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.

Contents

Suggested Citation

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 numbers of people moving on and off the active waiting list are 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. The recent increase in deceased organ donor numbers has been matched by an increase in the number of patients being listed, such that overall numbers on the waiting list are stable. Living 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 2014-2019

Event	2014	2015	2016	2017	2018	2019
Active start of year	**1076**	**1145**	**1071**	**953**	**965**	**966**
Made active	854	767	823	963	998	1080
Taken off list	148	156	135	144	146	120
DD graft	572	633	759	751	811	788
LD graft	56	42	37	45	34	33
Overseas graft	0	2	1	1	0	0
Died on list	9	8	9	10	6	5
Active end of year	**1145**	**1071**	**953**	**965**	**966**	**1100**

Table 6.2 shows data for non-Indigenous and Indigenous patients respectively.

Table 6.2 Australian Kidney Transplant Waiting List Dynamics by Ethnicity 2014-2019

Ethnicity	Event	2014	2015	2016	2017	2018	2019
Non-Indigenous	Active start of year	971	1040	957	851	882	869
	Made active	764	668	738	884	876	951
	Taken off list	129	135	122	124	134	103
	DD graft	503	566	680	675	718	691
	LD graft	54	40	32	43	32	30
	Overseas graft	0	2	1	1	0	0
	Died on list	9	8	9	10	5	5
	Active end of year	1040	957	851	882	869	991
Indigenous	Active start of year	36	32	31	33	31	44
	Made active	43	40	40	39	67	77
	Taken off list	11	10	7	9	8	9
	DD graft	36	31	30	32	45	53
	LD graft	0	0	1	0	0	1
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	1	0
	Active end of year	32	31	33	31	44	58
Not reported	Active start of year	69	73	83	69	52	53
	Made active	47	59	45	40	55	52
	Taken off list	8	11	6	11	4	8
	DD graft	33	36	49	44	48	44
	LD graft	2	2	4	2	2	2
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	0	0
	Active end of year	73	83	69	52	53	51

The numbers of both dialysis patients and transplants vary with age; in table 6.3 the waiting list dynamics for the years 2014-2019 is shown by broad age groups.

Table 6.3 Australian Kidney Transplant Waiting List Dynamics by Age 2014-2019

Age	Event	2014	2015	2016	2017	2018	2019
0-17	Active start of year	11	10	16	23	17	20
	Made active	15	16	27	27	32	22
	Taken off list	2	0	1	3	2	0
	DD graft	12	10	17	28	26	21
	LD graft	2	0	1	2	1	3
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	1	0	0	0
	Active end of year	10	16	23	17	20	18
18-44	Active start of year	281	303	318	274	295	332
	Made active	206	214	215	258	296	339
	Taken off list	40	30	42	27	36	35
	DD graft	119	155	199	186	197	220
	LD graft	25	13	17	21	23	18
	Overseas graft	0	1	0	1	0	0
	Died on list	0	0	1	2	3	2
	Active end of year	303	318	274	295	332	396
45-54	Active start of year	260	275	250	244	252	250
	Made active	190	164	206	246	238	282
	Taken off list	35	44	23	35	37	27
	DD graft	127	135	180	188	201	203
	LD graft	11	7	7	12	2	5
	Overseas graft	0	1	0	0	0	0
	Died on list	2	2	2	3	0	2
	Active end of year	275	250	244	252	250	295
55-64	Active start of year	297	326	301	255	253	258
	Made active	251	233	222	280	298	296
	Taken off list	39	40	44	49	44	34
	DD graft	172	204	216	223	241	226
	LD graft	9	10	6	7	6	6
	Overseas graft	0	0	1	0	0	0
	Died on list	2	4	1	3	2	0
	Active end of year	326	301	255	253	258	288
65+	Active start of year	227	231	186	157	148	106
	Made active	192	140	153	152	134	141
	Taken off list	32	42	25	30	27	24
	DD graft	142	129	147	126	146	118
	LD graft	9	12	6	3	2	1
	Overseas graft	0	0	0	0	0	0
	Died on list	5	2	4	2	1	1
	Active end of year	231	186	157	148	106	103

