	1	1088	257
New Zealand	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
	2020	169	17	1	0	0	187	87
	2021	173	14	0	0	0	187	85
	2022	165	9	0	0	0	174	70
	2023	151	22	2	0	0	175	74

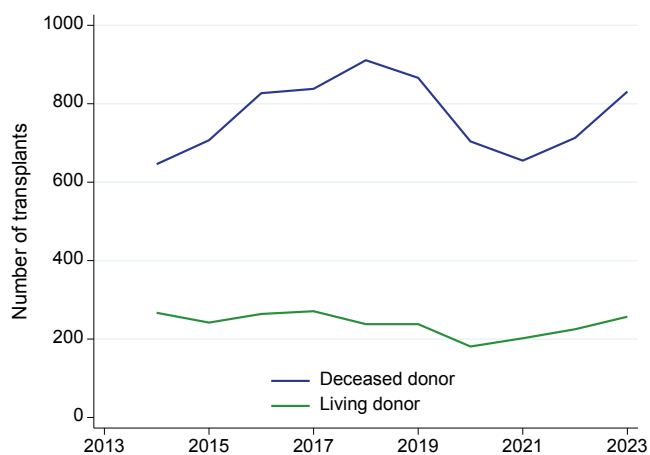
Table 7.2 shows the types of transplants between 2019 and 2023.

**Table 7.2**  
**Transplant Type 2019-2023**

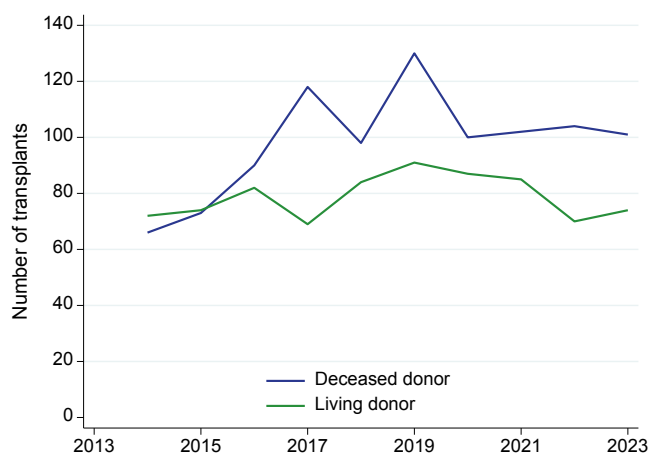
Country	Transplant Type	2019	2020	2021	2022	2023
Australia	<b>Living Donor</b>	<b>238</b>	<b>181</b>	<b>202</b>	<b>225</b>	<b>257</b>
	ABOi	27 (11.3%)	27 (14.9%)	22 (10.9%)	31 (13.8%)	36 (14.0%)
	<b>Deceased Donor</b>	<b>866</b>	<b>704</b>	<b>655</b>	<b>713</b>	<b>831</b>
	ABOi	8 (0.9%)	3 (0.4%)	6 (0.9%)	5 (0.7%)	1 (0.1%)
	DNDD	591 (68.2%)	497 (70.6%)	477 (72.8%)	534 (74.9%)	539 (64.9%)
	DCDD	265 (30.6%)	207 (29.4%)	178 (27.2%)	179 (25.1%)	292 (35.1%)
	DNDD/DCDD Unknown	10 (1.2%)	-	-	-	-
New Zealand	<b>Living Donor</b>	<b>91</b>	<b>87</b>	<b>85</b>	<b>70</b>	<b>74</b>
	ABOi	17 (18.7%)	6 (6.9%)	9 (10.6%)	5 (7.1%)	7 (9.5%)
	<b>Deceased Donor</b>	<b>130</b>	<b>100</b>	<b>102</b>	<b>104</b>	<b>101</b>
	DNDD	112 (86.2%)	87 (87.0%)	96 (94.1%)	89 (85.6%)	93 (92.1%)
	DCDD	18 (13.8%)	13 (13.0%)	6 (5.9%)	15 (14.4%)	8 (7.9%)

ABOi: ABO incompatible, DNDD: Donation after neurological determination of death, DCDD: donation after circulatory determination of death

**Figure 7.1.1**  
**Deceased and Living Donor Transplants - Australia 2014-2023**

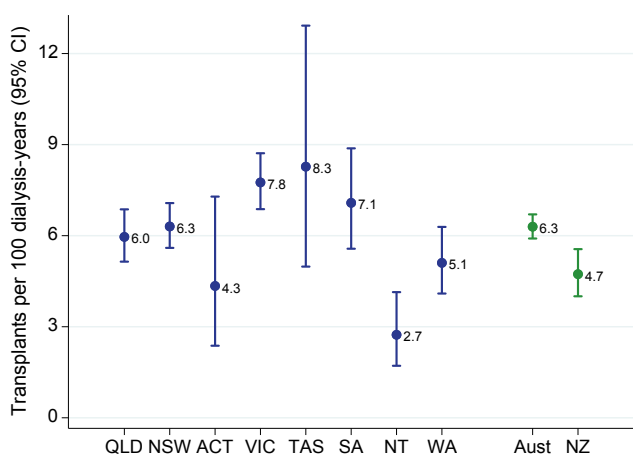


**Figure 7.1.2**  
**Deceased and Living Donor Transplants - New Zealand 2014-2023**

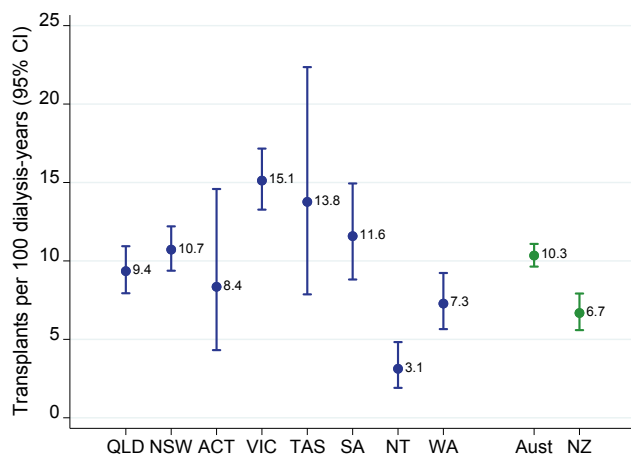


The transplant rate for dialysed patients is presented in Figure 7.2 (for all dialysis patients) and Figure 7.3 (for dialysis patients aged 15-64 years). This represents the number of transplants performed per 100 years of dialysis. Differences in the rates between states/territories and countries depend on several 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 both countries, the transplant rate of First Nations patients is lower than in other ethnic groups; see also chapters 10 and 11.

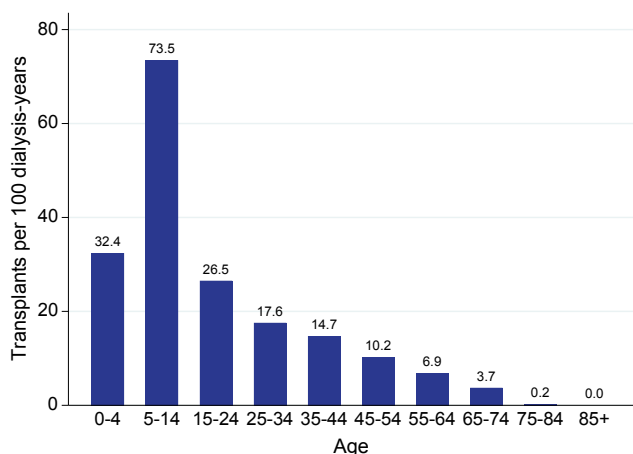
**Figure 7.2**  
**Transplant Rate of Dialysed Patients 2023 - All Dialysis Patients**



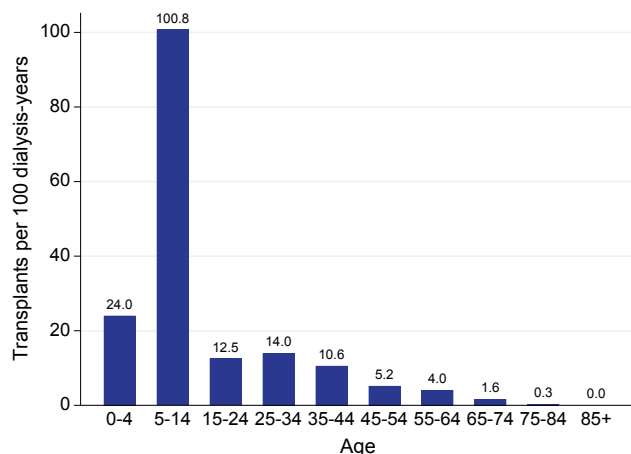
**Figure 7.3**  
**Transplant Rate of Dialysed Patients 2023 - Patients Aged 15-64**



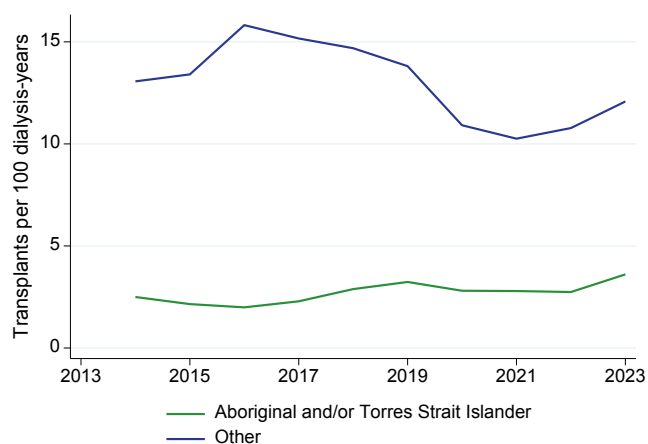
**Figure 7.4.1**  
**Transplant Rate of Dialysed Patients by Age 2023 - Australia**



**Figure 7.4.2**  
**Transplant Rate of Dialysed Patients by Age 2023 - New Zealand**



**Figure 7.5.1**  
**Transplant Rate of Dialysed Patients by Ethnicity**  
**2014-2023 - Australia, Patients Aged 15-64**



**Figure 7.5.2**  
**Transplant Rate of Dialysed Patients by Ethnicity**  
**2014-2023 - New Zealand, Patients Aged 15-64**

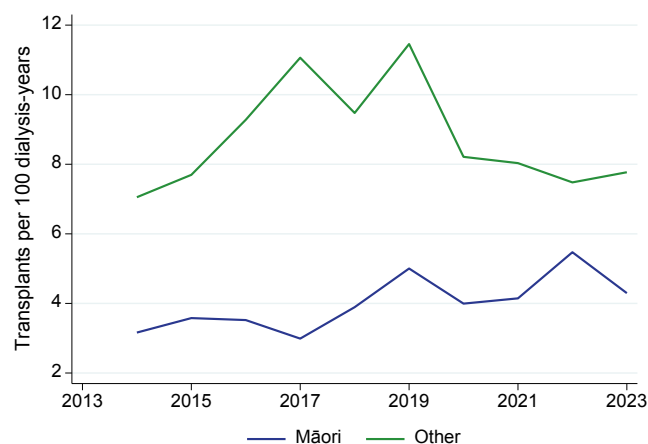


Table 7.3 shows the number of grafts performed according to donor type, graft number and recipient age in 2023. Transplant rates by age, per million population, are presented in Figure 7.6.

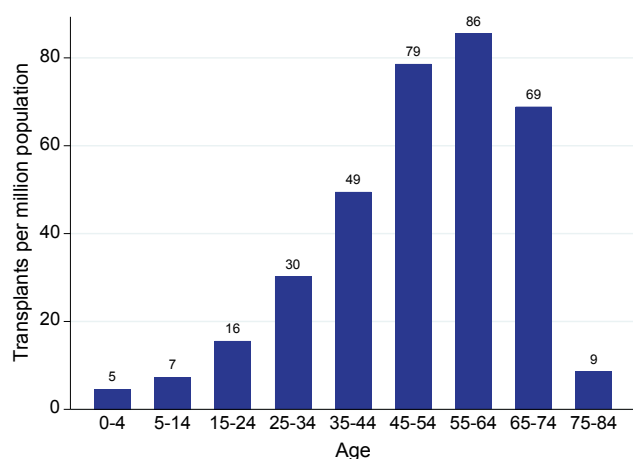
Population estimates for Australia and New Zealand used throughout this chapter for the calculation of prevalence per million population were sourced from the Australian Bureau of Statistics (2023)<sup>1</sup> and Stats NZ (2023)<sup>2</sup>.

**Table 7.3**  
**Age of Recipients Transplanted in 2023**

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	17	31	70	134	176	172	131	8
		2	0	0	2	14	18	17	20	6	1
		3	0	0	0	2	2	2	3	1	0
		4	0	0	0	0	0	0	1	0	0
		5	0	0	0	0	0	1	0	0	0
	Living	1	5	7	16	30	27	56	56	33	4
		2	0	0	2	2	1	6	7	0	0
		3	0	0	1	0	1	1	1	0	0
		4	0	0	0	0	1	0	0	0	0
		5	0	0	0	0	0	0	0	0	0
New Zealand	Deceased	1	1	1	3	11	19	17	24	11	0
		2	0	0	0	2	4	5	1	1	0
		3	0	0	0	0	1	0	0	0	0
	Living	1	0	1	5	11	17	10	11	8	1
		2	0	0	1	0	3	3	1	1	0
		3	0	0	0	0	0	1	0	0	0



**Figure 7.6.1**  
**Transplant Operations (Per Million Population) 2023 - Australia**



**Figure 7.6.2**  
**Transplant Operations (Per Million Population) 2023 - New Zealand**

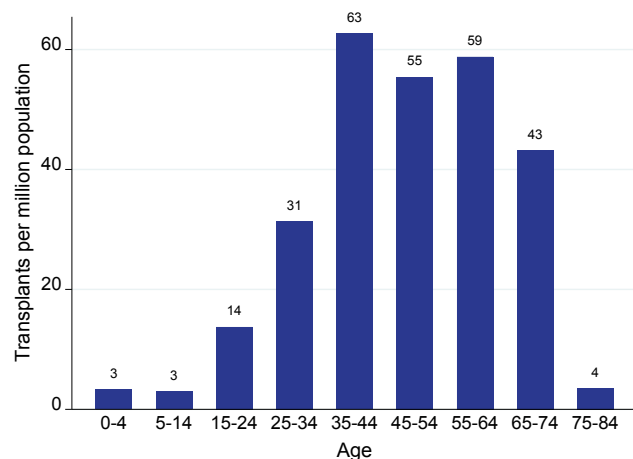


Table 7.4 shows the ethnicity of the recipients transplanted between 2019 and 2023.

**Table 7.4**  
**Ethnicity of Recipients Transplanted 2019-2023**

Country	Ethnicity	2019	2020	2021	2022	2023
Australia	Aboriginal and/or Torres Strait Islander	58 (5.3%)	49 (5.5%)	52 (6.1%)	55 (5.9%)	70 (6.4%)
	Other	988 (89.5%)	796 (89.9%)	777 (90.7%)	847 (90.3%)	975 (89.6%)
	Not reported	58 (5.3%)	40 (4.5%)	28 (3.3%)	36 (3.8%)	43 (4.0%)
	<b>Total</b>	<b>1104</b>	<b>885</b>	<b>857</b>	<b>938</b>	<b>1088</b>
New Zealand	Māori	35 (15.8%)	37 (19.8%)	37 (19.8%)	41 (23.6%)	33 (18.9%)
	Other	186 (84.2%)	148 (79.1%)	148 (79.1%)	133 (76.4%)	140 (80.0%)
	Not reported	-	2 (1.1%)	2 (1.1%)	-	2 (1.1%)
	<b>Total</b>	<b>221</b>	<b>187</b>	<b>187</b>	<b>174</b>	<b>175</b>

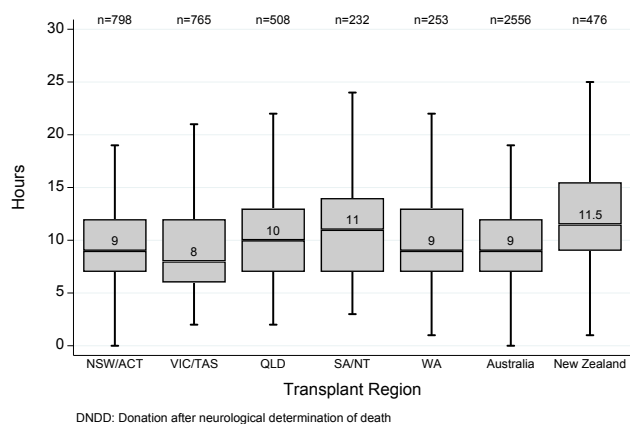
Table 7.5 shows the number of transplants (per million population) performed by transplanting region over 2019-2023.

