



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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Suggested citation

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Waiting List Dynamics

The waiting list data reported here are derived from the Australian National Organ Matching System (NOMS) and ANZDATA, and only relate to wait-listing for deceased donor (DD) kidney-only transplants. Patients wait-listed for multi-organ transplants are excluded. Recipients of living donor (LD) transplants may or may not be on the waiting list prior to transplantation.

To understand the relative contributions of deceased and living donor transplants to patients on (and off) the kidney-only waiting list, LD transplants to recipients not on the kidney-only waiting list are also included.

The numbers of people moving on and off the active waiting list for any reason are shown. Patients are categorised as either active or off the list - an "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.

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. 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 2012-2017

Event	2012	2013	2014	2015	2016	2017
Active start of year	1088	1078	1077	1145	1070	952
Made active	748	779	854	766	824	963
Taken off list	154	141	148	156	135	144
DD graft	552	581	573	633	760	751
LD graft	46	54	56	42	37	45
Overseas graft	0	1	0	2	1	1
Died on list	6	3	9	8	9	10
Active end of year	1078	1077	1145	1070	952	964

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

Table 6.2 Australian Kidney Transplant Waiting List Dynamics by Ethnicity 2012-2017

Ethnicity	Event	2012	2013	2014	2015	2016	2017
Non-Indigenous	Active start of year	1054	1042	1037	1103	1024	900
	Made active	717	739	801	708	765	894
	Taken off list	146	137	137	144	127	134
	DD graft	532	551	533	592	720	701
	LD graft	46	53	56	41	32	43
	Overseas graft	0	1	0	2	1	1
	Died on list	5	2	9	8	9	10
	Active end of year	1042	1037	1103	1024	900	905
Indigenous	Active start of year	33	34	36	32	31	32
	Made active	30	37	44	41	39	39
	Taken off list	8	4	11	10	7	8
	DD graft	20	29	37	32	30	32
	LD graft	0	1	0	0	1	0
	Overseas graft	0	0	0	0	0	0
	Died on list	1	1	0	0	0	0
	Active end of year	34	36	32	31	32	31
Not reported	Active start of year	1	2	4	10	15	20
	Made active	1	3	9	17	20	30
	Taken off list	0	0	0	2	1	2
	DD graft	0	1	3	9	10	18
	LD graft	0	0	0	1	4	2
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	0	0
	Active end of year	2	4	10	15	20	28

The numbers of both dialysis patients and transplants vary with age; in table 6.3 the waiting list dynamics for the years 2012-2017 is shown by broad age groups.

Table 6.3 Australian Kidney Transplant Waiting List Dynamics by Age 2012-2017

Age	Event	2012	2013	2014	2015	2016	2017
0-17	Active start of year	5	10	15	15	19	26
	Made active	17	24	24	18	32	31
	Taken off list	1	0	2	1	2	3
	DD graft	9	18	20	12	21	30
	LD graft	2	1	2	1	1	2
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	1	0
	Active end of year	10	15	15	19	26	22
18-44	Active start of year	282	280	321	342	363	315
	Made active	181	227	228	246	248	294
	Taken off list	26	31	45	34	46	32
	DD graft	134	133	136	177	231	219
	LD graft	20	21	26	13	18	24
	Overseas graft	0	0	0	1	0	1
	Died on list	3	1	0	0	1	3
	Active end of year	280	321	342	363	315	330
45-54	Active start of year	270	262	277	305	266	244
	Made active	183	187	209	172	208	248
	Taken off list	31	25	37	48	28	40
	DD graft	148	134	132	151	192	193
	LD graft	12	13	10	8	8	10
	Overseas graft	0	0	0	1	0	0
	Died on list	0	0	2	3	2	3
	Active end of year	262	277	305	266	244	246
55-64	Active start of year	330	327	300	309	291	260
	Made active	217	208	246	232	227	293
	Taken off list	58	42	41	39	39	51
	DD graft	152	178	181	197	208	222
	LD graft	7	13	10	11	7	7
	Overseas graft	0	1	0	0	1	0
	Died on list	3	1	5	3	3	3
	Active end of year	327	300	309	291	260	270
65+	Active start of year	201	199	164	174	131	107
	Made active	150	133	147	98	109	97
	Taken off list	38	43	23	34	20	18
	DD graft	109	118	104	96	108	87
	LD graft	5	6	8	9	3	2
	Overseas graft	0	0	0	0	0	0
	Died on list	0	1	2	2	2	1
	Active end of year	199	164	174	131	107	96

