

CHAPTER 8

Kidney Donation

Reporting the number of deceased and living kidney donors in Australia and Aotearoa New Zealand and describing donor characteristics

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SUMMARY AND HIGHLIGHTS

Chapter 8 describes the trends and characteristics in organ donation for kidney transplantation in Australia and New Zealand. The data for this chapter come from the Australia and New Zealand Organ Donor (ANZOD) Registry and the Australia and New Zealand Living Kidney Donor (ANZLKD) Registry. Much more information about deceased organ donors in Australia and New Zealand can be found on the ANZOD website, <https://www.anzdata.org.au/anzod/>, and about living kidney donors in Australia and New Zealand on the ANZLKD website, <https://www.anzdata.org.au/anzlkd/>.

The proportions of deceased donor kidneys have remained relatively consistent with most donors being from donation after neurological determination of death (DNDD) standard criteria donors, followed by Donation after Circulatory Determination of Death (DCDD) and then DNDD expanded criteria donors. For deceased donation, the increase in deceased donor age and kidney donor risk index which had peaked in 2015 has levelled off in recent years. There is variation in the kidney donor profile index between transplanting centres. The rates of non-utilised retrieved kidneys have plateaued since peaking in 2019. For living donation, the proportion of transplants from living donors continued to be higher in New Zealand than Australia. There has been an increase in the proportion of living donors from the kidney paired exchange in New Zealand. The number of ABO incompatible transplants has increased to the numbers seen prior to the COVID-19 pandemic. Across both countries, women continue to make up the greater proportion of donors. For the past year, there has been a slight decline in the proportion of pre-emptive transplants.

SUGGESTED CITATION

G Irish, C Davies, E Au, S Bateman, J Chen, K Hurst, F Kholmurodova, D Lee, H McCarthy, S McDonald, W Mulley, M Roberts, B Solomon, T Sun, P Clayton. 47th Report, Chapter 8: Kidney Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2024. Available at: <http://www.anzdata.org.au>

DECEASED KIDNEY DONORS

Figure 8.1 shows the different types of deceased kidney donors in each country over 2014-2023.

Figure 8.1.1
Deceased Kidney Donor Type - Australia 2014-2023

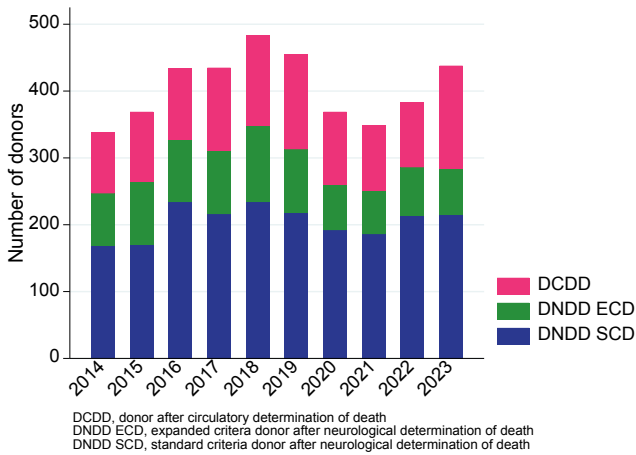
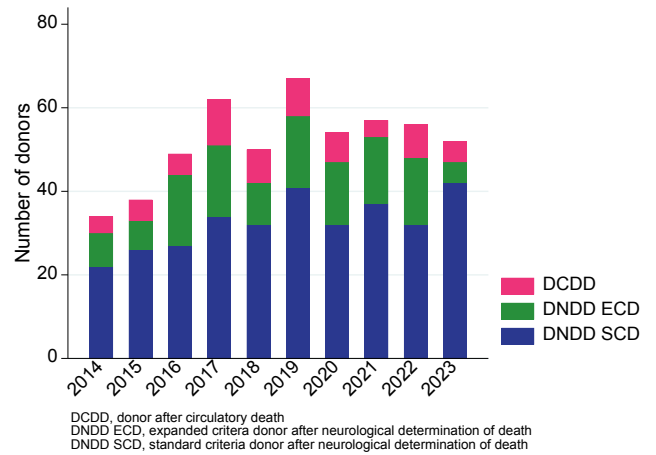


Figure 8.1.2
Deceased Kidney Donor Type - New Zealand 2014-2023



The causes of death of deceased donors are shown in Figure 8.2.