**Table 7.5**  
**Transplants (pmp) by Transplanting Region and Country 2019-2023**

State	2019	2020	2021	2022	2023
NSW/ACT	350 (41)	292 (34)	267 (31)	317 (37)	354 (40)
VIC/TAS	351 (50)	267 (37)	234 (33)	320 (44)	333 (45)
QLD	207 (41)	143 (28)	164 (31)	122 (23)	204 (37)
SA/NT	93 (46)	93 (46)	99 (48)	79 (38)	108 (51)
WA	103 (39)	90 (33)	93 (34)	100 (36)	89 (31)
<b>Australia</b>	<b>1104 (44)</b>	<b>885 (35)</b>	<b>857 (33)</b>	<b>938 (36)</b>	<b>1088 (41)</b>
<b>New Zealand</b>	<b>221 (44)</b>	<b>187 (37)</b>	<b>187 (37)</b>	<b>174 (34)</b>	<b>175 (33)</b>

Figure 7.7 shows the distribution of total ischaemic time by transplant region and donation pathway in Australia and New Zealand for 2019 and 2023.

**Figure 7.7.1**  
**Total Ischaemic Time by Transplant Region DNDD Donors 2019-2023**



**Figure 7.7.2**  
**Total Ischaemic Time by Transplant Region DCDD Donors 2019-2023**

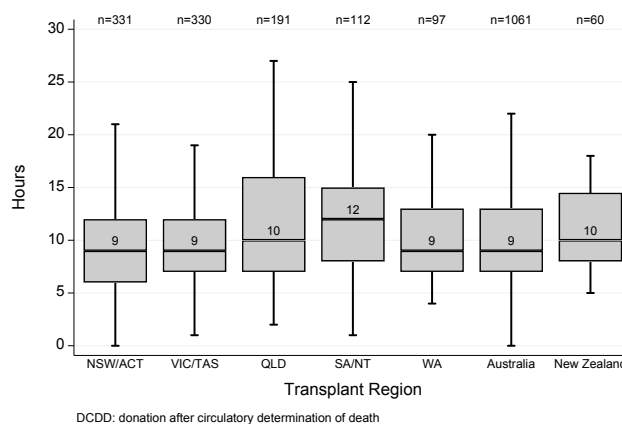
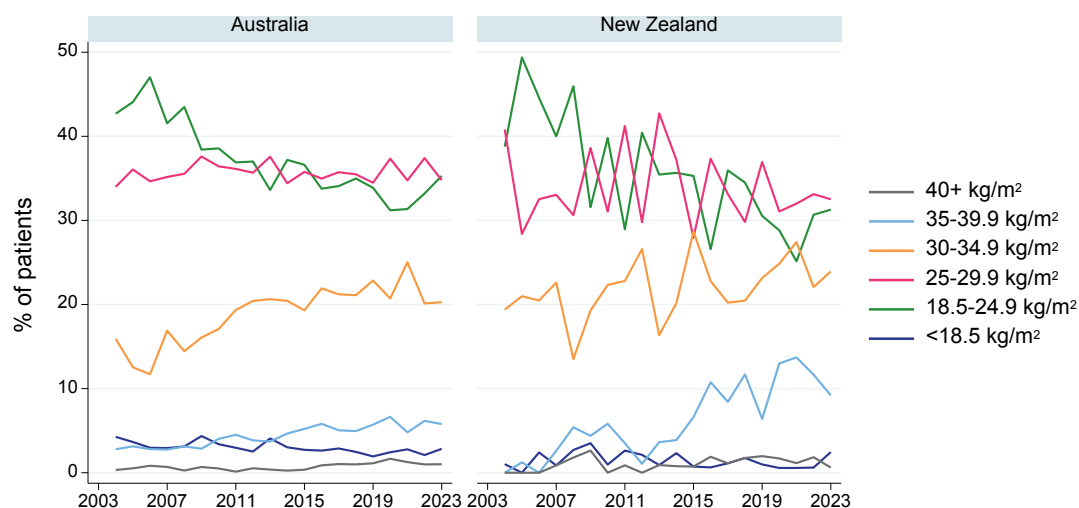


Table 7.6 shows the body mass index (BMI, in kg/m<sup>2</sup>) category at transplant of adult recipients in 2023. Trends in the distribution of BMI at transplant are shown in Figure 7.8.

**Table 7.6**  
**BMI Category at Transplant for Adult Recipients 2023**

Country	BMI Category at Transplant	n (%)
Australia	<18.5	28 (3%)
	18.5-24.9	348 (33%)
	25-29.9	343 (33%)
	30-34.9	200 (19%)
	35-39.9	57 (5%)
	40+	10 (1%)
	Not reported	54 (5%)
New Zealand	<18.5	4 (2%)
	18.5-24.9	51 (30%)
	25-29.9	53 (32%)
	30-34.9	39 (23%)
	35-39.9	15 (9%)
	40+	1 (1%)
	Not reported	5 (3%)

**Figure 7.8**  
**BMI Category at Transplant for Adult Recipients**



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 2014-2023 are presented in Table 7.7. 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.

**Table 7.7**  
**Transplant Operations Performed Overseas on Australian/NZ Dialysis Patients 2014-2023**

Year	Australia	New Zealand
2014	3	0
2015	6	1
2016	3	1
2017	2	1
2018	3	1
2019	5	0
2020	0	0
2021	1	0
2022	2	0
2023	5	1

## PREVALENT TRANSPLANTS

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

Table 7.8 presents the number of transplants performed (by country of transplantation) and functioning (by country of residence) at the end of 2023. The patients with transplants of “unknown” source were transplanted outside Australia/New Zealand.

**Table 7.8**  
**Total Number of Transplants Performed\* and Functioning\*\* at End of 2023**

Country	Donor type	Graft number	Performed*	Functioning**
Australia	Living	1	6824	3934
		2	645	340
		3	97	53
		4	13	7
		5	1	1
		All	7580	4335
	Deceased	1	20701	8167
		2	2872	962
		3	442	126
		4	66	16
		5	7	1
		All	24088	9272
	Unknown	1	0	39
		2	0	2
		All	0	41
All	All	31668	13648	
New Zealand	Living	1	1775	1054
		2	149	88
		3	8	4
		4	1	1
		All	1933	1147
	Deceased	1	3228	1090
		2	487	109
		3	81	13
		4	8	1
		All	3804	1213
	Unknown	1	0	14
		All	0	14
	All	All	5737	2374

\*Performed by country of transplantation

\*\*Functioning by country of residence

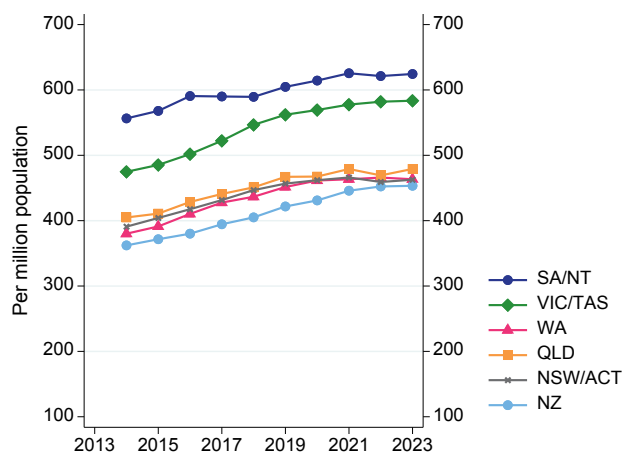
[BACK TO CONTENTS](#)

Table 7.9 presents the number of functioning transplants at the end of 2014-2023 by transplant region. These data are shown graphically in Figure 7.9.

**Table 7.9**  
**Functioning Transplants (pmp) by Transplanting Region 2014-2023**

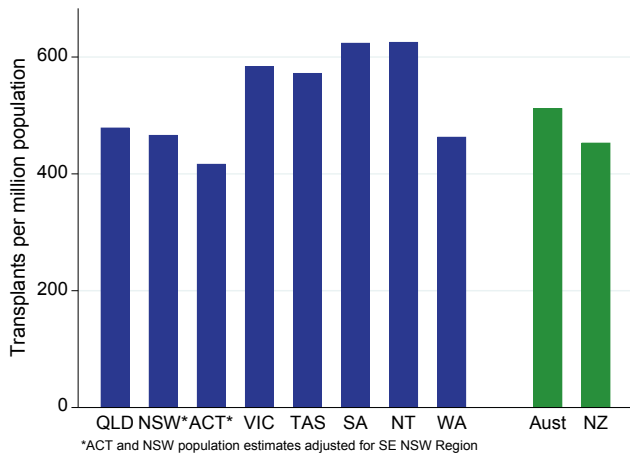
Year	NSW/ACT	VIC/TAS	QLD	SA/NT	WA	Australia	New Zealand
2014	3087 (391)	3043 (475)	1911 (405)	1074 (557)	957 (380)	10072 (429)	1636 (362)
2015	3238 (404)	3173 (485)	1963 (411)	1105 (568)	994 (391)	10473 (440)	1713 (372)
2016	3397 (418)	3358 (502)	2077 (429)	1157 (591)	1049 (410)	11038 (456)	1792 (380)
2017	3569 (432)	3567 (522)	2172 (441)	1166 (590)	1106 (428)	11580 (471)	1899 (395)
2018	3744 (447)	3805 (547)	2258 (451)	1175 (589)	1143 (437)	12125 (486)	1985 (405)
2019	3874 (457)	3983 (562)	2377 (467)	1218 (605)	1201 (452)	12653 (500)	2100 (422)
2020	3952 (462)	4084 (569)	2415 (468)	1252 (614)	1252 (461)	12955 (505)	2194 (431)
2021	3985 (466)	4110 (578)	2499 (479)	1283 (626)	1274 (463)	13151 (512)	2279 (446)
2022	3960 (459)	4192 (582)	2497 (469)	1287 (621)	1301 (466)	13237 (509)	2315 (452)
2023	4074 (463)	4310 (584)	2616 (479)	1314 (624)	1334 (463)	13648 (512)	2374 (453)

**Figure 7.9**  
**Functioning Transplants Per Million Population by Transplanting Region - Australia and New Zealand 2014-2023**



The prevalence of functioning transplants per million population at 31 December 2023 by state/territory is shown in Figure 7.10. State/territory is based on the location of the treating hospital.\*

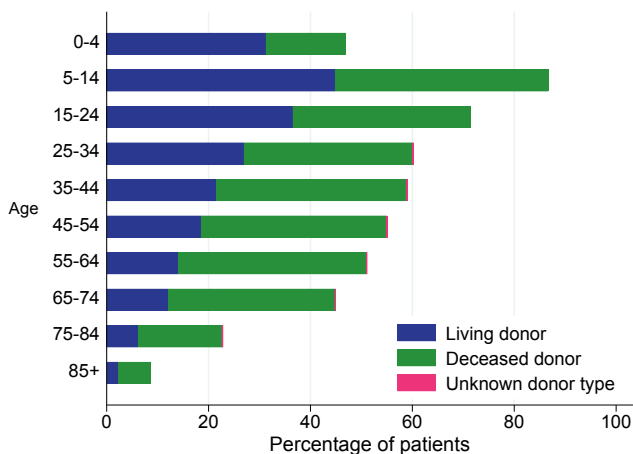
**Figure 7.10**  
**Prevalence of Functioning Transplants 31 Dec 2023 - Per Million Population**



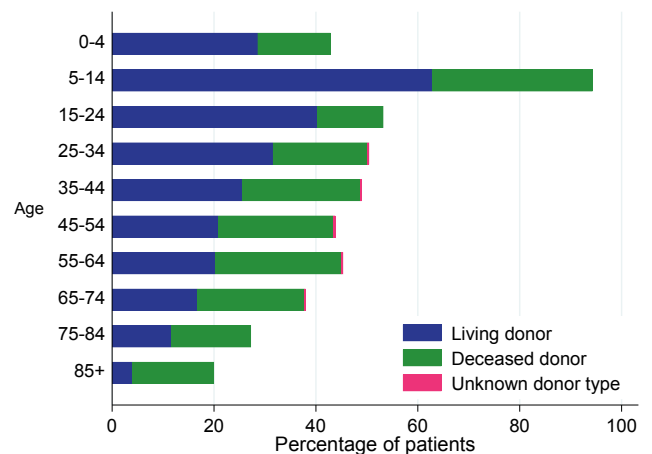
\*NSW population estimates exclude residents of the NSW South Eastern region which includes the local government areas of Bega Valley, Eurobodalla, Goulburn Mulwaree, Hilltops, Queanbeyan-Palerang Regional, Snowy Monaro Regional, Upper Lachlan Shire and Yass Valley. ACT population includes residents of the NSW South Eastern region. The population base for the NSW South Eastern region is based on the estimated resident population by local government area from the Australian Bureau of Statistics (2024)<sup>3</sup>.

The percentage of prevalent kidney replacement therapy patients with a functioning transplant is shown in Figure 7.11 by age group. The number of prevalent transplant patients by age and donor source is shown in Table 7.10. Finally, the age distribution, and distribution per million population, are shown in Figures 7.12 and 7.13 for Australia and New Zealand, respectively.

**Figure 7.11.1**  
**Percentage of KRT Patients with a Functioning Transplant - By Age, Australia 2023**



**Figure 7.11.2**  
**Percentage of KRT Patients with a Functioning Transplant - By Age, New Zealand 2023**

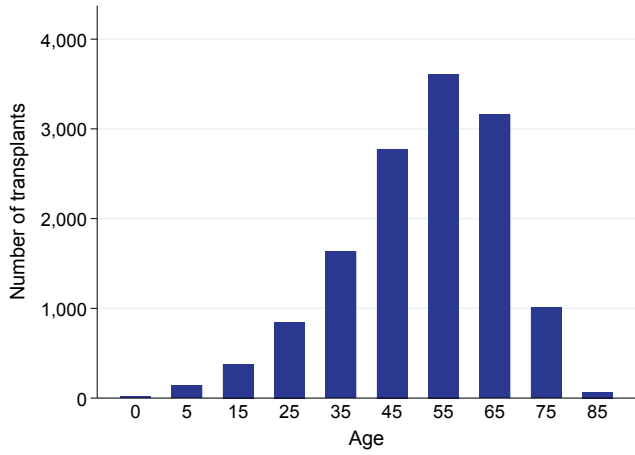


[BACK TO CONTENTS](#)

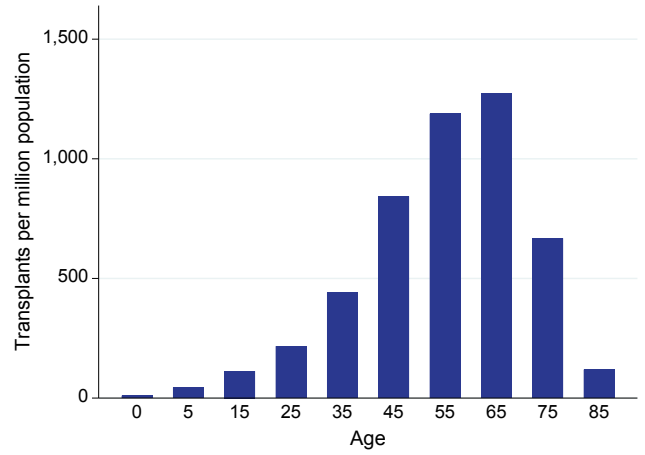
Table 7.10  
Age Distribution of Functioning Transplant Patients - 31 Dec 2023