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 2012-2017

State	Event	2012	2013	2014	2015	2016	2017
NSW/ACT	Active start of year	518	534	478	511	444	361
	Made active	269	227	293	240	228	329
	Taken off list	81	75	70	70	66	64
	DD graft	142	167	151	207	220	215
	LD graft	28	38	36	23	21	29
	Overseas graft	0	0	0	2	0	1
	Died on list	2	3	3	5	4	3
	Active end of year	534	478	511	444	361	378
VIC/TAS	Active start of year	323	340	383	393	382	385
	Made active	247	268	278	254	295	299
	Taken off list	43	45	55	52	39	57
	DD graft	172	166	192	200	234	244
	LD graft	12	13	16	11	14	11
	Overseas graft	0	1	0	0	1	0
	Died on list	3	0	5	2	4	6
	Active end of year	340	383	393	382	385	366
QLD	Active start of year	127	106	112	117	125	103
	Made active	112	128	130	132	155	178
	Taken off list	12	14	10	20	16	14
	DD graft	120	108	114	99	161	159
	LD graft	1	0	1	5	0	2
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	0	0
	Active end of year	106	112	117	125	103	106
SA/NT	Active start of year	57	56	65	65	75	62
	Made active	77	82	80	91	75	85
	Taken off list	10	2	10	8	10	7
	DD graft	63	68	67	69	76	55
	LD graft	4	3	2	3	2	2
	Overseas graft	0	0	0	0	0	0
	Died on list	1	0	1	1	0	1
	Active end of year	56	65	65	75	62	82
WA	Active start of year	63	42	39	59	44	41
	Made active	43	74	73	49	71	72
	Taken off list	8	5	3	6	4	2
	DD graft	55	72	49	58	69	78
	LD graft	1	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	42	39	59	44	41	32

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 2012-2017

Blood Group	Event	2012	2013	2014	2015	2016	2017
A	Active start of year	295	310	327	329	312	242
	Made active	292	291	311	301	301	328
	Taken off list	44	39	56	40	29	36
	DD graft	219	212	225	255	322	273
	LD graft	11	20	25	19	18	8
	Overseas graft	0	0	0	1	0	1
	Died on list	3	3	3	3	2	0
	Active end of year	310	327	329	312	242	252
AB	Active start of year	23	20	21	24	16	23
	Made active	30	24	37	36	32	46
	Taken off list	2	3	2	2	0	2
	DD graft	27	20	32	41	25	41
	LD graft	4	0	0	1	0	0
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	0	0	0	0
	Active end of year	20	21	24	16	23	26
B	Active start of year	161	179	178	210	187	175
	Made active	111	102	128	97	118	144
	Taken off list	26	23	19	32	23	34
	DD graft	63	77	66	83	98	84
	LD graft	4	3	10	3	7	10
	Overseas graft	0	0	0	0	0	0
	Died on list	0	0	1	2	2	3
	Active end of year	179	178	210	187	175	188
O	Active start of year	609	569	551	582	555	512
	Made active	315	362	378	332	373	445
	Taken off list	82	76	71	82	83	72
	DD graft	243	272	250	254	315	353
	LD graft	27	31	21	19	12	27
	Overseas graft	0	1	0	1	1	0
	Died on list	3	0	5	3	5	7
	Active end of year	569	551	582	555	512	498

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 2017, 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 2017.

