

Australia and New Zealand Organ Donation Registry

**ANZ
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AUSTRALIA &
NEW ZEALAND
ORGAN DONATION
REGISTRY



**2018
Annual Report**

Data to 31-December-2017



SECTION 1

Snapshot of Deceased Donor Activity

SUMMARY

This section summarises some key messages from the report on organ donation and activity in Australia and New Zealand, in 2017.

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Executive Summary

Since its inception in 1989 in Australia and 1993 in New Zealand, the Australian and New Zealand Organ Donation Registry (ANZOD) continues to record and report on organ donation within Australia and New Zealand.

Data related to organ donation and transplantation activity is essential in identifying opportunities for improving care of donors, informing on quality of transplant organs and transplant recipient outcomes.

One Donor can benefit the lives of a number of recipients suffering from end stage organ disease. One donor could donate up to 9 organs including, kidneys (left and right), liver (split left and right), heart, lungs (left and right), pancreas and intestine, improving the lives of people wait listed for an organ transplant.

In 2017, both Australia and New Zealand reached their highest rates of donation. The following provides a snapshot of deceased donation activity in 2017.

Suggested Citation:

ANZOD Registry, 2018 Annual Report, Section 1: Summary of Organ Donation and Transplant Activity. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at www.anzdata.org.au

Australian Snapshot



In Australia there were **510** actual deceased solid organ donors in 2017, an increase of 1.4% in the number of donors from 2016 (503 donors);

The deceased organ donors per million population (pmp) was **20.7** donors pmp in 2017, a slight decrease from 20.8 donors pmp in 2016; although there was an 18.0% increase in the number of donors after circulatory death to 151 in 2017;

A total number of **1,400** recipients, whose lives were saved or improved by an organ transplant;



a total number of **832** kidney transplants (**33.8pmp**);



a total number of **281** liver transplants (**11.4pmp**);



a total number of **98** heart transplants (**4.0pmp**);



a total number of **206** lung transplants (**8.4pmp**);



a total number of **49** pancreas transplants (**2.0pmp**);



and **one** liver intestine transplant performed.

In 2017, over 9,600 Australian benefited from eye and tissue donation from Australian Donors. Of the 510 deceased organ donors, 309 also donated eye and/or tissue. In addition, there were 4,248 living tissue donations.



New Zealand Snapshot

In New Zealand there were **73** actual deceased solid organ donors in 2017, an increase of 19.7% in the number of donors from 2016 (61 donors);

A increase in the deceased organ donors per million population (pmp) to **15.2** donors pmp in 2017; and a 10.9% increase in the number of donors after brain death to 61 with an increase in the number of donors after circulatory death to 12 in 2017;



An increase of 26.5% in the total number of patients (**215**) whose lives were saved or improved by an organ transplant to recipients;



the total number of **118** kidney transplants (**24.6pmp**);



a total number of **51** liver transplants (**10.6pmp**);



a total number of **23** heart transplants (**4.8pmp**)



a total number of **24** lung transplants (**5.0pmp**);



a total number of **four** pancreas transplants (**0.8pmp**)





SECTION 2

Deceased Organ Donation

This section summarises organ donation in Australia and New Zealand. Figures reported here include the number of donors per million population; and number of transplant recipients and organs transplanted during 2017 in comparison to previous years.

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Executive Summary

2017 saw a stabilisation of donor rates in Australia, and a continuing rise in donor rates in New Zealand. Much of the growth in organ donor numbers is due to the increasing use of organs from donors after circulatory death. As a consequence, the greatest growth in transplant recipients is in kidney transplants and, in Australia, lung transplants.

Suggested Citation:

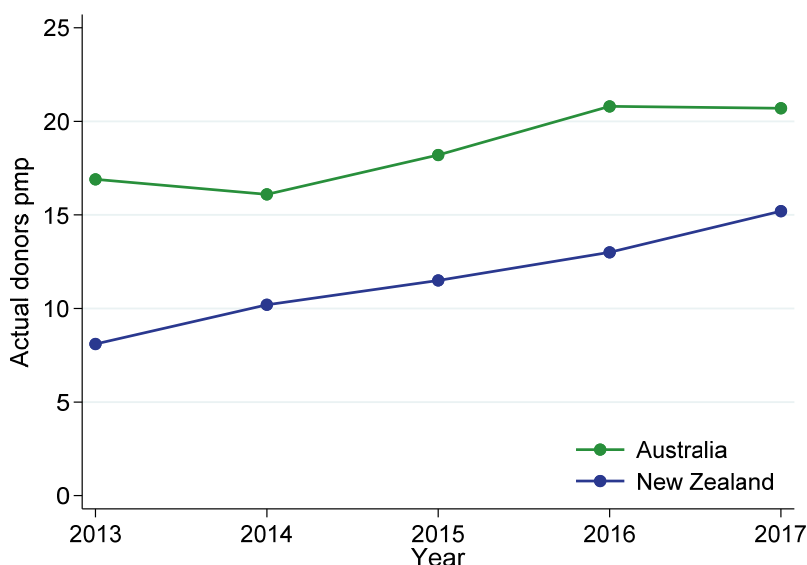
ANZOD Registry, 2018 Annual Report, Section 2: Deceased Organ. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at www.anzdata.org.au

Actual Deceased Organ Donors

Australian and New Zealand donor figures include all donors consented for organ and tissue donation who went to the operating theatre for the purpose of organ or tissue retrieval for transplantation. This is consistent with international reporting (World Health Organisation - Human Organ and Tissue Transplantation. http://www.who.int/ethics/topics/human_transplant/en/). These are termed “actual donors”

The rate of deceased organ donors per million population (dpmp) remained stable in Australia at 20.7 dpmp in 2017. In New Zealand, the rate rose to 15.2 dpmp in 2017, from 13.0 dpmp in 2016.

Figure 2.1 - Number of Actual Deceased Donors Per Million Population - Australia and New Zealand, 2013 – 2017



In Australia, there remains variation in organ donation rates between jurisdictions (Table 2.1). In 2017, rates varied from 12.2 dpmp in the Northern Territory to 36.5 dpmp in Tasmania.

Table 2.1 Number of Actual Deceased Donors (rate per million population) - Australia and New Zealand, 2013 - 2017

State/Country	2013	2014	2015	2016	2017
QLD	77 (16.5)	71 (15.0)	72 (15.0)	106 (21.9)	105 (21.3)
NSW ³	102 (14.2)	92 (12.6)	127 (17.2)	133 (17.7)	135 (17.7)
ACT ³	6 (10.0)	11 (18.0)	13 (21.0)	20 (31.9)	14 (22.0)
VIC	110 (19.0)	117 (19.8)	126 (20.9)	140 (22.7)	148 (23.4)
TAS	8 (15.6)	9 (17.5)	9 (17.5)	11 (21.3)	19 (36.5)
SA	34 (20.3)	36 (21.3)	42 (24.7)	40 (23.4)	32 (18.6)
NT	7 (28.8)	7 (28.7)	4 (16.3)	6 (24.4)	3 (12.2)
WA	47 (18.9)	35 (13.9)	42 (16.5)	47 (18.4)	54 (20.9)
AUS	391 (16.9)	378 (16.1)	435 (18.2)	503 (20.8)	510 (20.7)
NZ	36 (8.1)	46 (10.2)	53 (11.5)	61 (13.0)	73 (15.2)

¹ This table relates to the number of donors for whom the retrieval operation commenced for the purpose of transplantation. It includes donors who may have been deemed medically unsuitable at the time of the surgery or after removal of organs.

² Refers to retrieval State (i.e. Albury-NSW donors are retrieved by Victoria)

³ NSW population excludes residents of the NSW Southern Area Health Service (included in ACT population) Population Data - June 2017. Please refer to methodology section of this report for detail.

The variation, since 1998, in the number of actual deceased donors by Australian state/territory and for New Zealand is shown in Figure 2.2.

Figure 2.2.1 - Number of Actual Deceased Donors Australian States and Territories 1998 - 2017

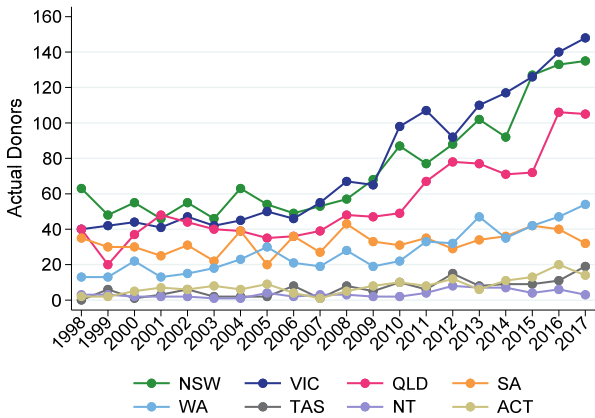
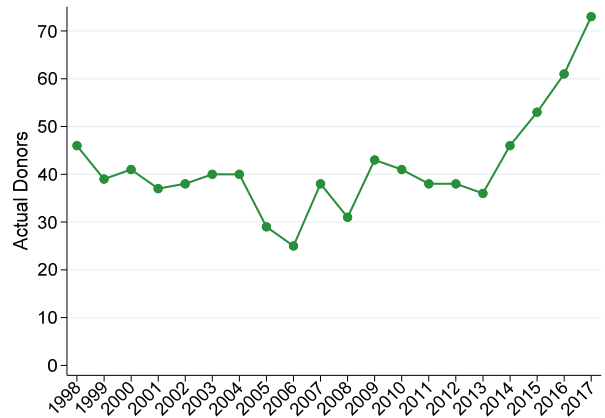
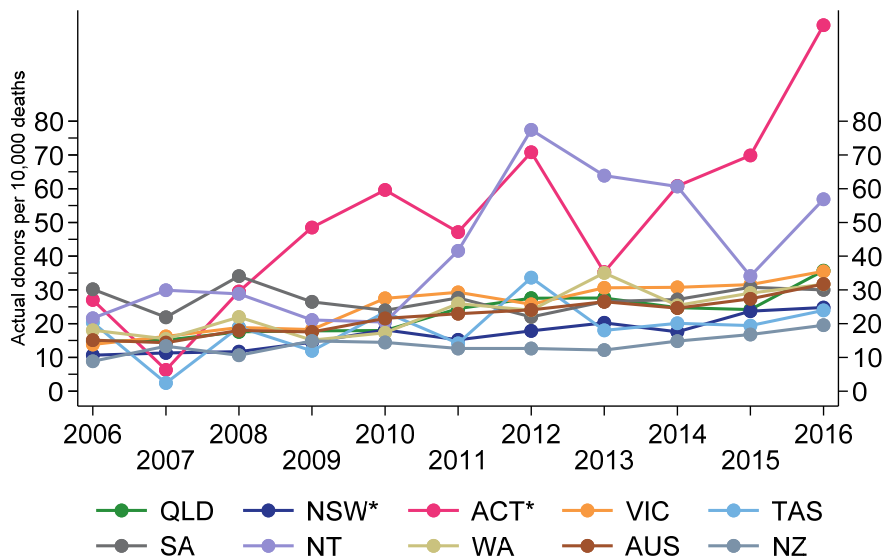


Figure 2.2.2 - Number of Actual Deceased Donors New Zealand, 1998 - 2017



There has been a steady decline in overall death rates among most ages in Australia over recent years. In many respects, using the number of deaths as the denominator to illustrate organ donation outcomes may be a more meaningful comparator. Rates for various jurisdictions using this metric are shown in Figure 2.3 and Table 2.2.