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	15	143	379	847	1638	2776	3611	3161	1011	67	13648
	Unknown	1	-	-	-	2	5	11	8	10	3	-	39
		2	-	-	-	-	1	-	1	-	-	-	2
		All	-	-	-	2	6	11	9	10	3	-	41
	Deceased	1	5	69	158	386	887	1528	2283	2108	695	48	8167
		2	-	-	26	71	126	250	277	172	39	1	962
		3	-	-	1	9	19	39	41	16	1	-	126
		4	-	-	-	-	2	8	5	1	-	-	16
		5	-	-	-	-	-	1	-	-	-	-	1
		All	5	69	185	466	1034	1826	2606	2297	735	49	9272
	Living	1	10	74	178	344	534	833	890	793	263	15	3934
		2	-	-	15	33	50	89	88	53	9	3	340
		3	-	-	1	2	13	15	14	8	-	-	53
		4	-	-	-	-	1	2	3	-	1	-	7
		5	-	-	-	-	-	-	1	-	-	-	1
All		10	74	194	379	598	939	996	854	273	18	4335	
New Zealand	All	All	3	33	66	171	319	440	701	483	148	10	2374
	Unknown	1	-	-	-	1	2	4	4	3	-	-	14
		All	-	-	-	1	2	4	4	3	-	-	14
	Deceased	1	1	11	14	52	137	196	341	249	81	8	1090
		2	-	-	2	11	13	25	38	17	3	-	109
		3	-	-	-	-	1	5	5	1	1	-	13
		4	-	-	-	-	-	-	-	1	-	-	1
		All	1	11	16	63	151	226	384	268	85	8	1213
	Living	1	2	22	49	100	145	182	286	204	62	2	1054
		2	-	-	1	7	21	25	26	7	1	-	88
		3	-	-	-	-	-	3	-	1	-	-	4
		4	-	-	-	-	-	-	1	-	-	-	1
All		2	22	50	107	166	210	313	212	63	2	1147	

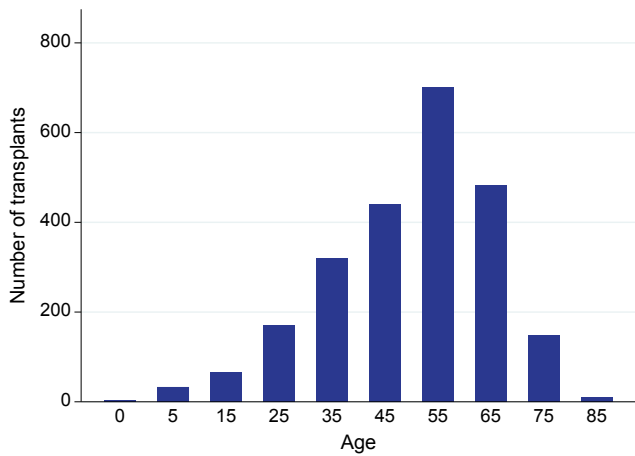
**Figure 7.12.1**  
**Age Distribution of Functioning Transplants - Australia 2023 (n=13648)**



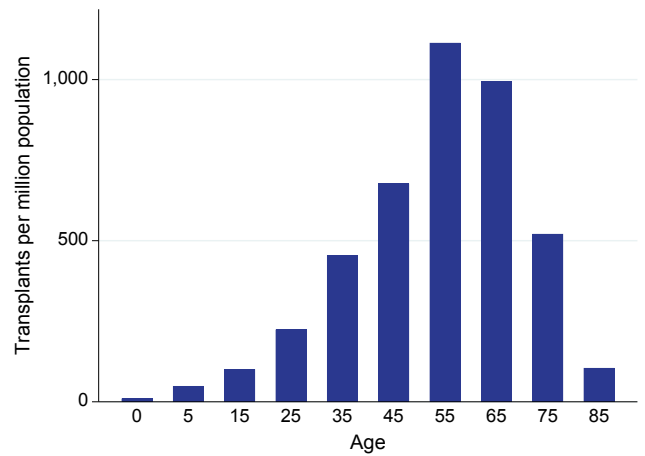
**Figure 7.12.2**  
**Age Distribution of Functioning Transplants - Per Million Population, Australia 2023**



**Figure 7.13.1**  
**Age Distribution of Functioning Transplants - New Zealand 2023 (n=2374)**



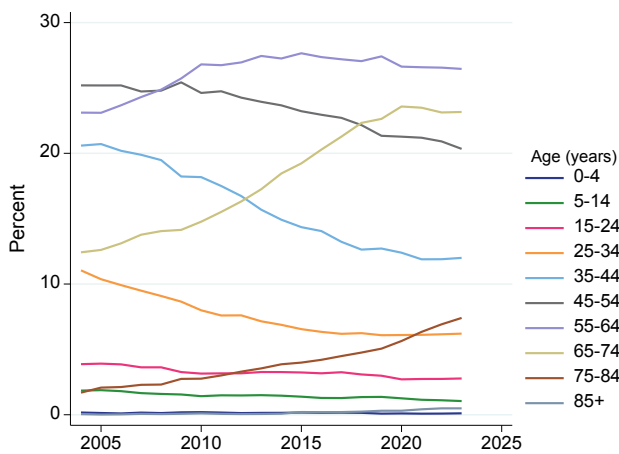
**Figure 7.13.2**  
**Age Distribution of Functioning Transplants - Per Million Population, New Zealand 2023**



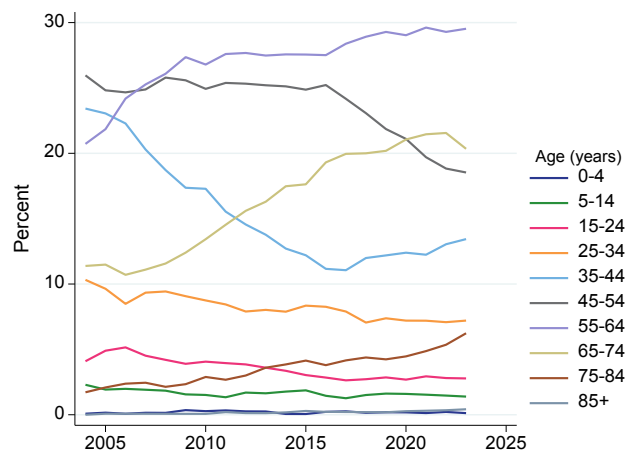


The trends in the age of prevalent transplant recipients are illustrated in Figure 7.14 as a percentage of the total number of prevalent transplant patients, and as a rate per million population in Figure 7.15.

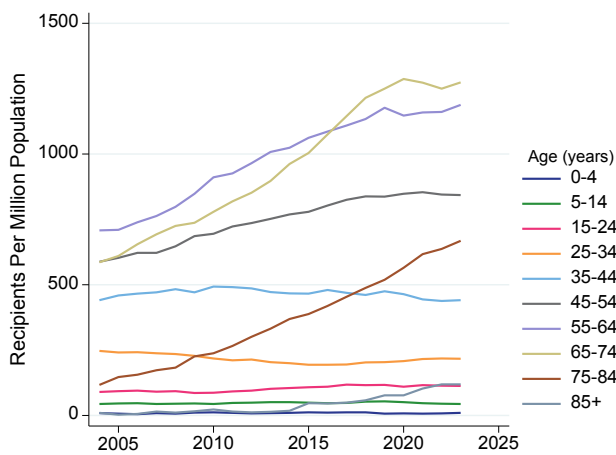
**Figure 7.14.1**  
**Prevalent Transplant Recipients by Age Group**  
**2004-2023 - Australia**



**Figure 7.14.2**  
**Prevalent Transplant Recipients by Age Group**  
**2004-2023 - New Zealand**



**Figure 7.15.1**  
**Prevalent Transplant Recipients Per Million**  
**Population by Age Group - Australia 2004-2023**



**Figure 7.15.2**  
**Prevalent Transplant Recipients Per Million**  
**Population by Age Group - New Zealand 2004-2023**

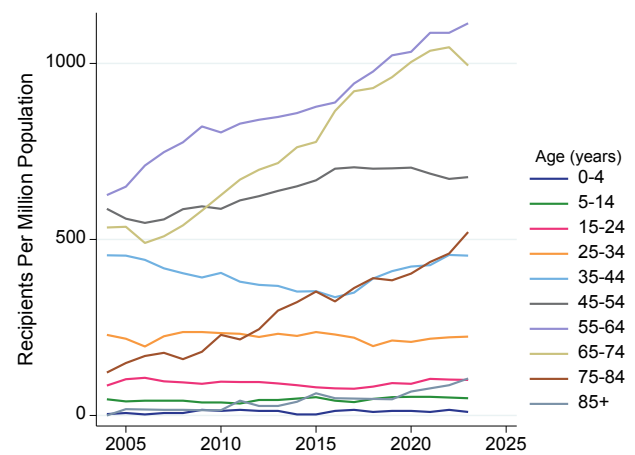


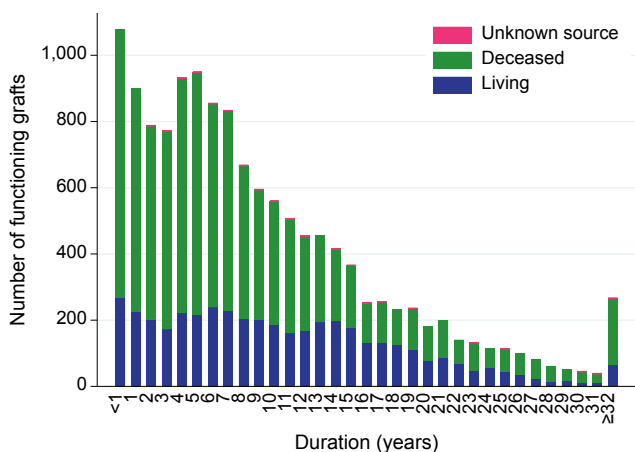
Table 7.11 presents the number of prevalent patients with a functioning transplant by gender, ethnicity and age.

**Table 7.11**  
**Functioning Transplant Patients by Gender, Ethnicity and Age Group - 31 Dec 2023**

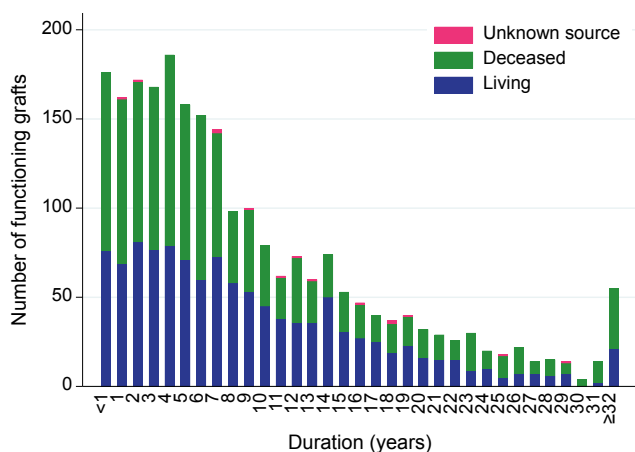
Country	Gender	Ethnicity	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Australia	All	Total	15	143	379	847	1638	2776	3611	3161	1011	67	13648
		Aboriginal and/or Torres Strait Islander	-	2	11	18	31	55	55	20	1	-	193
	Female	Other	3	41	129	276	609	962	1225	1104	342	27	4718
		Not reported	-	3	4	19	44	69	87	101	40	2	369
		Total	3	46	144	313	684	1086	1367	1225	383	29	5280
	Male	Aboriginal and/or Torres Strait Islander	-	3	18	17	39	66	69	46	8	-	266
		Other	10	93	204	492	857	1505	2007	1753	576	35	7532
		Not reported	2	1	13	25	58	119	168	137	44	3	570
		Total	12	97	235	534	954	1690	2244	1936	628	38	8368
	New Zealand	All	Total	3	33	66	171	319	440	701	483	148	10
Māori			-	3	9	13	28	36	27	11	2	-	129
Female		Other	1	11	24	65	108	151	242	184	47	5	838
		Not reported	-	-	-	1	1	-	1	-	-	-	3
		Total	1	14	33	79	137	187	270	195	49	5	970
Male		Māori	-	5	3	15	29	34	55	37	5	-	183
		Other	2	14	30	77	153	216	372	251	94	5	1214
		Not reported	-	-	-	-	-	3	4	-	-	-	7
	Total	2	19	33	92	182	253	431	288	99	5	1404	

Figure 7.16 shows the duration of function of prevalent transplants at the end of 2023. In Australia there were 5273 grafts that had functioned for  $\geq 10$  years, 1531  $\geq 20$  years and 351  $\geq 30$  years. In New Zealand there were 858 grafts that had functioned for  $\geq 10$  years, 293  $\geq 20$  years and 73  $\geq 30$  years.

**Figure 7.16.1**  
**Number of Functioning Grafts by Graft Duration - Australia 2023 (n=13648)**



**Figure 7.16.2**  
**Number of Functioning Grafts by Graft Duration - New Zealand 2023 (n=2374)**



## GRAFT LOSS

Table 7.12 presents the overall graft loss rate in 2014-2023 by country, stratified into graft failure and death with a functioning graft. These rates are expressed as graft losses per 100 graft-years.

**Table 7.12**  
**Graft Loss Rate 2014-2023**

Country	Outcome	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Australia	Graft failure	2.7	3.0	2.6	2.8	3.1	2.6	2.5	2.7	3.0	2.7
	Death with function	2.4	2.5	2.5	2.6	2.7	2.7	2.8	3.3	4.8	3.6
	<b>All losses</b>	<b>5.1</b>	<b>5.5</b>	<b>5.2</b>	<b>5.4</b>	<b>5.7</b>	<b>5.3</b>	<b>5.3</b>	<b>5.9</b>	<b>7.7</b>	<b>6.3</b>
New Zealand	Graft failure	2.8	2.0	2.6	2.0	2.7	2.3	2.6	2.5	2.6	2.2
	Death with function	2.8	2.6	3.0	2.9	2.8	3.4	2.3	2.5	4.3	3.3
	<b>All losses</b>	<b>5.6</b>	<b>4.6</b>	<b>5.6</b>	<b>4.9</b>	<b>5.5</b>	<b>5.7</b>	<b>4.8</b>	<b>5.0</b>	<b>6.9</b>	<b>5.5</b>

The causes of graft loss over 2014-2023 are presented in Table 7.13. Since 2020 chronic allograft nephropathy has been removed as a cause for graft loss and has been replaced by other options. 'Chronic antibody mediated rejection', 'interstitial fibrosis and tubular atrophy' (not due to rejection) and 'gradual graft failure' (where a biopsy has not been performed to confirm a specific diagnosis) have been added. These data are further categorised by timing post-transplant (first year versus later years) for 2019-2023 in Table 7.14.

Table 7.13  
Causes of Graft Loss 2014-2023

Country	Cause of graft loss	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Australia	Death with function	218	237	250	262	280	290	306	365	525	393	3126
	Acute rejection	11	16	14	15	18	12	15	22	12	10	145
	Chronic allograft nephropathy	167	189	153	148	177	121	31	-	-	-	986
	Chronic antibody mediated rejection	-	-	-	-	1	2	31	56	55	44	189
	Interstitial fibrosis/tubular atrophy - not due to rejection	-	-	-	-	1	-	9	8	12	9	39
	Gradual graft failure - biopsy not performed	-	-	-	-	5	3	81	81	78	91	339
	Hyperacute rejection	1	-	1	1	-	2	1	-	-	-	6
	Vascular	7	12	10	5	16	13	10	8	8	9	98
	Technical	6	2	6	6	4	4	6	3	5	5	47
	Glomerular Disease	12	20	19	19	13	16	13	15	27	17	171
	Complications of drug therapy*	6	13	7	2	1	1	4	4	25	21	84
	Non-compliance	14	3	8	16	17	9	9	14	16	14	120
	Rejection following I/S reduction due to infection	3	2	4	4	6	6	4	8	6	5	48
	BK Virus Nephropathy	7	6	2	3	10	5	5	5	6	3	52
	Unknown	-	1	-	-	-	1	14	27	21	19	83
	Other	13	14	23	35	29	37	27	31	39	33	281
Not reported	-	-	7	31	23	47	13	10	15	17	163	
<b>Total</b>		<b>465</b>	<b>515</b>	<b>504</b>	<b>547</b>	<b>601</b>	<b>569</b>	<b>579</b>	<b>657</b>	<b>850</b>	<b>690</b>	<b>5977</b>
New Zealand	Death with function	43	42	50	50	50	64	44	50	88	69	550
	Acute rejection	3	1	2	2	4	5	2	5	4	7	35
	Chronic allograft nephropathy	28	22	26	17	31	18	4	-	-	-	146
	Chronic antibody mediated rejection	-	-	-	-	-	-	2	7	1	7	17
	Interstitial fibrosis/tubular atrophy - not due to rejection	-	-	-	-	-	-	3	2	4	5	14
	Gradual graft failure - biopsy not performed	-	-	-	-	-	1	18	15	17	10	61
	Hyperacute rejection	-	-	-	-	-	-	-	-	-	-	0
	Vascular	1	-	3	1	-	1	1	4	2	1	14
	Technical	1	1	2	-	-	1	5	-	1	-	11
	Glomerular Disease	2	2	2	5	1	3	1	7	8	-	31
	Complications of drug therapy*	1	-	1	1	1	-	-	1	2	2	9
	Non-compliance	6	-	-	1	3	4	5	2	3	2	26
	Rejection following I/S reduction due to infection	-	-	1	-	2	-	1	-	1	-	5
	BK Virus Nephropathy	-	2	-	1	-	-	-	1	-	1	5
	Unknown	-	-	-	-	-	-	-	-	1	1	2
	Other	1	3	4	2	5	2	2	5	7	10	41
Not reported	-	1	3	5	2	9	6	2	3	1	32	
<b>Total</b>		<b>86</b>	<b>74</b>	<b>94</b>	<b>85</b>	<b>99</b>	<b>108</b>	<b>94</b>	<b>101</b>	<b>142</b>	<b>116</b>	<b>999</b>