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 2017

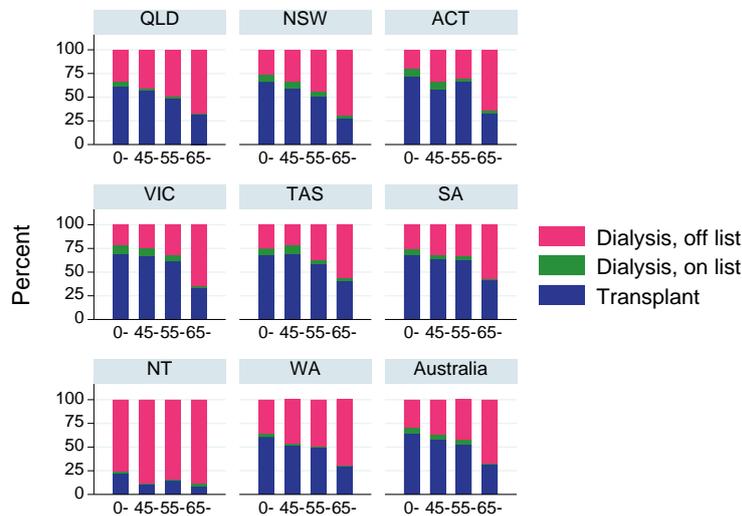
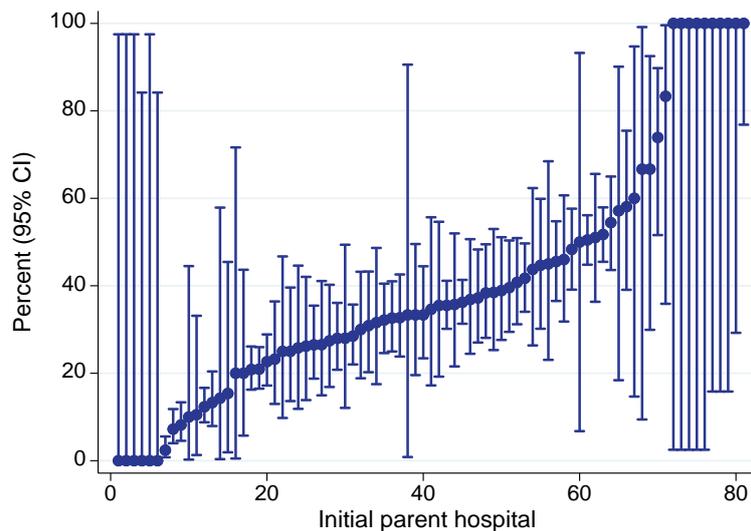


Figure 6.2 shows differences in access to the waiting list or transplantation, in incident patients, by treating hospital. This analysis is restricted to patients aged 18-60 who commenced renal replacement therapy in Australia over 2012-2016, and shows the proportion of these patients who had either 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 2012-2016



Waiting List Demographics

Table 6.6 shows the demographic characteristics of actively wait-listed patients over 2012-2017. In general, the demographics are very stable.

Table 6.6 Demographics of the Australian Kidney Transplant Waiting List 2012-2017