Figure 2.3 - Number of Actual Deceased Donors Per 10,000 Deaths - Australian States/Territories and New Zealand, 2006 - 2016



* NSW and ACT values are not adjusted for the NSW Southern Area Health Service, as death data were not available. Australian data on deaths 2016 was the latest release at the time of this publication. Australian Bureau of Statistics - Deaths 3302.0 and Statistics New Zealand

Table 2.2 Actual Deceased Donors per 10,000 Deaths Aged < 75 Years, 2012 - 2016 () is the % Deaths < 75 years as a proportion of all deaths*

Year	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUS	NZ
2012	74 (37%)	54 (33%)	211 (34%)	84 (31%)	98 (34%)	72 (30%)	102 (76%)	64 (37%)	71 (34%)	34 (37%)
2013	72 (38%)	61 (33%)	91 (39%)	98 (31%)	51 (36%)	84 (32%)	88 (73%)	93 (38%)	77 (34%)	33 (37%)
2014	67 (37%)	53 (33%)	171 (36%)	95 (32%)	56 (36%)	89 (31%)	82 (74%)	67 (38%)	72 (34%)	41 (36%)
2015	65 (37%)	72 (33%)	190 (37%)	102 (31%)	56 (35%)	99 (31%)	47 (72%)	77 (38%)	81 (34%)	46 (36%)
2016	95 (37%)	76 (32%)	313 (35%)	113 (31%)	65 (37%)	96 (31%)	80 (71%)	88 (36%)	94 (34%)	53 (37%)

* The number of actual donors is compared to the number of deaths that are aged less than 75 years. Australian Bureau of Statistics - Deaths 3302.0 and Statistics New Zealand. Australian data on deaths in 2016 was the latest release at the time of this publication.

Organ Donation Activity

Figure 2.4 shows the number of actual deceased organ donors, organs transplanted, transplant recipients and transplantation procedures per million population over time for Australia and New Zealand.

Figure 2.4.1 - Total Number of Actual Deceased Organ Donors, Procedures, Recipients and Organ Transplanted Per Million Population, Australia, 1998 – 2017

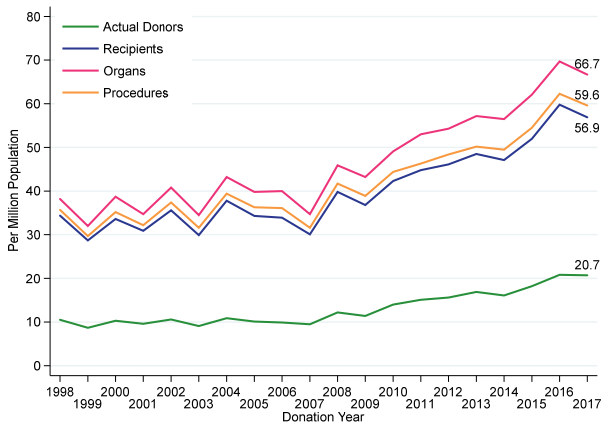
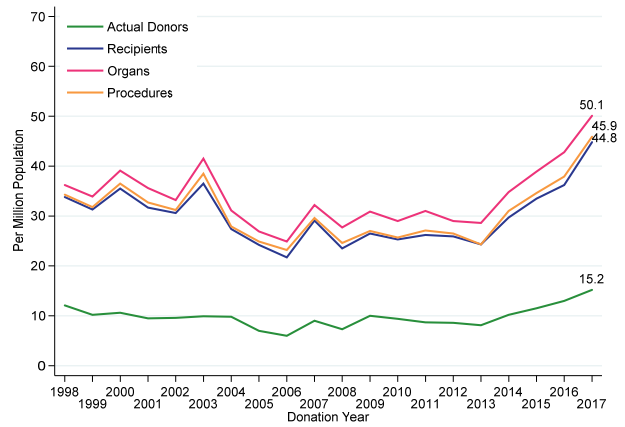


Figure 2.4.2 - Total Number of Actual Deceased Organ Donors, Procedures, Recipients and Organ Transplanted Per Million Population, New Zealand, 1998 – 2017



Organ Donation Pathway

Much of the increase in donor numbers has arisen from changes in rates of donors after circulatory death (DCD), demonstrated in Figure 2.5.

Figure 2.5.1 - Organ Donation Pathway Australia 1998 – 2017

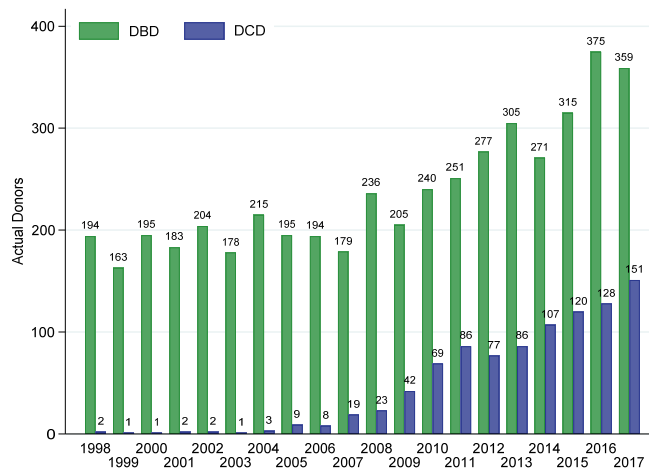
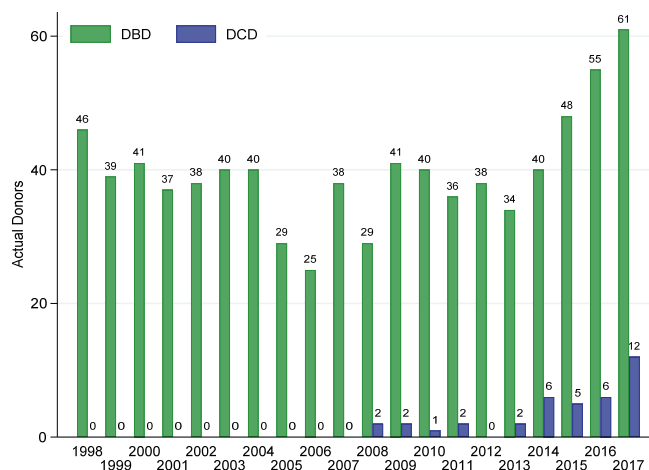


Figure 2.5.2 - Organ Donation Pathway New Zealand 1998 – 2017



Organ Donation Overview

Tables 2.3 and 2.4 show the number (and rate) of recipients who received various organs from donors in 2017.

Table 2.3 Australia Overview - 2017 (pmp) per million population

Population (million)	24.6
Actual Deceased Organ Donors - both DBD & DCD included (pmp)	510 (20.7)
Kidney Transplant Recipients from deceased donors- includes all combinations (pmp)	832 (33.8)
Liver Transplant Recipients from deceased donors- includes all combinations (pmp)	281 (11.4)
Heart Transplant Recipients from deceased donors- includes all combinations (pmp)	98 (4.0)
Lung Transplant Recipients from deceased donors- includes all combinations (pmp)	206 (8.4)
Pancreas Transplant Recipients from deceased donors- includes all combinations (pmp)	51 (2.1)
Intestine Transplant Recipients from deceased donors- includes all combinations (pmp)	1 (<1.0)
Total Number of Transplanted Recipients (pmp)¹	1402 (57.0)
Total Number of Organs Transplanted (pmp)²	1643 (66.8)

Table 2.4 New Zealand Overview - 2017 (pmp) per million population

Population (million)	4.8
Actual Deceased Organ Donors - both DBD & DCD included (pmp)	73 (15.2)
Kidney Transplant Recipients from deceased donors- includes all combinations (pmp)	118 (24.6)
Liver Transplant Recipients from deceased donors- includes all combinations (pmp)	51 (10.6)
Heart Transplant Recipients from deceased donors- includes all combinations (pmp)	23 (4.8)
Lung Transplant Recipients from deceased donors- includes all combinations (pmp)	24 (5.0)
Pancreas Transplant Recipients from deceased donors- includes all combinations (pmp)	4 (0.8)
Total Number of Transplanted Recipients (pmp)¹	215 (44.8)
Total Number of Organs Transplanted (pmp)²	240 (50.1)

¹ The total number of recipients includes all combinations of multi-organ transplants as a single count of transplantation.

² The total number of transplanted organs differs from total number of transplant recipients as each organ is counted as a single organ transplant.

Organ Transplants

Table 2.5 shows the number (and rate) of various organs by jurisdiction of donation.

Table 2.5 Number of Organs Transplanted in 2017 by Donor State & Country (pmp) in Australia and New Zealand

Organs	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUS	NZ
Kidney	184	216	22	234	36	46	6	97	841 ¹ (34.2)	121 ² (25.2)
Liver	56	69	4	58	12	20	3	34	256 ³ (10.4)	48 ⁴ (10.0)
Heart	15	33	2	20	7	7	0	14	98 (4.0)	23 (4.8)
Lung	84	87	6	137	15	25	0	42	396 ⁵ (16.1)	44 ⁶ (9.2)
Pancreas	6	15	3	16	0	1	1	9	51 (2.1)	4 (0.8)
Intestine	0	0	0	0	0	0	0	1	1 (0.0)	0 (0.0)
Total	345	420	37	465	70	99	10	197	1643 (66.8)	240 (50.1)

The kidneys and lungs are counted as two separate organs (i.e. left and right kidney; left and right lung).

¹ Includes 823 single kidney, 4 double adult kidney and 5 en-bloc kidney transplant procedures in Australia.

² Includes 115 single kidney, 3 double adult kidney and 0 en-bloc kidney transplant procedures in New Zealand.

³ Includes 228 whole liver, 50 split liver and 3 cut down liver transplant procedures in Australia.

⁴ Includes 44 whole liver, 6 split liver and 1 cut down liver transplant procedures in New Zealand.

⁵ Includes 190 double lung and 16 single lung transplant procedures in Australia.

⁶ Includes 20 double lung and 4 single lung transplant procedures in New Zealand.

The mean number of organs transplanted per donor is calculated from the number of organs retrieved from actual donors for the purpose of transplantation and subsequently transplanted, divided by the number of actual donors. The number of organs transplanted per donor each year from 2004-2017 in Australia and New Zealand is shown in Figure 2.6. The mean number of transplant organs per deceased donor across Australia ranged from 2.6 in ACT to 3.7 in TAS.

Figure 2.6 - Number of Organs Transplanted per Donor 2004 - 2017



Figure 2.7 shows the organ-specific transplant rates for Australia and New Zealand over the period 1998 - 2017 (shown are rate of organ transplants per million population).

Figure 2.7.1 - Organs Transplanted 1998-2017 Per Million Population, Australia

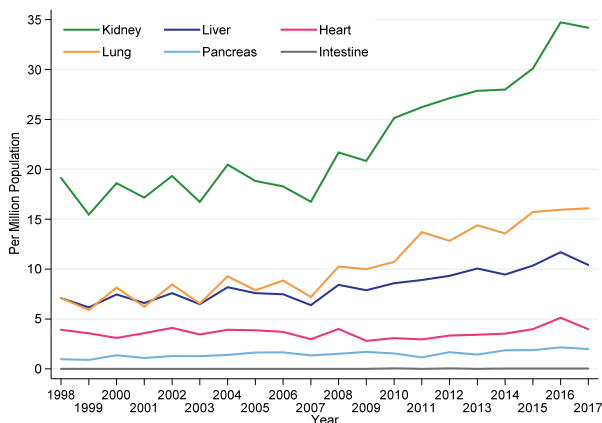


Figure 2.7.2 - Organs Transplanted 1998-2017 Per Million Population, New Zealand

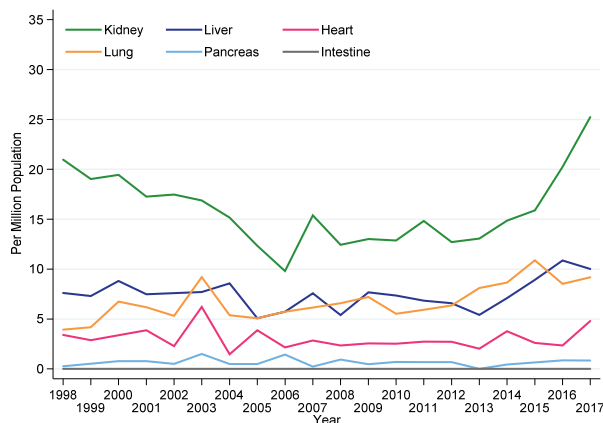


Figure 2.8 shows the corresponding rates for donation after circulatory death for Australia and New Zealand. Transplantation of organs from DCD has contributed to a significant increase in the rate of kidney transplantation and, in Australia, lung transplantation.