Figure 8.2.1
Cause of Donor Death - Australia 2014-2023

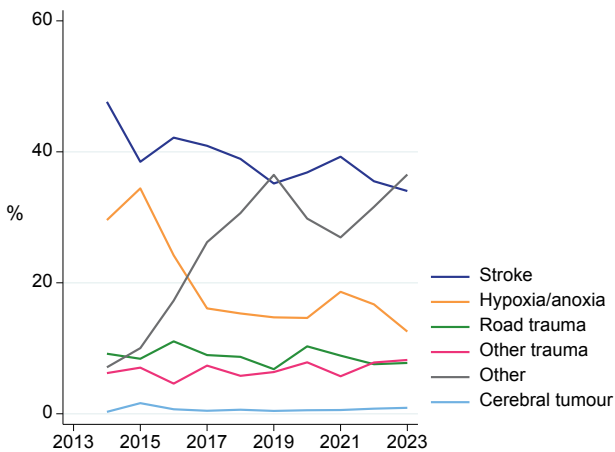


Figure 8.2.2
Cause of Donor Death - New Zealand 2014-2023

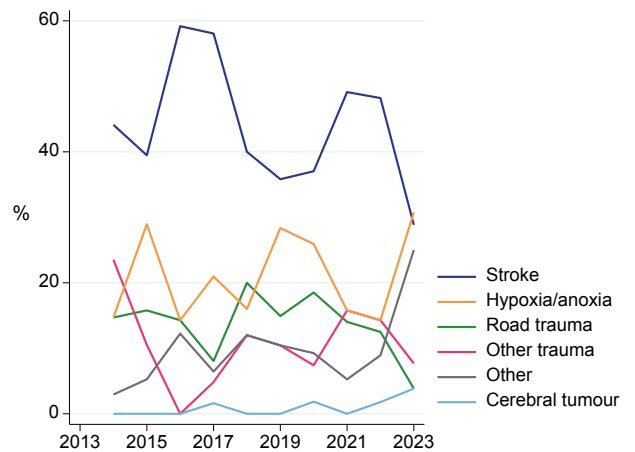


Figure 8.3 shows the mean age of deceased kidney donors in Australia and New Zealand since the ANZOD registry commenced in 1989 in Australia and 1993 in New Zealand.

Figure 8.3.1
Deceased Kidney Donor Age - Australia 1989-2023

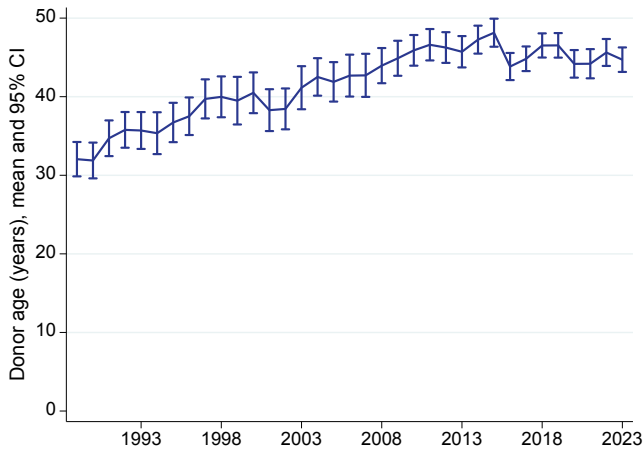


Figure 8.3.2
Deceased Kidney Donor Age - New Zealand 1993-2023

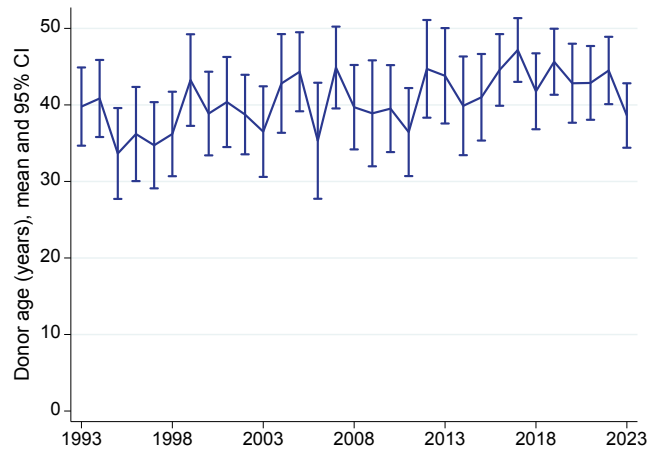


Figure 8.4 shows the mean raw Kidney Donor Risk Index (KDRI) of deceased kidney donors in Australia and New Zealand over the last 20 years.