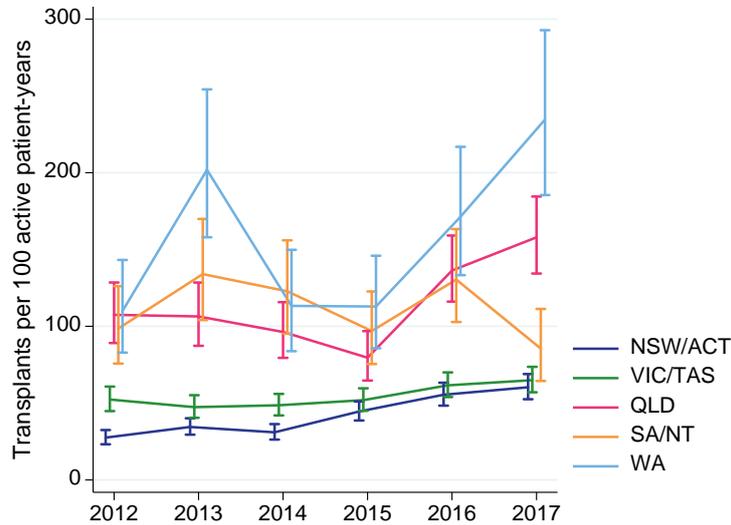
Factor	2012	2013	2014	2015	2016	2017
N	1078	1077	1145	1070	952	964
Waiting time (years), median (IQR)	2.8 (1.5, 4.5)	2.6 (1.4, 4.5)	2.6 (1.4, 4.4)	2.4 (1.3, 4.1)	2.3 (1.4, 3.9)	2.2 (1.2, 3.6)
Blood group						
A	310 (28.8%)	327 (30.4%)	329 (28.7%)	312 (29.2%)	242 (25.4%)	252 (26.1%)
AB	20 (1.9%)	21 (1.9%)	24 (2.1%)	16 (1.5%)	23 (2.4%)	26 (2.7%)
B	179 (16.6%)	178 (16.5%)	210 (18.3%)	187 (17.5%)	175 (18.4%)	188 (19.5%)
O	569 (52.8%)	551 (51.2%)	582 (50.8%)	555 (51.9%)	512 (53.8%)	498 (51.7%)
Previous grafts						
0	830 (77.0%)	804 (74.7%)	839 (73.3%)	772 (72.1%)	689 (72.4%)	722 (74.9%)
1	213 (19.8%)	233 (21.6%)	253 (22.1%)	242 (22.6%)	215 (22.6%)	201 (20.9%)
2	28 (2.6%)	33 (3.1%)	46 (4.0%)	50 (4.7%)	42 (4.4%)	39 (4.0%)
3	7 (0.6%)	7 (0.6%)	7 (0.6%)	6 (0.6%)	6 (0.6%)	2 (0.2%)
Age (years)						
0-44	347 (32.2%)	365 (33.9%)	357 (31.2%)	359 (33.6%)	296 (31.1%)	299 (31.0%)
45-54	282 (26.2%)	278 (25.8%)	305 (26.6%)	261 (24.4%)	244 (25.6%)	237 (24.6%)
55-64	304 (28.2%)	294 (27.3%)	309 (27.0%)	292 (27.3%)	255 (26.8%)	261 (27.1%)
65+	145 (13.5%)	140 (13.0%)	174 (15.2%)	158 (14.8%)	157 (16.5%)	167 (17.3%)
Gender						
Male	630 (58.4%)	656 (60.9%)	712 (62.2%)	662 (61.9%)	595 (62.5%)	612 (63.5%)
Ethnicity						
Caucasian	759 (70.4%)	757 (70.3%)	772 (67.4%)	711 (66.4%)	586 (61.6%)	591 (61.3%)
Aboriginal/Torres Strait Islander	34 (3.2%)	36 (3.3%)	32 (2.8%)	31 (2.9%)	32 (3.4%)	31 (3.2%)
