



# 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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## Executive Summary

Chapter 8 describes the trends and characteristics in organ donation for kidney transplantation in Australia and New Zealand. The data for this section 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/>

When considering the trends in organ donation for kidney transplantation reported below it is important to recognize that the 2020 survey collection period coincided with the outbreak of the global COVID-19 pandemic which had a major impact on health care systems across Australia and New Zealand, including temporary cessation of kidney transplantation in some jurisdictions. This is likely to have had a significant influence on the observed trends.

After a prolonged period of increased growth in the number of deceased kidney donors over the last decade, total donor numbers fell in Australia in 2019 and again in 2020 and have reached a plateau in New Zealand over the last 4 years (Figure 8.1). Stroke remains the most common cause of death for deceased kidney donor in both countries (Figure 8.2) and donor age has remained relatively static over the past 5 years (Figure 8.3). After 4 years of increasing non-utilisation of retrieved organs in Australia the rate fell in 2020, whilst in New Zealand this historically low rate increased in 2020 (Figure 8.4).

The percentage of all kidney transplants performed that came from live donors remained stable in both countries with the New Zealand continuing to have over twice the rate of that seen in Australia (47% vs 20%, Table 8.1). The number of ABO blood group incompatible transplants was lower in both countries compared to historical numbers (Table 8.3). Female donors continue to make up a higher percentage of live donors compared with male donors and around a fifth of live donors in both Australia and New Zealand had a BMI of >30kg/m<sup>2</sup> (Table 8.4). Pre-emptive transplantation was performed in 40% of live donor transplant in Australia and 44% in New Zealand (Table 8.5).

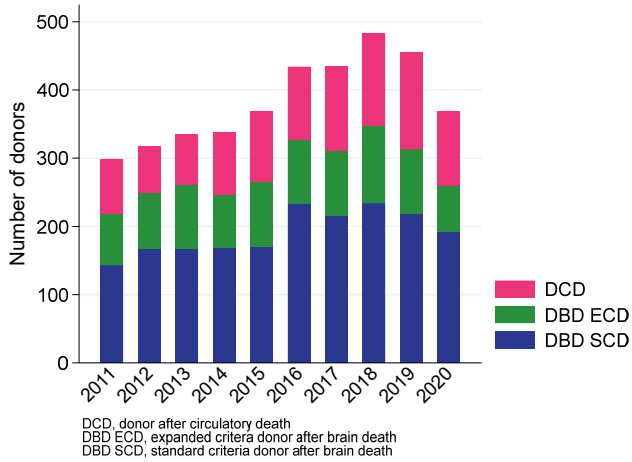
## Suggested Citation

ANZDATA Registry. 44th Report, Chapter 8: Kidney Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2021. Available at: <http://www.anzdata.org.au>

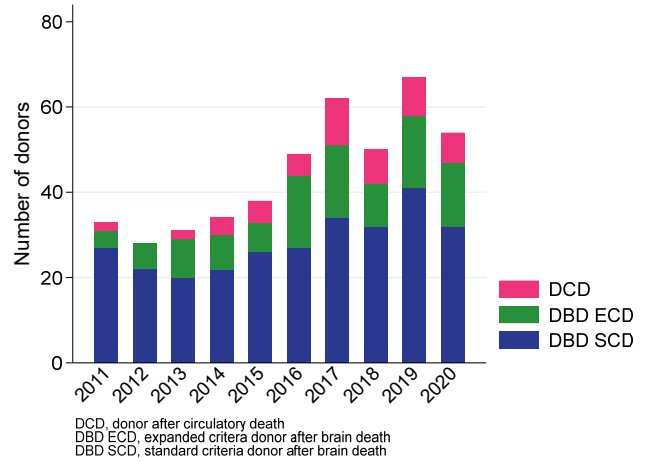
## Deceased Kidney Donors

Figure 8.1 shows the different types of deceased kidney donors in each country over 2011-2020.