Figure 8.4.1
Deceased Kidney Donor KDRI - Australia 2004-2023

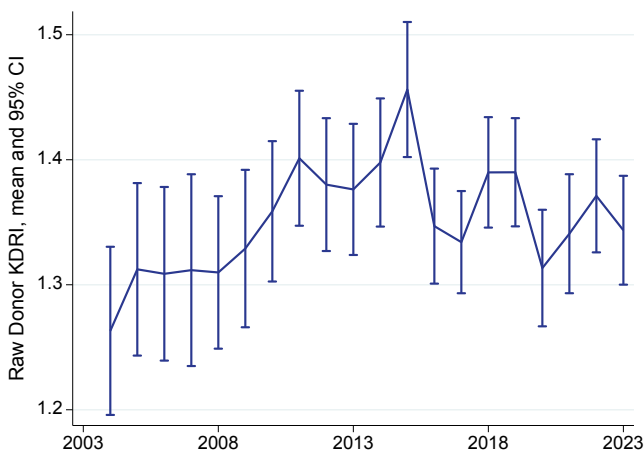


Figure 8.4.2
Deceased Kidney Donor KDRI - New Zealand 2004-2023

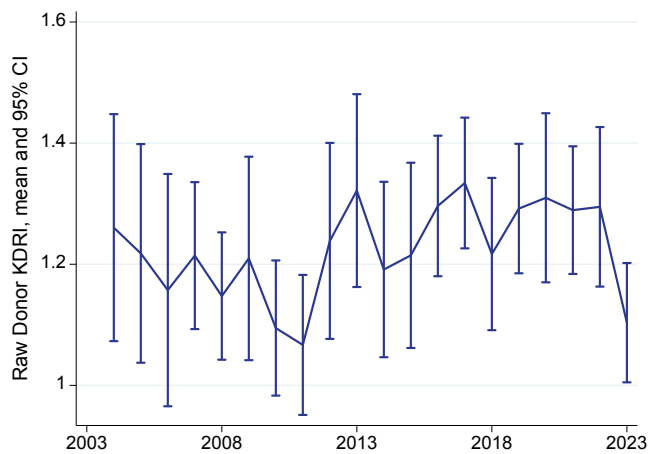


Figure 8.5 shows the median and IQR of the Kidney Donor Profile Index (KDPI) of deceased kidney donors in Australia and New Zealand over the last 5 years by transplant hospital, and Figure 8.6 shows the same data by transplant region.

Figure 8.5
Deceased Kidney Donor KDPI by Transplant Hospital - Australia and New Zealand 2019-2023

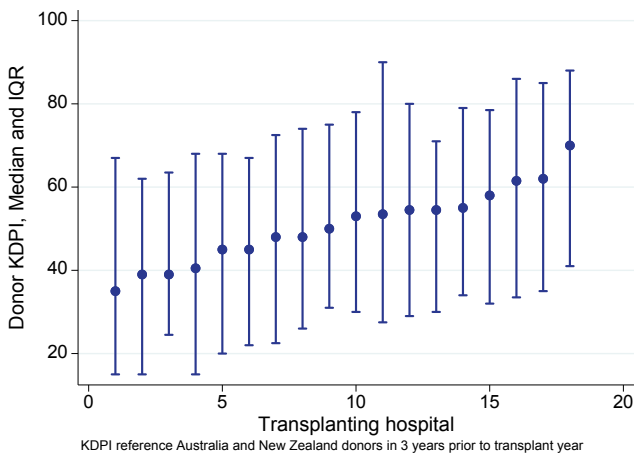


Figure 8.6
Deceased Kidney Donor KDPI by Transplant Region - Australia and New Zealand 2019-2023

