



CHAPTER 6

Australian Transplant Waiting List

Reporting the deceased donor kidney transplant waiting list dynamics in Australia, the demographics of patients on the waiting list, and transplantation rates and survival for wait listed patients.

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Summary and Highlights

The COVID-19 pandemic continued to have a significant impact on the dynamics of the deceased donor transplant waiting list in Australia in 2021. Table 6.1 shows a continuing trend in 2020 where there was a further increase in the number of active waitlisted patients from 1166 to 1338 at the end of 2020 and 2021 respectively. Unlike in 2020, while the number of deceased donor transplants continued to decrease from 633 to 598 in 2021 (with the trajectory somewhat attenuated), the number of patients made active increased from 904 to 1002, similar to the pre-pandemic level, suggesting that the health services were able to adapt and maintain the delivery of pre-transplant assessment. Despite both Victoria & NSW being significantly impacted by COVID in the second half of 2021, Victoria/Tasmania was disproportionately impacted with a drop in deceased donor transplants from 253 in 2019 to 158 in 2021, below that in NSW for the first time in several years. Unless there is an increase in deceased donor transplants in the near future, it is anticipated that there will be an accumulation of active waitlisted patients with a longer waiting time in Australia.

Interestingly, for the age 65+ subgroup as shown in Table 6.3, there was a disproportionate reduction in the number of patients made active as well as the number of deceased donor transplants performed, resulting in a reasonably stable number of active patients at the end of 2021 compared with pre-2020. This could reflect the challenges in working up complex patients and being more cautious in accepting kidneys from older donors and/or at risk of prolonged delayed graft function during the pandemic. With the implementation of the revised national and state kidney allocation algorithm including prognosis matching in May 2021, it will be of interest to monitor the impact on this age group in their access to transplantation. Another key objective of the new allocation system was to prioritise kidneys from compatible deceased donors to the highly sensitised patients. Table 6.6 showed a reduction in the proportion of waitlisted patients with 1 previous graft from 19.7% 2020 to 15.3% in 2021, suggesting that the new allocation algorithm may have achieved this objective. It will be important to monitor whether this is only a temporary “bolus” effect as seen in the United States after their changes to their Kidney Allocation System.

Suggested Citation

ANZDATA Registry. 45th Report, Chapter 6: Australian Transplant Waiting List. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2022. Available at: <http://www.anzdata.org.au>

Waiting List Dynamics

On 1 April 2019 Australia implemented a new national clinical transplant system for the management of solid organ transplant waiting lists and organ allocation known as OrganMatch that replaced the previous National Organ Matching System (NOMS). The waiting list data presented in this chapter has been provided to ANZDATA by NOMS and OrganMatch for reporting purposes and relates to wait-listing for deceased donor (DD) kidney-only transplants. Patients wait-listed for multi-organ transplants are excluded. Data has been sourced from NOMS prior to 1 Jan 2019 and from OrganMatch from 1 Jan 2019 onwards. The OrganMatch data includes NOMS data migrated to OrganMatch from 1 Jan 2019 to 1 April 2019 as NOMS was the clinical system in use during this time period.

The number of people moving on and off the active waiting list is shown. Patients are categorised as either active or off the list - an 'on hold', 'interim' or 'temporarily off list' status is considered to be 'off list', since these patients will not be allocated kidneys. A number of de-listed patients may return to the list in subsequent years. If a patient was listed and de-listed more than once in a calendar year, only the net change is counted.

The ANZDATA registry does not currently receive deceased donor kidney waiting list data for New Zealand and hence this is not reported.

Table 6.1 shows the waiting list dynamics tables for Australia for each year. Live donor (LD) transplants performed in patients who were not on the DD waiting list are not included in this table.

Table 6.1 Australian Kidney Transplant Waiting List Dynamics 2016-2021

Event	2016	2017	2018	2019	2020	2021
Active start of year	1071	953	965	966	1120	1166
Made active	823	963	998	1099	904	1002
Taken off list	135	144	146	120	191	188
DD graft	759	751	811	787	633	598
LD graft	37	45	34	33	31	37
Overseas graft	1	1	0	0	0	0
Died on list	9	10	6	5	3	7
Active end of year	953	965	966	1120	1166	1338

Table 6.2 shows data for non-Indigenous and First Nations patients.

Table 6.2 Australian Kidney Transplant Waiting List Dynamics by Ethnicity 2016-2021

Ethnicity	Event	2016	2017	2018	2019	2020	2021
Non-Indigenous	Active start of year	1032	906	919	910	1048	1110
	Made active	770	913	913	1005	844	903
	Taken off list	127	133	137	110	173	176
	DD graft	724	711	747	721	575	541
	LD graft	35	45	33	31	31	37
	Overseas graft	1	1	0	0	0	0
	Died on list	9	10	5	5	3	6
	Active end of year	906	919	910	1048	1110	1253
First Nations	Active start of year	33	36	35	44	62	49
	Made active	41	41	67	81	51	87
	Taken off list	7	9	9	9	16	12
	DD graft	30	33	48	53	48	49
	LD graft	1	0	0	1	0	0
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	1	0	0	1
	Active end of year	36	35	44	62	49	74
Not reported	Active start of year	6	11	11	12	10	7
	Made active	12	9	18	13	9	12
	Taken off list	1	2	0	1	2	0
	DD graft	5	7	16	13	10	8
	LD graft	1	0	1	1	0	0
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	0	0
	Active end of year	11	11	12	10	7	11

The numbers of both dialysis patients and transplants vary with age; in table 6.3 the waiting list dynamics for the years 2016-2021 is shown by broad age groups.

Table 6.3 Australian Kidney Transplant Waiting List Dynamics by Age 2016-2021

Age	Event	2016	2017	2018	2019	2020	2021
0-17	Active start of year	7	18	11	12	7	16
	Made active	25	22	27	15	23	32
	Taken off list	1	3	1	0	0	4
	DD graft	12	25	24	20	13	20
	LD graft	0	1	1	0	1	0
	Overseas graft	0	0	0	0	0	0
	Died on list	1	0	0	0	0	0
	Active end of year	18	11	12	7	16	24
18-44	Active start of year	269	241	275	300	372	410
	Made active	185	236	260	308	279	301
	Taken off list	35	20	32	31	49	60
	DD graft	162	161	177	183	176	189
	LD graft	15	18	23	20	14	17
	Overseas graft	0	1	0	0	0	0
	Died on list	1	2	3	2	2	2
	Active end of year	241	275	300	372	410	443
45-54	Active start of year	252	229	210	239	270	308
	Made active	188	210	229	258	236	257
	Taken off list	25	36	30	23	37	40
	DD graft	174	176	168	196	154	146
	LD graft	10	14	2	6	7	10
	Overseas graft	0	0	0	0	0	0
	Died on list	2	3	0	2	0	1
	Active end of year	229	210	239	270	308	368
55-64	Active start of year	292	261	279	260	306	306
	Made active	223	294	287	311	255	289
	Taken off list	42	48	49	36	58	56
	DD graft	207	218	249	225	192	164
	LD graft	5	8	6	4	4	10
	Overseas graft	0	0	0	0	0	0
	Died on list	0	2	2	0	1	3
	Active end of year	261	279	260	306	306	362
65+	Active start of year	251	204	190	155	165	126
	Made active	202	201	195	207	111	123
	Taken off list	32	37	34	30	47	28
	DD graft	204	171	193	163	98	79
	LD graft	7	4	2	3	5	0
	Overseas graft	1	0	0	0	0	0
	Died on list	5	3	1	1	0	1
	Active end of year	204	190	155	165	126	141