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 State 2014-2019

State	Event	2014	2015	2016	2017	2018	2019
NSW/ACT	Active start of year	478	511	444	361	378	370
	Made active	293	240	227	329	316	377
	Taken off list	70	70	66	64	52	51
	DD graft	151	207	219	215	251	226
	LD graft	36	23	21	29	17	21
	Overseas graft	0	2	0	1	0	0
	Died on list	3	5	4	3	4	2
	Active end of year	511	444	361	378	370	447
VIC/TAS	Active start of year	383	393	382	385	366	319
	Made active	278	254	295	299	322	329
	Taken off list	55	52	39	57	62	41
	DD graft	192	200	234	244	297	253
	LD graft	16	11	14	11	10	10
	Overseas graft	0	0	1	0	0	0
	Died on list	5	2	4	6	0	1
	Active end of year	393	382	385	366	319	343
QLD	Active start of year	112	117	126	104	107	134
	Made active	130	133	155	178	194	183
	Taken off list	10	20	16	14	18	15
	DD graft	114	99	161	159	146	157
	LD graft	1	5	0	2	3	0
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	0	2
	Active end of year	117	126	104	107	134	143
SA/NT	Active start of year	64	65	75	62	82	99
	Made active	80	91	75	85	85	94
	Taken off list	10	8	10	7	11	12
	DD graft	66	69	76	55	52	74
	LD graft	2	3	2	2	4	2
	Overseas graft	0	0	0	0	0	0
	Died on list	1	1	0	1	1	0
	Active end of year	65	75	62	82	99	105
WA	Active start of year	39	59	44	41	32	44
	Made active	73	49	71	72	81	97
	Taken off list	3	6	4	2	3	1
	DD graft	49	58	69	78	65	78
	LD graft	1	0	0	1	0	0
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	1	0	1	0
	Active end of year	59	44	41	32	44	62

Table 6.5 shows the same data by blood group. Turnover is highest for blood group AB patients.

Table 6.5 Australian Kidney Transplant Waiting List Dynamics by Blood group 2014-2019

Blood group	Event	2014	2015	2016	2017	2018	2019
A	Active start of year	326	329	312	242	252	227
	Made active	311	301	301	328	348	419
	Taken off list	56	40	29	36	31	17
	DD graft	224	255	322	273	331	321
	LD graft	25	19	18	8	8	12
	Overseas graft	0	1	0	1	0	0
	Died on list	3	3	2	0	3	0
	Active end of year	329	312	242	252	227	296
AB	Active start of year	21	24	17	24	27	15
	Made active	37	37	32	46	47	39
	Taken off list	2	2	0	2	1	0
	DD graft	32	41	25	41	56	34
	LD graft	0	1	0	0	2	1
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	0	0
	Active end of year	24	17	24	27	15	19
B	Active start of year	178	210	187	175	188	199
	Made active	128	97	117	144	148	150
	Taken off list	19	32	23	34	36	26
	DD graft	66	83	97	84	95	96
	LD graft	10	3	7	10	5	7
	Overseas graft	0	0	0	0	0	0
	Died on list	1	2	2	3	1	1
	Active end of year	210	187	175	188	199	219
O	Active start of year	551	582	555	512	498	525
	Made active	378	332	373	445	455	472
	Taken off list	71	82	83	72	78	77
	DD graft	250	254	315	353	329	337
	LD graft	21	19	12	27	19	13
	Overseas graft	0	1	1	0	0	0
	Died on list	5	3	5	7	2	4
	Active end of year	582	555	512	498	525	566

Proportion of Patients Transplanted or on Waiting List

Figure 6.1 shows the proportion of prevalent renal replacement therapy patients who were either transplanted or actively wait-listed at the end of 2019, by state and age group. In all states and all age groups, the majority of dialysis patients were not actively wait-listed at the end of 2019. Younger patients were more likely to be transplanted or wait-listed, and the proportion of dialysis patients wait-listed varied substantially by state.