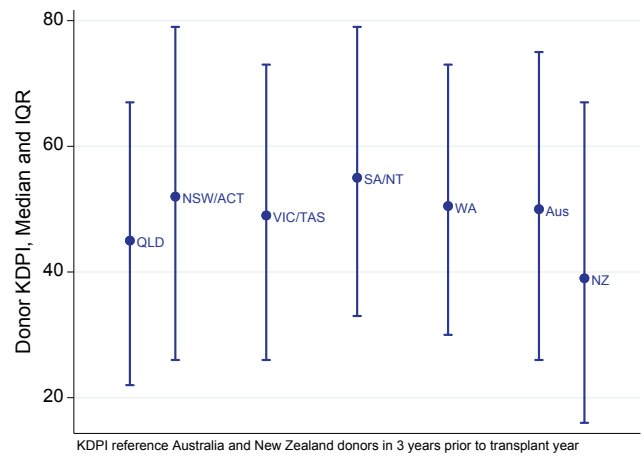


Figure 8.7 shows the non-utilisation rate of retrieved kidneys - the proportion of kidneys that were retrieved for the purpose of transplantation, but not ultimately transplanted into a recipient (either due to an absence of suitable recipients, or the kidney was deemed medically unsuitable after retrieval).

Figure 8.7.1
Non-utilisation Rate of Retrieved Kidneys - Australia 2014-2023

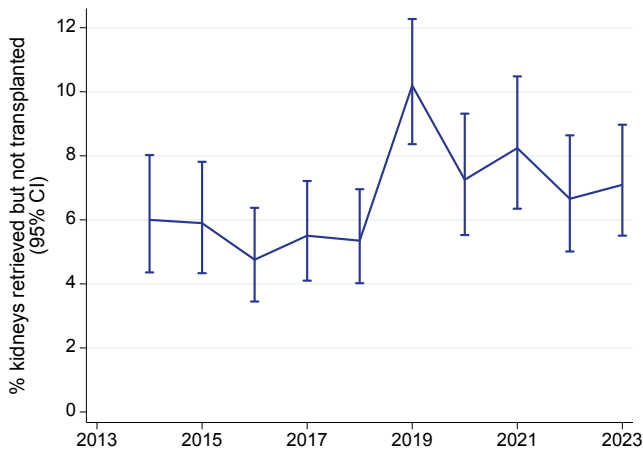
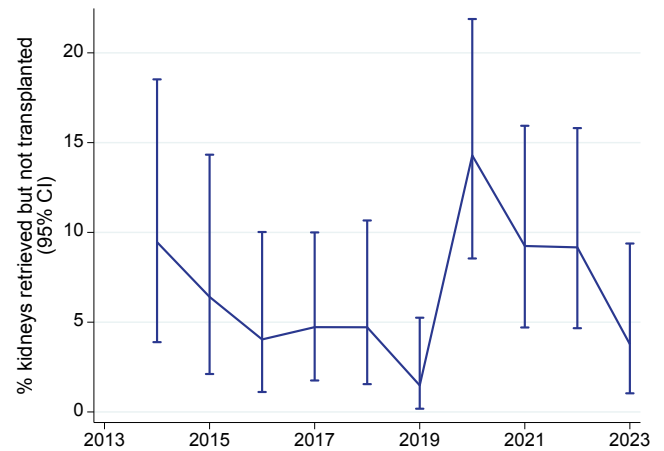


Figure 8.7.2
Non-utilisation Rate of Retrieved Kidneys - New Zealand 2014-2023



LIVING KIDNEY DONORS

There were 257 living donor kidney transplants performed in 2023 in Australia, representing 24% of all transplant operations (Table 8.1). In New Zealand, the 74 living donor transplants in 2023 represented 42% of all transplants.

Table 8.1
Living Donor Transplants (% of All Transplants) by Country 2018-2023

Country	2018	2019	2020	2021	2022	2023
Australia	238 (21%)	238 (22%)	181 (20%)	202 (24%)	225 (24%)	257 (24%)
New Zealand	84 (46%)	91 (41%)	87 (47%)	85 (45%)	70 (40%)	74 (42%)

The living donor percentage of transplants in Australia and New Zealand is shown in Figure 8.8 by recipient age groups for the years 2016-2019 to 2020-2023. For most age groups in both countries, living donors made up a smaller proportion of all transplants in 2020-2023 compared with 2016-2019.