Figure 2.8.1 - Organs Transplanted from DCD Donors, 1998-2017 Per Million Population, Australia

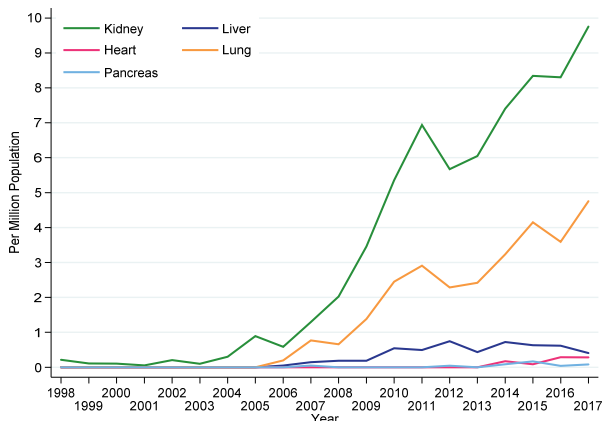
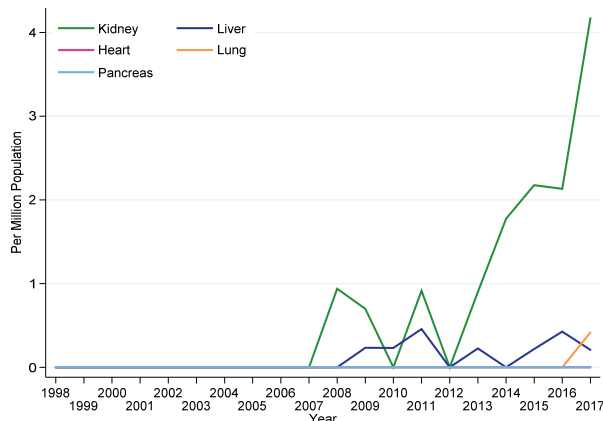


Figure 2.8.2 - Organs Transplanted from DCD Donors, 1998-2017 Per Million Population, New Zealand



Deceased Organ Donation Location

The number of deceased donors reported are based on the State/Territory/Country in which the donor died. Appendix 1 shows a more detailed breakdown of the number of donors by retrieval hospital.

Table 2.6 details the number and proportion of donors in Australia for 2013 - 2017 by the remoteness category of their postcode of residence. "Overseas" refers to donors who usually reside outside of Australia. The ABS standardised remoteness structure, known as the Accessibility/Remoteness Index of Australia (ARIA), is used (<http://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness+structure>).

In 2017, there were 10 deceased donors in Australia who were considered overseas visitors.

Postcode information was not collected for deceased donors in New Zealand as of the end of 2017.

Table 2.6 Location of Postcodes of Deceased Donors 2013 - 2017

Remoteness Area of Postcode	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUS
Major Cities of Australia	240 (56%)	428 (73%)	36 (57%)	436 (68%)	1 (2%)	125 (68%)	2 (7%)	169 (75%)	1437 (65%)
Inner Regional Australia	99 (23%)	115 (20%)	21 (33%)	167 (26%)	35 (63%)	27 (15%)	0 (0%)	23 (10%)	487 (22%)
Outer Regional Australia	75 (17%)	27 (5%)	5 (8%)	29 (5%)	18 (32%)	22 (12%)	20 (74%)	16 (7%)	212 (10%)
Remote Australia	2 (<1%)	3 (1%)	0 (0%)	0 (0%)	1 (2%)	5 (3%)	2 (7%)	7 (3%)	20 (1%)
Very Remote Australia	5 (1%)	1 (<1%)	0 (0%)	0 (0%)	1 (2%)	2 (1%)	1 (4%)	3 (1%)	13 (1%)
Overseas	8 (2%)	12 (2%)	1 (2%)	5 (1%)	0 (0%)	3 (2%)	2 (7%)	6 (3%)	37 (2%)
Total	429	586	63	637	56	184	27	224	2206

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SECTION 3

Deceased Organ Donation Pathway

This section summarises organ donation in Australia and New Zealand. In 2017 both countries reached the highest rates of donation. Figures reported here include the number of donors per million population; and number of transplant recipients and organs transplanted during 2017 in comparison to previous years.

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Suggested Citation

ANZOD Registry. 2018 Annual Report, Section 3: Deceased Organ Donor Pathway. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at:
<http://www.anzdata.org.au>

Registration of Intent to Donate

The Registry collects the intention to be an organ donor in the form of a decision recorded on a national register.

In Australia, the Australian Organ Donor Register¹ is the national register for people to record their stated intent about becoming an organ and tissue donor for transplantation after death. This provides a record of a person's donation decision for families and clinicians in the event of their death and can only be verified by authorised medical personnel. The Australian Organ Donor Register (the Donor Register) is managed by the Department of Human Services on behalf of the Australian Government.

Only people aged 18 years and over can register a legally valid consent or objection on the Australian Organ Donor Register. People aged less than 18 years can become organ and tissue donors; for this group consent is sought from family/ next of kin at the time of death.

Table 3.1 Actual Donors Enrolled in the Australian Organ Donor Register¹ 2017 (2016)

	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST
Registered as Yes	35 (25)	55 (54)	5 (5)	40 (30)	8 (2)	13 (28)	1 (3)	17 (23)	174 (170)
Registered as No	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not Registered	66 (67)	66 (70)	9 (13)	100 (96)	11 (9)	19 (10)	2 (3)	33 (23)	306 (291)
Not Accessed	4 (14)	14 (9)	0 (2)	8 (14)	0 (0)	0 (2)	0 (0)	4 (1)	30 (42)
Total	105 (106)	135 (133)	14 (20)	148 (140)	19 (11)	32 (40)	3 (6)	54 (47)	510 (503)

¹ The Australian Organ Donor Register (the Donor Register) is managed by the Department of Human Services on behalf of the Australian Government, not by ANZOD. The Donor Register is the only national register for people to record their decision about becoming an organ and tissue donor for transplantation after death. Registering is voluntary and people have complete choice over which organs and tissues they wish to donate. If a person does not want to become an organ and tissue donor, they can register their decision not to donate on the Donor Register which is available at <http://www.medicareaustralia.gov.au/provider/patients/aodr/index.jsp>

Coroner's Cases

Table 3.2 shows the number of actual donors subject to Coronerial inquiry. In Australia, 50% of donors in 2017 were subject to Coronerial inquiry, compared to 47% in 2016. In New Zealand, it was 29% for 2017 and 33% in 2016.

Table 3.2 Coroner's Cases 2013 - 2017

	Australia					New Zealand				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Yes	187	166	211	235	253	10	23	25	20	21
No	204	212	224	268	257	26	23	28	41	52
Total	391	378	435	503	510	36	46	53	61	73

Table 3.3 shows the number of Australian Coroner's cases by jurisdiction and the number of Coroner's cases in New Zealand for 2017 compared to 2016.

Table 3.3 Coroner's Cases by State and Country 2017 (2016)

	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
Yes	55 (51)	59 (47)	7 (10)	72 (73)	7 (4)	20 (22)	2 (2)	31 (26)	253 (235)	21 (20)
No	50 (55)	76 (86)	7 (10)	76 (67)	12 (7)	12 (18)	1 (4)	23 (21)	257 (268)	52 (41)
Total	105 (106)	135 (133)	14 (20)	148 (140)	19 (11)	32 (40)	3 (6)	54 (47)	510 (503)	73 (61)

Cause of Death – All Donors

Table 3.4 shows the cause of death by percentage in Australia, for each Australian State, and New Zealand over the last five years.

In Australia for the period 2013-2017, intracranial haemorrhage accounted for an overall 39% of donor deaths and traumatic brain injury for 16%.

Table 3.4 Cause of Donor Death 2013 - 2017 (%)

Cause of Death	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
Intracranial Haemorrhage	37%	42%	38%	37%	46%	38%	44%	37%	39%	50%
Traumatic Brain Injury	20%	16%	25%	14%	7%	18%	4%	14%	16%	17%
Cerebral Infarct	3%	5%	5%	8%	7%	7%	11%	9%	6%	7%
Cerebral Hypoxia / Ischaemia	33%	31%	31%	35%	27%	32%	30%	32%	32%	22%
Other Neurological Condition	1%	2%	0%	2%	5%	2%	0%	0%	1%	2%
Non-Neurological Condition	3%	4%	2%	4%	2%	2%	4%	3%	3%	1%

Table 3.5 shows the cause of death of donors by age group in 2017 in Australia and New Zealand. In donors aged 55 years and older, intracranial haemorrhage accounted for 52% of deaths in Australia and 64% in New Zealand in 2017, but a diminishing proportion in younger age groups. .

Conversely, among donors aged 15-34 years, cerebral hypoxia/ischaemia accounted for 54% of deaths in Australia and 33% in New Zealand in 2017.

Table 3.5 Cause of Donor Death by Age Group 2017

Cause of Death	Australia					New Zealand				
	0-14	15-34	35-54	55+	n (%)	0-14	15-34	35-54	55+	n (%)
Intracranial Haemorrhage	5	9	76	97	187 (37%)	0	3	14	21	38 (52%)
Traumatic Brain Injury	6	33	21	30	90 (18%)	0	6	1	3	10 (14%)
Cerebral Infarct	0	2	14	10	26 (5%)	0	1	2	3	6 (8%)
Cerebral Hypoxia / Ischaemia	13	58	70	40	181 (35%)	1	6	4	5	16 (22%)
Other Neurological Condition	1	4	2	2	9 (2%)	0	2	0	1	3 (4%)
Non-Neurological Condition	0	2	9	6	17 (3%)	0	0	0	0	0 (0%)
Total	25	108	192	185	510	1	18	21	33	73

Table 3.6 Cause of Death by Age Group and Australian State 2017

State of Donation	Cause of Death	0-14	15-34	35-54	55+	Total
QLD	Intracranial Haemorrhage	0	2	18	15	35
	Traumatic Brain Injury	0	8	10	6	24
	Cerebral Infarct	0	0	2	1	3
	Cerebral Hypoxia / Ischaemia	3	14	16	8	41
	Other	0	1	1	0	2
	Total		3	25	47	30
NSW	Intracranial Haemorrhage	2	3	19	34	58
	Traumatic Brain Injury	3	11	2	8	24
	Cerebral Infarct	0	0	0	3	3
	Cerebral Hypoxia / Ischaemia	2	17	17	8	44
	Other	1	0	3	2	6
	Total		8	31	41	55
ACT	Intracranial Haemorrhage	0	0	2	2	4
	Traumatic Brain Injury	0	1	0	3	4
	Cerebral Infarct	0	0	1	0	1
	Cerebral Hypoxia / Ischaemia	0	2	1	2	5
	Other	0	0	0	0	0
	Total		0	3	4	7
VIC	Intracranial Haemorrhage	2	4	24	27	57
	Traumatic Brain Injury	2	5	2	11	20
	Cerebral Infarct	0	0	7	4	11
	Cerebral Hypoxia / Ischaemia	3	8	22	12	45
	Other	0	4	5	6	15
	Total		7	21	60	60
TAS	Intracranial Haemorrhage	0	0	3	7	10
	Traumatic Brain Injury	0	1	2	0	3
	Cerebral Infarct	0	0	1	0	1
	Cerebral Hypoxia / Ischaemia	0	0	3	1	4
	Other	0	1	0	0	1
	Total		0	2	9	8
SA	Intracranial Haemorrhage	0	0	1	7	8
	Traumatic Brain Injury	0	4	0	2	6
	Cerebral Infarct	0	1	2	0	3
	Cerebral Hypoxia / Ischaemia	0	6	4	4	14
	Other	0	0	1	0	1
	Total		0	11	8	13
NT	Intracranial Haemorrhage	0	0	0	1	1
	Traumatic Brain Injury	0	0	0	0	0
	Cerebral Infarct	0	0	0	0	0
	Cerebral Hypoxia / Ischaemia	0	1	1	0	2
	Other	0	0	0	0	0
	Total		0	1	1	1
WA	Intracranial Haemorrhage	1	0	9	4	14
	Traumatic Brain Injury	1	3	5	0	9
	Cerebral Infarct	0	1	1	2	4
	Cerebral Hypoxia / Ischaemia	5	10	6	5	26
	Other	0	0	1	0	1
	Total		7	14	22	11

Cardiopulmonary Resuscitation

Cardiopulmonary resuscitation is recorded, and includes the period leading up to the admission and during hospital stay for the patient prior to organ donation. Table 3.7 shows the number of recorded events of cardiopulmonary resuscitation for Australia and New Zealand donors from 2013 to 2017.