\*Complications of drug therapy requiring reduction or withdrawal of steroid and/or immunosuppressants. I/S: Immunosuppression

Table 7.14  
Graft Losses 2019-2023

Country	Outcome	Cause of death or graft failure	First year	Beyond first year	Total
	Death with function	Cardiovascular	22 (28%)	393 (22%)	415 (22%)
		Withdrawal	3 (4%)	59 (3%)	62 (3%)
		Cancer	4 (5%)	382 (21%)	386 (21%)
		Infection	31 (39%)	336 (19%)	367 (20%)
		Other	17 (22%)	413 (23%)	430 (23%)
		Not reported	2 (3%)	217 (12%)	219 (12%)
		<b>Total</b>	<b>79 (100%)</b>	<b>1800 (100%)</b>	<b>1879 (100%)</b>
Australia	Graft Failure	Acute rejection	19 (15%)	52 (4%)	71 (5%)
		Chronic allograft nephropathy	2 (2%)	150 (11%)	152 (10%)
		Chronic antibody mediated rejection	3 (2%)	185 (14%)	188 (13%)
		Interstitial fibrosis/tubular atrophy - not due to rejection	1 (1%)	37 (3%)	38 (3%)
		Gradual graft failure - biopsy not performed	3 (2%)	331 (25%)	334 (23%)
		Hyperacute rejection	3 (2%)	-	3 (<1%)
		Vascular	32 (26%)	16 (1%)	48 (3%)
		Technical	16 (13%)	7 (1%)	23 (2%)
		Glomerular Disease	3 (2%)	85 (6%)	88 (6%)
		Complications of drug therapy*	1 (1%)	54 (4%)	55 (4%)
		Non-compliance	2 (2%)	60 (4%)	62 (4%)
		Rejection following I/S reduction due to infection	1 (1%)	28 (2%)	29 (2%)
		BK Virus Nephropathy	3 (2%)	21 (2%)	24 (2%)
		Unknown	1 (1%)	81 (6%)	82 (6%)
		Other	29 (23%)	138 (10%)	167 (11%)
Not reported	6 (5%)	96 (7%)	102 (7%)		
<b>Total</b>	<b>125 (100%)</b>	<b>1341 (100%)</b>	<b>1466 (100%)</b>		
	Death with function	Cardiovascular	6 (43%)	93 (31%)	99 (31%)
		Withdrawal	-	3 (1%)	3 (1%)
		Cancer	1 (7%)	72 (24%)	73 (23%)
		Infection	5 (36%)	77 (26%)	82 (26%)
		Other	1 (7%)	51 (17%)	52 (17%)
		Not reported	1 (7%)	5 (2%)	6 (2%)
		<b>Total</b>	<b>14 (100%)</b>	<b>301 (100%)</b>	<b>315 (100%)</b>
New Zealand	Graft Failure	Acute rejection	3 (11%)	20 (9%)	23 (9%)
		Chronic allograft nephropathy	-	22 (10%)	22 (9%)
		Chronic antibody mediated rejection	-	17 (8%)	17 (7%)
		Interstitial fibrosis/tubular atrophy - not due to rejection	-	14 (6%)	14 (6%)
		Gradual graft failure - biopsy not performed	-	61 (28%)	61 (25%)
		Vascular	9 (33%)	-	9 (4%)
		Technical	6 (22%)	1 (<1%)	7 (3%)
		Glomerular Disease	2 (7%)	17 (8%)	19 (8%)
		Complications of drug therapy*	1 (4%)	4 (2%)	5 (2%)
		Non-compliance	-	16 (7%)	16 (7%)
		Rejection following I/S reduction due to infection	1 (4%)	1 (<1%)	2 (1%)
		BK Virus Nephropathy	-	2 (1%)	2 (1%)
		Unknown	1 (4%)	1 (<1%)	2 (1%)
Other	3 (11%)	23 (11%)	26 (11%)		
Not reported	1 (4%)	20 (9%)	21 (9%)		
<b>Total</b>	<b>27 (100%)</b>	<b>219 (100%)</b>	<b>246 (100%)</b>		

\*Complications of drug therapy requiring reduction or withdrawal of steroid and/or immunosuppressants. I/S: Immunosuppression

## IMMUNOSUPPRESSION

The induction immunosuppression is shown in Table 7.15.

**Table 7.15**  
**Induction Immunosuppression 2019-2023; Number of Kidney Transplant Recipients Receiving Each Agent by Year (% Total New Transplants)**

Country	Type of agent	2019	2020	2021	2022	2023
Australia	Intravenous immunoglobulin	32 (2.9%)	11 (1.2%)	13 (1.5%)	23 (2.5%)	22 (2.0%)
	Anti-CD25	872 (79.0%)	712 (80.5%)	657 (76.7%)	717 (76.4%)	812 (74.6%)
	Rituximab	6 (0.5%)	4 (0.5%)	4 (0.5%)	9 (1.0%)	11 (1.0%)
	T cell depleting polyclonal Ab	138 (12.5%)	125 (14.1%)	166 (19.4%)	163 (17.4%)	188 (17.3%)
	Other	4 (0.4%)	2 (0.2%)	3 (0.4%)	1 (0.1%)	1 (0.1%)
	Not reported	104 (9.4%)	48 (5.4%)	42 (4.9%)	55 (5.9%)	80 (7.4%)
	<b>Total new transplants</b>	<b>1104</b>	<b>885</b>	<b>857</b>	<b>938</b>	<b>1088</b>
New Zealand	Anti-CD25	217 (98.2%)	185 (98.9%)	186 (99.5%)	172 (98.9%)	175 (100.0%)
	Rituximab	12 (5.4%)	5 (2.7%)	5 (2.7%)	4 (2.3%)	6 (3.4%)
	T cell depleting polyclonal Ab	9 (4.1%)	4 (2.1%)	1 (0.5%)	2 (1.1%)	-
	Not reported	4 (1.8%)	-	-	3 (1.7%)	-
	<b>Total new transplants</b>	<b>221</b>	<b>187</b>	<b>187</b>	<b>174</b>	<b>175</b>

Immunosuppressive therapy at baseline, 1 and 2 years post-transplant for primary grafts over 2016-2023 is presented for deceased and living donors in Tables 7.16 and 7.17, respectively. (TAC tacrolimus; CYC cyclosporine; MMF mycophenolate mofetil; MPA mycophenolic acid; PRE prednisolone; AZA azathioprine; EVE everolimus; SIR sirolimus; NR No immunosuppression data reported).

Table 7.16.1

## Immunosuppressive Therapy - Primary Deceased Donor Grafts Australia 2016-2023

Time	Year transplanted	TAC	CYC	MMF	MPA	PRE	AZA	EVE	SIR	NR	Number of deceased donor grafts
Initial treatment	2016	612 (88%)	3 (<1%)	424 (61%)	201 (29%)	623 (89%)	-	2 (<1%)	-	67 (10%)	697
	2017	677 (95%)	2 (<1%)	485 (68%)	196 (28%)	679 (96%)	-	1 (<1%)	-	26 (4%)	710
	2018	758 (94%)	3 (<1%)	537 (66%)	228 (28%)	773 (96%)	3 (<1%)	5 (1%)	1 (<1%)	31 (4%)	809
	2019	746 (96%)	3 (<1%)	506 (65%)	237 (31%)	739 (95%)	-	3 (<1%)	1 (<1%)	20 (3%)	774
	2020	612 (96%)	6 (1%)	433 (68%)	181 (28%)	606 (95%)	1 (<1%)	6 (1%)	1 (<1%)	16 (3%)	637
	2021	545 (97%)	-	378 (68%)	165 (29%)	539 (96%)	2 (<1%)	2 (<1%)	-	14 (2%)	560
	2022	575 (92%)	1 (<1%)	510 (82%)	63 (10%)	572 (92%)	2 (<1%)	3 (<1%)	-	44 (7%)	625
	2023	707 (95%)	2 (<1%)	639 (86%)	72 (10%)	701 (95%)	-	1 (<1%)	-	28 (4%)	741
Treatment at 1 year	2016	584 (89%)	20 (3%)	355 (54%)	209 (32%)	607 (93%)	27 (4%)	24 (4%)	5 (1%)	35 (5%)	654
	2017	592 (87%)	11 (2%)	345 (51%)	209 (31%)	618 (91%)	19 (3%)	29 (4%)	9 (1%)	54 (8%)	678
	2018	689 (89%)	11 (1%)	425 (55%)	212 (27%)	705 (91%)	33 (4%)	31 (4%)	9 (1%)	60 (8%)	775
	2019	615 (84%)	13 (2%)	352 (48%)	197 (27%)	635 (87%)	39 (5%)	25 (3%)	8 (1%)	88 (12%)	732
	2020	499 (82%)	16 (3%)	286 (47%)	177 (29%)	511 (84%)	14 (2%)	20 (3%)	11 (2%)	83 (14%)	606
	2021	407 (77%)	8 (2%)	250 (47%)	113 (21%)	412 (78%)	20 (4%)	13 (2%)	4 (1%)	109 (21%)	530
	2022	486 (81%)	11 (2%)	353 (59%)	100 (17%)	504 (84%)	23 (4%)	23 (4%)	3 (<1%)	89 (15%)	601
Treatment at 2 years	2016	543 (86%)	17 (3%)	323 (51%)	186 (29%)	563 (89%)	33 (5%)	30 (5%)	5 (1%)	56 (9%)	631
	2017	557 (85%)	14 (2%)	313 (48%)	197 (30%)	588 (90%)	28 (4%)	27 (4%)	13 (2%)	60 (9%)	654
	2018	637 (84%)	11 (1%)	367 (49%)	205 (27%)	653 (87%)	39 (5%)	35 (5%)	13 (2%)	88 (12%)	754
	2019	591 (83%)	17 (2%)	339 (48%)	199 (28%)	615 (86%)	39 (5%)	31 (4%)	13 (2%)	79 (11%)	712
	2020	458 (78%)	19 (3%)	249 (43%)	144 (25%)	473 (81%)	26 (4%)	29 (5%)	8 (1%)	102 (17%)	585
	2021	382 (75%)	6 (1%)	247 (48%)	100 (20%)	387 (76%)	26 (5%)	20 (4%)	6 (1%)	113 (22%)	510

[BACK TO CONTENTS](#)



Table 7.16.2

## Immunosuppressive Therapy - Primary Deceased Donor Grafts New Zealand 2016-2023

Time	Year transplanted	TAC	CYC	MMF	MPA	PRE	AZA	EVE	SIR	NR	Number of deceased donor grafts
Initial treatment	2016	22 (28%)	54 (68%)	79 (99%)	-	79 (99%)	1 (1%)	-	-	1 (1%)	80
	2017	31 (28%)	81 (72%)	111 (99%)	-	111 (99%)	-	-	-	-	112
	2018	31 (35%)	58 (65%)	89 (100%)	-	89 (100%)	-	-	-	-	89
	2019	47 (41%)	66 (57%)	112 (97%)	-	113 (98%)	1 (1%)	-	-	2 (2%)	115
	2020	42 (47%)	48 (54%)	88 (99%)	-	89 (100%)	-	-	-	-	89
	2021	52 (54%)	44 (46%)	96 (100%)	-	96 (100%)	-	-	-	-	96
	2022	74 (74%)	25 (25%)	100 (100%)	-	100 (100%)	-	-	-	-	100
	2023	71 (82%)	16 (18%)	87 (100%)	-	87 (100%)	-	-	-	-	87
Treatment at 1 year	2016	35 (47%)	38 (51%)	69 (92%)	1 (1%)	74 (99%)	3 (4%)	-	-	-	75
	2017	64 (60%)	41 (38%)	101 (94%)	-	105 (98%)	4 (4%)	-	-	1 (1%)	107
	2018	44 (52%)	39 (46%)	81 (96%)	-	83 (99%)	-	-	-	1 (1%)	84
	2019	66 (62%)	38 (36%)	98 (92%)	-	105 (98%)	1 (1%)	-	1 (1%)	1 (1%)	107
	2020	62 (71%)	24 (28%)	81 (93%)	-	86 (99%)	1 (1%)	-	-	1 (1%)	87
	2021	59 (67%)	28 (32%)	79 (90%)	-	87 (99%)	1 (1%)	-	-	1 (1%)	88
	2022	73 (82%)	13 (15%)	85 (96%)	-	89 (100%)	1 (1%)	-	-	-	89
	2023	71 (82%)	16 (18%)	87 (100%)	-	87 (100%)	-	-	-	-	87
Treatment at 2 years	2016	38 (51%)	36 (49%)	66 (89%)	1 (1%)	74 (100%)	5 (7%)	-	-	-	74
	2017	66 (64%)	36 (35%)	95 (92%)	-	101 (98%)	6 (6%)	-	-	1 (1%)	103
	2018	45 (54%)	37 (45%)	79 (95%)	-	81 (98%)	1 (1%)	-	-	1 (1%)	83
	2019	67 (64%)	34 (33%)	89 (86%)	-	100 (96%)	2 (2%)	-	1 (1%)	3 (3%)	104
	2020	60 (72%)	23 (28%)	78 (94%)	-	80 (96%)	1 (1%)	-	-	-	83
	2021	58 (68%)	26 (31%)	77 (91%)	-	84 (99%)	2 (2%)	-	-	1 (1%)	85

[BACK TO CONTENTS](#)

Table 7.17.1  
**Immunosuppressive Therapy - Primary Living Donor Grafts Australia 2016-2023**

Time	Year transplanted	TAC	CYC	MMF	MPA	PRE	AZA	EVE	SIR	NR	Number of living donor grafts
Initial treatment	2016	212 (90%)	6 (3%)	161 (69%)	54 (23%)	216 (92%)	-	-	-	16 (7%)	235
	2017	227 (94%)	1 (<1%)	173 (72%)	53 (22%)	224 (93%)	3 (1%)	-	-	13 (5%)	241
	2018	200 (92%)	2 (1%)	147 (67%)	54 (25%)	203 (93%)	-	1 (<1%)	-	13 (6%)	218
	2019	201 (94%)	-	142 (67%)	64 (30%)	207 (97%)	-	1 (<1%)	-	5 (2%)	213
	2020	162 (97%)	2 (1%)	118 (71%)	47 (28%)	162 (97%)	-	-	-	1 (1%)	167
	2021	174 (98%)	-	119 (67%)	54 (31%)	169 (95%)	-	1 (1%)	-	2 (1%)	177
	2022	183 (91%)	1 (<1%)	149 (74%)	34 (17%)	181 (90%)	1 (<1%)	-	-	18 (9%)	202
	2023	220 (94%)	-	189 (81%)	35 (15%)	212 (91%)	-	-	-	11 (5%)	234
Treatment at 1 year	2016	206 (88%)	9 (4%)	142 (60%)	56 (24%)	209 (89%)	10 (4%)	-	3 (1%)	19 (8%)	235
	2017	196 (84%)	7 (3%)	138 (59%)	50 (21%)	206 (88%)	12 (5%)	9 (4%)	3 (1%)	24 (10%)	234
	2018	177 (83%)	5 (2%)	114 (54%)	53 (25%)	187 (88%)	11 (5%)	9 (4%)	1 (<1%)	23 (11%)	212
	2019	185 (88%)	2 (1%)	114 (54%)	57 (27%)	185 (88%)	3 (1%)	6 (3%)	1 (<1%)	21 (10%)	211
	2020	139 (84%)	3 (2%)	85 (52%)	42 (25%)	143 (87%)	6 (4%)	8 (5%)	-	20 (12%)	165
	2021	150 (85%)	3 (2%)	83 (47%)	46 (26%)	148 (84%)	9 (5%)	6 (3%)	1 (1%)	23 (13%)	176
	2022	162 (82%)	3 (2%)	126 (64%)	31 (16%)	161 (82%)	2 (1%)	8 (4%)	2 (1%)	30 (15%)	197
Treatment at 2 years	2016	192 (84%)	8 (4%)	130 (57%)	47 (21%)	197 (86%)	14 (6%)	4 (2%)	4 (2%)	25 (11%)	228
	2017	191 (82%)	8 (3%)	133 (57%)	50 (22%)	201 (87%)	20 (9%)	9 (4%)	2 (1%)	24 (10%)	232
	2018	180 (85%)	3 (1%)	110 (52%)	49 (23%)	185 (87%)	12 (6%)	9 (4%)	2 (1%)	26 (12%)	212
	2019	170 (81%)	3 (1%)	98 (46%)	53 (25%)	167 (79%)	5 (2%)	9 (4%)	3 (1%)	36 (17%)	211
	2020	129 (80%)	4 (2%)	77 (48%)	36 (22%)	134 (83%)	9 (6%)	10 (6%)	-	25 (16%)	161
	2021	139 (81%)	4 (2%)	80 (47%)	41 (24%)	142 (83%)	10 (6%)	6 (3%)	2 (1%)	27 (16%)	172