**Figure 8.1.1 - Deceased Kidney Donor Type - Australia 2011-2020**

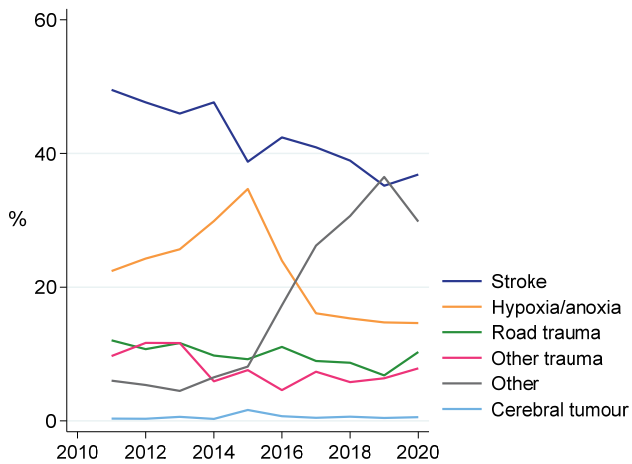


**Figure 8.1.2 - Deceased Kidney Donor Type - New Zealand 2011-2020**



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

**Figure 8.2.1 - Cause of Donor Death - Australia 2011-2020**



**Figure 8.2.2 - Cause of Donor Death - New Zealand 2011-2020**

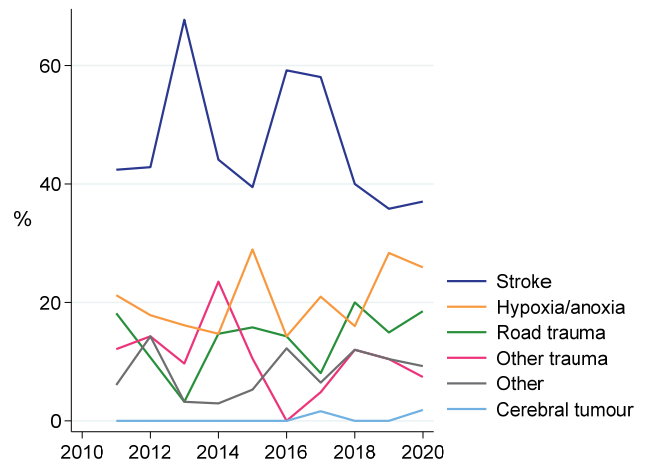
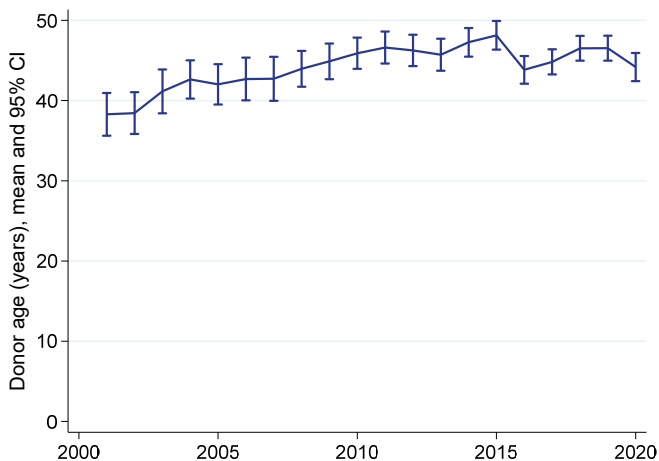


Figure 8.3 shows the mean age of deceased kidney donors in Australia and New Zealand over the last 20 years.