Differences between transplanting regions are shown in table 6.4. Waiting list numbers in each region are reflective of both listing practices and donation rates, both current and historical.

Table 6.4 Australian Kidney Transplant Waiting List Dynamics by Transplant Region 2016-2021

Transplant Region	Event	2016	2017	2018	2019	2020	2021
NSW/ACT	Active start of year	444	361	378	370	451	491
	Made active	227	329	316	380	318	338
	Taken off list	66	64	52	51	72	65
	DD graft	219	215	251	225	184	180
	LD graft	21	29	17	21	20	17
	Overseas graft	0	1	0	0	0	0
	Died on list	4	3	4	2	2	4
	Active end of year	361	378	370	451	491	563
VIC/TAS	Active start of year	382	385	366	319	349	350
	Made active	295	299	322	335	258	286
	Taken off list	39	57	62	41	63	69
	DD graft	234	244	297	253	186	158
	LD graft	14	11	10	10	7	15
	Overseas graft	1	0	0	0	0	0
	Died on list	4	6	0	1	1	1
	Active end of year	385	366	319	349	350	393
QLD	Active start of year	126	104	107	134	150	189
	Made active	155	178	194	190	191	179
	Taken off list	16	14	18	15	29	35
	DD graft	161	159	146	157	122	124
	LD graft	0	2	3	0	1	5
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	2	0	0
	Active end of year	104	107	134	150	189	204
SA/NT	Active start of year	75	62	82	99	107	81
	Made active	75	85	85	96	64	95
	Taken off list	10	7	11	12	19	10
	DD graft	76	55	52	74	69	62
	LD graft	2	2	4	2	2	0
	Overseas graft	0	0	0	0	0	0
	Died on list	0	1	1	0	0	2
	Active end of year	62	82	99	107	81	102
WA	Active start of year	44	41	32	44	63	55
	Made active	71	72	81	98	73	104
	Taken off list	4	2	3	1	8	9
	DD graft	69	78	65	78	72	74
	LD graft	0	1	0	0	1	0
	Overseas graft	0	0	0	0	0	0
	Died on list	1	0	1	0	0	0
	Active end of year	41	32	44	63	55	76

Table 6.5 shows the same data by blood group.

Table 6.5 Australian Kidney Transplant Waiting List Dynamics by Blood Group 2016-2021

Blood Group	Event	2016	2017	2018	2019	2020	2021
A	Active start of year	312	242	252	227	300	322
	Made active	301	328	348	423	343	362
	Taken off list	29	36	31	17	48	50
	DD graft	322	273	331	321	266	234
	LD graft	18	8	8	12	7	11
	Overseas graft	0	1	0	0	0	0
	Died on list	2	0	3	0	0	2
	Active end of year	242	252	227	300	322	387
AB	Active start of year	17	24	27	15	18	28
	Made active	32	46	47	38	42	41
	Taken off list	0	2	1	0	2	2
	DD graft	25	41	56	34	29	43
	LD graft	0	0	2	1	1	0
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	0	0
	Active end of year	24	27	15	18	28	24
B	Active start of year	187	175	188	199	223	195
	Made active	117	144	148	154	119	151
	Taken off list	23	34	36	26	37	29
	DD graft	97	84	95	96	101	68
	LD graft	7	10	5	7	8	5
	Overseas graft	0	0	0	0	0	0
	Died on list	2	3	1	1	1	0
	Active end of year	175	188	199	223	195	244
O	Active start of year	555	512	498	525	579	621
	Made active	373	445	455	484	400	448
	Taken off list	83	72	78	77	104	107
	DD graft	315	353	329	336	237	253
	LD graft	12	27	19	13	15	21
	Overseas graft	1	0	0	0	0	0
	Died on list	5	7	2	4	2	5
	Active end of year	512	498	525	579	621	683

Proportion of Patients Transplanted or on Waiting List

Figure 6.1 shows the proportion of prevalent kidney replacement therapy (KRT) patients who were either transplanted or actively wait-listed at the end of 2021, by state or territory and age group. Figure 6.2 shows the proportion of dialysis patients who were actively wait-listed at the end of 2021, by state or territory and age group.

Figure 6.1 - Proportion of Patients Transplanted or on Waiting List - By State or Territory and Age, Dec 2021

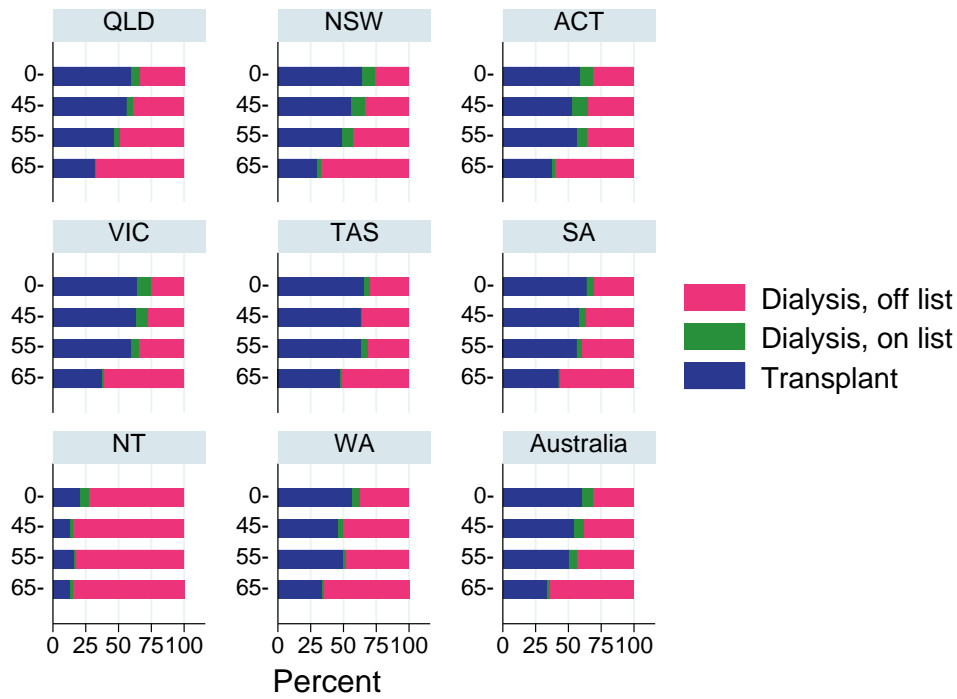


Figure 6.2 - Proportion of Dialysis Patients on Waiting List - By State or Territory and Age, Dec 2021