Table 7.17.2

## Immunosuppressive Therapy - Primary Living Donor Grafts New Zealand 2016-2023

Time	Year transplanted	TAC	CYC	MMF	MPA	PRE	AZA	EVE	SIR	NR	Number of living donor grafts
Initial treatment	2016	27 (36%)	47 (63%)	74 (99%)	-	74 (99%)	-	-	-	1 (1%)	75
	2017	35 (56%)	27 (44%)	58 (94%)	1 (2%)	62 (100%)	3 (5%)	-	-	-	62
	2018	37 (46%)	44 (54%)	79 (98%)	1 (1%)	81 (100%)	1 (1%)	-	-	-	81
	2019	56 (69%)	25 (31%)	81 (100%)	-	81 (100%)	-	-	-	-	81
	2020	37 (46%)	42 (52%)	79 (99%)	-	80 (100%)	1 (1%)	-	-	-	80
	2021	48 (62%)	29 (38%)	76 (99%)	1 (1%)	77 (100%)	-	-	-	-	77
	2022	49 (75%)	16 (25%)	64 (98%)	-	64 (98%)	-	-	-	1 (2%)	65
	2023	52 (81%)	11 (17%)	64 (100%)	1 (2%)	63 (98%)	-	-	-	-	64
Treatment at 1 year	2016	39 (53%)	33 (45%)	71 (97%)	-	72 (99%)	1 (1%)	-	-	-	73
	2017	42 (72%)	15 (26%)	52 (90%)	-	58 (100%)	4 (7%)	-	-	-	58
	2018	49 (61%)	28 (35%)	72 (90%)	-	78 (98%)	1 (1%)	-	2 (2%)	1 (1%)	80
	2019	61 (76%)	17 (21%)	73 (91%)	-	78 (98%)	2 (2%)	-	-	1 (1%)	80
	2020	43 (57%)	29 (39%)	70 (93%)	-	74 (99%)	4 (5%)	-	-	-	75
	2021	55 (72%)	21 (28%)	69 (91%)	1 (1%)	76 (100%)	5 (7%)	-	-	-	76
	2022	52 (83%)	10 (16%)	62 (98%)	-	62 (98%)	-	-	-	1 (2%)	63
	2023	52 (81%)	11 (17%)	64 (100%)	1 (2%)	63 (98%)	-	-	-	-	64
Treatment at 2 years	2016	39 (54%)	32 (44%)	67 (93%)	-	71 (99%)	3 (4%)	-	-	-	72
	2017	42 (72%)	16 (28%)	46 (79%)	-	58 (100%)	10 (17%)	-	-	-	58
	2018	50 (63%)	26 (33%)	65 (82%)	-	76 (96%)	6 (8%)	-	1 (1%)	1 (1%)	79
	2019	62 (78%)	15 (19%)	67 (85%)	-	75 (95%)	5 (6%)	-	-	2 (3%)	79
	2020	43 (59%)	28 (38%)	65 (89%)	-	72 (99%)	6 (8%)	-	-	-	73
	2021	53 (72%)	20 (27%)	65 (88%)	1 (1%)	73 (99%)	7 (9%)	-	-	1 (1%)	74

[BACK TO CONTENTS](#)

## DELAYED GRAFT FUNCTION

The proportion of patients experiencing delayed graft function (requiring dialysis within 7 days of transplant), stratified by donor type, is presented in Table 7.18.

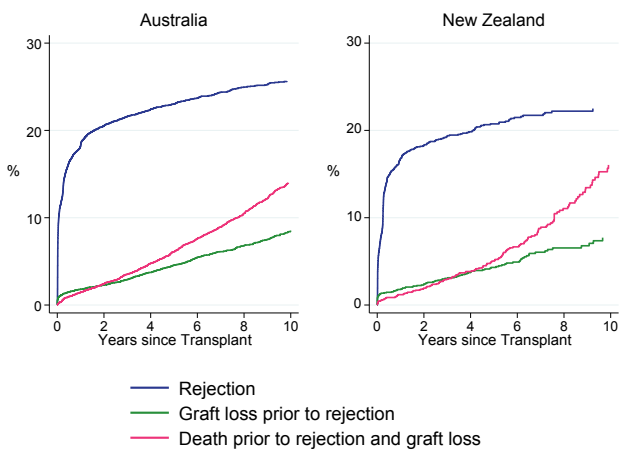
**Table 7.18**  
**Delayed Graft Function by Donor Type 2019-2023**

Country	Donor Type	2019	2020	2021	2022	2023
Australia	Living donor	4.4%	3.4%	3.0%	4.0%	3.3%
	Deceased donor	34.1%	30.1%	28.5%	33.0%	39.0%
	DNDD	22.9%	21.4%	22.7%	25.0%	25.6%
	DCDD	59.6%	51.0%	44.0%	56.7%	63.9%
New Zealand	Living donor	3.3%	3.4%	2.4%	0.0%	1.4%
	Deceased donor	28.7%	22.0%	17.6%	22.1%	17.8%
	DNDD	27.0%	18.4%	16.7%	20.2%	14.0%
	DCDD	38.9%	46.2%	33.3%	33.3%	62.5%

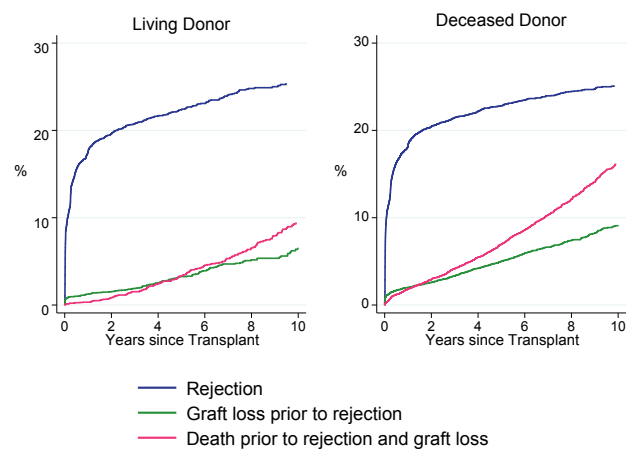
# REJECTION

Figures 7.17 to 7.20 show the time to first rejection after transplantation. These analyses show the cumulative incidence of rejection, graft loss prior to rejection and death prior to rejection and graft loss. Each outcome is considered a competing risk for the other outcomes, and only the first event is considered.

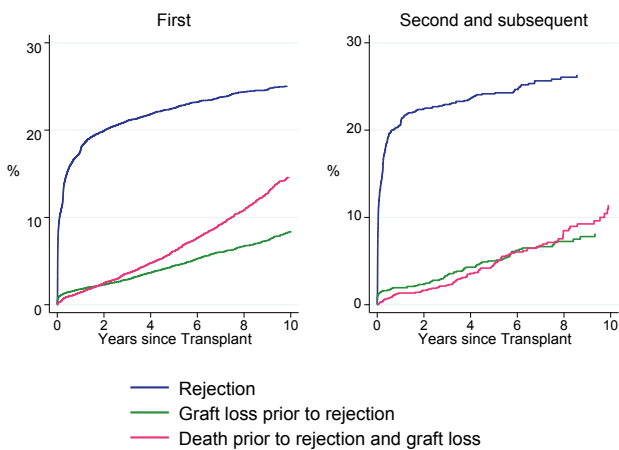
**Figure 7.17**  
**Time to Rejection from Transplant - Transplants 2012-2023**



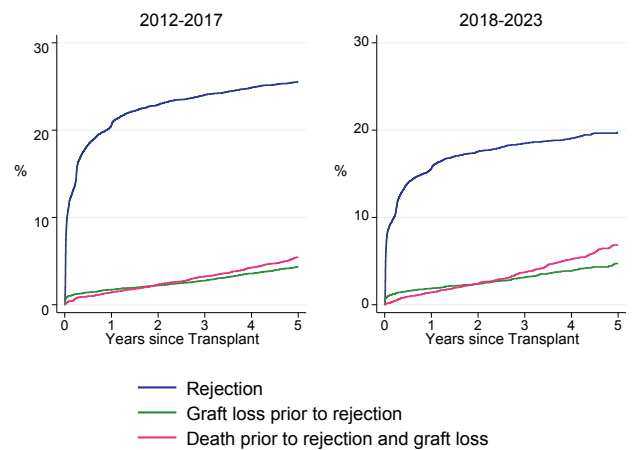
**Figure 7.18**  
**Time to Rejection from Transplant by Donor Type - Transplants 2012-2023**



**Figure 7.19**  
**Time to Rejection from Transplant by Graft Number - Transplants 2012-2023**



**Figure 7.20**  
**Time to Rejection from Transplant by Era - Transplants 2012-2023**



The proportion of patients experiencing a rejection episode within 6- and 12-months post-transplant, stratified by donor type and graft number, is presented in Table 7.19. Antibody-mediated rejection (AMR) rates are presented in Table 7.20. Rejection episodes reported after graft loss are not included. The years shown are the year that the transplants were performed. These tables represent the Australia and Aotearoa New Zealand cohort combined.

**Table 7.19**  
**Rejection Rates at 6- and 12-Months Post-Transplant 2013-2022**

Graft Number	Donor Type	Transplants	Rejection within 6 months	Rejection within 12 months	Transplants	Rejection within 6 months	Rejection within 12 months
First	Deceased donor	3542	632 (17.8%)	715 (20.2%)	3894	522 (13.4%)	592 (15.2%)
	Living donor	1479	282 (19.1%)	319 (21.6%)	1361	157 (11.5%)	178 (13.1%)
Second and subsequent	Deceased donor	512	113 (22.1%)	119 (23.2%)	489	88 (18.0%)	94 (19.2%)
	Living donor	175	32 (18.3%)	33 (18.9%)	140	21 (15.0%)	22 (15.7%)

**Table 7.20**  
**Antibody-Mediated Rejection (AMR) Rates at 6- and 12-Months Post-Transplant 2013-2022**

Graft Number	Donor Type	Transplants	AMR within 6 months	AMR within 12 months	Transplants	AMR within 6 months	AMR within 12 months
First	Deceased donor	3542	187 (5.3%)	208 (5.9%)	3894	126 (3.2%)	145 (3.7%)
	Living donor	1479	64 (4.3%)	73 (4.9%)	1361	34 (2.5%)	40 (2.9%)
Second and subsequent	Deceased donor	512	58 (11.3%)	62 (12.1%)	489	42 (8.6%)	47 (9.6%)
	Living donor	175	9 (5.1%)	10 (5.7%)	140	9 (6.4%)	10 (7.1%)

**Table 7.21**  
**Rejection Type by Rejection Timing Post-transplant 2021-2023 (% of Total episodes)**

Rejection Timing Post-transplant	Rejection type	2021	2022	2023
<6 months	Cell-mediated rejection	100 (62.9%)	96 (61.5%)	148 (61.2%)
	Antibody-mediated rejection	20 (12.6%)	29 (18.6%)	47 (19.4%)
	Mixed (both cell- and antibody-mediated)	25 (15.7%)	19 (12.2%)	25 (10.3%)
	Rejection reported but type not defined	14 (8.8%)	12 (7.7%)	22 (9.1%)
	<b>Total episodes</b>	<b>159</b>	<b>156</b>	<b>242</b>
6+ months	Cell-mediated rejection	75 (36.9%)	69 (43.9%)	121 (50.8%)
	Antibody-mediated rejection	67 (33.0%)	42 (26.8%)	44 (18.5%)
	Mixed (both cell- and antibody-mediated)	33 (16.3%)	33 (21.0%)	57 (23.9%)
	Rejection reported but type not defined	28 (13.8%)	13 (8.3%)	16 (6.7%)
	<b>Total episodes</b>	<b>203</b>	<b>157</b>	<b>238</b>

[BACK TO CONTENTS](#)

Table 7.22 shows the number of people who received antibody agents for treating acute rejection by calendar year. The percentage shown represents the number of rejection episodes treated with antibodies divided by the number of new transplant recipients in each calendar year, but readers should be aware that although the 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 at risk during the year is also reported.

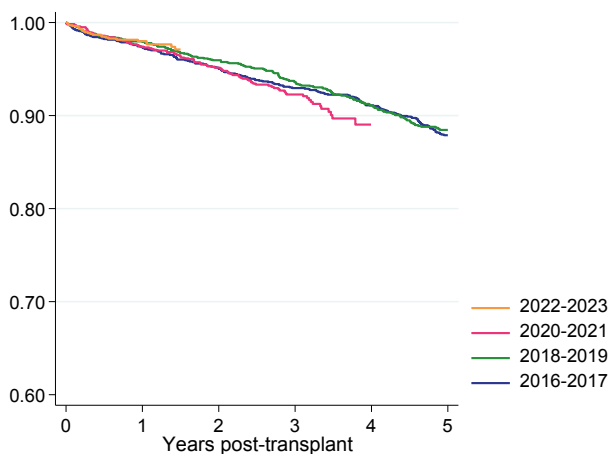
**Table 7.22**  
**7.22 Antibody Therapy for Acute Rejection 2019-2023**

Country	Type of agent	2019	2020	2021	2022	2023
Australia	Intravenous immunoglobulin	63 (5.7%)	79 (8.9%)	57 (6.7%)	63 (6.7%)	94 (8.6%)
	Anti-CD25	1 (0.1%)	-	-	-	-
	Rituximab	9 (0.8%)	4 (0.5%)	5 (0.6%)	3 (0.3%)	1 (0.1%)
	T cell depleting polyclonal Ab	32 (2.9%)	45 (5.1%)	48 (5.6%)	27 (2.9%)	63 (5.8%)
	Not specified	18 (1.6%)	24 (2.7%)	17 (2.0%)	10 (1.1%)	16 (1.5%)
	<b>Total new transplants</b>	<b>1104</b>	<b>885</b>	<b>857</b>	<b>938</b>	<b>1088</b>
	<b>Total transplants at risk</b>	<b>13229</b>	<b>13538</b>	<b>13812</b>	<b>14089</b>	<b>14325</b>
New Zealand	Intravenous immunoglobulin	-	4 (2.1%)	9 (4.8%)	4 (2.3%)	10 (5.7%)
	Rituximab	-	1 (0.5%)	3 (1.6%)	1 (0.6%)	4 (2.3%)
	T cell depleting polyclonal Ab	16 (7.2%)	16 (8.6%)	14 (7.5%)	15 (8.6%)	30 (17.1%)
	Not specified	2 (0.9%)	1 (0.5%)	3 (1.6%)	3 (1.7%)	2 (1.1%)
	<b>Total new transplants</b>	<b>221</b>	<b>187</b>	<b>187</b>	<b>174</b>	<b>175</b>
	<b>Total transplants at risk</b>	<b>2206</b>	<b>2287</b>	<b>2381</b>	<b>2453</b>	<b>2490</b>

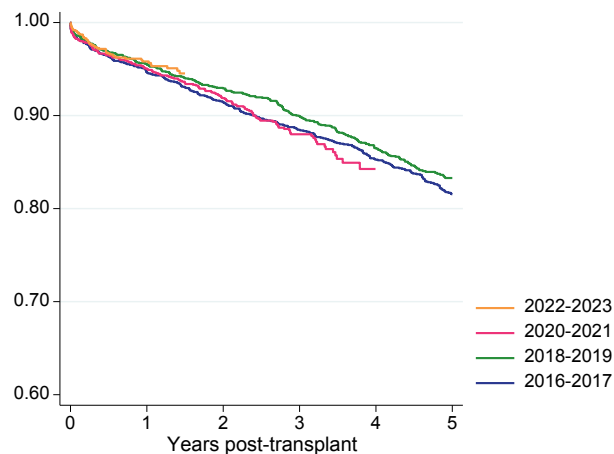
## PATIENT AND GRAFT SURVIVAL

The remainder of the chapter presents patient and graft survival by transplant era and by 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 7.21**  
**Primary Deceased Donor Grafts - Patient Survival - Australia**