Asian	205 (19.0%)	200 (18.6%)	238 (20.8%)	209 (19.5%)	217 (22.8%)	195 (20.2%)
Māori	14 (1.3%)	13 (1.2%)	10 (0.9%)	8 (0.7%)	8 (0.8%)	8 (0.8%)
Pacific	29 (2.7%)	32 (3.0%)	35 (3.1%)	34 (3.2%)	31 (3.3%)	32 (3.3%)
Other	35 (3.2%)	35 (3.2%)	48 (4.2%)	62 (5.8%)	58 (6.1%)	70 (7.3%)
Not reported	2 (0.2%)	4 (0.4%)	10 (0.9%)	15 (1.4%)	20 (2.1%)	37 (3.8%)
Primary renal disease						
Diabetic Nephropathy	131 (12.2%)	146 (13.6%)	147 (12.8%)	138 (12.9%)	127 (13.3%)	136 (14.1%)
Glomerulonephritis	475 (44.1%)	440 (40.9%)	489 (42.7%)	455 (42.5%)	421 (44.2%)	404 (41.9%)
Hypertension	89 (8.3%)	87 (8.1%)	81 (7.1%)	77 (7.2%)	75 (7.9%)	79 (8.2%)
Polycystic Disease	150 (13.9%)	142 (13.2%)	141 (12.3%)	135 (12.6%)	109 (11.4%)	115 (11.9%)
Reflux Nephropathy	79 (7.3%)	85 (7.9%)	93 (8.1%)	81 (7.6%)	67 (7.0%)	64 (6.6%)
Other	113 (10.5%)	135 (12.5%)	148 (12.9%)	144 (13.5%)	114 (12.0%)	106 (11.0%)
Uncertain	41 (3.8%)	41 (3.8%)	45 (3.9%)	35 (3.3%)	28 (2.9%)	34 (3.5%)
Not reported	0 (0.0%)	1 (0.1%)	1 (0.1%)	5 (0.5%)	11 (1.2%)	26 (2.7%)
Comorbidities						
Diabetes	205 (19.0%)	226 (21.0%)	229 (20.1%)	228 (21.4%)	222 (23.5%)	213 (22.4%)
Coronary artery disease	199 (18.5%)	201 (18.7%)	182 (15.9%)	152 (14.2%)	161 (17.0%)	158 (16.6%)
Peripheral vascular disease	98 (9.1%)	110 (10.2%)	107 (9.4%)	86 (8.1%)	78 (8.2%)	79 (8.3%)
Cerebrovascular disease	65 (6.0%)	55 (5.1%)	63 (5.5%)	53 (5.0%)	49 (5.2%)	51 (5.4%)
Chronic lung disease	92 (8.5%)	97 (9.0%)	98 (8.6%)	88 (8.2%)	90 (9.5%)	86 (9.0%)