Figure 8.8.1
Living Donor Percentage of Transplants - Australia - Stratified by Age of Recipient, 2016-2019 vs 2020-2023

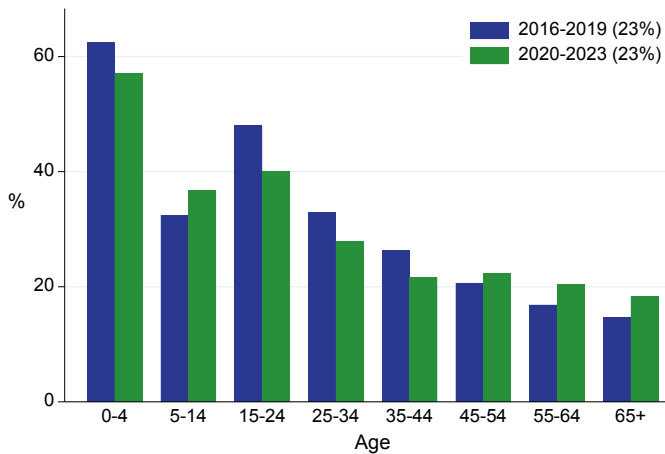


Figure 8.8.2
Living Donor Percentage of Transplants - New Zealand - Stratified by Age of Recipient, 2016-2019 vs 2020-2023

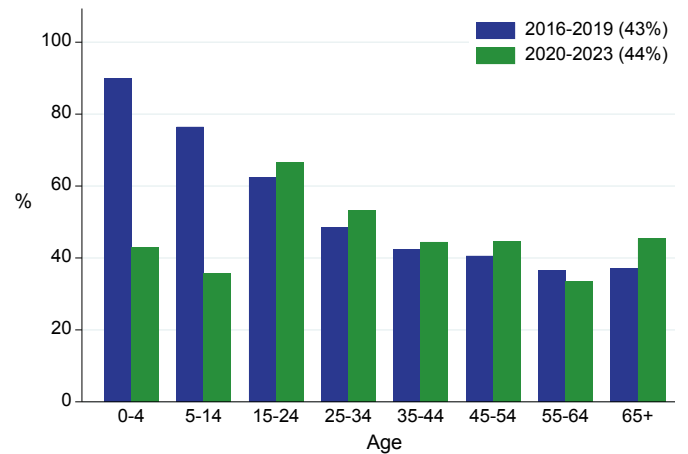


Figure 8.9 shows the living donor percentage of transplants for recipients aged 25-44 years by transplant region.

Figure 8.9
Living Donor Percentage of Transplants by Transplant Region - Age 25-44, 2016-2019 vs 2020-2023

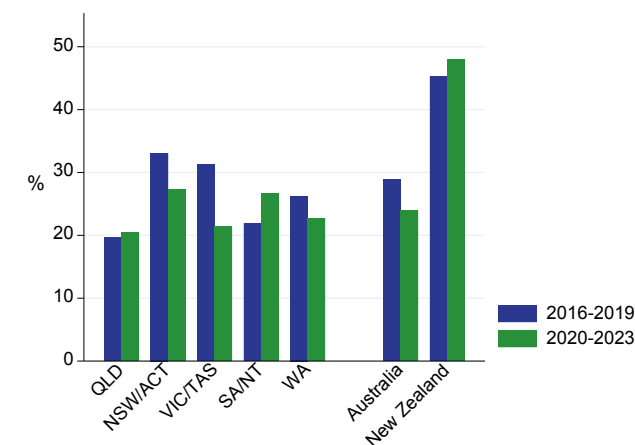


Figure 8.10 shows the number of living donors in Australia and New Zealand for the years 2014-2023 by donor age.