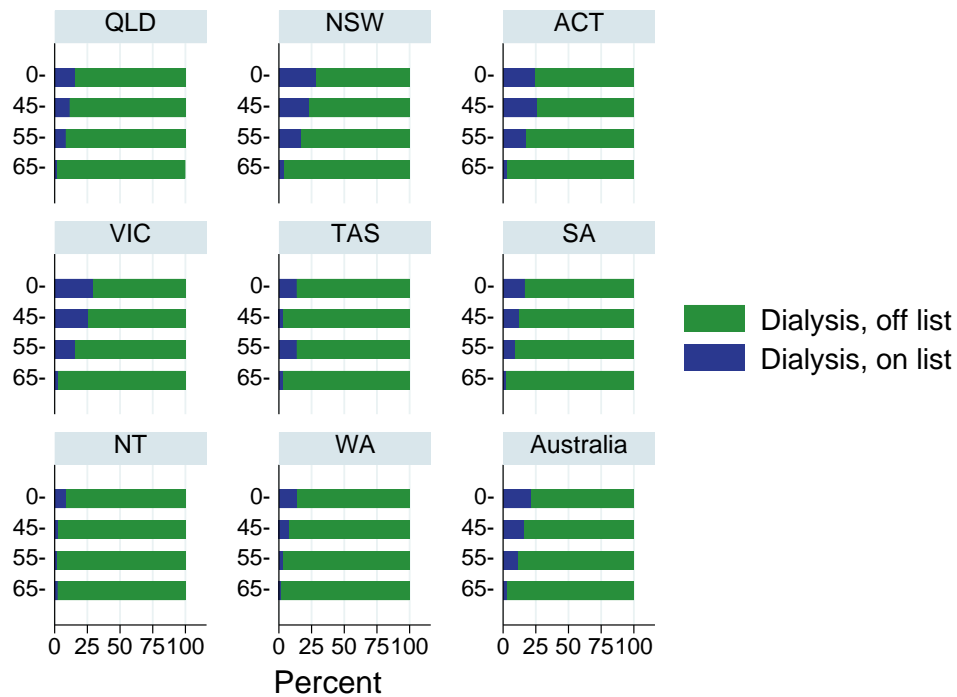
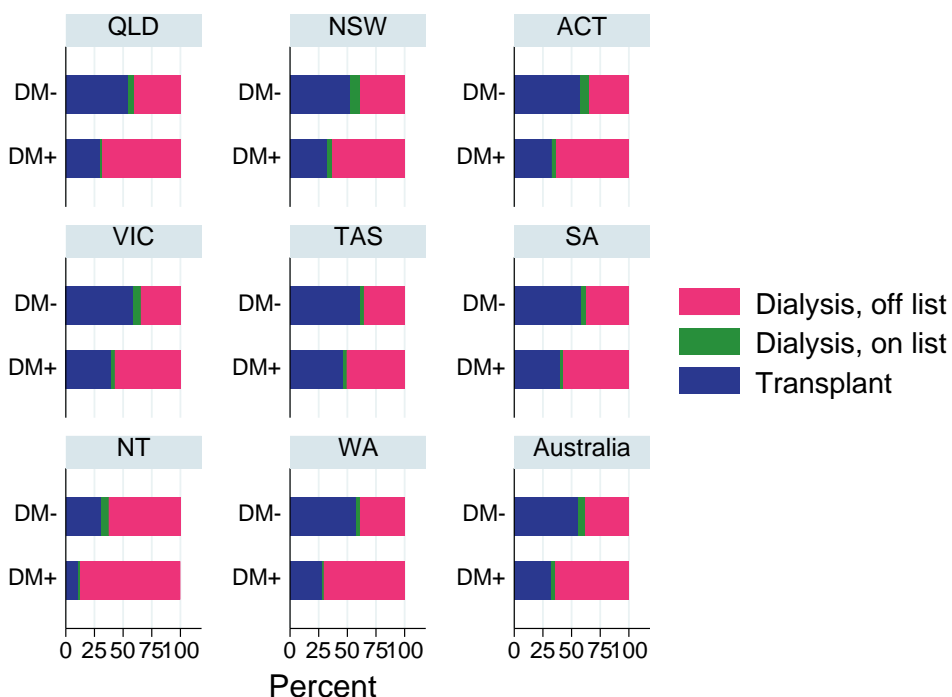


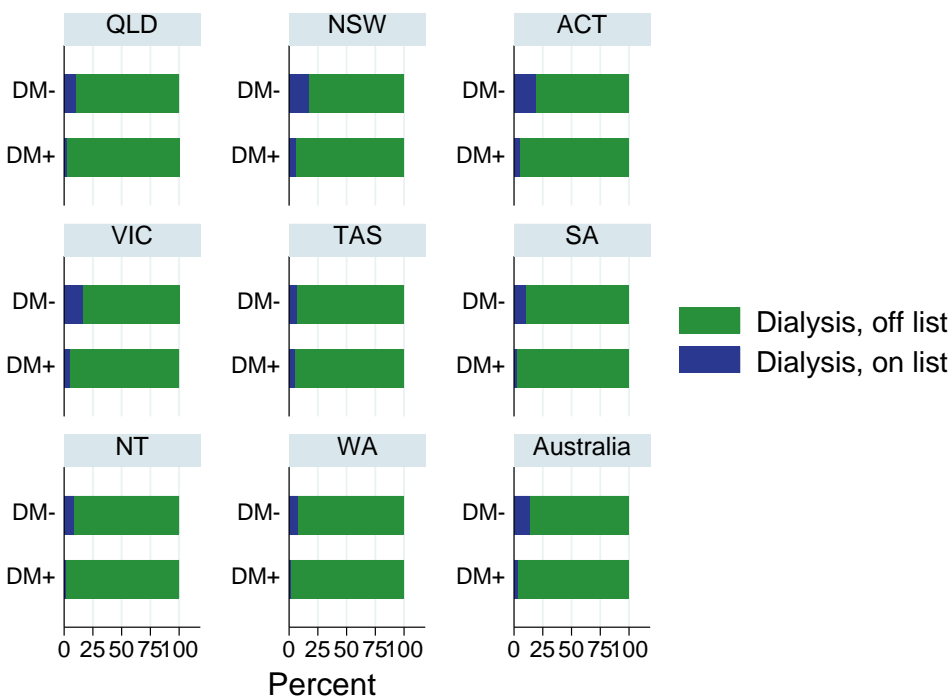
Figure 6.3 shows the proportion of prevalent KRT patients who were either transplanted or actively wait-listed at the end of 2021, by state or territory and diabetes status. Figure 6.4 shows the proportion of dialysis patients who were actively wait-listed at the end of 2021, by state or territory and diabetes status.