Figure 6.1 - Proportion of Patients Transplanted or on Waiting List - By State or Territory and Age, Dec 2019
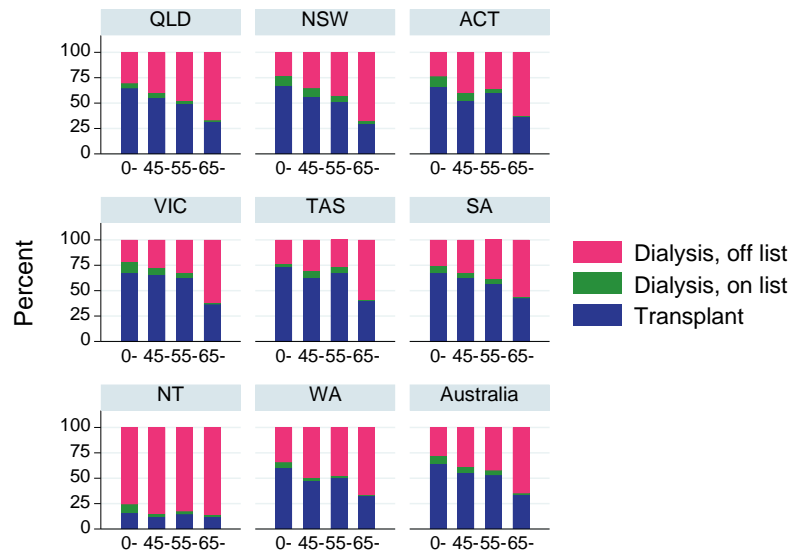
Figure 6.2 shows differences in access to the waiting list or transplantation for incident patients, by treating hospital. This analysis is restricted to patients aged 18-60 who commenced renal replacement therapy in Australia over 2014-2018, and shows the proportion of these patients who had either been made active on the kidney transplant waiting list or received a kidney transplant within one year of starting RRT. The proportions varied from 0% to 100% suggesting substantial differences in practice between treating hospitals.

Figure 6.2 - Proportion of new RRT patients aged 18-60 who were wait- listed and/or transplanted within 1 year of commencing RRT - Australia 2014-2018
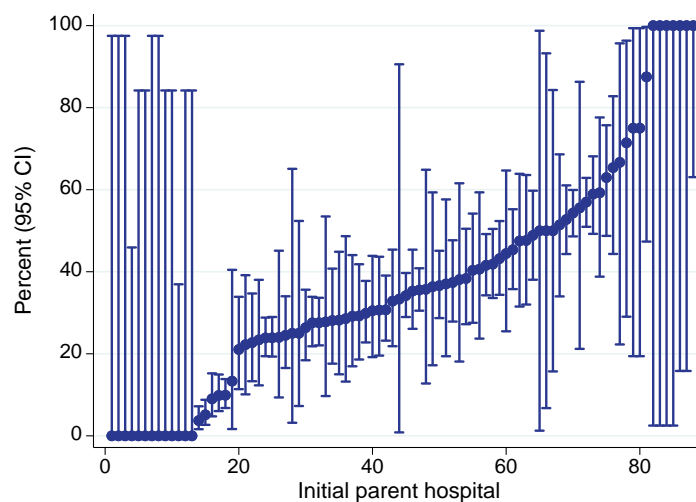
Waiting List Demographics

Table 6.6 shows the demographic characteristics of patients who were active of the deceased donor kidney transplant waiting list on 31st December each year, 2014-2019.

Table 6.6 Demographics of the Australian Kidney Transplant Waiting List 2014-2019