**Figure 8.3.1 - Deceased Kidney Donor Age - Australia 2001-2020**



**Figure 8.3.2 - Deceased Kidney Donor Age - New Zealand 2001-2020**

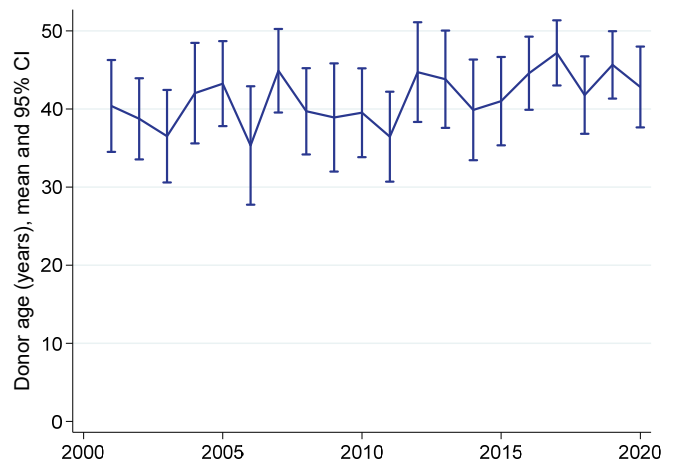
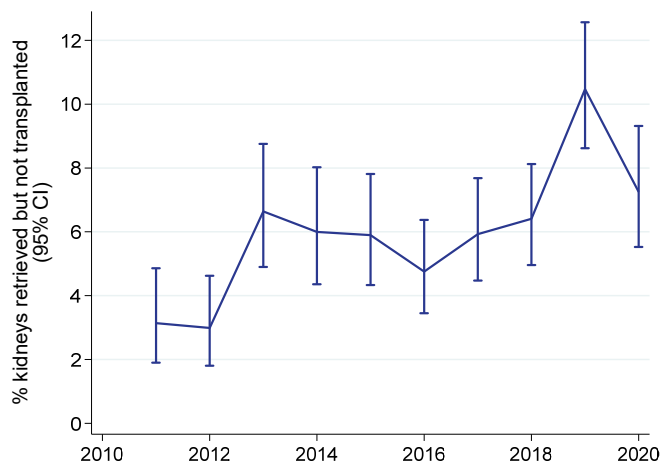
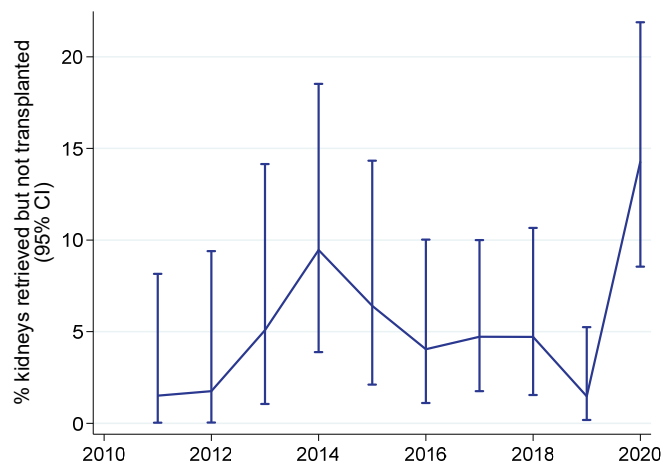


Figure 8.4 shows the non-utilisation rate of retrieved kidneys – the proportion of kidneys that were retrieved for the purpose of transplantation, but not ultimately transplanted into a recipient (either due to an absence of suitable recipients, or the kidney was deemed medically unsuitable after retrieval).