Figure 8.10.1
Living Kidney Donor Age - Australia 2014-2023

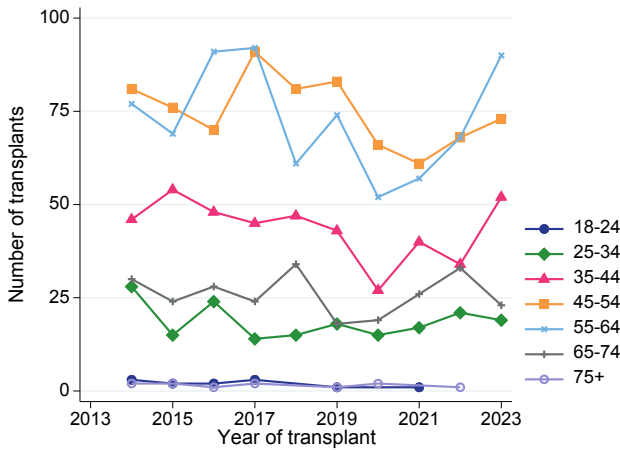
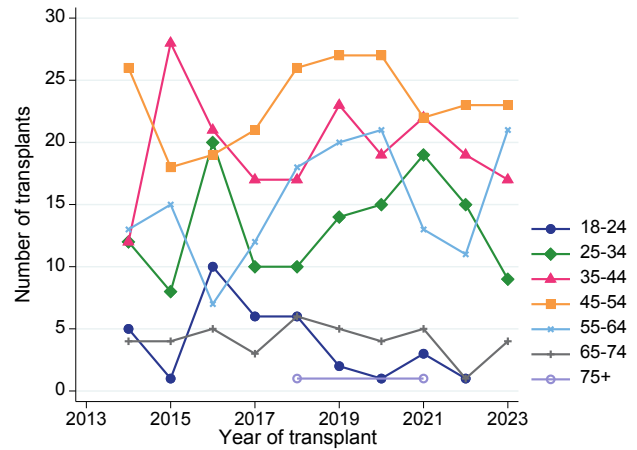


Figure 8.10.2
Living Kidney Donor Age - New Zealand 2014-2023



The total number of living donor transplants in Australia and New Zealand are shown in Figure 8.11. The proportion of genetically related donors was 46% (118 donors) in 2023 in Australia. In New Zealand 32 donors (43%) were genetically related to their recipient.

Figure 8.11.1
Source of Living Kidney Donor - Australia 2014-2023

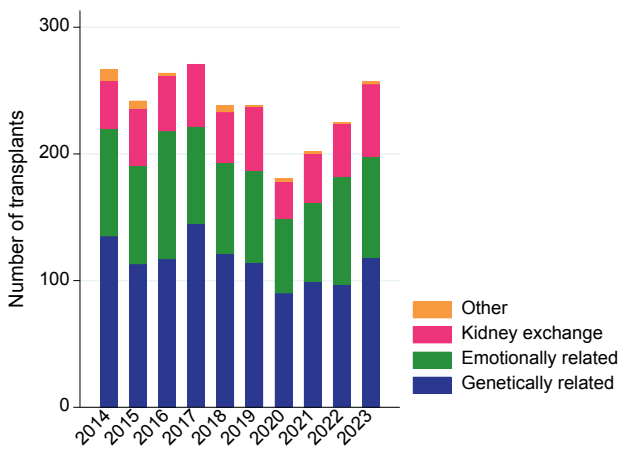


Figure 8.11.2
Source of Living Kidney Donor - New Zealand 2014-2023

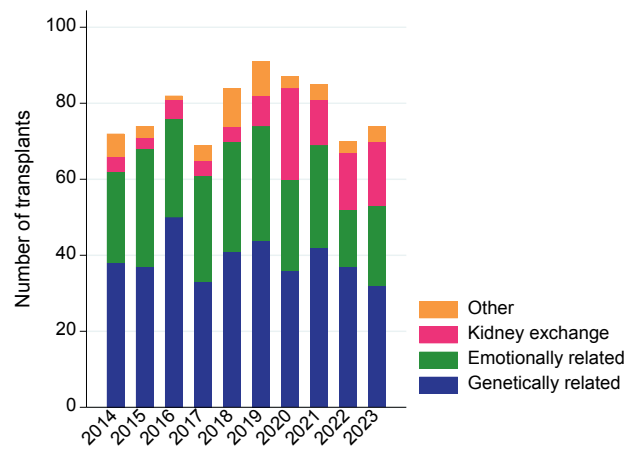


Table 8.2 provides details of the relationships between donors and recipients over 2019-2023 for Australia and New Zealand.