Factor	2014	2015	2016	2017	2018	2019
N	1145	1071	953	965	966	1100
Waiting time (years), median (IQR)	2.6 (1.4, 4.4)	2.4 (1.3, 4.1)	2.3 (1.4, 3.9)	2.2 (1.2, 3.6)	2.1 (1.2, 3.6)	2.1 (1.2, 3.6)
Blood group						
A	329 (28.7%)	312 (29.1%)	242 (25.4%)	252 (26.1%)	227 (23.5%)	297 (27.0%)
AB	24 (2.1%)	17 (1.6%)	24 (2.5%)	27 (2.8%)	15 (1.6%)	19 (1.7%)
B	210 (18.3%)	187 (17.5%)	175 (18.4%)	188 (19.5%)	199 (20.6%)	220 (20.0%)
O	582 (50.8%)	555 (51.8%)	512 (53.7%)	498 (51.6%)	525 (54.3%)	564 (51.3%)
Previous grafts						
0	839 (73.3%)	773 (72.2%)	690 (72.4%)	723 (74.9%)	733 (75.9%)	839 (76.3%)
1	253 (22.1%)	242 (22.6%)	215 (22.6%)	201 (20.8%)	196 (20.3%)	220 (20.0%)
2	46 (4.0%)	50 (4.7%)	42 (4.4%)	39 (4.0%)	35 (3.6%)	40 (3.6%)
3	7 (0.6%)	6 (0.6%)	6 (0.6%)	2 (0.2%)	2 (0.2%)	1 (0.1%)
Age (years)						
0-44	357 (31.2%)	360 (33.6%)	297 (31.2%)	300 (31.1%)	312 (32.3%)	353 (32.1%)
45-54	305 (26.6%)	261 (24.4%)	244 (25.6%)	237 (24.6%)	240 (24.8%)	266 (24.2%)
55-64	308 (26.9%)	292 (27.3%)	255 (26.8%)	261 (27.0%)	259 (26.8%)	298 (27.1%)
65+	175 (15.3%)	158 (14.8%)	157 (16.5%)	167 (17.3%)	155 (16.0%)	183 (16.6%)
Gender						
Male	712 (62.2%)	662 (61.8%)	595 (62.4%)	612 (63.4%)	585 (60.6%)	676 (61.5%)
Ethnicity*						
Caucasian	708 (61.8%)	644 (60.1%)	539 (56.6%)	568 (58.9%)	521 (53.9%)	601 (54.6%)
Aboriginal/Torres Strait Islander	32 (2.8%)	31 (2.9%)	33 (3.5%)	31 (3.2%)	44 (4.6%)	58 (5.3%)
Asian	241 (21.0%)	216 (20.2%)	228 (23.9%)	207 (21.5%)	234 (24.2%)	263 (23.9%)
Māori	10 (0.9%)	8 (0.7%)	8 (0.8%)	9 (0.9%)	10 (1.0%)	13 (1.2%)
Pacific	35 (3.1%)	37 (3.5%)	33 (3.5%)	34 (3.5%)	36 (3.7%)	37 (3.4%)
Other	46 (4.0%)	52 (4.9%)	43 (4.5%)	56 (5.8%)	57 (5.9%)	65 (5.9%)
Not reported	73 (6.4%)	83 (7.7%)	69 (7.2%)	60 (6.2%)	64 (6.6%)	63 (5.7%)
Primary renal disease						
Diabetic Nephropathy	148 (12.9%)	139 (13.0%)	129 (13.5%)	138 (14.3%)	158 (16.4%)	186 (16.9%)
Glomerulonephritis	485 (42.4%)	450 (42.0%)	411 (43.1%)	400 (41.5%)	375 (38.8%)	408 (37.1%)
Hypertension	81 (7.1%)	73 (6.8%)	73 (7.7%)	73 (7.6%)	80 (8.3%)	108 (9.8%)
Polycystic Disease	142 (12.4%)	137 (12.8%)	110 (11.5%)	116 (12.0%)	121 (12.5%)	136 (12.4%)
Reflux Nephropathy	93 (8.1%)	83 (7.7%)	69 (7.2%)	66 (6.8%)	69 (7.1%)	72 (6.5%)
Other	148 (12.9%)	147 (13.7%)	122 (12.8%)	120 (12.4%)	114 (11.8%)	133 (12.1%)
Uncertain	47 (4.1%)	38 (3.5%)	31 (3.3%)	35 (3.6%)	40 (4.1%)	43 (3.9%)
Not reported	1 (0.1%)	4 (0.4%)	8 (0.8%)	17 (1.8%)	9 (0.9%)	14 (1.3%)
Comorbidities						
Diabetes	240 (21.0%)	237 (22.2%)	226 (23.8%)	217 (22.6%)	233 (24.1%)	297 (27.2%)
Coronary artery disease	211 (18.5%)	172 (16.1%)	194 (20.5%)	182 (18.9%)	182 (18.8%)	229 (21.0%)
Peripheral vascular disease	128 (11.2%)	97 (9.1%)	97 (10.2%)	95 (9.9%)	92 (9.5%)	107 (9.8%)
Cerebrovascular disease	77 (6.7%)	61 (5.7%)	56 (5.9%)	55 (5.7%)	55 (5.7%)	54 (4.9%)
Chronic lung disease	109 (9.6%)	96 (9.0%)	101 (10.7%)	92 (9.6%)	92 (9.5%)	87 (8.0%)