**Figure 8.4.1 - Non-utilisation Rate of Retrieved Kidneys - Australia 2011-2020**



**Figure 8.4.2 - Non-utilisation Rate of Retrieved Kidneys - New Zealand 2011-2020**



## Living Kidney Donors

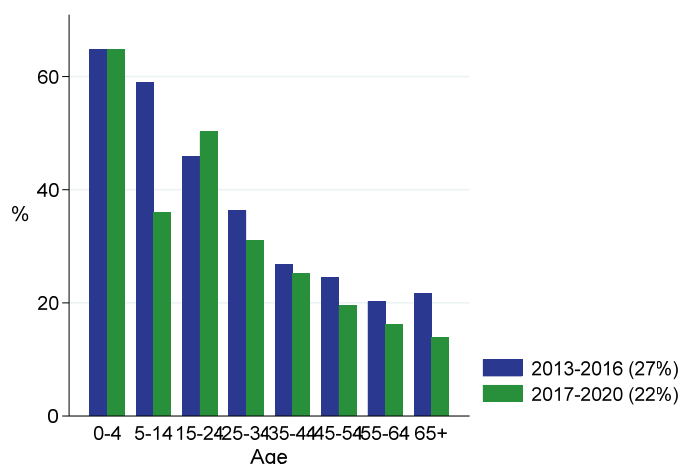
There were 181 living donor kidney transplants performed in 2020 in Australia, representing 20% of all transplant operations (table 8.1). In New Zealand, the 87 living donor transplants in 2020 represented 47% of all transplants.

**Table 8.1 Living Donor Percentage of Transplants by Country 2015-2020**

Country	2015	2016	2017	2018	2019	2020
Australia	26%	24%	24%	21%	22%	20%
New Zealand	50%	48%	37%	46%	41%	47%

The living donor percentage of transplants in Australia and New Zealand is shown in figure 8.5 by recipient age groups for the years 2013-2016 to 2017-2020.

**Figure 8.5.1 - Living Donor Percentage of Transplants - Australia - Stratified by Age of Recipient, 2013-2016 vs 2017-2020**



**Figure 8.5.2 - Living Donor Percentage of Transplants - New Zealand - Stratified by Age of Recipient, 2013-2016 vs 2017-2020**

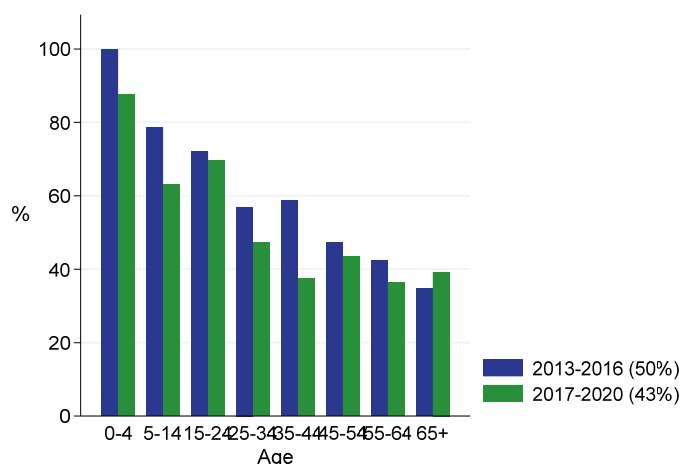


Figure 8.6 shows the living donor percentage of transplants for recipients aged 25-44 years by transplant region.