Figure 6.3 - Proportion of Patients Transplanted or on Waiting List - By State or Territory and Diabetes Status, Dec 2021



DM- : No diabetes
DM+ : Diabetes

Figure 6.4 - Proportion of Dialysis Patients on Waiting List - By State or Territory and Diabetes Status, Dec 2021



DM- : No diabetes
DM+ : Diabetes

Figure 6.5 shows differences in access to the waiting list or transplantation for incident patients, by treating hospital. This analysis is restricted to patients aged 18-60 who commenced KRT at an adult hospital in Australia over 2016-2020 and shows the proportion of these patients who had either been made active on the kidney transplant waiting list or received a kidney transplant within one year of starting KRT. Figure 6.6 shows the same data by transplant region.

Figure 6.5 - Proportion of New KRT Patients Aged 18-60 who were Wait-listed and/or Transplanted within 1 year of Commencing KRT - By Hospital, Australia 2016-2020

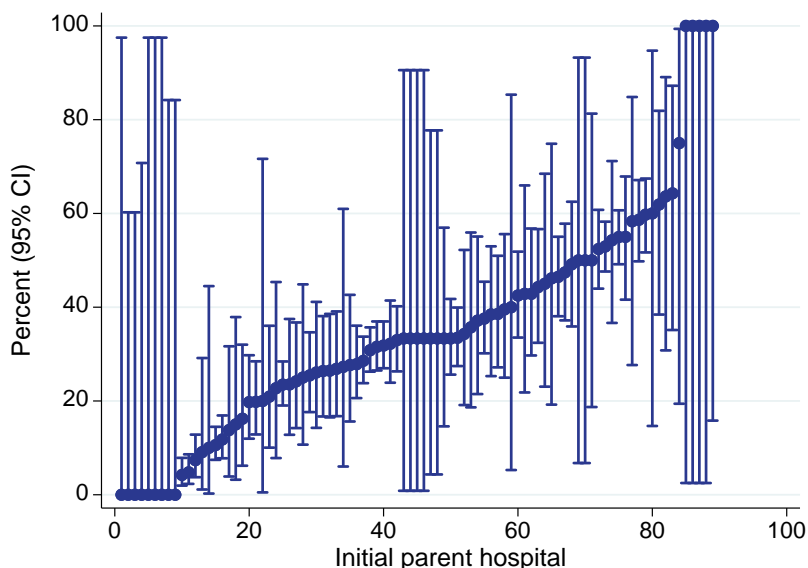
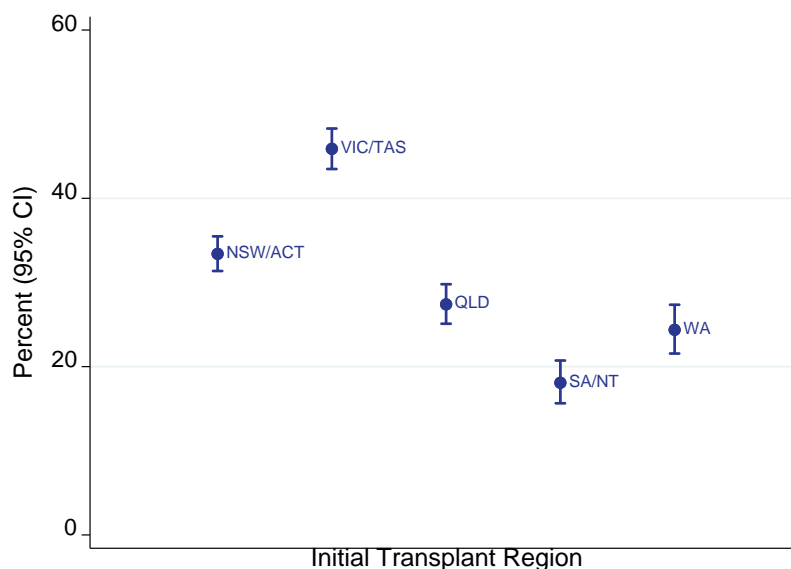


Figure 6.6 - Proportion of New KRT Patients Aged 18-60 who were Wait-listed and/or Transplanted within 1 year of Commencing KRT - By Transplant Region, Australia 2016-2020



Time to Wait-listing

Figures 6.7 and 6.8 show the time to wait-listing to receive a kidney transplant for patients who commenced KRT during 2016-2021. These analyses show the cumulative incidence of wait-listing for deceased donor transplantation, living donor transplantation and death. Each outcome is considered a competing risk for the other outcomes, and only the first event is considered.