Transplant Rate

The transplant rate represents the likelihood of receiving a kidney transplant in patients who are active on the waiting list. 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 6.3-6.6 show the transplant rate by state, age, ethnicity and blood group respectively.

Figure 6.3 - Deceased Donor Transplant Rate by Transplanting Region - Per 100 Active Patient-Years
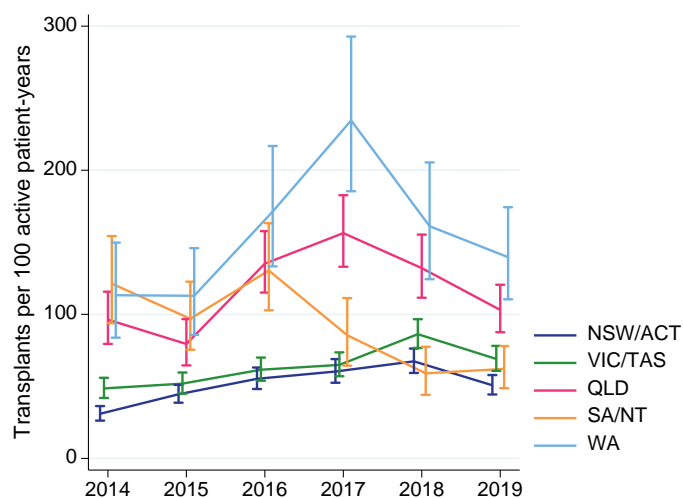
Paediatric patients are preferentially allocated kidneys and so have historically had a higher transplant rate than adult patients. Since the allocation system otherwise ignores age, patients in other age groups have similar transplant rates (figure 6.4) and differences are likely to represent differences in acceptance of kidney offers. Indigenous patients are more likely to be listed in states with a higher overall transplant rate which may explain the higher transplant rate for this population compared to non-indigenous patients (figure 6.5).

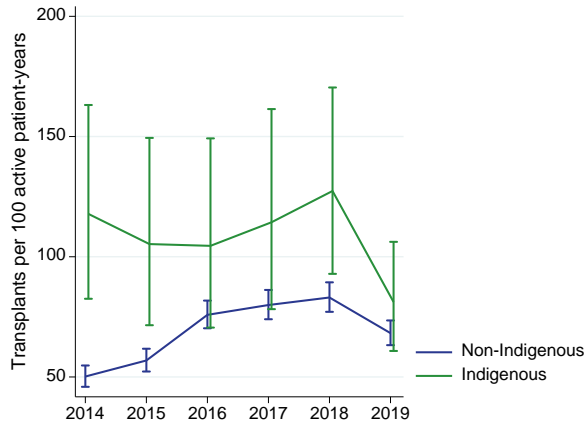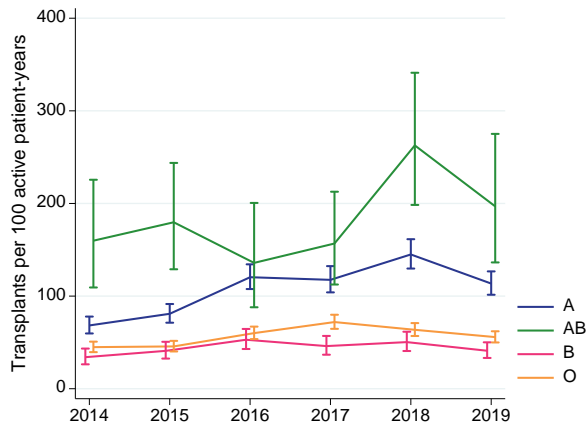*Figure 6.4 - Deceased Donor Transplant Rate by Age - Per 100 Active Patient-Years*
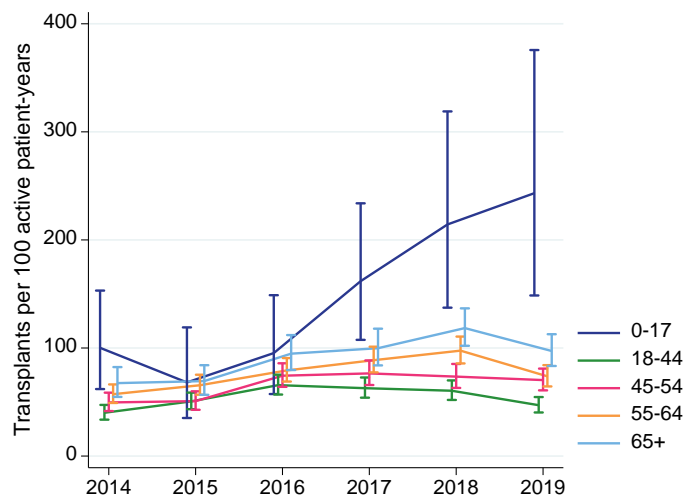
Figure 6.5 - Deceased Donor Transplant Rate by Ethnicity - Per 100 Active Patient-Years