Table 3.7 Cardiopulmonary Resuscitation 2013 - 2017

	Australia					New Zealand				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Yes	155	170	212	236	239	8	15	25	23	27
No	234	207	223	266	271	27	31	28	38	46
Unknown	2	1	0	1	0	1	0	0	0	0
Total	391	378	435	503	510	36	46	53	61	73

Table 3.8 Cardiopulmonary Resuscitation by Australian State 2017 (2016)

	QLD	NSW	ACT	VIC	TAS	SA	NT	WA
Yes	46 (56)	64 (52)	7 (9)	61 (73)	6 (5)	19 (18)	2 (2)	34 (21)
No	59 (50)	71 (81)	7 (11)	87 (66)	13 (6)	13 (22)	1 (4)	20 (26)
Unknown	0 (0)	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Total	105 (106)	135 (133)	14 (20)	148 (140)	19 (11)	32 (40)	3 (6)	54 (47)

Initial Mention of Organ Donation

In 2017, organ donation was predominantly raised by Intensive Care Clinicians and Registrars; 52% of cases in Australia and 82% in New Zealand, as shown in Table 3.9. In Australia, organ donation was raised by a Donor Specialist on 76 (15%) occasions which is an increase from 10% in 2016. Organ donation in New Zealand was initially mentioned by a Donor Coordinator in one case. In 2017, 29% of families raised the subject of organ donation in Australia, compared to 34% in 2016. In New Zealand, 8% of families raised donation in 2017 (8% in 2016).

Table 3.10 shows the category of person who initially mentioned organ donation for Australian states and territories in 2016 and 2017.

Table 3.9 Initial Mention of Organ Donation 2013 - 2017

	Australia					New Zealand				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Donor Specialist	21	45	29	51	76	1	2	0	1	1
ICU Consultant	242	186	228	246	241	28	35	37	48	60
ICU Trainee (E.g. Registrar)	13	24	25	21	25	0	2	3	2	0
Social Worker	0	1	0	0	1	0	0	0	0	0
Emergency Clinician	8	9	8	7	9	0	0	0	0	0
Family	100	112	142	169	148	5	5	8	5	6
Nursing Staff	2	1	1	1	3	0	1	2	3	3
Other	5	0	2	8	7	2	1	3	2	3
TOTAL	391	378	435	503	510	36	46	53	61	73

Table 3.10 Initial Mention of Organ Donation by Australian State 2017 (2016)

	QLD	NSW	ACT	VIC	TAS	SA	NT	WA
Donor Specialist	10 (7)	14 (24)	4 (1)	36 (11)	5 (6)	4 (0)	1 (2)	2 (0)
ICU Consultant	59 (54)	69 (65)	5 (7)	63 (65)	3 (2)	16 (31)	1 (1)	25 (21)
ICU Trainee (E.g. Registrar)	3 (2)	5 (2)	0 (2)	10 (12)	1 (1)	2 (1)	0 (0)	4 (1)
Social Worker	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Emergency Clinician	1 (0)	4 (3)	0 (1)	2 (2)	1 (0)	0 (0)	0 (0)	1 (1)
Family	30 (43)	42 (36)	4 (8)	36 (47)	5 (1)	9 (8)	1 (3)	21 (23)
Nursing Staff	0 (0)	1 (0)	1 (0)	1 (0)	0 (1)	0 (0)	0 (0)	0 (0)
Other	1 (0)	0 (3)	0 (1)	0 (3)	4 (0)	1 (0)	0 (0)	1 (1)
TOTAL	105 (106)	135 (133)	14 (20)	148 (140)	19 (11)	32 (40)	3 (6)	54 (47)

Donation Not Proceeding

An intended donor is a person for whom authority had been given, but organ donation did not proceed. A donation may not proceed due to positive virology tests, cardiac arrest or further investigations (for example, discovery of a cancer or infection). Donations after circulatory death may also not proceed if the time has between withdrawal of support and cessation of circulation exceeded the limits set s. This was the main reason donors did not proceed to organ donation in 2017.

Table 3.11 represents the number of non-proceeding DBD and DCD donors for each State/Territory and overall for Australia and New Zealand compared to the number of actual donors who did proceed to theatre for organ donation. In Australia, there were 132 donors who did not proceed down the pathway of solid organ donation, of which 26 (20%) were DBD and 105 (80%) were DCD and in New Zealand there was one DBD and two DCD intended donors.

Table 3.11 Actual vs Intended (Non-Proceeding) Donors 2017

	DBD		DCD		Total	
	Actual	Intended	Actual	Intended	Actual	Intended
QLD	71 (93%)	5 (7%)	34 (69%)	15 (31%)	105 (84%)	20 (16%)
NSW	103 (95%)	5 (5%)	32 (68%)	15 (32%)	135 (87%)	20 (13%)
ACT	7 (100%)	-	7 (70%)	3 (30%)	14 (82%)	3 (18%)
VIC	86 (93%)	6 (7%)	62 (57%)	47 (43%)	148 (74%)	53 (26%)
TAS	17 (94%)	1 (6%)	2 (33%)	4 (67%)	19 (79%)	5 (21%)
SA	25 (89%)	3 (11%)	7 (41%)	10 (59%)	32 (70%)	14 (30%)
NT	3 (75%)	1 (25%)	-	-	3 (75%)	1 (25%)
WA	47 (90%)	5 (10%)	7 (39%)	11 (61%)	54 (77%)	16 (23%)
AUSTRALIA	359 (93%)	26 (7%)	151 (59%)	105 (41%)	510 (79%)	132 (21%)
NEW ZEALAND	61 (98%)	1 (2%)	12 (86%)	2 (14%)	73 (96%)	3 (4%)

The reasons for donations not proceeding in Australia in 2017 are shown in Table 3.12.

Table 3.12 Reasons Why Donation Did Not Proceed 2017, Australia

Organ Outcome Details	Freq.
Planned Donation After Circulatory Death Who Died Outside Time Limit	63
Medical Contraindication Discovered During Consideration for Donation	41
No Suitable Recipients	12
Declined by Family After Initially Giving Consent	8
High Risk - Not Medically Suitable	2
Refusal by Coroner / Pathologist	2
Did Not Progress to Brain Death	2
Increased GCS > Donation After Circulatory Death Timeframe	1
No Available Retrieval Team	1
TOTAL	132

Donation After Circulatory Death

The majority of organs are donated by the Donation after Brain Death (DBD) pathway. After certification of brain death, the donor remains on the ventilator and the removal of organs occurs hours later. The Donation after Circulatory Death (DCD) pathway is defined by patients with irreversible cessation of circulation, typically after withdrawal of cardiopulmonary support in an intensive care setting. As soon as cessation of circulation is confirmed, the retrieval procedure is commenced in order to minimise warm ischaemic time.

The number of DCD donors since 1989 has risen to 955 donors for Australia and 40 DCD donors for New Zealand. In Australia, in 2017, there were 151 DCD donors and in New Zealand there were 12 DCD donors. Table 3.13 shows the number of DCD Donors by jurisdiction for 2013 - 2017.

Table 3.13 Donation After Circulatory Death by Jurisdiction 2013 - 2017

Year	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
2013	24	15	0	35	3	2	2	5	86	2
2014	20	27	3	47	0	4	2	4	107	6
2015	19	40	4	47	0	5	0	5	120	5
2016	17	36	5	56	1	6	2	5	128	6
2017	34	32	7	62	2	7	0	7	151	12

In 2017 in Australia, the mean age for a DCD donor was 46.8 years and the age range were 1.5 to 73.5 years.

In New Zealand, the mean age of DCD was 45.7 years and the age range were 15.5 to 59.5 years.

Causes of death leading to DCD in Australia in 2017 were intracranial haemorrhage (33), cerebral hypoxia/ischaemia (55), traumatic brain injury (37), cerebral infarct (7), other neurological conditions (2) and non-neurological conditions (17).

Causes of death leading to DCD in New Zealand in 2017 were intracranial haemorrhage (3), cerebral hypoxia/ischaemia (5), traumatic brain injury (1), cerebral infarct (2), other neurological conditions (1) and non-neurological conditions (0).

Time from Admission to Brain Death

In 2017, 25% of Australian donors were declared brain dead within 24 hours of hospital admission. Of donors who were declared brain dead between 1 – 5 days of hospital admission. 9% of donors (31) were in hospital for more than 5 days before being declared brain dead.

In 2017, 33% of New Zealand donors were declared brain dead within 24 hours of hospital admission. of donors were declared brain dead between 1 – 5 days of hospital admission. 5% of donors (3) were in hospital for more than 5 days before being declared brain dead.

Figure 3.1.1 Time from Admission to Brain Death (hours) DBD Donors - Australia 2013-2017

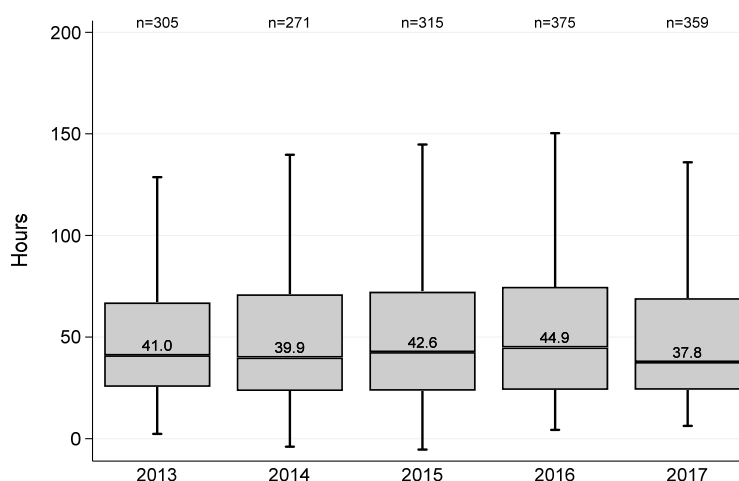
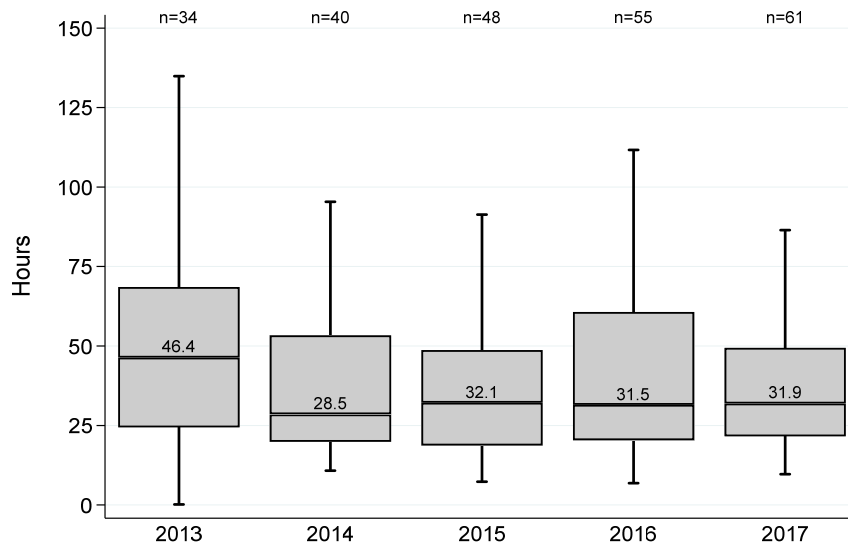


Figure 3.1.2 Time from Admission to Brain Death (hours) DBD Donors - New Zealand 2013-2017

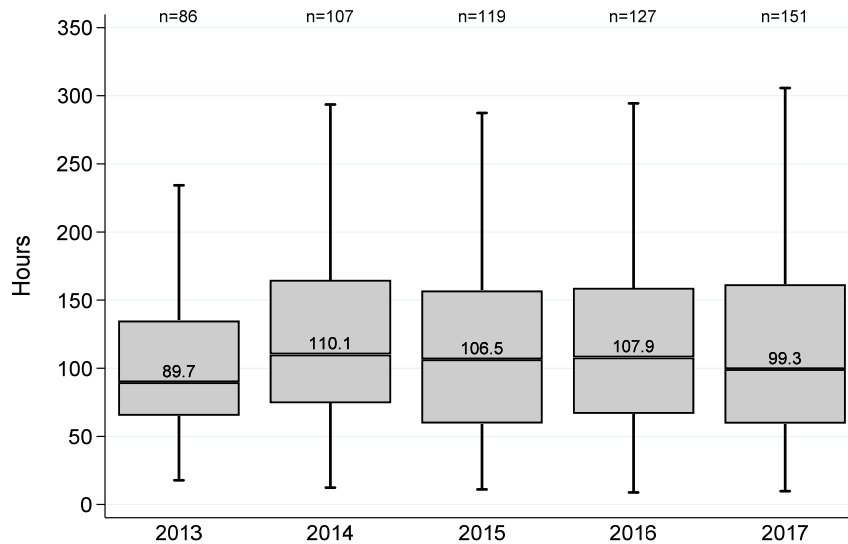


Time from Admission to Circulatory Death

As shown in Figure 3.2, in 2017, 5% of Australian DCD donors died within 24 hours of hospital admission. of DCD donors died between 1 – 5 days of hospital admission. 36% of DCD donors (55) were in hospital for more than 5 days prior to death.