Figure 6.7 - Time to Wait-listing - Australian Incident KRT Patients 2016-2021

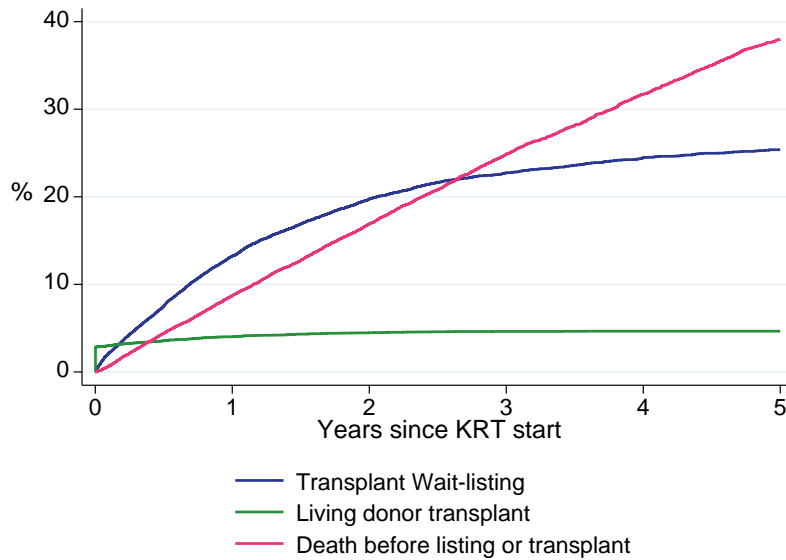
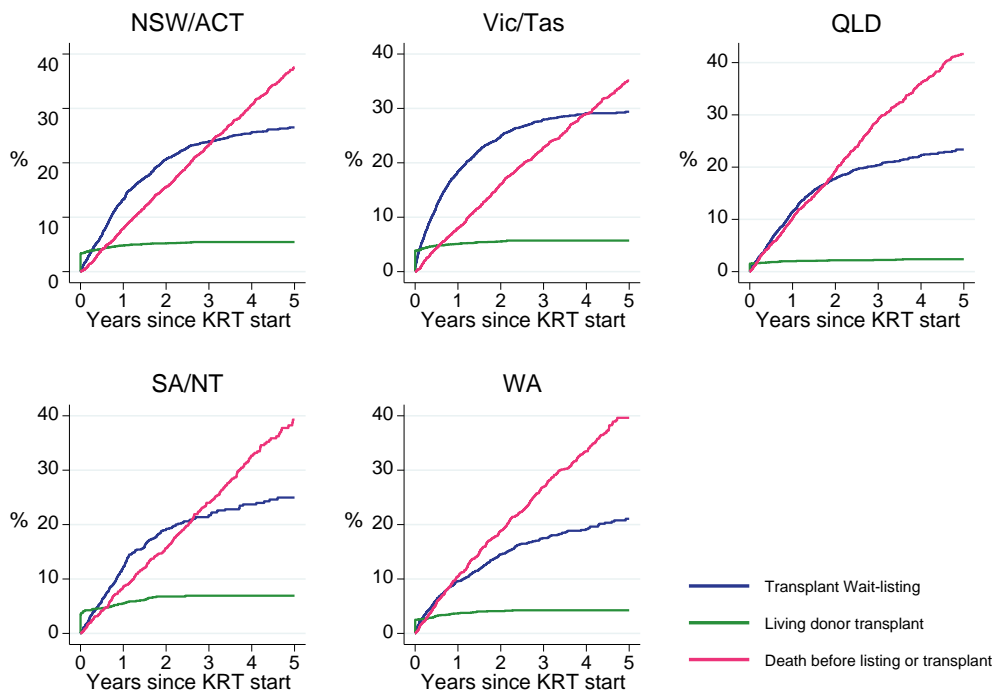


Figure 6.8 - Time to Wait-listing by Transplanting Region - Australian Incident KRT Patients 2016-2021



Waiting List Demographics

Table 6.6 shows the demographic characteristics of actively wait-listed patients over 2016-2021. Tables 6.7 and 6.8 show the waiting time by transplant region and blood group, respectively.

Table 6.6 Demographics of the Australian Kidney Transplant Waiting List 2016-2021

Factor	2016	2017	2018	2019	2020	2021
N	953	965	966	1122	1164	1335
Waiting time (years), median (IQR)	2.3 (1.4, 3.9)	2.2 (1.2, 3.6)	2.1 (1.2, 3.6)	2.1 (1.2, 3.6)	2.2 (1.3, 3.4)	2.3 (1.4, 3.6)
Blood Group						
A	242 (25.4%)	252 (26.1%)	227 (23.5%)	302 (26.9%)	323 (27.7%)	387 (29.0%)
AB	24 (2.5%)	27 (2.8%)	15 (1.6%)	18 (1.6%)	28 (2.4%)	24 (1.8%)
B	175 (18.4%)	188 (19.5%)	199 (20.6%)	224 (20.0%)	195 (16.8%)	244 (18.3%)
O	512 (53.7%)	498 (51.6%)	525 (54.3%)	578 (51.5%)	618 (53.1%)	680 (50.9%)
Previous grafts						
0	690 (72.4%)	723 (74.9%)	733 (75.9%)	859 (76.6%)	900 (77.3%)	1090 (81.6%)
1	215 (22.6%)	201 (20.8%)	196 (20.3%)	221 (19.7%)	229 (19.7%)	204 (15.3%)
2	42 (4.4%)	39 (4.0%)	35 (3.6%)	40 (3.6%)	33 (2.8%)	39 (2.9%)
3	6 (0.6%)	2 (0.2%)	2 (0.2%)	2 (0.2%)	2 (0.2%)	2 (0.1%)
Age (years)						
0-44	297 (31.2%)	300 (31.1%)	312 (32.3%)	356 (31.7%)	385 (33.1%)	374 (28.0%)
45-54	243 (25.5%)	237 (24.6%)	239 (24.7%)	274 (24.4%)	284 (24.4%)	347 (26.0%)
55-64	256 (26.9%)	261 (27.0%)	260 (26.9%)	305 (27.2%)	315 (27.1%)	383 (28.7%)
65+	157 (16.5%)	167 (17.3%)	155 (16.0%)	187 (16.7%)	180 (15.5%)	231 (17.3%)
Gender						
Male	595 (62.4%)	611 (63.3%)	585 (60.6%)	689 (61.4%)	725 (62.3%)	844 (63.2%)
Ethnicity						
First Nations	36 (3.8%)	35 (3.6%)	44 (4.6%)	62 (5.5%)	49 (4.2%)	74 (5.5%)
Non-Indigenous	881 (92.4%)	891 (92.3%)	874 (90.5%)	1024 (91.3%)	1085 (93.2%)	1234 (92.4%)
Not reported	36 (3.8%)	39 (4.0%)	48 (5.0%)	36 (3.2%)	30 (2.6%)	27 (2.0%)
Primary kidney disease						
Diabetic Kidney Disease	129 (13.5%)	138 (14.3%)	159 (16.5%)	187 (16.7%)	167 (14.3%)	202 (15.1%)
Glomerular Disease	412 (43.2%)	403 (41.8%)	381 (39.4%)	421 (37.5%)	454 (39.0%)	506 (37.9%)
Hypertension	73 (7.7%)	74 (7.7%)	80 (8.3%)	108 (9.6%)	90 (7.7%)	101 (7.6%)
Polycystic Disease	110 (11.5%)	116 (12.0%)	121 (12.5%)	140 (12.5%)	149 (12.8%)	167 (12.5%)
Reflux Nephropathy	69 (7.2%)	66 (6.8%)	70 (7.2%)	74 (6.6%)	84 (7.2%)	81 (6.1%)
Other	122 (12.8%)	119 (12.3%)	108 (11.2%)	133 (11.9%)	151 (13.0%)	190 (14.2%)
Uncertain	31 (3.3%)	33 (3.4%)	39 (4.0%)	44 (3.9%)	56 (4.8%)	68 (5.1%)
Not reported	7 (0.7%)	16 (1.7%)	8 (0.8%)	15 (1.3%)	13 (1.1%)	20 (1.5%)
Comorbidities						
Diabetes	226 (23.8%)	217 (22.6%)	233 (24.1%)	304 (27.3%)	282 (24.3%)	328 (24.7%)
Coronary artery disease	194 (20.5%)	182 (18.9%)	182 (18.8%)	232 (20.9%)	207 (17.9%)	254 (19.1%)
Peripheral vascular disease	97 (10.2%)	95 (9.9%)	92 (9.5%)	109 (9.8%)	95 (8.2%)	102 (7.7%)
Cerebrovascular disease	56 (5.9%)	55 (5.7%)	55 (5.7%)	54 (4.9%)	71 (6.1%)	72 (5.4%)
Chronic lung disease	101 (10.7%)	92 (9.6%)	92 (9.5%)	90 (8.1%)	87 (7.5%)	109 (8.2%)