Table 8.2.1
Living Kidney Donor Relationship to Recipient, Australia 2019-2023

Donor source	2019	2020	2021	2022	2023
Total	238	181	202	225	257
Genetically Related Total	114	90	99	97	118
Sister	22	12	22	17	27
Brother	20	21	15	20	18
Mother	34	30	36	20	27
Father	26	14	19	23	22
Monozygotic (Identical Twin Girl)	0	0	0	1	0
Daughter	2	3	3	4	6
Son	3	5	2	3	5
Grandmother	0	0	0	1	1
Cousin	2	2	0	4	7
Niece	0	0	0	0	1
Nephew	0	1	0	0	1
Aunt	3	1	2	1	2
Uncle	2	2	0	0	1
Emotionally Related Total	73	59	63	85	80
Wife	33	28	25	43	35
Husband	10	12	8	15	15
Partner	8	11	8	6	10
Fiance / Fiancee	0	0	0	1	1
Mother-in-law	1	0	0	2	0
Father-in-law	0	0	0	0	1
Stepfather	0	0	0	0	1
Stepsister	0	0	0	0	0
Sister-in-law	3	0	1	0	2
Brother-in-law	3	1	2	0	3
Daughter-in-law	1	0	0	0	0
Son-in-law	1	0	2	1	2
Stepdaughter	0	0	0	0	0
Stepson	0	0	0	1	0
Friend	12	6	16	15	9
Other emotionally related	1	1	1	1	1
Kidney Exchange Total	50	29	38	42	57
Directed kidney exchange	49	26	36	34	52
Non-directed, kidney exchange	1	3	2	8	5
Other Unrelated Total	1	3	2	1	2
Non-directed, waiting list	1	2	2	1	2
Pathological	0	1	0	0	0

Table 8.2.2
Living Kidney Donor Relationship to Recipient, New Zealand 2019-2023

Donor source	2019	2020	2021	2022	2023
Total	91	87	85	70	74
Genetically Related Total	44	36	42	37	32
Sister	8	5	8	4	9
Brother	6	7	10	10	4
Mother	11	6	7	6	8
Father	5	7	4	4	3
Monozygotic (Identical Twin Girl)	0	1	0	0	0
Daughter	3	5	3	6	3
Son	4	2	10	3	1
Grandmother	0	0	0	0	0
Cousin	2	1	0	2	1
Niece	0	0	0	0	2
Nephew	1	1	0	0	0
Aunt	3	1	0	1	1
Uncle	1	0	0	1	0
Emotionally Related Total	30	24	27	15	21
Wife	11	11	6	1	7
Husband	4	0	3	1	1
Partner	3	4	3	2	3
Fiance / Fiancee	0	0	0	0	0
Mother-in-law	0	0	0	1	0
Father-in-law	0	0	1	0	0
Stepfather	1	1	0	0	0
Stepsister	0	1	0	0	0
Sister-in-law	1	1	2	0	0
Brother-in-law	0	0	0	0	1
Daughter-in-law	0	0	0	1	0
Son-in-law	0	0	0	0	0
Stepdaughter	0	0	1	0	0
Stepson	0	0	1	0	0
Friend	10	5	9	6	9
Other emotionally related	0	1	1	3	0
Kidney Exchange Total	8	24	12	15	17
Directed kidney exchange	4	21	9	12	12
Non-directed, kidney exchange	4	3	3	3	5
Other Unrelated Total	9	3	4	3	4
Non-directed, waiting list	9	3	4	3	4
Pathological	0	0	0	0	0

Table 8.3 shows the number of ABO incompatible living donor transplants performed in each country over the last 10 years.

Table 8.3
Living Donor Transplant Numbers by Blood Group Status 2014-2023

Country	Year	Compatible	Incompatible	Unknown
Australia	2014	224	39	4
	2015	201	27	14
	2016	208	48	8
	2017	226	45	0
	2018	196	41	1
	2019	211	27	0
	2020	150	27	4
	2021	180	22	0
	2022	194	31	0
	2023	221	36	0
New Zealand	2014	62	9	1
	2015	65	9	0
	2016	76	6	0
	2017	55	14	0
	2018	73	11	0
	2019	74	17	0
	2020	81	6	0
	2021	76	9	0
	2022	65	5	0
	2023	67	7	0

LIVING DONOR CHARACTERISTICS

Table 8.4 shows the clinical characteristics of living kidney donors over 2014-2023.