**Figure 8.6 - Living Donor Percentage of Transplants by Transplant Region - Age 25-44, 2013-2016 vs 2017-2020**

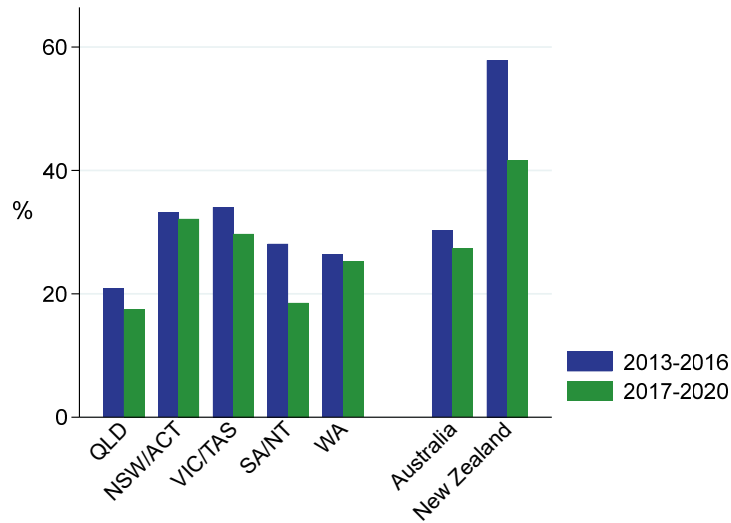
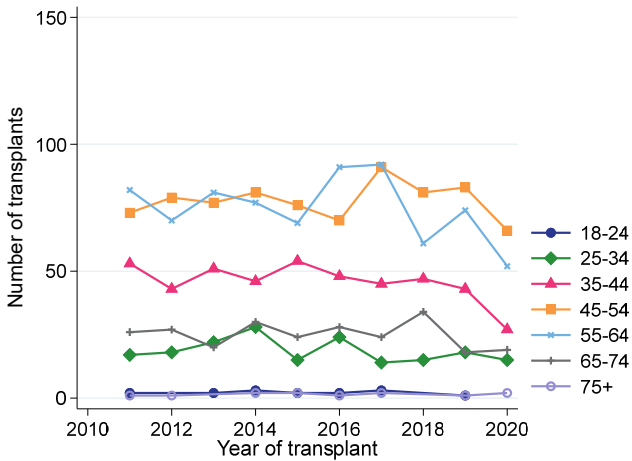
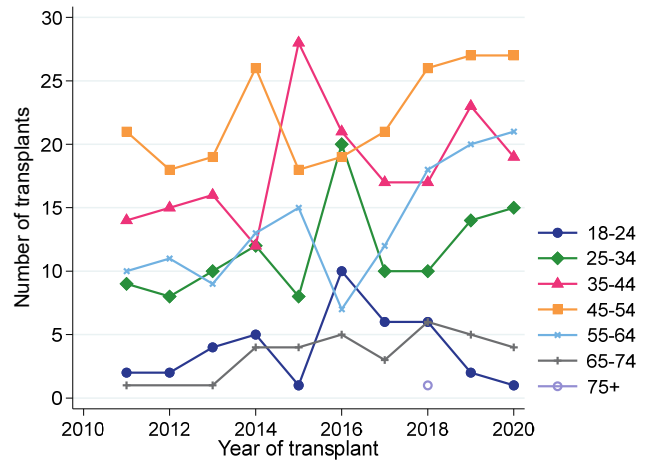


Figure 8.7 shows the number of living donors in Australia and New Zealand for the years 2011-2020 by donor age.

**Figure 8.7.1 - Living Kidney Donor Age - Australia 2011-2020**

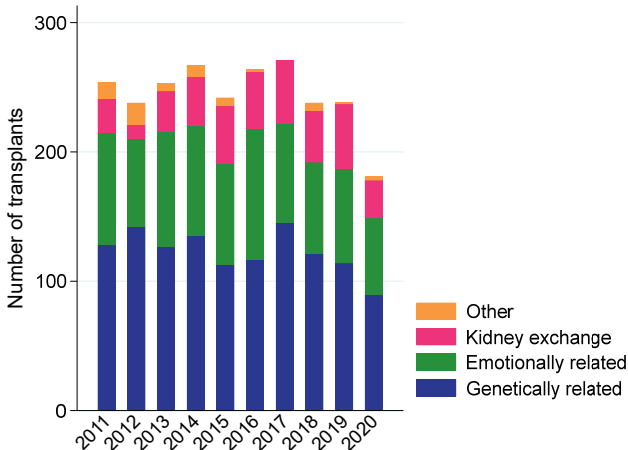


**Figure 8.7.2 - Living Kidney Donor Age - New Zealand 2011-2020**



The total number of living donor transplants in Australia and New Zealand are shown in figure 8.8. The proportion of genetically related donors was 50% (90 donors) in 2020 in Australia. In New Zealand 36 donors (41%) were genetically related to their recipient