Table 6.7 Waiting time (years), median (IQR) of the Australian Kidney Transplant Waiting List by Transplant Region 2016-2021

Transplant Region	2016	2017	2018	2019	2020	2021
NSW/ACT	2.5 (1.6, 4.0)	2.3 (1.3, 3.4)	2.2 (1.4, 3.5)	2.3 (1.4, 3.7)	2.4 (1.5, 3.5)	2.7 (1.7, 3.7)
VIC/TAS	2.2 (1.2, 3.6)	1.9 (1.2, 3.3)	2.0 (1.1, 3.8)	1.9 (1.0, 3.4)	2.0 (1.2, 3.4)	2.0 (1.2, 3.3)
QLD	2.6 (1.3, 5.0)	2.2 (1.1, 4.8)	1.5 (0.9, 3.3)	1.8 (1.0, 3.3)	1.8 (1.1, 2.7)	2.2 (1.3, 3.2)
SA/NT	2.1 (1.3, 3.4)	1.6 (1.0, 3.1)	2.3 (1.2, 3.2)	2.2 (1.4, 3.4)	2.9 (1.9, 4.2)	2.7 (1.6, 4.1)
WA	2.7 (1.1, 4.4)	4.6 (2.8, 7.4)	4.5 (2.1, 6.8)	2.5 (1.1, 5.9)	2.4 (1.4, 3.9)	1.8 (1.0, 3.2)

Table 6.8 Waiting time (years), median (IQR) of the Australian Kidney Transplant Waiting List by Blood Group 2016-2021

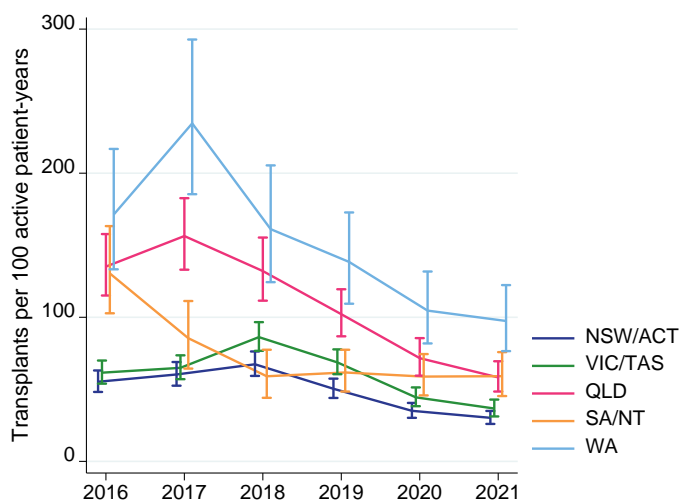
Blood Group	2016	2017	2018	2019	2020	2021
A	2.0 (1.2, 3.8)	1.8 (1.1, 2.9)	1.6 (0.9, 3.4)	1.6 (0.9, 3.0)	1.9 (1.1, 2.8)	2.1 (1.3, 3.2)
AB	1.6 (0.7, 5.6)	1.4 (0.8, 2.3)	1.4 (0.6, 3.5)	3.6 (1.7, 4.9)	1.9 (0.7, 4.9)	1.5 (1.0, 4.0)
B	2.7 (1.7, 3.9)	2.5 (1.2, 3.8)	2.4 (1.3, 4.0)	2.5 (1.5, 3.9)	2.7 (1.4, 4.0)	2.4 (1.5, 4.0)
O	2.4 (1.4, 4.0)	2.3 (1.3, 3.7)	2.2 (1.2, 3.6)	2.1 (1.2, 3.5)	2.3 (1.4, 3.4)	2.5 (1.5, 3.7)

Transplant Rate

The transplant rate represents the likelihood of receiving a kidney transplant in patients who are actively wait-listed. For these analyses the transplant rate was calculated as the number of deceased donor kidney-only transplants performed (numerator) per 100 patient-years on the active kidney-only waiting list (denominator). The transplant rate depends on the number of organs available, the number of patients on the waiting list, and the kidney allocation system. Figures 6.9-6.12 show the transplant rate by state, age, ethnicity and blood group respectively.

Figure 6.9 shows the transplant rate by transplanting region.

Figure 6.9 - Deceased Donor Transplant Rate by Transplanting Region - Per 100 Active Patient-Years



Transplant rate by age group is shown in Figure 6.10, for people of Aboriginal and Torres Strait Islander ethnicity compared with other ethnicities in Figure 6.11, and by blood group in Figure 6.12.

Figure 6.10 - Deceased Donor Transplant Rate by Age - Per 100 Active Patient-Years

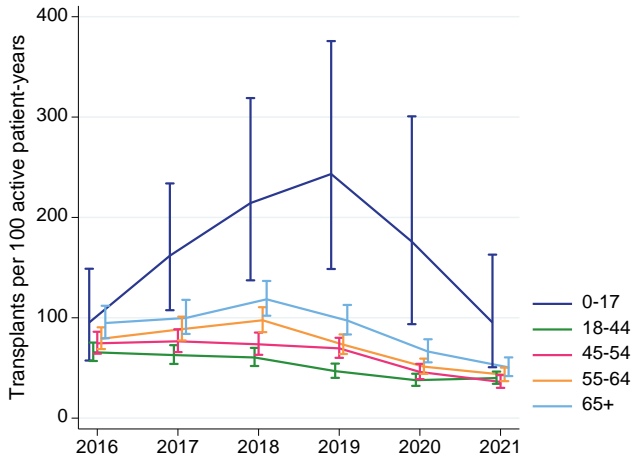


Figure 6.11 - Deceased Donor Transplant Rate by Ethnicity - Per 100 Active Patient-Years