**Figure 7.22**  
**Primary Deceased Donor Grafts - Graft Survival - Australia**

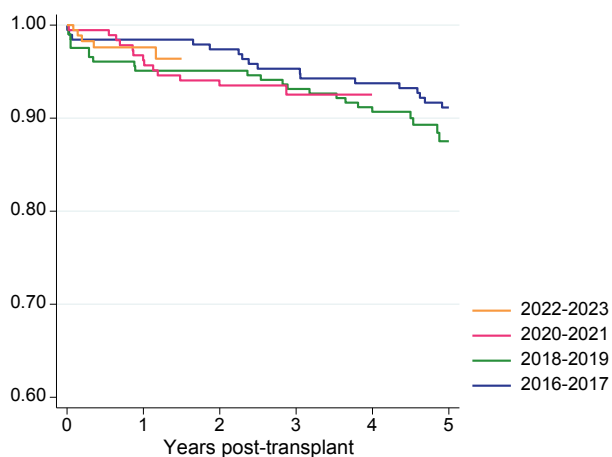


**Table 7.23**  
**Primary Deceased Donor Grafts - Australia 2016-2023; % [95% Confidence Interval]**

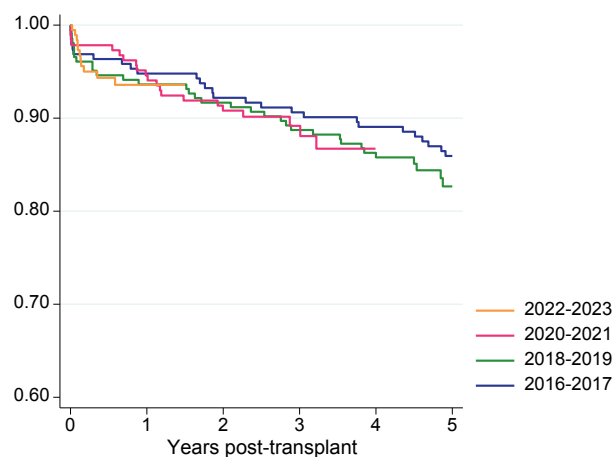
Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2016-2017 (n=1407)	99 [99, 100]	98 [97, 99]	97 [96, 98]	88 [86, 89]
	2018-2019 (n=1583)	100 [99, 100]	98 [98, 99]	98 [97, 99]	88 [87, 90]
	2020-2021 (n=1197)	100 [99, 100]	99 [98, 99]	97 [96, 98]	-
	2022-2023 (n=1366)	100 [99, 100]	98 [98, 99]	98 [97, 99]	-
Graft survival	2016-2017 (n=1407)	98 [97, 99]	96 [95, 97]	95 [93, 96]	82 [79, 83]
	2018-2019 (n=1583)	99 [98, 99]	97 [96, 98]	96 [94, 96]	83 [81, 85]
	2020-2021 (n=1197)	98 [97, 99]	96 [95, 97]	95 [94, 96]	-
	2022-2023 (n=1366)	99 [98, 99]	97 [95, 98]	96 [94, 97]	-



**Figure 7.23**  
**Primary Deceased Donor Grafts - Patient Survival -**  
**New Zealand**



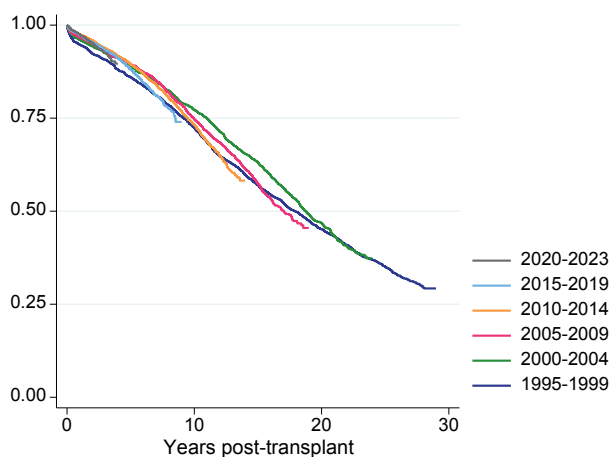
**Figure 7.24**  
**Primary Deceased Donor Grafts - Graft Survival -**  
**New Zealand**



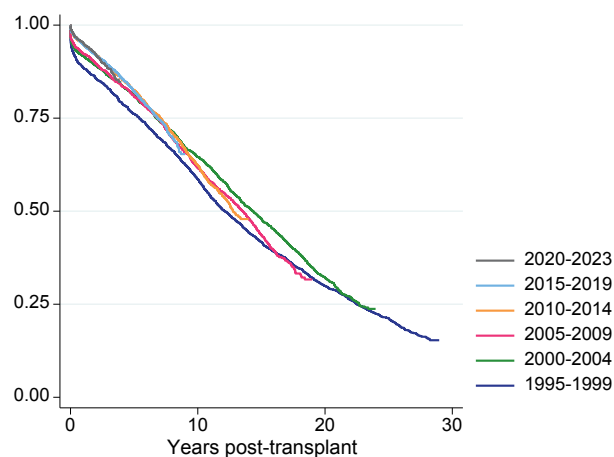
**Table 7.24**  
**Primary Deceased Donor Grafts - New Zealand 2016-2023; % [95% Confidence Interval]**

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2016-2017 (n=192)	98 [95, 99]	98 [95, 99]	98 [95, 99]	91 [86, 94]
	2018-2019 (n=204)	98 [94, 99]	96 [92, 98]	95 [91, 97]	88 [82, 92]
	2020-2021 (n=185)	99 [96, 100]	99 [96, 100]	96 [92, 98]	-
	2022-2023 (n=187)	99 [96, 100]	98 [94, 99]	98 [94, 99]	-
Graft survival	2016-2017 (n=192)	97 [93, 99]	96 [93, 98]	95 [91, 97]	86 [80, 90]
	2018-2019 (n=204)	96 [92, 98]	95 [90, 97]	94 [89, 96]	83 [76, 87]
	2020-2021 (n=185)	98 [94, 99]	98 [94, 99]	95 [90, 97]	-
	2022-2023 (n=187)	98 [95, 99]	94 [90, 97]	94 [89, 96]	-

**Figure 7.25**  
**Primary Deceased Donor Grafts - Patient Survival - Australia and New Zealand**



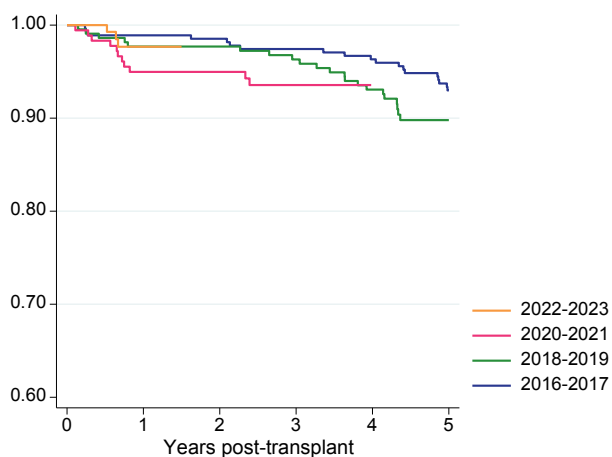
**Figure 7.26**  
**Primary Deceased Donor Grafts - Graft Survival - Australia and New Zealand**



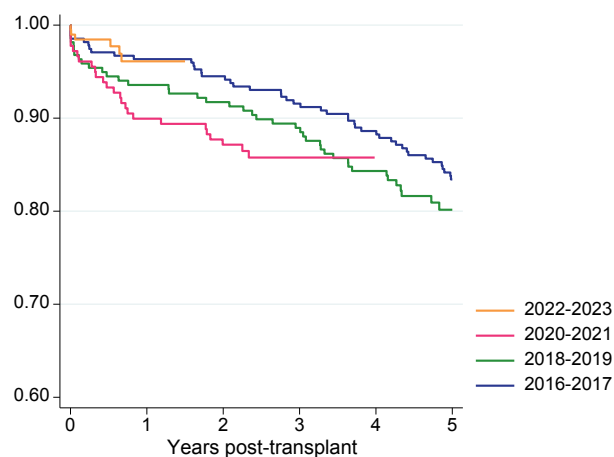
**Table 7.25**  
**Primary Deceased Donor Grafts - Australia and New Zealand 1995-2023; % [95% Confidence Interval]**

Outcome	Era	1 year	5 years	10 years	15 years	20 years
Patient survival	1995-1999 (n=1779)	95 [94, 96]	86 [84, 88]	72 [70, 74]	57 [55, 59]	45 [43, 47]
	2000-2004 (n=1849)	96 [95, 97]	89 [88, 90]	77 [75, 79]	63 [61, 65]	47 [44, 49]
	2005-2009 (n=1911)	97 [96, 97]	90 [88, 91]	75 [73, 77]	57 [55, 60]	-
	2010-2014 (n=2923)	98 [97, 98]	89 [88, 90]	73 [72, 75]	-	-
	2015-2019 (n=4081)	97 [97, 98]	88 [87, 89]	-	-	-
	2020-2023 (n=2935)	97 [97, 98]	-	-	-	-
Graft survival	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, 50]	32 [30, 34]
	2005-2009 (n=1911)	92 [91, 93]	81 [79, 83]	62 [59, 64]	44 [41, 46]	-
	2010-2014 (n=2923)	95 [94, 96]	82 [81, 84]	62 [61, 64]	-	-
	2015-2019 (n=4081)	95 [94, 95]	82 [81, 83]	-	-	-
	2020-2023 (n=2935)	95 [94, 96]	-	-	-	-

**Figure 7.27**  
**Second and Subsequent Deceased Donor Grafts - Patient Survival - Australia and New Zealand**



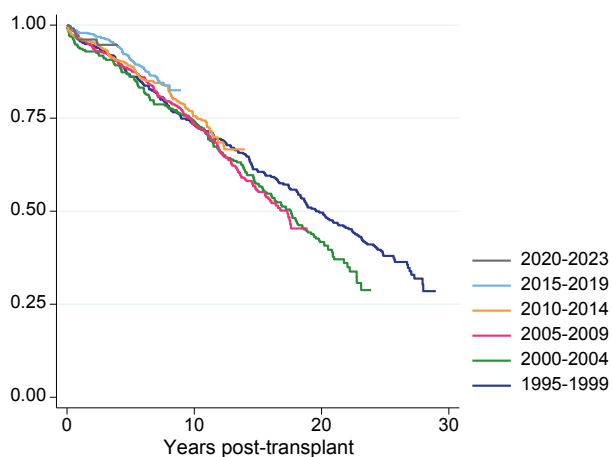
**Figure 7.28**  
**Second and Subsequent Deceased Donor Grafts - Graft Survival - Australia and New Zealand**



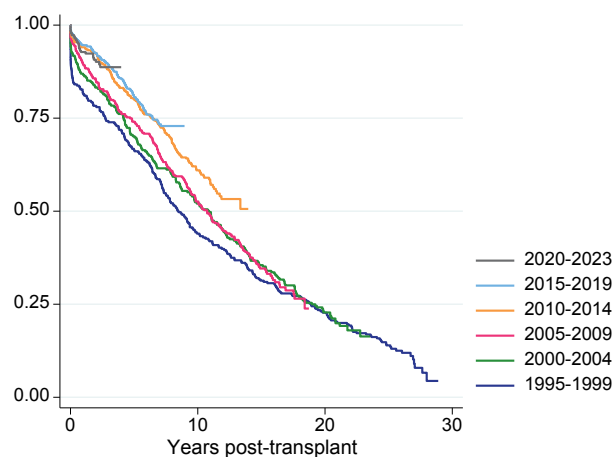
**Table 7.26**  
**Second and Subsequent Deceased Donor Grafts - Australia and New Zealand 2016-2023;**  
**% [95% Confidence Interval]**

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2016-2017 (n=274)	100	99 [97, 100]	99 [97, 100]	93 [89, 95]
	2018-2019 (n=218)	100	99 [96, 100]	98 [95, 99]	90 [85, 93]
	2020-2021 (n=179)	100	98 [95, 99]	95 [91, 97]	-
	2022-2023 (n=196)	100	100	98 [93, 99]	-
Graft survival	2016-2017 (n=274)	99 [96, 99]	97 [94, 99]	96 [93, 98]	83 [78, 87]
	2018-2019 (n=218)	97 [93, 98]	94 [90, 97]	94 [89, 96]	80 [74, 85]
	2020-2021 (n=179)	97 [93, 99]	93 [88, 96]	90 [85, 94]	-
	2022-2023 (n=196)	98 [95, 99]	98 [95, 99]	96 [91, 98]	-

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



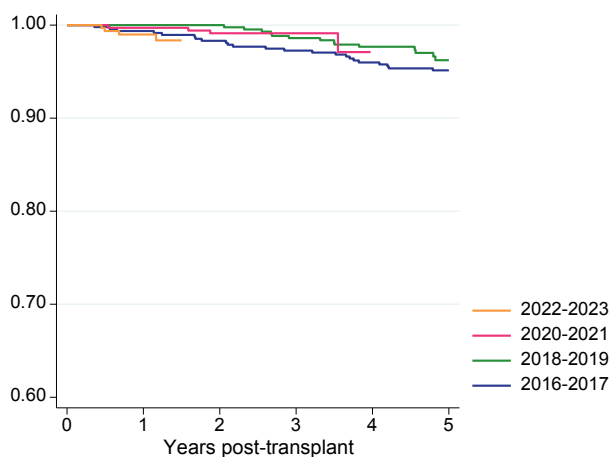
**Figure 7.30**  
**Second and Subsequent Deceased Donor Grafts - Graft Survival - Australia and New Zealand**



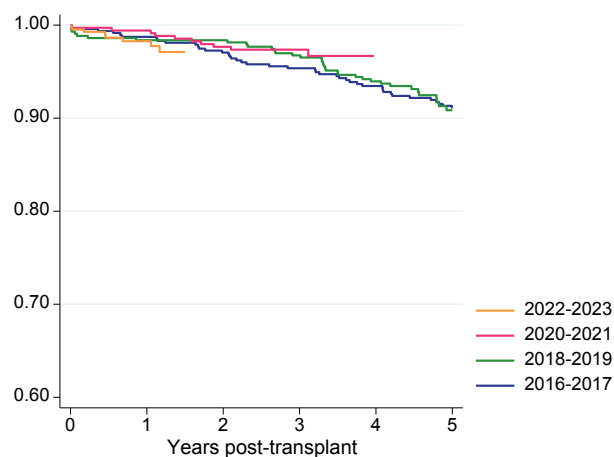
**Table 7.27**  
**Second and Subsequent Deceased Donor Grafts - Australia and New Zealand 1995-2023;**  
**% [95% Confidence Interval]**

Outcome	Era	1 year	5 years	10 years	15 years	20 years
Patient survival	1995-1999 (n=295)	96 [93, 98]	86 [82, 90]	73 [68, 78]	61 [55, 66]	50 [44, 55]
	2000-2004 (n=268)	94 [90, 96]	86 [81, 90]	74 [68, 79]	57 [51, 63]	42 [36, 48]
	2005-2009 (n=343)	96 [94, 98]	88 [84, 91]	73 [68, 78]	56 [50, 61]	-
	2010-2014 (n=370)	96 [94, 98]	89 [85, 92]	76 [71, 80]	-	-
	2015-2019 (n=577)	98 [96, 99]	91 [88, 93]	-	-	-
	2020-2023 (n=375)	96 [93, 98]	-	-	-	-
Graft survival	1995-1999 (n=295)	82 [77, 86]	66 [61, 72]	44 [38, 50]	31 [26, 37]	23 [18, 28]
	2000-2004 (n=268)	87 [82, 90]	70 [64, 75]	52 [46, 58]	36 [30, 41]	23 [18, 28]
	2005-2009 (n=343)	90 [86, 92]	74 [69, 78]	53 [47, 58]	35 [30, 40]	-
	2010-2014 (n=370)	94 [91, 96]	80 [76, 84]	61 [56, 66]	-	-
	2015-2019 (n=577)	95 [92, 96]	81 [77, 84]	-	-	-
	2020-2023 (n=375)	93 [89, 95]	-	-	-	-