In New Zealand, 58% of DCD donors died between 1-5 days of hospital admission. 42% of DCD donors (5) were in hospital for more than five days prior to death.

Figure 3.2 Time from Admission to Circulatory Death (hours) DCD Donors - Australia 2013-2017



Time from Ventilation to Brain Death

Figure 3.3 shows the time from commencement of ventilation to brain death in Australia and New Zealand for 2013-2017.

Figure 3.3.1 Time from Ventilation to Brain Death (hours) DBD Donors - Australia 2013-2017

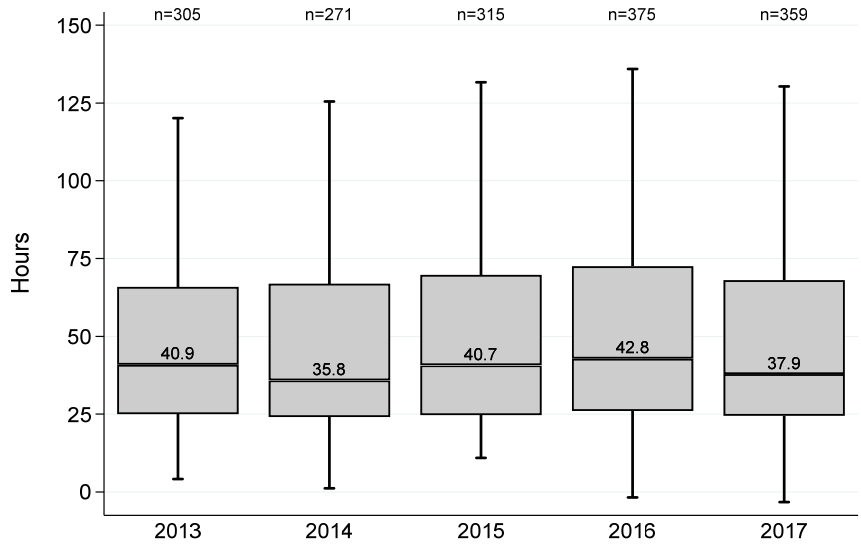
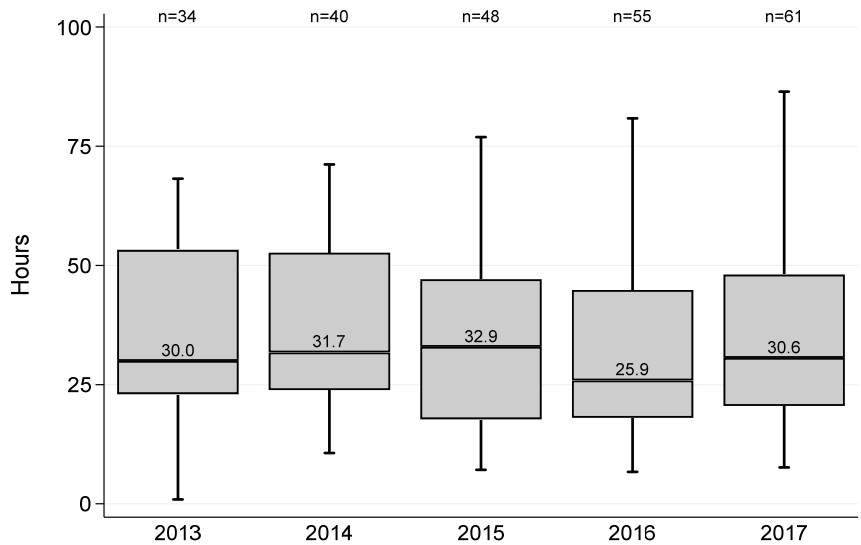


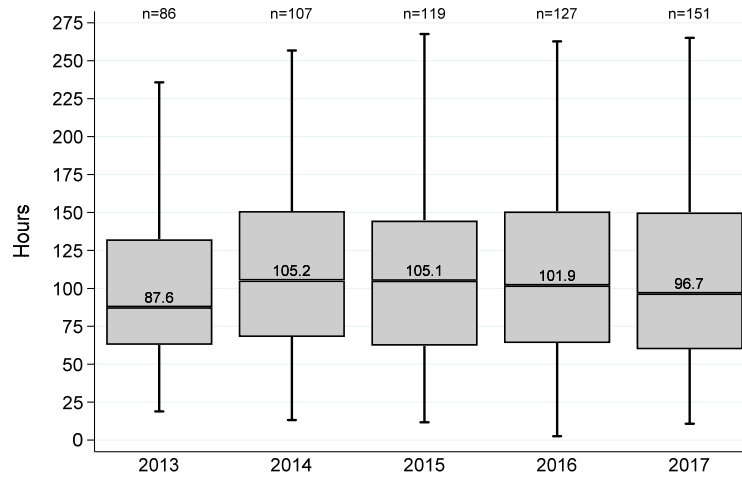
Figure 3.3.2 Time from Ventilation to Brain Death (hours) DBD Donors - New Zealand 2013-2017



Time from Ventilation to Circulatory Death

Figure 3.4 shows the time from ventilation to circulatory death in Australia for 2013-2017. The median time in New Zealand in 2017 from ventilation to circulatory death was 114.6 hours.

Figure 3.4 Time from Ventilation to Circulatory Death (hours) DCD Donors - Australia 2013-2017



Time from Brain Death to Donation

Figure 3.5 shows the time from ventilation to brain death in Australia and New Zealand for 2013-2017. In 2017, 11% (39) of Australian DBD donors underwent aortic cross clamp within twelve hours of the certification of brain death. Cross clamp did not proceed in 7 Australian donors.

In 2017, 28% (17) of New Zealand DBD donors underwent aortic cross clamp within twelve hours of the certification of brain death. Cross clamp did not proceed in 2 New Zealand donors.

Figure 3.5.1 Time from Brain Death to Donation (hours) DBD Donors - Australia 2013-2017

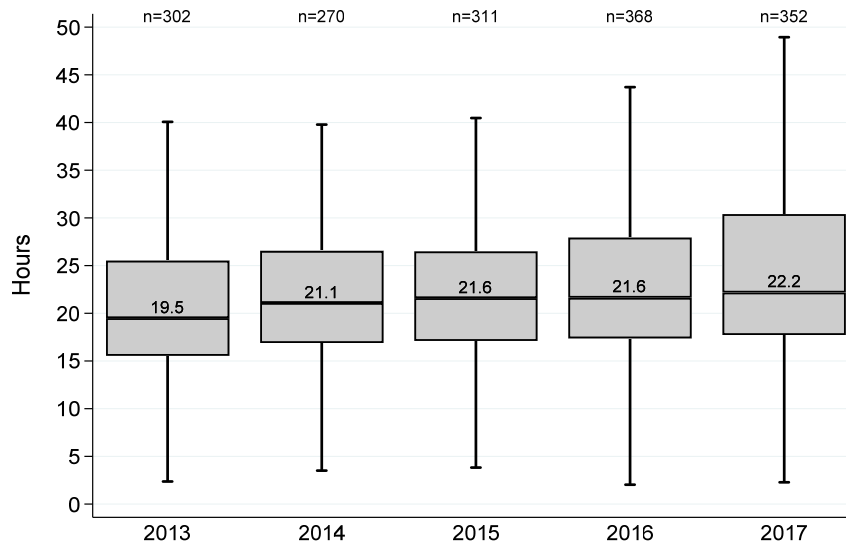
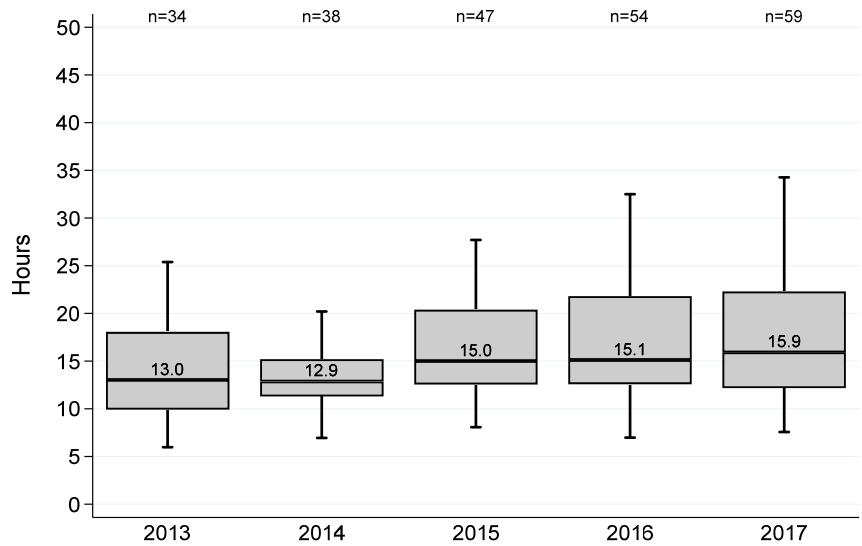


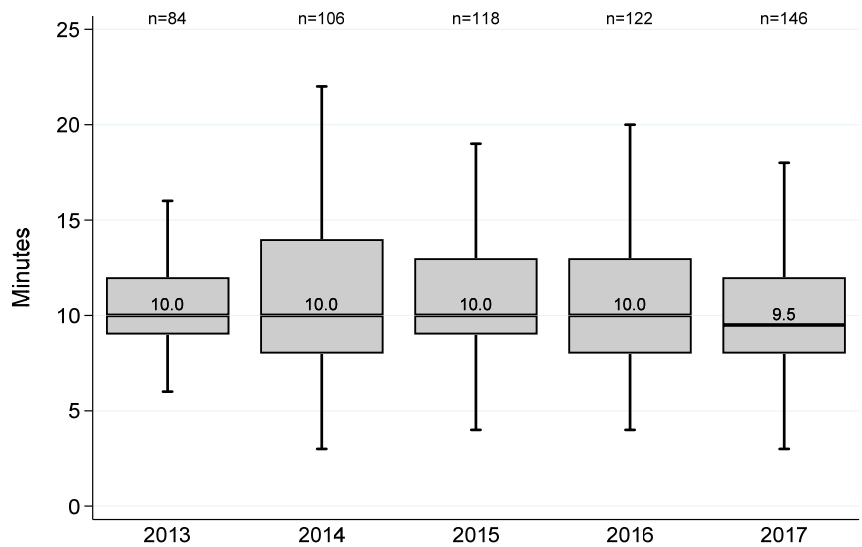
Figure 3.5.2 Time from Brain Death to Donation (hours) DBD Donors - New Zealand 2013-2017



Time from Circulatory Death to Donation

As shown in Figure 3.6, in 2017, 56% (84) of Australian DCD donors underwent cold perfusion within ten minutes of the certification of circulatory death. Cold perfusion did not proceed in 5 Australian donors.

Figure 3.6 Time from Circulatory Death to Donation (minutes) DCD Donors - Australia 2013-2017



In 2017, 75% (9) of New Zealand DCD donors underwent cold perfusion within ten minutes of the certification of circulatory death. Cold perfusion did not proceed for 1 New Zealand donor. The median time was 8 minutes.

Summary – Organs Requested, Consent Given, Retrieved and Transplanted

Table 3.14 shows the outcome of organs requested in 2017 (2016). The information on request for organ donation, refers only to those patients who become actual donors. The reasons for organs not requested, not retrieved or not transplanted are documented for each of the specific organs in their sections later in this report.