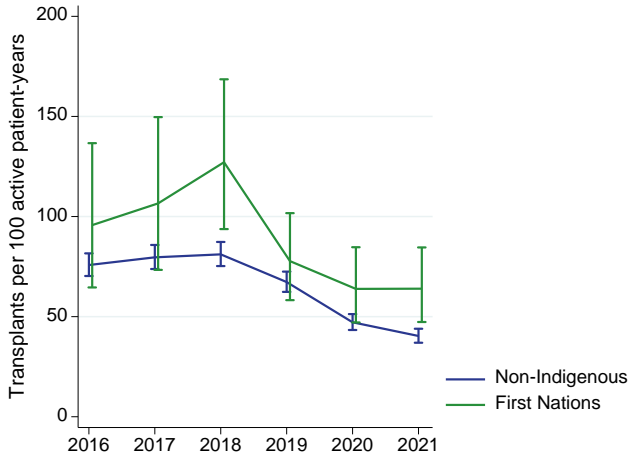
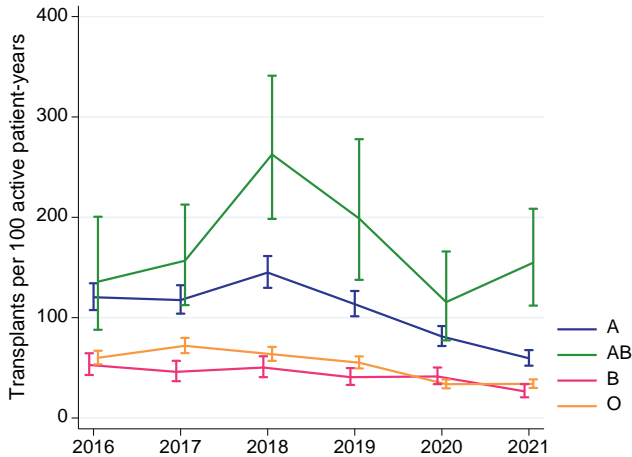


Figure 6.12 - Deceased Donor Transplant Rate by Blood Group - Per 100 Active Patient-Years



Outcomes of Wait-listing

Figures 6.13-6.17 show the outcomes of patients who commenced dialysis during 2016-2021 and were subsequently wait-listed for a kidney transplant. These analyses show the cumulative incidence of deceased donor transplantation, living donor transplantation or death. Each outcome is considered a competing risk for the other outcomes, and only the first event is considered.

Figure 6.13 - Outcomes after Wait-listing - Australian Incident Dialysis Patients 2016-2021

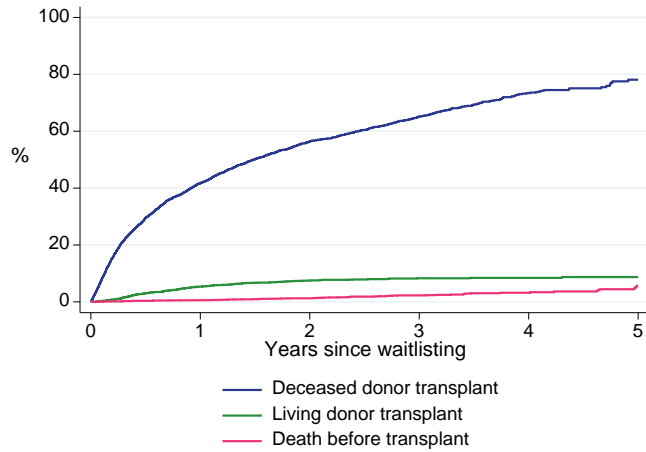


Figure 6.14 - Outcomes after Wait-listing by Transplanting Region - Australian Incident Dialysis Patients 2016-2021

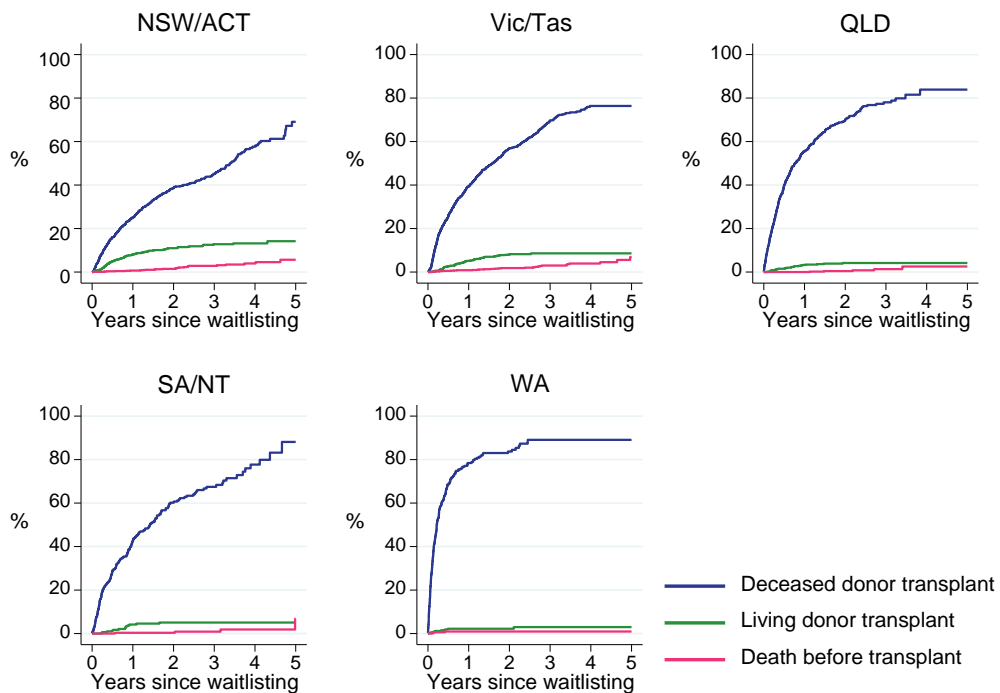


Figure 6.15 - Outcomes after Wait-listing by Blood Group - Australian Incident Dialysis Patients 2016-2021