Blood group AB patients have the highest transplant rate and blood group B the lowest (Figure 6.6).

Figure 6.6 - Deceased Donor Transplant Rate by Blood Group - Per 100 Active Patient-Years

Outcomes after Waitlisting

Figures 6.7-6.9 show the outcomes of patients who commenced dialysis during 2014-2019 and were subsequently wait-listed for a kidney transplant. These analyses show the cumulative incidence of deceased donor transplantation, living donor transplantation or death from the time of first active wait listing. Each outcome is considered a competing risk for the other outcomes, and only the first event is considered.

Overall, patients were much more likely to undergo deceased donor transplantation than to receive a living donor transplant or to die (figure 6.7). There were important differences between states, with longer times to deceased donor transplantation in NSW/ACT and Victoria compared with the other states, and correspondingly higher rates of living donor transplantation (especially in NSW/ACT) (figure 6.8). Note that these analyses only consider time from waitlisting; differences in time from dialysis start to wait-listing may reduce some of these discrepancies. Figure 6.9 shows the same data by blood group; patients who were blood group AB or A received transplants more quickly than blood group B or O patients.

Figure 6.7 - Outcomes after wait-listing - Australian incident dialysis patients 2014-2019
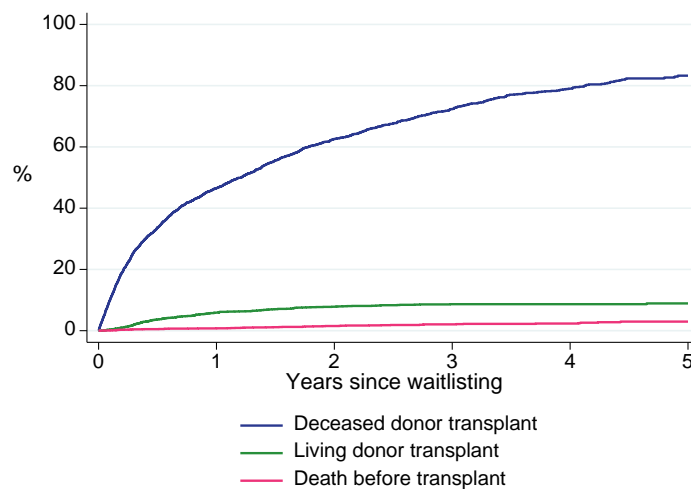