Table 3.14 Summary for Organ Donation Pathway by Organ Type 2017 (2016)

Country		Kidneys ¹	Liver	Heart	Lungs ¹	Pancreas	Intestines
AUSTRALIA	Organs for donation	1020 (1006)	510 (503)	510 (503)	1020 (1006)	510 (503)	510 (503)
	Organs Requested	989 (981)	459 (464)	387 (393)	936 (912)	407 (406)	275 (246)
	Organs Consented	987 (977)	453 (456)	358 (370)	910 (886)	393 (394)	242 (213)
	Organs Retrieved	894 (883)	271 (298)	109 (125)	421 (410)	95 (120)	1 (1)
	Utilised organs for transplantation	841 (841)	256 (283)	98 (124)	396 (386)	49 (52)	1 (1)
	Recipients transplanted ²	832 (821)	281 (314)	98 (124)	206 (196)	49 (52)	1 (1)
NEW ZEALAND	Organs for donation	146 (122)	73 (61)	73 (61)	146 (122)	73 (61)	73 (61)
	Organs Requested	143 (120)	69 (60)	49 (50)	112 (110)	40 (45)	0 (0)
	Organs Consented	143 (120)	69 (60)	49 (50)	112 (110)	40 (45)	0 (0)
	Organs Retrieved	127 (99)	49 (51)	23 (11)	47 (40)	4 (4)	0 (0)
	Utilised organs for transplantation	121 (95)	48 (51)	23 (11)	44 (40)	4 (4)	0 (0)
	Recipients transplanted ³	118 (90)	51 (53)	23 (11)	24 (20)	4 (4)	0 (0)

¹ Kidneys and Lungs are counted as two separate organs (i.e. left and right).

² For Australia 2017 (2016), includes 9 (20) Double adult/Enbloc Kidneys, 50 (62) Split Livers, 4 (6) Reduced Size Livers, 16 (6) Single Lung and 190 (190) Double Lung Transplants

³ For New Zealand 2017 (2016), includes 3 (5) Double-adult/Enbloc Kidneys, 6 (4) Split Livers, 3 (0) Reduced Size Livers, 4 (0) Single Lung and 20 (20) Double Lung Transplants.

Multiple Organ Retrieval

For Australia, there were 510 actual deceased organ donors in 2017. Of those donors, 495 donors had at least one organ retrieved; and 482 resulted in at least one organ transplanted. There were 155 (30%) Australian donors in 2017 who had a single organ retrieved. Kidney only donation occurred in 120 cases, 15 donating a liver, 1 donating a heart and 19 donating lungs. In 2017, 340 (67%) donors had two or more organs retrieved for the purpose of transplantation. (Table 3.15)

Similarly, for New Zealand, there were 73 actual deceased organ donors in 2017. Of those donors, 69 had at least one organ retrieved; and 68 resulted in at least one organ transplanted. There were 18 (25%) single organ donors in 2017, 14 donating kidneys, 4 donating a liver, 0 donating a heart and 0 donating lungs. In 2017, 51 (70%) of donors had two or more organs retrieved for the purpose of transplantation. (Table 3.15)

Table 3.15 Multiple Organs Retrieved per donor 2013 - 2017

Organs Retrieved ¹	Australia					New Zealand				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
0	16 (4%)	8 (2%)	8 (2%)	14 (3%)	15 (3%)	0 (0%)	3 (7%)	3 (6%)	2 (3%)	4 (5%)
1	86 (22%)	86 (23%)	118 (27%)	123 (24%)	155 (30%)	9 (25%)	12 (26%)	11 (21%)	13 (21%)	18 (25%)
2	120 (31%)	107 (28%)	114 (26%)	166 (33%)	141 (28%)	13 (36%)	8 (17%)	14 (26%)	25 (41%)	21 (29%)
3	100 (26%)	91 (24%)	95 (22%)	99 (20%)	116 (23%)	8 (22%)	12 (26%)	19 (36%)	13 (21%)	18 (25%)
4	50 (13%)	51 (13%)	62 (14%)	62 (12%)	60 (12%)	6 (17%)	10 (22%)	5 (9%)	6 (10%)	10 (14%)
5	19 (5%)	35 (9%)	37 (9%)	39 (8%)	23 (5%)	0 (0%)	1 (2%)	1 (2%)	2 (3%)	2 (3%)
6	0 (0%)	0 (0%)	1 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

¹ The organ types retrieved from a donor are: Kidney, Liver, Lung, Heart, Pancreas and Intestine.

Table 3.16 Multiple Organs Retrieved per Donor by Jurisdiction 2017

Organs Retrieved ¹	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
0	1 (1%)	4 (3%)	1 (7%)	6 (4%)	0 (0%)	2 (6%)	0 (0%)	1 (2%)	15 (3%)	4 (5%)
1	31 (30%)	42 (31%)	9 (64%)	50 (34%)	3 (16%)	8 (25%)	0 (0%)	12 (22%)	155 (30%)	18 (25%)
2	33 (31%)	39 (29%)	1 (7%)	44 (30%)	7 (37%)	6 (19%)	2 (67%)	9 (17%)	141 (28%)	21 (29%)
3	29 (28%)	21 (16%)	0 (0%)	28 (19%)	7 (37%)	7 (22%)	0 (0%)	24 (44%)	116 (23%)	18 (25%)
4	9 (9%)	22 (16%)	2 (14%)	12 (8%)	2 (11%)	6 (19%)	1 (33%)	6 (11%)	60 (12%)	10 (14%)
5	2 (2%)	7 (5%)	1 (7%)	8 (5%)	0 (0%)	3 (9%)	0 (0%)	2 (4%)	23 (5%)	2 (3%)
6	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

¹ The organ types retrieved from a donor are: Kidney, Liver, Lung, Heart, Pancreas and Intestine.



SECTION 4

Deceased Organ Donor Profile

This section provides a detailed description of organ donor demographic characteristics, including gender, age, ethnicity and religions. Data also describes pre-existing medical condition and virology screening assessed prior to deceased organ donation.

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Suggested Citation:

ANZOD Registry, 2018 Annual Report, Section 4: Deceased Organ Donor Profile. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at www.anzdata.org.au

Donor Demographics

Table 4.1 contains a description of actual donors in Australia and New Zealand in 2017 compared to 2016. In Australia there continues to be more male than female donors. In both countries there is a preponderance of blood groups O and A.

Table 4.1.1 Demography of Deceased Donors in Australia 2016 - 2017

Australian Donor	2016			2017		
	DBD	DCD	Total	DBD	DCD	Total
Gender						
Male	198 (53%)	79 (62%)	277 (55%)	185 (52%)	90 (60%)	275 (54%)
Female	177 (47%)	49 (38%)	226 (45%)	174 (48%)	61 (40%)	235 (46%)
Age						
0-4	7 (2%)	3 (2%)	10 (2%)	6 (2%)	2 (1%)	8 (2%)
5-14	12 (3%)	4 (3%)	16 (3%)	12 (3%)	5 (3%)	17 (3%)
15-24	51 (14%)	9 (7%)	60 (12%)	30 (8%)	16 (11%)	46 (9%)
25-34	46 (12%)	17 (13%)	63 (13%)	50 (14%)	12 (8%)	62 (12%)
35-44	60 (16%)	15 (12%)	75 (15%)	60 (17%)	24 (16%)	84 (16%)
45-54	73 (19%)	38 (30%)	111 (22%)	77 (21%)	31 (21%)	108 (21%)
55-64	70 (19%)	24 (19%)	94 (19%)	60 (17%)	41 (27%)	101 (20%)
65-74	41 (11%)	18 (14%)	59 (12%)	55 (15%)	20 (13%)	75 (15%)
75+	15 (4%)	-	15 (3%)	9 (3%)	-	9 (2%)
BMI (kg/m2)						
Underweight (<18.5)	24 (6%)	6 (5%)	30 (6%)	20 (6%)	10 (7%)	30 (6%)
Normal (18.5-<25)	143 (38%)	42 (33%)	185 (37%)	130 (36%)	42 (28%)	172 (34%)
Overweight (25-<30)	127 (34%)	52 (41%)	179 (36%)	120 (33%)	60 (40%)	180 (35%)
Obese (>=30)	81 (22%)	28 (22%)	109 (22%)	89 (25%)	38 (25%)	127 (25%)
Unknown	-	-	-	-	1 (1%)	1 (0%)
Blood Group						
A	143 (38%)	55 (43%)	198 (39%)	129 (36%)	51 (34%)	180 (35%)
AB	6 (2%)	3 (2%)	9 (2%)	10 (3%)	5 (3%)	15 (3%)
B	36 (10%)	13 (10%)	49 (10%)	34 (9%)	13 (9%)	47 (9%)
O	190 (51%)	57 (45%)	247 (49%)	186 (52%)	82 (54%)	268 (53%)
Ethnicity¹						
Australian	285 (76%)	100 (78%)	385 (77%)	266 (74%)	119 (79%)	385 (75%)
Aboriginal/Torres Strait Islander	15 (4%)	5 (4%)	20 (4%)	10 (3%)	2 (1%)	12 (2%)
New Zealand European	2 (1%)	2 (2%)	4 (1%)	4 (1%)	1 (1%)	5 (1%)
New Zealand Māori	5 (1%)	-	5 (1%)	4 (1%)	1 (1%)	5 (1%)
Pacific Islander	2 (1%)	1 (1%)	3 (1%)	1 (0%)	1 (1%)	2 (0%)
European	32 (9%)	11 (9%)	43 (9%)	44 (12%)	16 (11%)	60 (12%)
North African and Middle Eastern	2 (1%)	-	2 (0%)	1 (0%)	2 (1%)	3 (1%)
Asian	27 (7%)	7 (5%)	34 (7%)	24 (7%)	8 (5%)	32 (6%)
American	3 (1%)	1 (1%)	4 (1%)	2 (1%)	1 (1%)	3 (1%)
Sub-Saharan African	2 (1%)	1 (1%)	3 (1%)	3 (1%)	-	3 (1%)

¹ Ethnicity categories listed in Table 4.1.1 and 4.1.2 are based on the Australian Bureau of Statistics (ABS) and Stats NZ ethnicity classifications below:

Australian: Oceanian - Australian

Aboriginal/Torres Strait Islander: Oceanian - Australian Aboriginal/Australian South Sea Islander/Torres Strait Islander

New Zealand European: Oceanian - New Zealand European

New Zealand Māori: Oceanian - New Zealand Māori

Pacific Islander: Oceanian - Melanesian And Papuan/Micronesian/Polynesian/Cook Islander/Fijian/Niuean/Samoan/Tongan/Tokelauan

European: North-West European, Southern and Eastern European - Italian/Greek

North African and Middle Eastern: North African and Middle Eastern - Arab/Turkish

Asian: South-East Asian - Vietnamese/Filipino/Indonesian/Malay, North-East Asian - Chinese, Southern and Central Asian - Indian

American: North American, Hispanic North American, South American, Central American, Caribbean Islander