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 6.3-6.6 show the transplant rate by state, age, ethnicity and blood group respectively.

The transplant rate is typically highest in WA (figure 6.3).

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. This gap has narrowed in recent years, which is likely to represent a change in acceptance practices in favour of waiting for well-matched grafts for paediatric patients, along with a rise in the overall transplant rate due to increased donor numbers. Since the allocation system otherwise ignores age, patients in other age groups have similar transplant rates (figure 6.4). Indigenous patients are more likely to be listed in states with a higher donor rate, and thus have a higher transplant rate (figure 6.5).

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

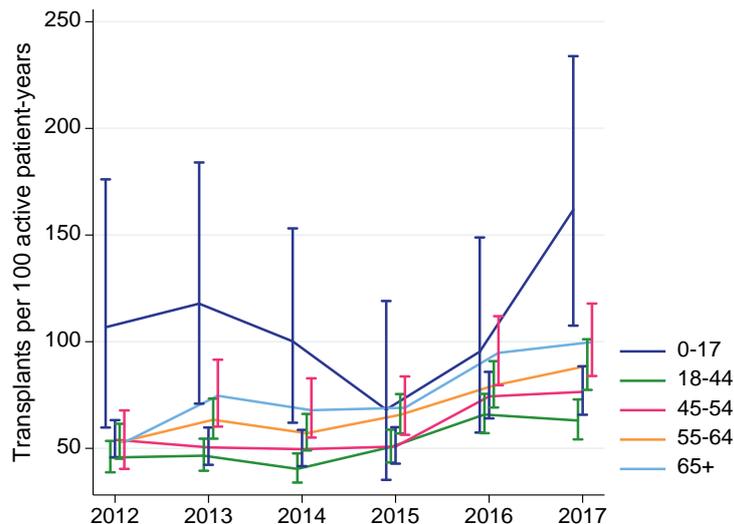
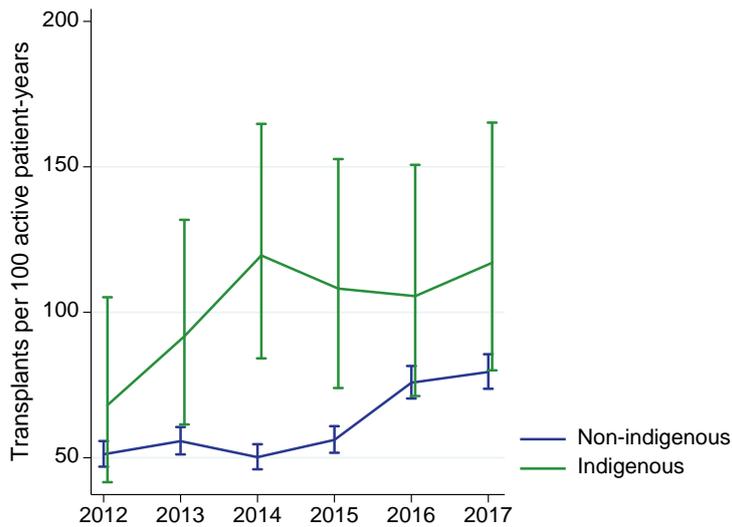
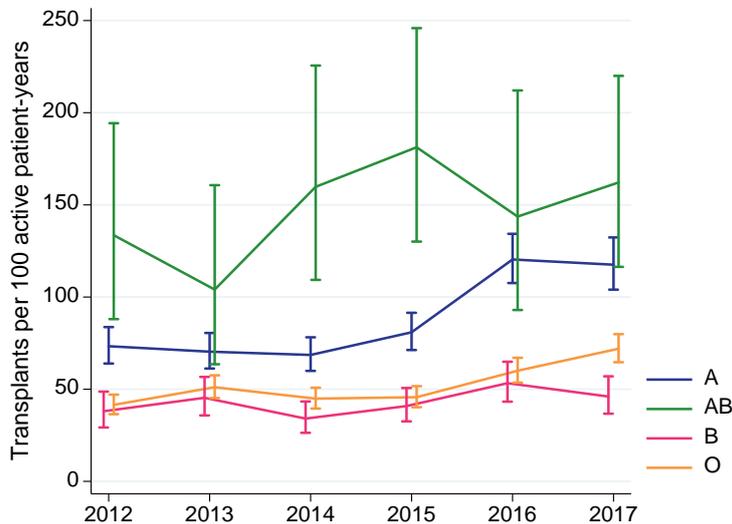


Figure 6.5 - Deceased Donor Transplant Rate by Ethnicity - Per 100 Active Patient-Years



Blood group AB patients have the highest transplant rate due to their compatibility with all donors (Figure 6.6).

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



Outcomes of wait-listing

Figures 6.7-6.9 show the outcomes of patients who commenced dialysis during 2012-2017 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.

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 wait-listing; 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 2012-2017