**Figure 7.31**  
**Primary Living Donor Grafts - Patient Survival - Australia**



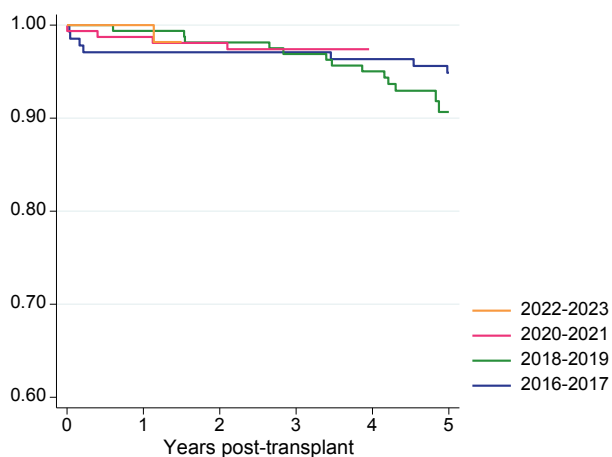
**Figure 7.32**  
**Primary Living Donor Grafts - Graft Survival - Australia**



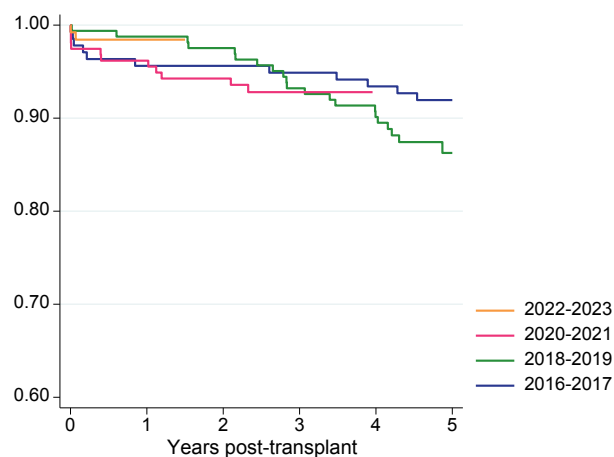
**Table 7.28**  
**Primary Living Donor Grafts - Australia 2016-2023; % [95% Confidence Interval]**

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2016-2017 (n=476)	100	100 [99, 100]	99 [98, 100]	95 [93, 97]
	2018-2019 (n=431)	100	100	100	96 [94, 98]
	2020-2021 (n=344)	100	100	100 [98, 100]	-
	2022-2023 (n=436)	100	99 [97, 100]	99 [97, 100]	-
Graft survival	2016-2017 (n=476)	100 [98, 100]	99 [98, 100]	99 [97, 99]	91 [88, 93]
	2018-2019 (n=431)	99 [98, 100]	99 [97, 99]	98 [97, 99]	91 [87, 93]
	2020-2021 (n=344)	100 [98, 100]	100 [98, 100]	99 [98, 100]	-
	2022-2023 (n=436)	100 [98, 100]	99 [97, 99]	98 [96, 99]	-

**Figure 7.33**  
**Primary Living Donor Grafts - Patient Survival -**  
**New Zealand**



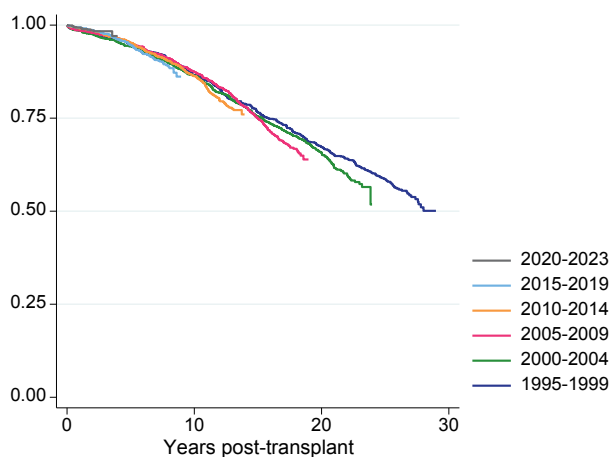
**Figure 7.34**  
**Primary Living Donor Grafts - Graft Survival -**  
**New Zealand**



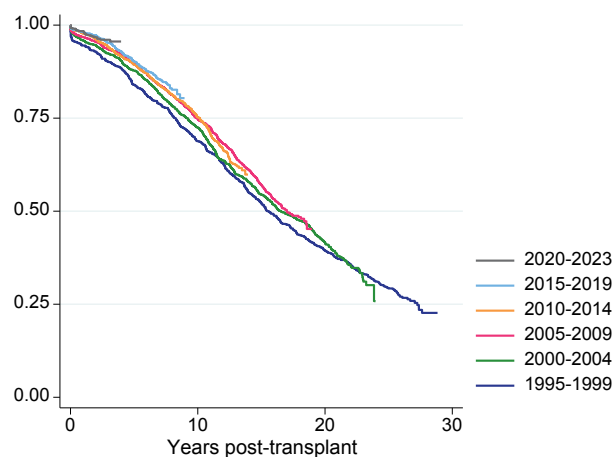
**Table 7.29**  
**Primary Living Donor Grafts - New Zealand 2016-2023; % [95% Confidence Interval]**

Outcome	Era	1 month	6 months	1 year	5 years
Patient survival	2016-2017 (n=137)	99 [94, 100]	97 [92, 99]	97 [92, 99]	95 [90, 98]
	2018-2019 (n=162)	100	100	99 [96, 100]	91 [84, 95]
	2020-2021 (n=157)	99 [96, 100]	99 [95, 100]	99 [95, 100]	-
	2022-2023 (n=129)	100	100	100	-
Graft survival	2016-2017 (n=137)	98 [93, 99]	96 [91, 98]	96 [91, 98]	92 [86, 95]
	2018-2019 (n=162)	99 [96, 100]	99 [96, 100]	99 [95, 100]	86 [80, 91]
	2020-2021 (n=157)	97 [93, 99]	96 [92, 98]	96 [92, 98]	-
	2022-2023 (n=129)	98 [94, 100]	98 [94, 100]	98 [94, 100]	-

**Figure 7.35**  
**Primary Living Donor Grafts - Patient Survival -**  
**Australia and New Zealand**



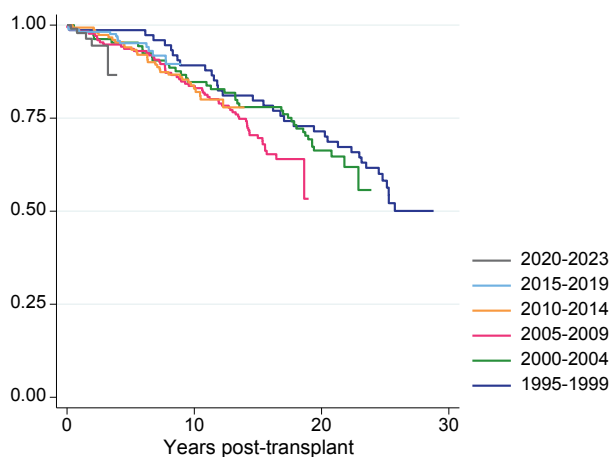
**Figure 7.36**  
**Primary Living Donor Grafts - Graft Survival -**  
**Australia and New Zealand**



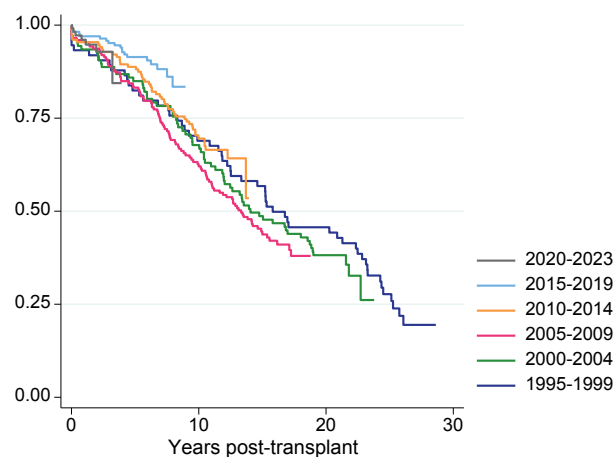
**Table 7.30**  
**Primary Living Donor Grafts - Australia and New Zealand 1995-2023; % [95% Confidence Interval]**

Outcome	Era	1 year	5 years	10 years	15 years	20 years
Patient survival	1995-1999 (n=767)	99 [97, 99]	95 [93, 96]	87 [84, 89]	77 [73, 79]	67 [64, 71]
	2000-2004 (n=1194)	98 [98, 99]	94 [93, 95]	86 [84, 88]	75 [73, 78]	66 [63, 68]
	2005-2009 (n=1586)	99 [98, 99]	95 [94, 96]	87 [86, 89]	75 [73, 77]	-
	2010-2014 (n=1458)	99 [98, 99]	95 [94, 96]	86 [84, 88]	-	-
	2015-2019 (n=1486)	99 [99, 100]	95 [93, 96]	-	-	-
	2020-2023 (n=1066)	99 [99, 100]	-	-	-	-
Graft survival	1995-1999 (n=767)	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]	54 [52, 57]	42 [39, 44]
	2005-2009 (n=1586)	97 [96, 97]	90 [88, 91]	75 [73, 77]	57 [55, 60]	-
	2010-2014 (n=1458)	98 [97, 98]	89 [88, 91]	75 [73, 77]	-	-
	2015-2019 (n=1486)	98 [97, 99]	90 [89, 92]	-	-	-
	2020-2023 (n=1066)	98 [97, 99]	-	-	-	-

**Figure 7.37**  
**Second and Subsequent Living Donor Grafts -**  
**Patient Survival - Australia and New Zealand**



**Figure 7.38**  
**Second and Subsequent Living Donor Grafts -**  
**Graft Survival - Australia and New Zealand**



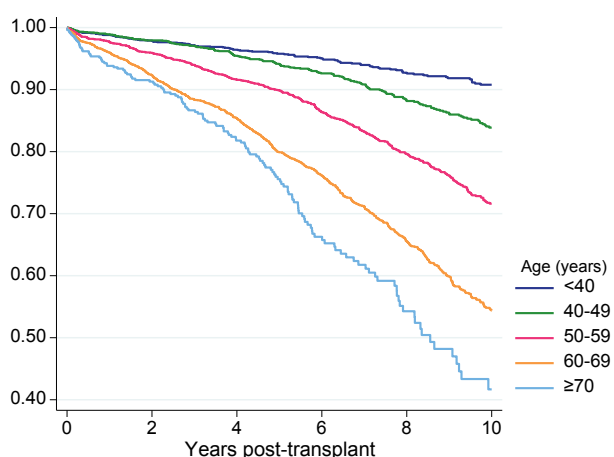
**Table 7.31**  
**Second and Subsequent Living Donor Grafts - Australia and New Zealand 1995-2023; % [95% Confidence Interval]**

Outcome	Era	1 year	5 years	10 years	15 years	20 years
Patient survival	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]	66 [56, 75]
	2005-2009 (n=175)	98 [95, 99]	94 [89, 96]	84 [77, 88]	70 [62, 76]	-
	2010-2014 (n=153)	99 [95, 100]	94 [89, 97]	83 [76, 88]	-	-
	2015-2019 (n=167)	98 [95, 99]	95 [91, 98]	-	-	-
	2020-2023 (n=115)	98 [92, 99]	-	-	-	-
Graft survival	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]	49 [39, 58]	38 [29, 47]
	2005-2009 (n=175)	95 [91, 98]	83 [77, 88]	62 [54, 69]	44 [36, 51]	-
	2010-2014 (n=153)	95 [91, 98]	89 [83, 93]	70 [61, 76]	-	-
	2015-2019 (n=167)	97 [93, 99]	91 [86, 95]	-	-	-
	2020-2023 (n=115)	96 [90, 99]	-	-	-	-

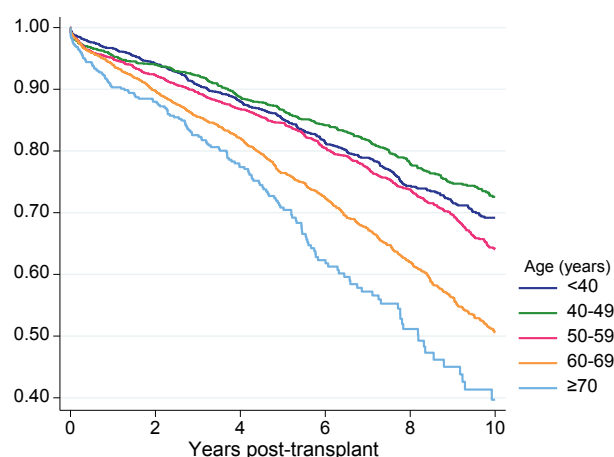


The following figures show patient and graft survival for primary transplants by recipient age. Note that in the survival graphs the y axis ranges from 0.40 to 1.00 in order to show the differences between the age groups more clearly.

**Figure 7.39**  
**Primary Deceased Donor Grafts - Patient Survival by Age - Australia 2009-2023**



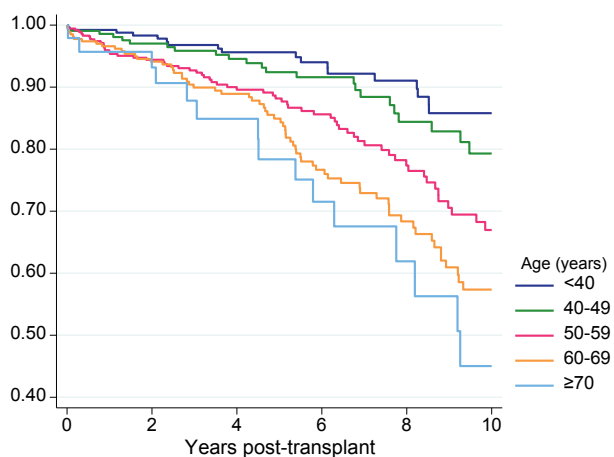
**Figure 7.40**  
**Primary Deceased Donor Grafts - Graft Survival by Age - Australia 2009-2023**



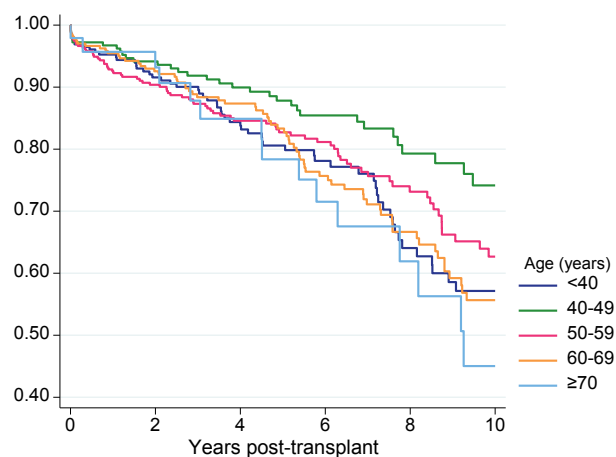
**Table 7.32**  
**Primary Deceased Donor Grafts By Age - Australia 2009-2023; % [95% Confidence Interval]**

Outcome	Age (years)	1 month	6 months	1 year	5 years	10 years
Patient survival	<40 (n=1907)	100 [99, 100]	99 [99, 99]	99 [98, 99]	96 [95, 97]	91 [89, 92]
	40-49 (n=1821)	100 [100, 100]	99 [99, 100]	99 [98, 99]	94 [93, 95]	84 [81, 86]
	50-59 (n=2529)	100 [99, 100]	98 [98, 99]	98 [97, 98]	90 [88, 91]	72 [69, 74]
	60-69 (n=2451)	99 [99, 100]	98 [97, 98]	96 [95, 97]	80 [78, 82]	54 [51, 57]
	≥70 (n=508)	99 [98, 100]	96 [94, 98]	94 [91, 96]	76 [71, 80]	42 [33, 50]
Graft survival	<40 (n=1907)	99 [98, 99]	98 [97, 98]	97 [96, 97]	85 [83, 87]	69 [66, 72]
	40-49 (n=1821)	98 [98, 99]	97 [96, 97]	95 [94, 96]	87 [85, 88]	73 [70, 75]
	50-59 (n=2529)	98 [98, 99]	96 [95, 97]	95 [94, 96]	85 [83, 86]	64 [61, 67]
	60-69 (n=2451)	98 [98, 99]	96 [95, 97]	94 [93, 95]	76 [74, 78]	51 [48, 53]
	≥70 (n=508)	97 [95, 98]	94 [92, 96]	90 [87, 93]	71 [66, 75]	40 [31, 48]