Sub-Saharan African: Sub-Saharan African

Table 4.1.2 Demography of Deceased Donors in New Zealand 2016 – 2017

New Zealand Donors	2016			2017		
	DBD	DCD	Total	DBD	DCD	Total
Gender						
Male	31(56%)	4(67%)	35 (57%)	28(46%)	8(67%)	36 (49%)
Female	24(44%)	2(33%)	26 (43%)	33(54%)	4(33%)	37 (51%)
Age						
5-14	-	-	-	1(2%)	-	1 (1%)
15-24	8(15%)	-	8 (13%)	7(11%)	2(17%)	9 (12%)
25-34	10(18%)	1(17%)	11 (18%)	8(13%)	1(8%)	9 (12%)
35-44	3(5%)	1(17%)	4 (7%)	6(10%)	-	6 (8%)
45-54	9(16%)	4(67%)	13 (21%)	9(15%)	6(50%)	15 (21%)
55-64	15(27%)	-	15 (25%)	18(30%)	3(25%)	21 (29%)
65-74	9(16%)	-	9 (15%)	9(15%)	-	9 (12%)
75+	1(2%)	-	1 (2%)	3(5%)	-	3 (4%)
BMI (kg/m2)						
Underweight (<18.5)	1(2%)	-	1 (2%)	-	-	-
Normal (18.5-<25)	26(47%)	4(67%)	30 (49%)	28(46%)	3(25%)	31 (42%)
Overweight (25-<30)	19(35%)	1(17%)	20 (33%)	22(36%)	3(25%)	25 (34%)
Obese (>=30)	9(16%)	1(17%)	10 (16%)	11(18%)	6(50%)	17 (23%)
Blood Group						
A	22(40%)	-	22 (36%)	20(33%)	3(25%)	23 (32%)
AB	4(7%)	-	4 (7%)	2(3%)	1(8%)	3 (4%)
B	1(2%)	1(17%)	2 (3%)	5(8%)	4(33%)	9 (12%)
O	28(51%)	5(83%)	33 (54%)	34(56%)	4(33%)	38 (52%)
Ethnicity¹						
Australian	1(2%)	-	1 (2%)	1(2%)	-	1 (1%)
New Zealand European	36(65%)	5(83%)	41 (67%)	38(62%)	4(33%)	42 (58%)
New Zealand Māori	4(7%)	1(17%)	5 (8%)	7(11%)	-	7 (10%)
Pacific Islander	1(2%)	-	1 (2%)	-	4(33%)	4 (5%)
European	5(9%)	-	5 (8%)	10(16%)	1(8%)	11 (15%)
North African and Middle Eastern	1(2%)	-	1 (2%)	-	-	-
Asian	6(11%)	-	6 (10%)	1(2%)	3(25%)	4 (5%)
American	1(2%)	-	1 (2%)	1(2%)	-	1 (1%)
Sub-Saharan African	-	-	-	3(5%)	-	3 (4%)

¹ Ethnicity categories listed in Table 4.1.1 and 4.1.2 are based on the Australian Bureau of Statistics (ABS) and Stats NZ ethnicity classifications below:

- Australian: Oceanian - Australian
- Aboriginal/Torres Strait Islander: Oceanian - Australian Aboriginal/Australian South Sea Islander/Torres Strait Islander
- New Zealand European: Oceanian - New Zealand European
- New Zealand Māori: Oceanian - New Zealand Māori
- Pacific Islander: Oceanian - Melanesian And Papuan/Micronesian/Polynesian/Cook Islander/Fijian/Niuean/Samoan/Tongan/Tokelauan
- European: North-West European, Southern and Eastern European - Italian/Greek
- North African and Middle Eastern: North African and Middle Eastern - Arab/Turkish
- Asian: South-East Asian - Vietnamese/Filipino/Indonesian/Malay, North-East Asian - Chinese, Southern and Central Asian - Indian
- American: North American, Hispanic North American, South American, Central American, Caribbean Islander
- Sub-Saharan African: Sub-Saharan African

Donor Age and Gender

In Australia in 2017, 14.7% of donors (75) were 65-74 years of age and 1.8% (9 donors) were aged 75 years or older. The oldest donor was 81.6 years and the youngest was less than 1 year. In New Zealand in 2017, 16.4% of donors (12) were 65 years or older. The age range was from 14.3 years to 82.6 years.

The mean age of donors in Australia in 2017 was 46.4 years. The mean age in New Zealand was 48.7 years.

Figures 4.1.1 and 4.1.2 show the trends in donor numbers for each age group and gender; while there has been growth in all age groups this is more marked in the older age group.

Figure 4.1.1 - Age and Gender of Deceased Donors Australia 2009-2017

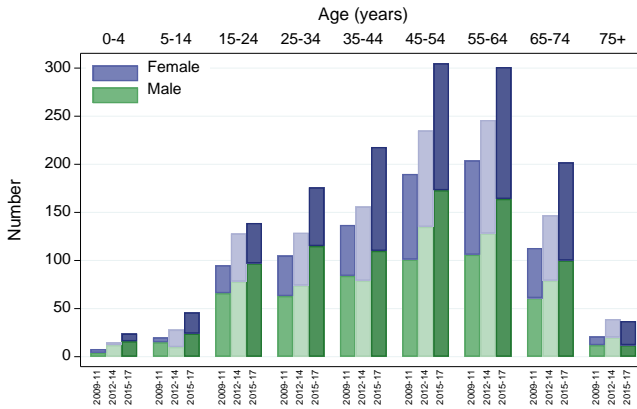
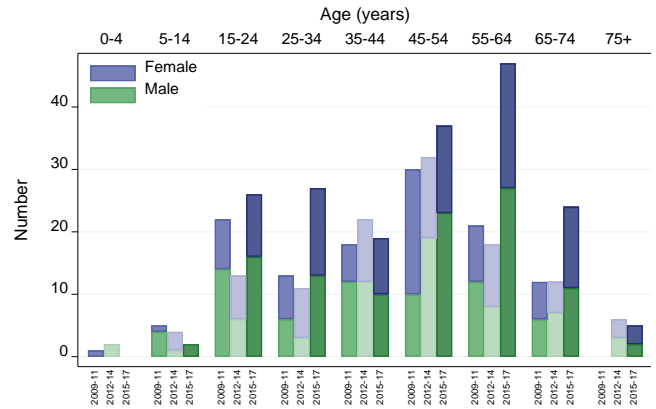


Figure 4.1.2 - Age and Gender of Deceased Donors New Zealand 2009-2017



The median age for Australian donors in 2017 was 47.0 years (Figure 4.2). The median age across Australian jurisdictions in 2017 ranged from 41.9 years in Western Australia to 54.7 years in the Australian Capital Territory.

The median age for New Zealand was 51.6 years in 2017. There were three donors aged 75 years or over and one donor aged less than 15 years.

Figure 4.2.1 - Age of Male and Female Donors 2009-2017 Australia

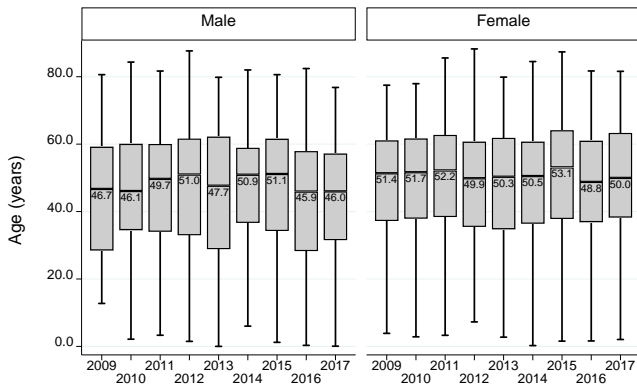
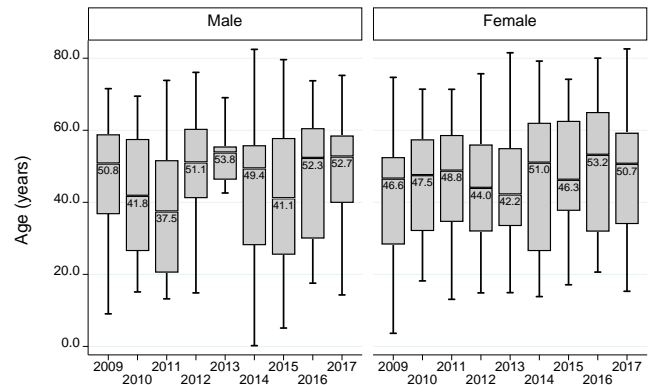
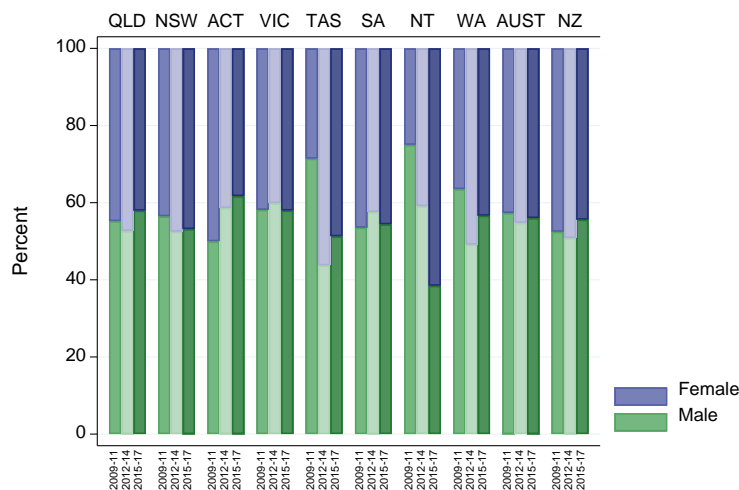


Figure 4.2.2 - Age of Male and Female Donors 2009-2017 New Zealand



Donor gender in each State, Australia and New Zealand is shown in three-year cohorts in Figure 4.3.

Figure 4.3 - Gender by State, Australia, New Zealand, 2009-2017



Donor Ethnic Origins

There have been no significant changes in the documented ethnicity of donors over the past five years in either Australia or New Zealand (Table 4.2).

Table 4.2 Ethnic Origin of Donors 2013-2017

Donor racial / ethnic origin ¹	Australia					New Zealand				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Australian	335 (86%)	286 (76%)	326 (75%)	385 (77%)	385 (75%)	-	4 (9%)	-	1 (2%)	1 (1%)
Australian Aboriginal/Torres Strait Islander	8 (2%)	9 (2%)	11 (3%)	20 (4%)	12 (2%)	-	-	-	-	-
New Zealand European	-	7 (2%)	5 (1%)	4 (1%)	5 (1%)	29 (81%)	27 (59%)	41 (77%)	41 (67%)	42 (58%)
New Zealand Māori	4 (1%)	1 (0%)	1 (0%)	5 (1%)	5 (1%)	3 (8%)	6 (13%)	5 (9%)	5 (8%)	7 (10%)
Pacific Islander	3 (1%)	2 (1%)	4 (1%)	3 (1%)	2 (0%)	-	1 (2%)	-	1 (2%)	4 (5%)
European	8 (2%)	31 (8%)	44 (10%)	43 (9%)	60 (12%)	-	4 (9%)	2 (4%)	5 (8%)	11 (15%)
North African and Middle Eastern	3 (1%)	2 (1%)	4 (1%)	2 (0%)	3 (1%)	-	-	-	1 (2%)	-
Asian	22 (6%)	25 (7%)	32 (7%)	34 (7%)	32 (6%)	3 (8%)	1 (2%)	2 (4%)	6 (10%)	4 (5%)
American	-	10 (3%)	5 (1%)	4 (1%)	3 (1%)	-	2 (4%)	3 (6%)	1 (2%)	1 (1%)
Sub-Saharan African	-	5 (1%)	3 (1%)	3 (1%)	3 (1%)	-	1 (2%)	-	-	3 (4%)
Not reported	8 (2%)	-	-	-	-	1 (3%)	-	-	-	-

¹ Ethnicity categories listed in Table 4.2 are based on the Australian Bureau of Statistics (ABS) and Stats NZ ethnicity classifications below:

Australian: Oceanian - Australian

Australian Aboriginal/Torres Strait Islander: Oceanian - Australian

Aboriginal/Australian South Sea Islander/Torres Strait Islander

New Zealand European: Oceanian - New Zealand European

New Zealand Māori: Oceanian - New Zealand Māori

Pacific Islander: Oceanian - Melanesian And Papuan/Micronesian/Polynesian/Cook Islander/Fijian/Niuean/Samoan/Tongan/Tokelauan

European: North-West European, Southern and Eastern European - Italian/Greek

North African and Middle Eastern: North African and Middle Eastern - Arab/Turkish

Asian: South-East Asian - Vietnamese/Filipino/Indonesian/Malay, North-East Asian - Chinese, Southern and Central Asian – Indian

American: North American, Hispanic North American, South American, Central American, Caribbean Islander

Sub-Saharan African: Sub-Saharan African

Donor Religion

Table 4.3 shows the reported religion of donors. This has remained stable over the 5 years to 2017.