**Figure 8.8.1 - Source of Living Kidney Donor - Australia 2011-2020**



**Figure 8.8.2 - Source of Living Kidney Donor - New Zealand 2011-2020**

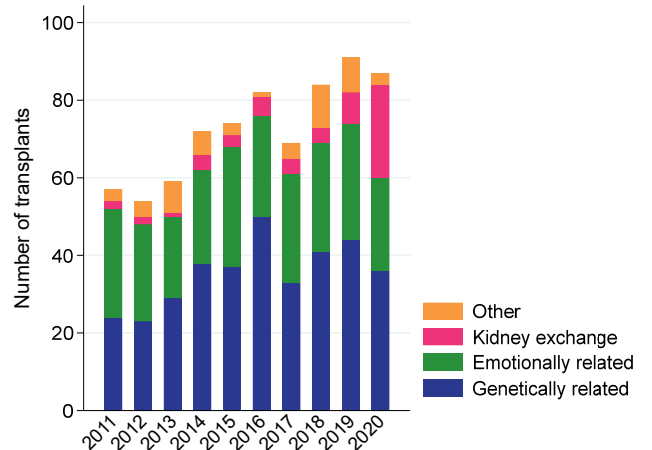


Table 8.2 provides details of the relationships between donors and recipients over 2016-2020 for Australia and New Zealand.

**Table 8.2.1 Living Kidney Donor Relationship to Recipient, Australia 2016-2020**

Donor source	2016	2017	2018	2019	2020
<b>Total</b>	<b>264</b>	<b>271</b>	<b>238</b>	<b>238</b>	<b>181</b>
<b>Genetically Related Total</b>	<b>117</b>	<b>145</b>	<b>121</b>	<b>114</b>	<b>90</b>
Sister	25	22	24	22	12
Brother	20	27	19	20	21
Mother	36	41	40	34	30
Father	17	30	22	26	14
Monozygotic (Identical Twin Girl)	0	0	0	0	0
Dizygotic (Non-Identical Twin Boy)	0	1	0	0	0
Daughter	2	5	5	2	3
Son	5	1	1	3	5
Grandmother	2	2	1	0	0
Grandfather	0	1	0	0	0
Cousin	4	5	2	2	2
Niece	0	1	1	0	0
Nephew	2	1	0	0	1
Aunt	3	4	3	3	1
Uncle	1	3	3	2	1
Other related (Genetically - Specify)	0	1	0	0	0
<b>Emotionally Related Total</b>	<b>101</b>	<b>77</b>	<b>71</b>	<b>73</b>	<b>59</b>
Wife	54	34	29	33	28
Husband	14	22	14	10	12
Partner	9	6	9	8	11
Mother-in-law	1	0	0	1	0
Father-in-law	0	0	3	0	0
Stepmother	0	0	1	0	0
Stepfather	1	0	1	0	0
Stepsister	0	0	1	0	0
Stepbrother	0	0	0	0	0
Sister-in-law	0	0	1	3	0
Brother-in-law	0	1	1	2	1
Daughter-in-law	0	0	1	1	0
Son-in-law	1	1	0	1	0
Stepdaughter	0	0	0	0	0
Stepson	0	0	0	0	0
Friend	18	10	9	12	6
Other related (Emotionally - Specify)	3	3	1	2	1
<b>Kidney Exchange Total</b>	<b>44</b>	<b>49</b>	<b>40</b>	<b>50</b>	<b>29</b>
Directed kidney exchange	42	47	37	49	26
Non-directed, kidney exchange	2	2	3	1	3
<b>Other Unrelated Total</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>3</b>
Non-directed, waiting list	0	0	4	1	2
Pathological	2	0	1	0	1
Other unrelated (Specify)	0	0	1	0	0