**Figure 7.41**  
**Primary Deceased Donor Grafts - Patient Survival**  
**by Age - New Zealand 2009-2023**



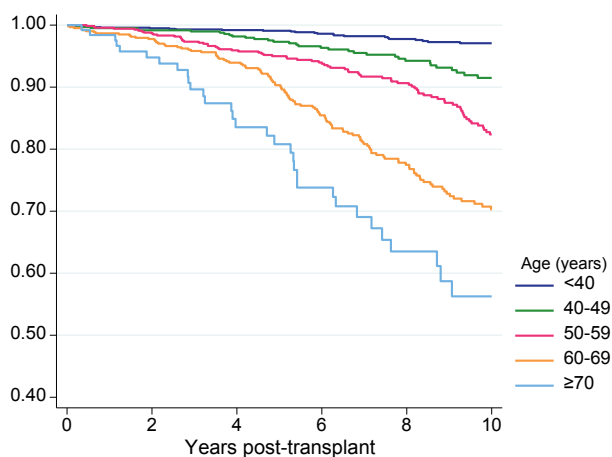
**Figure 7.42**  
**Primary Deceased Donor Grafts - Graft Survival**  
**by Age - New Zealand 2009-2023**



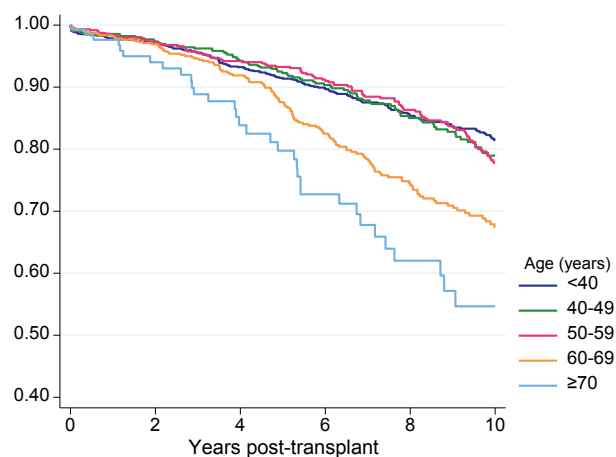
**Table 7.33**  
**Primary Deceased Donor Grafts By Age - New Zealand 2009-2023; % [95% Confidence Interval]**

Outcome	Age (years)	1 month	6 months	1 year	5 years	10 years
Patient survival	<40 (n=258)	99 [97, 100]	99 [97, 100]	99 [97, 100]	96 [92, 98]	86 [77, 91]
	40-49 (n=216)	99 [96, 100]	99 [96, 100]	99 [96, 100]	92 [87, 96]	79 [69, 86]
	50-59 (n=358)	99 [98, 100]	98 [96, 99]	96 [93, 97]	88 [84, 91]	67 [58, 74]
	60-69 (n=269)	99 [96, 99]	97 [95, 99]	97 [94, 98]	85 [79, 89]	57 [48, 66]
	≥70 (n=48)	98 [86, 100]	96 [84, 99]	96 [84, 99]	78 [61, 89]	45 [24, 64]
Graft survival	<40 (n=258)	98 [95, 99]	96 [93, 98]	95 [92, 97]	81 [74, 86]	57 [47, 66]
	40-49 (n=216)	97 [94, 99]	97 [94, 99]	97 [93, 98]	88 [82, 92]	74 [64, 82]
	50-59 (n=358)	97 [95, 99]	96 [93, 97]	93 [89, 95]	83 [78, 87]	63 [54, 70]
	60-69 (n=269)	98 [95, 99]	97 [94, 98]	95 [92, 97]	83 [78, 88]	56 [46, 64]
	≥70 (n=48)	98 [86, 100]	96 [84, 99]	96 [84, 99]	78 [61, 89]	45 [24, 64]

**Figure 7.43**  
**Primary Living Donor Grafts - Patient Survival by Age - Australia 2009-2023**



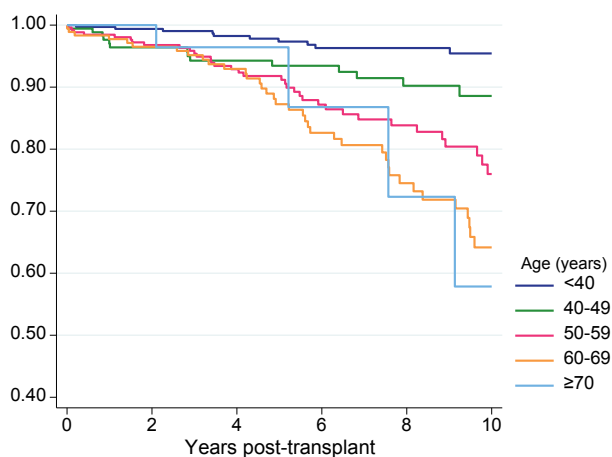
**Figure 7.44**  
**Primary Living Donor Grafts - Graft Survival by Age - Australia 2009-2023**



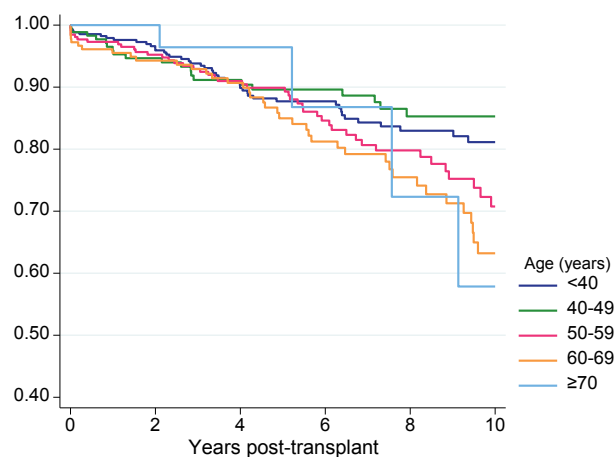
**Table 7.34**  
**Primary Living Donor Grafts By Age - Australia 2009-2023; % [95% Confidence Interval]**

Outcome	Age (years)	1 month	6 months	1 year	5 years	10 years
Patient survival	<40 (n=1241)	100	100 [99, 100]	100 [99, 100]	99 [98, 100]	97 [96, 98]
	40-49 (n=636)	100 [99, 100]	100 [99, 100]	100 [99, 100]	97 [95, 98]	91 [88, 94]
	50-59 (n=744)	100	100 [99, 100]	100 [99, 100]	95 [93, 96]	82 [78, 86]
	60-69 (n=621)	100 [99, 100]	99 [98, 100]	99 [97, 99]	90 [87, 93]	70 [65, 75]
	≥70 (n=130)	100	99 [95, 100]	98 [94, 100]	81 [71, 88]	56 [43, 68]
Graft survival	<40 (n=1241)	99 [98, 99]	98 [97, 99]	98 [97, 99]	91 [89, 93]	81 [78, 84]
	40-49 (n=636)	99 [98, 100]	99 [97, 99]	99 [97, 99]	92 [90, 94]	79 [74, 83]
	50-59 (n=744)	100 [99, 100]	99 [98, 100]	98 [97, 99]	93 [91, 95]	78 [73, 82]
	60-69 (n=621)	99 [98, 100]	99 [97, 99]	98 [97, 99]	88 [84, 90]	67 [62, 72]
	≥70 (n=130)	99 [95, 100]	98 [94, 100]	98 [93, 99]	80 [70, 87]	55 [41, 66]

**Figure 7.45**  
**Primary Living Donor Grafts - Patient Survival by Age -**  
**New Zealand 2009-2023**



**Figure 7.46**  
**Primary Living Donor Grafts - Graft Survival by Age -**  
**New Zealand 2009-2023**

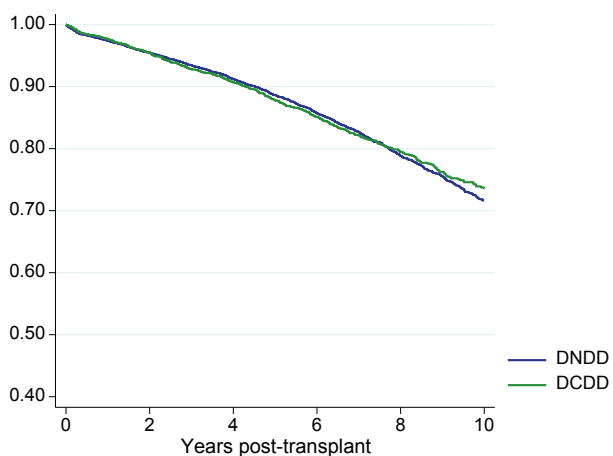


**Table 7.35**  
**Primary Living Donor Grafts By Age - New Zealand 2009-2023; % [95% Confidence Interval]**

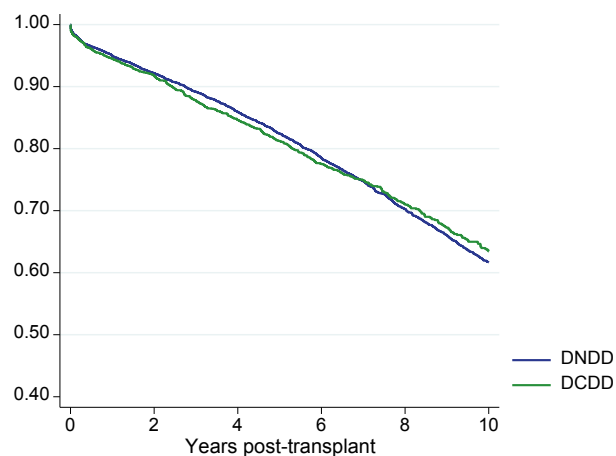
Outcome	Age (years)	1 month	6 months	1 year	5 years	10 years
Patient survival	<40 (n=344)	100	100 [98, 100]	100 [98, 100]	97 [94, 99]	95 [91, 98]
	40-49 (n=177)	99 [96, 100]	99 [96, 100]	97 [93, 99]	93 [88, 96]	89 [81, 93]
	50-59 (n=260)	100 [97, 100]	98 [96, 99]	98 [96, 99]	92 [87, 95]	76 [67, 83]
	60-69 (n=181)	99 [96, 100]	98 [95, 99]	98 [94, 99]	87 [80, 92]	64 [53, 73]
	≥70 (n=34)	100	100	100	96 [77, 99]	58 [19, 83]
Graft survival	<40 (n=344)	99 [97, 100]	99 [97, 99]	98 [96, 99]	88 [83, 91]	81 [75, 86]
	40-49 (n=177)	99 [96, 100]	98 [95, 99]	96 [92, 98]	90 [84, 94]	85 [78, 90]
	50-59 (n=260)	98 [96, 99]	97 [94, 99]	97 [94, 99]	90 [85, 93]	71 [61, 78]
	60-69 (n=181)	97 [93, 99]	96 [92, 98]	96 [91, 98]	85 [78, 90]	63 [52, 72]
	≥70 (n=34)	100	100	100	96 [77, 99]	58 [19, 83]

The following figures show patient and graft survival for primary deceased donor transplants by donor pathway (DNDD/DCDD). Note that in the survival graphs the y axis ranges from 0.40 to 1.00 in order to show the differences between the groups more clearly.

**Figure 7.47**  
**Primary Deceased Donor Grafts by Donor Pathway - Patient Survival - Australia 2009-2023**



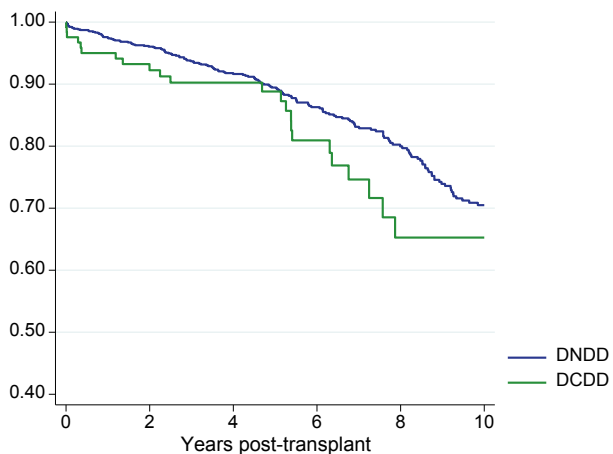
**Figure 7.48**  
**Primary Deceased Donor Grafts by Donor Pathway - Graft Survival - Australia 2009-2023**



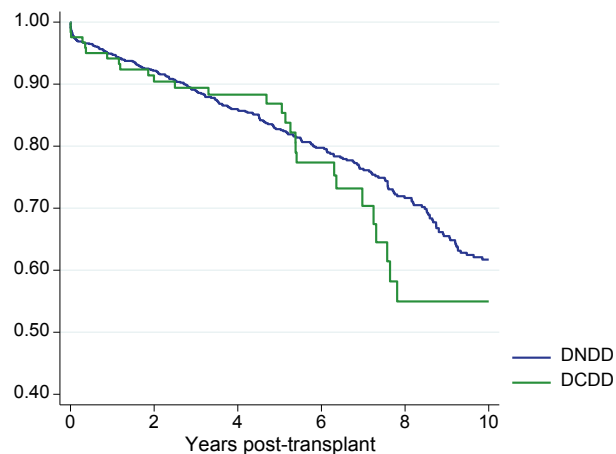
**Table 7.36**  
**Primary Deceased Donor Grafts By Donor Pathway - Australia 2009-2023; % [95% Confidence Interval]**

Outcome	Donor Pathway	1 month	6 months	1 year	5 years	10 years
Patient survival	DCDD (n=2443)	100 [99, 100]	98 [98, 99]	98 [97, 98]	88 [86, 89]	74 [71, 76]
	DNDD (n=6722)	100 [99, 100]	98 [98, 99]	97 [97, 98]	89 [88, 89]	72 [70, 73]
Graft survival	DCDD (n=2443)	98 [98, 99]	96 [95, 97]	95 [94, 95]	81 [79, 83]	63 [61, 66]
	DNDD (n=6722)	98 [98, 99]	96 [96, 97]	95 [94, 96]	82 [81, 83]	62 [60, 63]

**Figure 7.49**  
**Primary Deceased Donor Grafts by Donor Pathway - Patient Survival - New Zealand 2009-2023**



**Figure 7.50**  
**Primary Deceased Donor Grafts by Donor Pathway - Graft Survival - New Zealand 2009-2023**

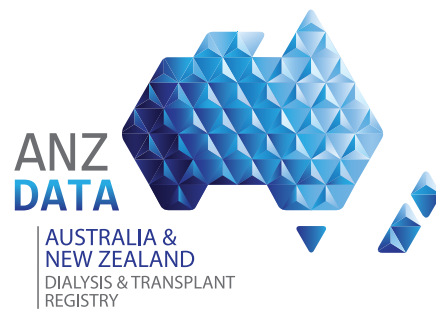


**Table 7.37**  
**Primary Deceased Donor Grafts By Donor Pathway - New Zealand 2009-2023; % [95% Confidence Interval]**

Outcome	Donor Pathway	1 month	6 months	1 year	5 years	10 years
Patient survival	DCDD (n=123)	98 [93, 99]	95 [89, 98]	95 [89, 98]	89 [81, 94]	65 [50, 77]
	DNDD (n=1026)	99 [98, 100]	99 [98, 99]	97 [96, 98]	89 [87, 91]	70 [66, 75]
Graft survival	DCDD (n=123)	98 [93, 99]	95 [89, 98]	94 [88, 97]	87 [79, 92]	55 [39, 68]
	DNDD (n=1026)	98 [96, 98]	96 [95, 97]	95 [93, 96]	83 [80, 85]	62 [57, 66]

## REFERENCES

1. Australian Bureau of Statistics, 2023, Quarterly Population Estimates (ERP), by State/Territory, Sex and Age, Jun 2023, viewed 14 Dec 2023, <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/jun-2023>
2. 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, 2023, Estimated Resident Population by Age and Sex (1991+) (Annual-Jun), NZ Infoshare, viewed 14 Dec 2023, <http://infoshare.stats.govt.nz/>
3. Australian Bureau of Statistics, 2024, Regional Population by Age and Sex, Australia, 2023, viewed 29 Aug 2024, <https://www.abs.gov.au/statistics/people/population/regional-population-age-and-sex/2023>



# CHAPTER 7

Kidney Transplantation