Figure 6.8 - Outcomes after wait-listing - Australian incident dialysis patients 2014-2019
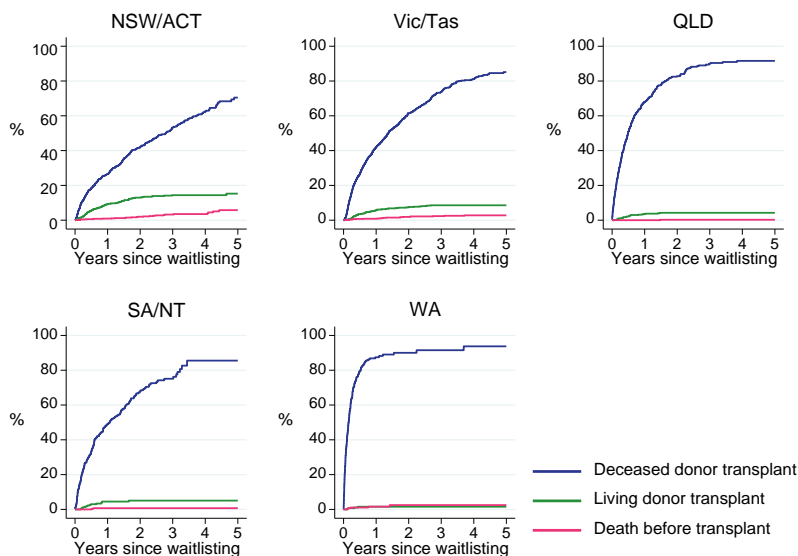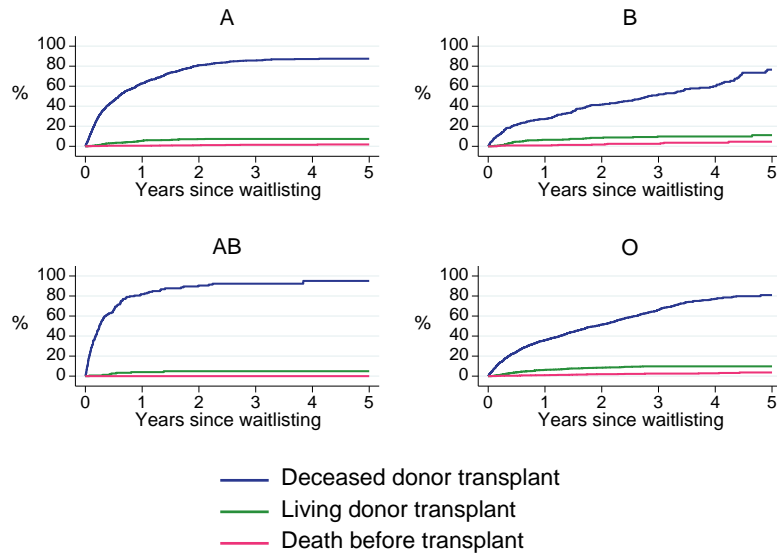
Figure 6.9 - Outcomes after wait-listing - Australian incident dialysis patients 2014-2019

Survival after Waitlisting

Figure 6.10 shows the survival of patients who commenced dialysis in Australia over 2014-2019 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 of this highly selected patient group was excellent with 1- and 3-year survival of 98.9% and 94.5% respectively. The mortality rate was correspondingly low at 1.7 deaths per 100 patient-years (95% CI 1.3-2.2).

Figure 6.10 - Survival after wait-listing - Australian incident dialysis patients 2014-2019 Censored at transplantation
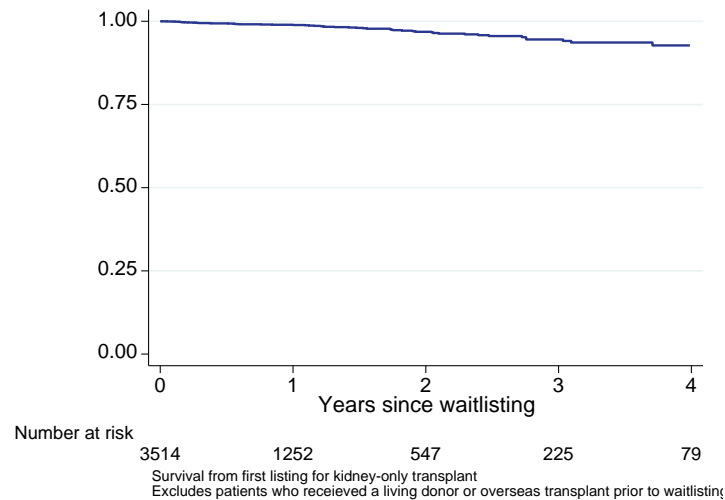
References:

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