**Table 8.2.2 Living Kidney Donor Relationship to Recipient, New Zealand 2016-2020**

Donor source	2016	2017	2018	2019	2020
<b>Total</b>	<b>82</b>	<b>69</b>	<b>84</b>	<b>91</b>	<b>87</b>
<b>Genetically Related Total</b>	<b>50</b>	<b>33</b>	<b>41</b>	<b>44</b>	<b>36</b>
Sister	6	3	7	8	5
Brother	13	6	7	6	7
Mother	4	7	8	11	6
Father	8	3	6	5	7
Monozygotic (Identical Twin Girl)	1	0	1	0	1
Dizygotic (Non-Identical Twin Boy)	0	0	1	0	0
Daughter	7	5	2	3	5
Son	9	5	7	4	2
Grandmother	0	0	0	0	0
Grandfather	0	0	0	0	0
Cousin	1	0	0	2	1
Niece	0	1	0	0	0
Nephew	1	0	1	1	1
Aunt	0	1	1	3	1
Uncle	0	2	0	1	0
Other related (Genetically - Specify)	0	0	0	0	0
<b>Emotionally Related Total</b>	<b>26</b>	<b>28</b>	<b>28</b>	<b>30</b>	<b>24</b>
Wife	8	10	8	11	11
Husband	1	3	4	4	0
Partner	3	2	2	3	4
Mother-in-law	1	0	0	0	0
Father-in-law	0	0	0	0	0
Stepmother	0	0	0	0	0
Stepfather	0	0	0	1	0
Stepsister	0	0	0	0	1
Stepbrother	0	1	0	0	0
Sister-in-law	0	2	3	1	1
Brother-in-law	1	1	0	0	0
Daughter-in-law	0	0	0	0	0
Son-in-law	0	0	0	0	0
Stepdaughter	2	0	0	0	0
Stepson	0	1	0	0	0
Friend	10	6	11	10	5
Other related (Emotionally - Specify)	0	2	0	0	2
<b>Kidney Exchange Total</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>8</b>	<b>24</b>
Directed kidney exchange	4	0	2	4	21
Non-directed, kidney exchange	1	4	2	4	3
<b>Other Unrelated Total</b>	<b>1</b>	<b>4</b>	<b>11</b>	<b>9</b>	<b>3</b>
Non-directed, waiting list	1	4	10	9	3
Pathological	0	0	0	0	0
Other unrelated (Specify)	0	0	1	0	0

The gender distribution of living donors by relation to recipient, state and country is shown in table 8.3.

**Table 8.3 Gender Distribution of Living Donors by Relation to Recipient, State and Country 2016-2020**

Donor Relationship	Transplant Region	2016			2017			2018			2019			2020		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Genetically Related	NSW/ACT	57%	43%	46	48%	52%	71	31%	69%	51	47%	53%	43	53%	47%	38
	VIC/TAS	34%	66%	38	32%	68%	44	40%	60%	43	41%	59%	32	31%	69%	26
	QLD	36%	64%	14	42%	58%	12	44%	56%	9	50%	50%	16	63%	38%	8
	SA/NT	13%	88%	8	60%	40%	5	50%	50%	8	75%	25%	8	45%	55%	11
	WA	18%	82%	11	77%	23%	13	40%	60%	10	40%	60%	15	57%	43%	7
	Australia	40%	60%	117	46%	54%	145	37%	63%	121	46%	54%	114	47%	53%	90
	New Zealand	62%	38%	50	48%	52%	33	54%	46%	41	39%	61%	44	50%	50%	36
Genetically Unrelated	NSW/ACT	37%	63%	59	48%	52%	42	50%	50%	50	39%	61%	44	37%	63%	35
	VIC/TAS	35%	65%	48	42%	58%	50	47%	53%	43	59%	41%	44	41%	59%	29
	QLD	36%	64%	14	50%	50%	10	33%	67%	12	42%	58%	19	38%	63%	8
	SA/NT	23%	77%	13	22%	78%	9	50%	50%	4	9%	91%	11	56%	44%	9
	WA	46%	54%	13	40%	60%	15	38%	63%	8	50%	50%	6	40%	60%	10
	Australia	36%	64%	147	43%	57%	126	46%	54%	117	44%	56%	124	41%	59%	91
	New Zealand	38%	63%	32	28%	72%	36	37%	63%	43	45%	55%	47	20%	80%	51

Table 8.4 shows the number of ABO incompatible living donor transplants performed in each country over the last 10 years.