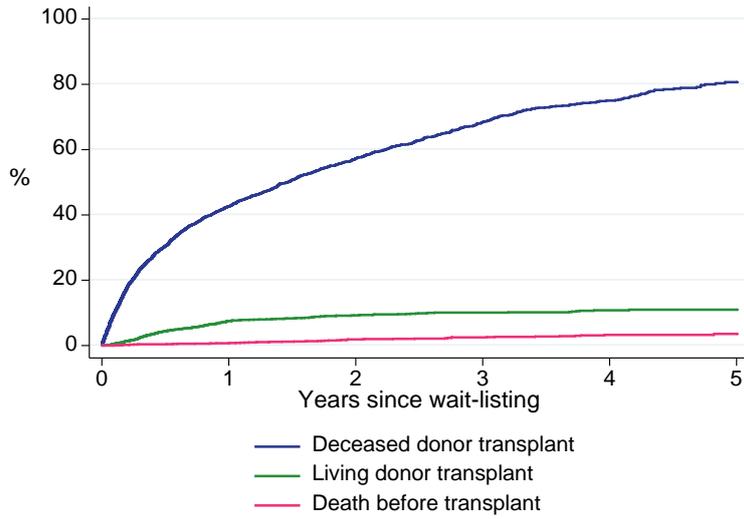


Figure 6.8 - Outcomes after wait-listing - Australian incident dialysis patients 2012-2017

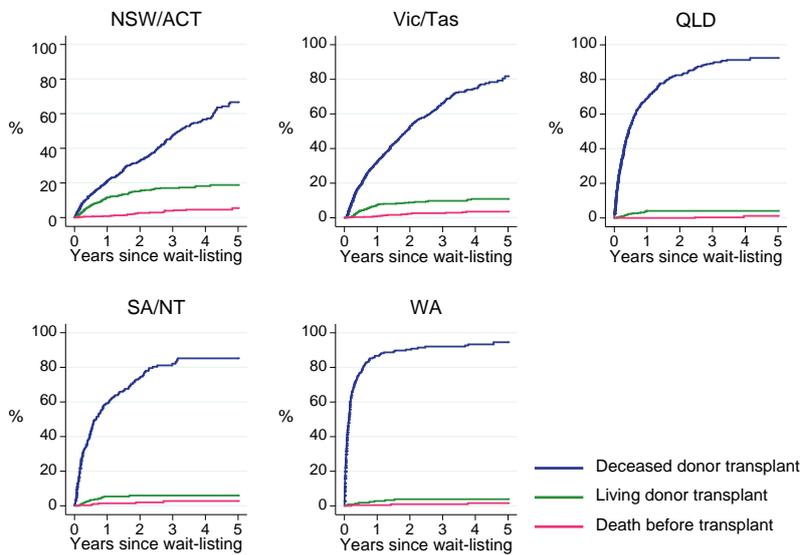
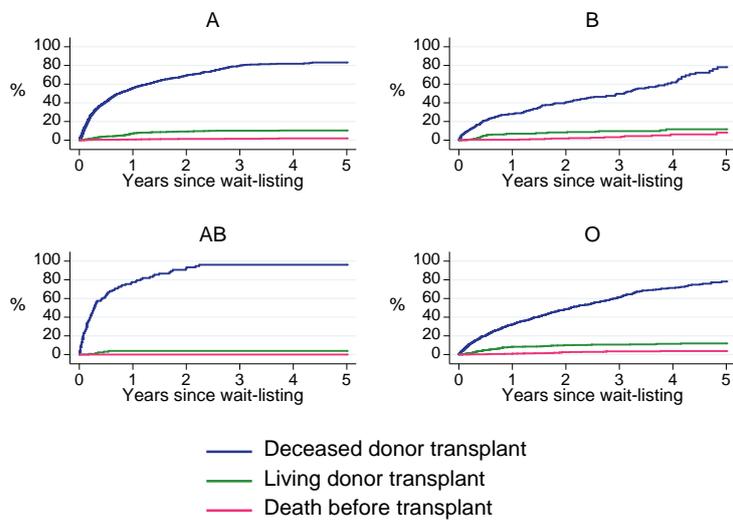


Figure 6.9 - Outcomes after wait-listing - Australian incident dialysis patients 2012-2017



Survival after wait-listing

Figure 6.10 shows the survival of patients who commenced dialysis in Australia over 2012-2017 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 93.6% respectively. The mortality rate was correspondingly low at 1.9 deaths per 100 patient-years (95% CI 1.5-2.5).

Figure 6.10 - Survival after wait-listing - Australian incident dialysis patients 2012-2017 Censored at transplantation