Table 8.4
Living Donor Clinical Characteristics 2014-2023

Factor	Australia		New Zealand	
	2014-2018	2019-2023	2014-2018	2019-2023
N	1269	1102	381	407
Age (years), mean (SD)	51.3 (11.1)	51.4 (10.9)	44.5 (12.7)	46.0 (11.8)
Hypertension	377 (29.8%)	339 (30.8%)	44 (11.5%)	53 (13.0%)
Gender				
Female	736 (58.0%)	619 (56.2%)	229 (60.1%)	236 (58.0%)
Male	533 (42.0%)	483 (43.8%)	152 (39.9%)	171 (42.0%)
Ethnicity				
First Nations Australian	5 (0.4%)	7 (0.6%)	-	-
Māori New Zealander	-	-	43 (11.3%)	53 (13.0%)
Other	1223 (96.4%)	1050 (95.3%)	336 (88.2%)	352 (86.5%)
Not reported	41 (3.2%)	45 (4.1%)	2 (0.5%)	2 (0.5%)
Body mass index (kg/m²)				
<18.5	9 (0.7%)	6 (0.5%)	1 (0.3%)	0 (0.0%)
18.5-24.9	400 (31.5%)	385 (34.9%)	119 (31.2%)	132 (32.4%)
25-29.9	562 (44.3%)	486 (44.1%)	163 (42.8%)	188 (46.2%)
≥30	244 (19.2%)	187 (17.0%)	92 (24.1%)	84 (20.6%)
Not reported	54 (4.3%)	38 (3.4%)	6 (1.6%)	3 (0.7%)
Glycaemic status				
Normal	1175 (92.6%)	1012 (91.8%)	370 (97.1%)	399 (98.0%)
Impaired fasting glucose	12 (0.9%)	23 (2.1%)	0 (0.0%)	2 (0.5%)
Impaired glucose tolerance	29 (2.3%)	17 (1.5%)	0 (0.0%)	0 (0.0%)
Diabetic	7 (0.6%)	4 (0.4%)	0 (0.0%)	1 (0.2%)
Not reported	46 (3.6%)	46 (4.2%)	11 (2.9%)	5 (1.2%)
Cigarette Smoking				
Never	790 (62.3%)	702 (63.7%)	227 (59.6%)	253 (62.2%)
Former	391 (30.8%)	314 (28.5%)	102 (26.8%)	114 (28.0%)
Current	25 (2.0%)	15 (1.4%)	40 (10.5%)	30 (7.4%)
Not reported	63 (5.0%)	71 (6.4%)	12 (3.1%)	10 (2.5%)

TIMING OF LIVING KIDNEY DONOR TRANSPLANTATION

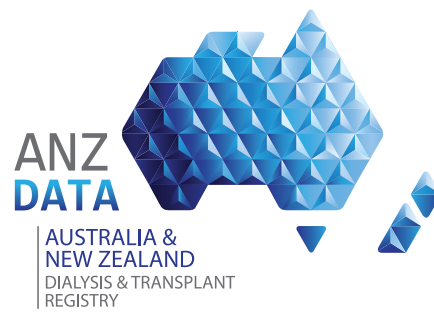
The timing of primary living donor transplants relative to the start of dialysis is shown in Table 8.5.

The proportion of all primary living donor transplants performed pre-emptively in Australia in 2023 was 36%. 37% of recipients had received dialysis treatment for twelve months or longer prior to a first living donor graft.

The proportion of pre-emptive primary living donor transplants in New Zealand in 2023 was 31%, 34% received dialysis for twelve months or longer prior to being transplanted.

Table 8.5
Timing of Living Kidney Donor Transplants 2019-2023

Country	Timing of transplant	2019	2020	2021	2022	2023
Australia	Pre-emptive	97 (46%)	65 (39%)	74 (42%)	83 (41%)	85 (36%)
	<1 month post dialysis	5 (2%)	7 (4%)	2 (1%)	4 (2%)	2 (1%)
	1 month to <6 months post dialysis	32 (15%)	20 (12%)	20 (11%)	27 (13%)	26 (11%)
	6 months to <1 year post dialysis	22 (10%)	27 (16%)	29 (16%)	27 (13%)	34 (15%)
	≥1 year post dialysis	57 (27%)	48 (29%)	52 (29%)	61 (30%)	87 (37%)
New Zealand	Pre-emptive	31 (38%)	35 (44%)	34 (44%)	20 (31%)	20 (31%)
	<1 month post dialysis	-	1 (1%)	-	1 (2%)	1 (2%)
	1 month to <6 months post dialysis	7 (9%)	3 (4%)	12 (16%)	5 (8%)	8 (12%)
	6 months to <1 year post dialysis	10 (12%)	9 (11%)	7 (9%)	9 (14%)	13 (20%)
	≥1 year post dialysis	33 (41%)	32 (40%)	24 (31%)	30 (46%)	22 (34%)



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