**Table 8.4 Living Donor Transplant Numbers by Blood Group Status 2011-2020**

Country	Year	Compatible	Incompatible	Unknown
Australia	2011	219	34	1
	2012	198	29	11
	2013	217	36	0
	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
New Zealand	2011	49	3	5
	2012	46	5	3
	2013	53	6	0
	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



## Living Donor Characteristics

Table 8.5 shows the clinical characteristics of living kidney donors over 2011-2020.

**Table 8.5 Living Donor Clinical Characteristics 2011-2020**

Factor	Australia	New Zealand
<b>N</b>	<b>2407</b>	<b>729</b>
<b>Age (years), mean (SD)</b>	51.1 (11.0)	45.0 (12.1)
<b>Gender</b>		
Female	1369 (56.9%)	442 (60.6%)
Male	1038 (43.1%)	287 (39.4%)
<b>Ethnicity</b>		
Aboriginal/Torres Strait Islander	33 (1.4%)	0 (0.0%)
Māori	0 (0.0%)	75 (10.3%)
Other	2306 (95.8%)	647 (88.8%)
Not reported	68 (2.8%)	7 (1.0%)
<b>Body mass index</b>		
<18.5 (underweight)	21 (0.9%)	1 (0.1%)
18.5-24.9 (normal)	779 (32.4%)	249 (34.2%)
25-29.9 (overweight)	1087 (45.2%)	314 (43.1%)
≥30 (obese)	434 (18.0%)	156 (21.4%)
Not reported	86 (3.6%)	9 (1.2%)
<b>Hypertension</b>	669 (27.8%)	80 (11.0%)
<b>Glycaemic status</b>		
Normal	2245 (93.3%)	709 (97.3%)
Impaired fasting glucose	30 (1.2%)	0 (0.0%)
Impaired glucose tolerance	49 (2.0%)	0 (0.0%)
Diabetic	10 (0.4%)	2 (0.3%)
Not reported	73 (3.0%)	18 (2.5%)
<b>Cigarette Smoking</b>		
Never	1469 (61.0%)	445 (61.0%)
Former	791 (32.9%)	190 (26.1%)
Current	52 (2.2%)	72 (9.9%)
Not reported	95 (3.9%)	22 (3.0%)

## Timing of Living Kidney Donor Transplantation

The timing of primary living donor transplants relative to the start of dialysis is shown in table 8.6.

The proportion of all primary living donor transplants performed pre-emptively in Australia in 2020 was 40%. 28% 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 2020 was 44%, 40% received dialysis for twelve months or longer prior to being transplanted.

**Table 8.6 Timing of Living Kidney Donor Transplants 2016-2020**

Country	Timing of transplant	2016	2017	2018	2019	2020
Australia	Pre-emptive	103 (44%)	117 (49%)	99 (45%)	97 (46%)	66 (40%)
	<1 month post dialysis	6 (3%)	3 (1%)	4 (2%)	5 (2%)	7 (4%)
	1 month to <1 year post dialysis	69 (29%)	59 (24%)	51 (23%)	54 (25%)	47 (28%)
	≥1 year post dialysis	57 (24%)	62 (26%)	64 (29%)	57 (27%)	47 (28%)
New Zealand	Pre-emptive	18 (24%)	19 (31%)	32 (40%)	31 (38%)	35 (44%)
	<1 month post dialysis	1 (1%)	-	2 (2%)	-	1 (1%)
	1 month to <1 year post dialysis	17 (23%)	12 (19%)	14 (17%)	17 (21%)	12 (15%)
	≥1 year post dialysis	39 (52%)	31 (50%)	33 (41%)	33 (41%)	32 (40%)