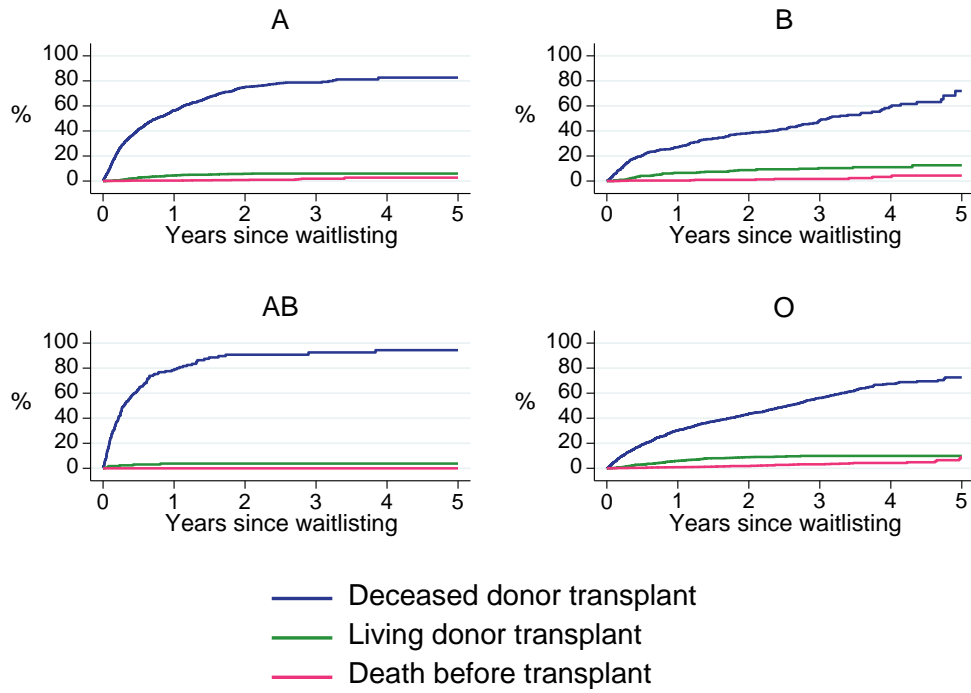


Figure 6.16 - Outcomes after Wait-listing by Age Group - Australian Incident Dialysis Patients 2016-2021

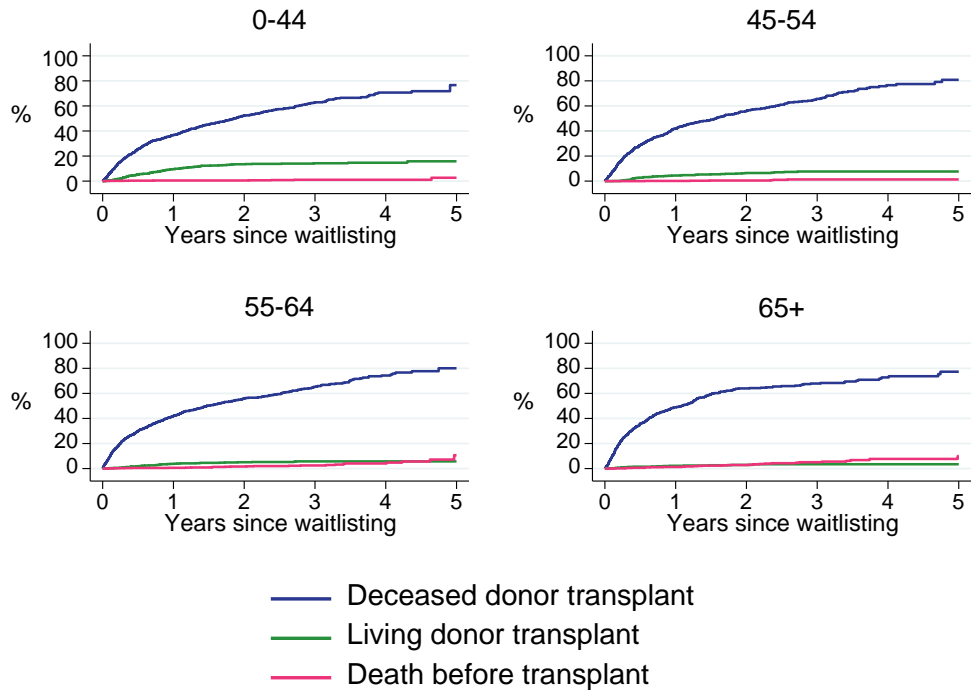
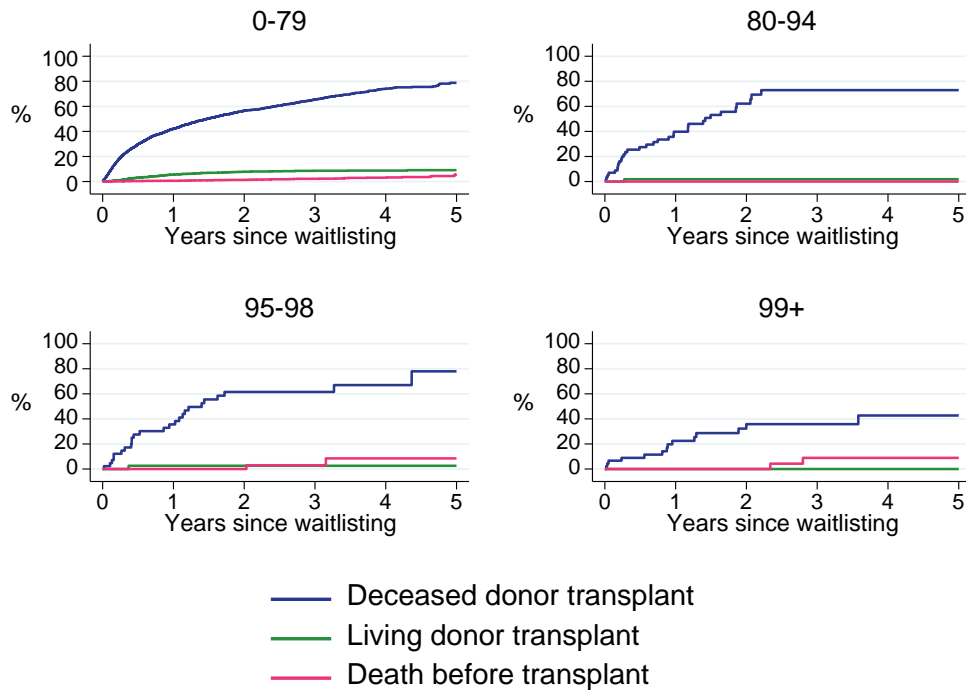


Figure 6.17 - Outcomes after Wait-listing by PRA Category - Australian Incident Dialysis Patients 2016-2021



Survival after Wait-listing

Figure 6.18 shows the survival of patients who commenced dialysis in Australia over 2016-2021 and were subsequently wait-listed for a deceased donor kidney-only transplant. Survival is shown from the time of listing and is censored at transplantation (but not at removal from the list). Survival at 1- and 3-year was 99.2% and 94.4% respectively and the mortality rate was 1.7 deaths per 100 patient-years (95% CI 1.3-2.1). Figure 6.19 shows the same data by age group.

Figure 6.18 - Survival after Wait-listing - Australian Incident Dialysis Patients 2016-2021 Censored at Transplantation



Figure 6.19 - Survival after Wait-listing by Age Group - Australian Incident Dialysis Patients 2016-2021 Censored at Transplantation