Table 4.3 Religion of Donors, 2013-2017 n (%)

Donor Religion	Australia					New Zealand				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Christianity	122 (31%)	96 (25%)	136 (31%)	150 (30%)	178 (35%)	3 (8%)	4 (9%)	3 (6%)	4 (7%)	2 (3%)
Judaism	3 (1%)	2 (1%)	2 (0%)	1 (0%)	-	-	-	-	1 (2%)	-
Islam	2 (1%)	-	1 (0%)	3 (1%)	3 (1%)	-	-	-	-	-
Buddhism	1 (0%)	7 (2%)	6 (1%)	8 (2%)	6 (1%)	-	-	-	-	-
Hinduism	-	2 (1%)	3 (1%)	4 (1%)	1 (0%)	1 (3%)	-	-	-	1 (1%)
Others	5 (1%)	3 (1%)	4 (1%)	6 (1%)	1 (0%)	-	-	-	-	-
No religion	77 (20%)	87 (23%)	92 (21%)	123 (24%)	123 (24%)	-	1 (2%)	-	-	-
Unknown	181 (46%)	181 (48%)	191 (44%)	208 (41%)	198 (39%)	32 (89%)	41 (89%)	50 (94%)	56 (92%)	70 (96%)

Donor Weight

The allocation of heart, lungs and livers are based in part on the matching of recipient and donor size and weight. In 2017 there were 18 donors in Australia and no donors in New Zealand who weighed less than 40 kilograms. There were 73 donors 100 kilograms and over in Australia and 11 donors in New Zealand. (Table 4.4)

Table 4.4 Donor Weight in Kilograms 2013 - 2017

Country	Year	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
AUSTRALIA	2013	10	2	3	7	24	62	95	90	53	45	391
	2014	4	4	2	4	29	53	104	86	54	38	378
	2015	7	4	3	8	33	70	93	86	63	68	435
	2016	9	6	4	10	34	82	115	113	73	57	503
	2017	8	6	4	8	41	91	97	102	80	73	510
NEW ZEALAND	2013	1	0	1	0	3	9	11	4	5	2	36
	2014	1	0	0	0	3	8	7	16	7	4	46
	2015	0	1	0	0	3	12	12	11	10	4	53
	2016	0	0	0	1	8	9	17	12	5	9	61
	2017	0	0	0	1	5	13	19	13	11	11	73

Donor Medical Conditions

Comorbid medical conditions are an important area in determining donor suitability, and one that has been changing over time. Table 4.5 lists the medical conditions of donors by jurisdiction for 2017 by donor type.

Table 4.5 Comorbid Medical Conditions of Actual Deceased Donors by Jurisdiction 2017 n (%)

Donor Type	Medical Condition	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUS	NZ
DBD	Diabetes Type I	-	-	-	-	-	1 (4%)	-	1 (2%)	2 (1%)	-
	Diabetes Type II	2 (3%)	9 (9%)	-	12 (14%)	2 (12%)	2 (8%)	-	5 (11%)	32 (9%)	4 (7%)
	Hypertension	13 (18%)	33 (32%)	3 (43%)	26 (30%)	7 (41%)	8 (32%)	1 (33%)	7 (15%)	98 (27%)	17 (28%)
	Smoking-Current	29 (41%)	39 (38%)	1 (14%)	40 (47%)	10 (59%)	11 (44%)	1 (33%)	24 (51%)	155 (43%)	23 (38%)
	Cancer	5 (7%)	9 (9%)	-	2 (2%)	5 (29%)	2 (8%)	-	3 (6%)	26 (7%)	2 (3%)
	Total		71	103	7	86	17	25	3	47	359
DCD	Diabetes Type I	-	1 (3%)	-	1 (2%)	-	-	-	-	2 (1%)	-
	Diabetes Type II	-	1 (3%)	1 (14%)	7 (11%)	-	1 (14%)	-	-	10 (7%)	-
	Hypertension	5 (15%)	4 (13%)	2 (29%)	19 (31%)	2 (100%)	-	-	-	32 (21%)	4 (33%)
	Smoking-Current	12 (35%)	14 (44%)	2 (29%)	24 (39%)	-	2 (29%)	-	3 (43%)	57 (38%)	7 (58%)
	Cancer	-	6 (19%)	-	11 (18%)	-	-	-	-	17 (11%)	-
	Total		34	32	7	62	2	7	-	7	151

Diabetes

There were 46 donors with diabetes in Australia in 2017, 4 donors with Type 1 and 42 with Type 2 diabetes. There were 4 donors in New Zealand with diabetes, all with Type 2. In Australia, there were three Type 2 diabetic donors that did not have organs retrieved. The remaining 39 Type 2 donors provided 133 organ and tissue grafts for transplantation. This included one double adult kidney, 55 single kidneys, 14 livers, 12 double lungs, three single lungs and three hearts. The four Type 1 diabetic donors, provided 11 organs; six single kidneys, two livers, two double lungs and one heart.

In New Zealand, the four Type 2 diabetic donors provided four single kidneys and two livers.

Hypertension

A past history of hypertension was recorded in 25.5% of donors (130) in Australia and 28.8% (21) donors in New Zealand in 2017.

Smoking

In 2017, 41.6% (212) of Australian donors were recorded as current smokers while in New Zealand, 41.1% (30) donors were reported as current smokers.

Cancer in Donor

In Australia, 43 actual donors had a past history of cancer prior to donation. Of the 42 actual donors who had organs retrieved, there were 21 donors with skin only cancers, 20 with non-skin cancers and one donor of an uncertain cancer history. One actual donor did not have organs retrieved.

In New Zealand, two donors had a past history of cancer, both with a history of skin cancer.

Virology Screening

Table 4.6 lists the cytomegalovirus (CMV) status of donors by country from 2012 to 2017

Table 4.6 Cytomegalovirus (CMV IgG) Status of Donors, 2012 - 2017.

CMV IgG	Australia						New Zealand					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Positive	225	242	228	268	332	309	30	21	23	26	33	47
Negative	129	148	148	167	169	200	8	15	23	27	26	26
Not Done	0	0	2	0	2	1	0	0	0	0	2	0
Unknown	0	1	0	0	0	0	0	0	0	0	0	0
Indeterminate	0	0	0	0	0	0	0	0	0	0	0	0
Pending	0	0	0	0	0	0	0	0	0	0	0	0
Total	354	391	378	435	503	510	38	36	46	53	61	73

Table 4.7 shows the Epstein-Barr Virus (EBV) status of donors from 2012 to 2017.

Table 4.7 Epstein-Barr Virus (EBV IgG) Status of Donors, 2012 - 2017

EBV IgG	Australia						New Zealand					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Positive	321	356	339	404	462	459	33	27	37	36	53	63
Negative	33	33	30	28	38	48	1	4	5	13	6	5
Not Done	0	2	5	1	2	2	4	0	3	2	2	5
Unknown	0	0	0	0	0	0	0	5	0	1	0	0
Indeterminate	0	0	1	0	1	1	0	0	1	0	0	0
Pending	0	0	3	2	0	0	0	0	0	1	0	0
Total	354	391	378	435	503	510	38	36	46	53	61	73

Table 4.8 shows there were 14 Hepatitis C positive actual donors in 2017 reported to the Registry; 12 in Australia and 2 in New Zealand.

Table 4.8 Hepatitis C Antibody Status of Donors (Anti-HCV), 2012 - 2017

Anti-HCV	Australia						New Zealand					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Positive	5	13	8	11	17	12	2	1	2	1	1	2
Negative	349	378	364	420	482	496	36	35	44	52	59	70
Not Done	0	0	5	4	4	2	0	0	0	0	1	1
Unknown	0	0	1	0	0	0	0	0	0	0	0	0
Indeterminate	0	0	0	0	0	0	0	0	0	0	0	0
Pending	0	0	0	0	0	0	0	0	0	0	0	0
Total	354	391	378	435	503	510	38	36	46	53	61	73

Table 4.9 shows the Hepatitis B Core Antibody status of actual donors from 2012 to 2017.

Table 4.9 Hepatitis B Core Antibody Status of Donors (Anti-HBcAb), 2012 - 2017

Anti-HBcAb	Australia						New Zealand					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Positive	15	17	21	20	19	22	8	2	3	3	7	11
Negative	339	374	337	394	473	475	30	34	42	50	54	62
Not Done	0	0	19	21	11	13	0	0	1	0	0	0
Unknown	0	0	1	0	0	0	0	0	0	0	0	0
Indeterminate	0	0	0	0	0	0	0	0	0	0	0	0
Pending	0	0	0	0	0	0	0	0	0	0	0	0
Total	354	391	378	435	503	510	38	36	46	53	61	73

Since 1993, all consented actual and intended donors in Australia and New Zealand have been tested for Hepatitis B surface antigen. Table 4.10 shows the status of actual donors from 2012 to 2017.

Table 4.10 Hepatitis B Surface Antigen Status of Donors (HBsAg), 2012 - 2017

HBsAg	Australia						New Zealand					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Positive	0	2	1	0	2	1	0	2	1	0	1	0
Negative	354	389	375	431	499	507	38	34	45	53	60	73
Not Done	0	0	2	4	2	1	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Indeterminate	0	0	0	0	0	1	0	0	0	0	0	0
Pending	0	0	0	0	0	0	0	0	0	0	0	0
Total	354	391	378	435	503	510	38	36	46	53	61	73



SECTION 5

Deceased Donor Kidney Donation

This section summarises kidney donation activity from deceased donors in 2017, compared with previous years. The rate of kidney transplant procedures in 2017 was 33.8 pmp in Australia and 19.2 pmp in New Zealand.

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Suggested citation

ANZOD Registry. 2018 Annual Report, Section 5: Deceased Donor Kidney Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at:
<http://www.anzdata.org.au>

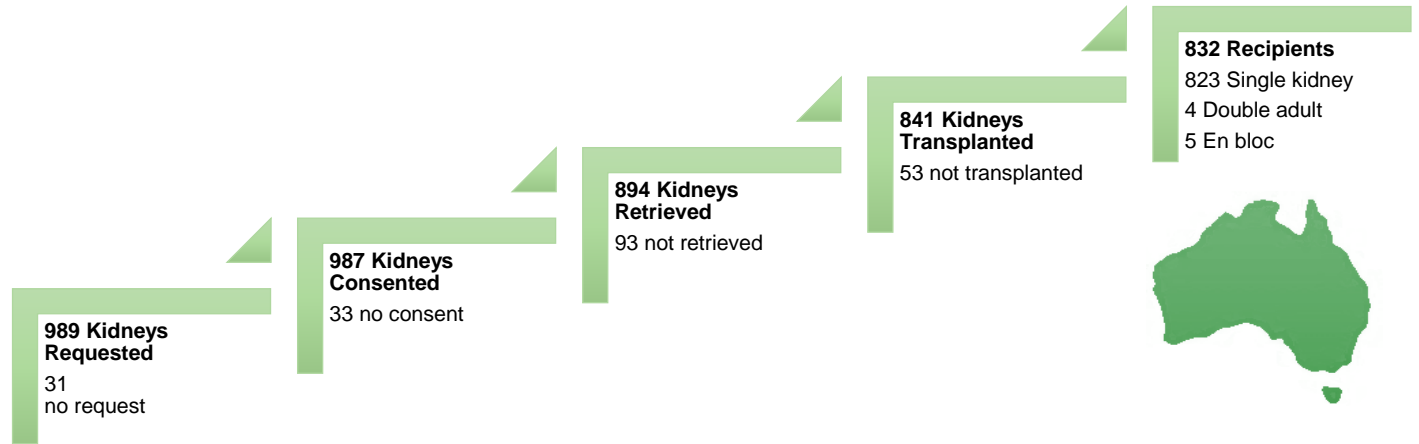
Kidney Donation

Of the 510 actual deceased organ donors in 2017 in Australia, 494 (96.9%) consented to kidney donation. From these kidney donors, 894 kidneys were retrieved and transplanted into 832 recipients. Of these 832 kidney transplant recipients, there were 47 kidney/pancreas recipients, four double adult kidney recipients, five en bloc kidney recipients, eight combined kidney/liver recipients, one combined kidney heart transplant recipient, one combined kidney double lung transplant recipient and one combined kidney pancreas liver and intestine transplant recipient.

There were 601 kidneys from the brain death donation pathway and 240 kidneys following donation after circulatory death, compared with 640 and 201 respectively in 2016.

There was an overall increase in the total number of kidney transplant recipients (832) compared to the previous year (821); although a slight decrease to 33.8 per million population (pmp) from 33.9 (pmp). Figure 5.1.1 shows the outcomes of requests for kidney donation in Australia.

Figure 5.1.1 Outcomes of Request for Kidney Donation from Actual Donors in Australia 2016

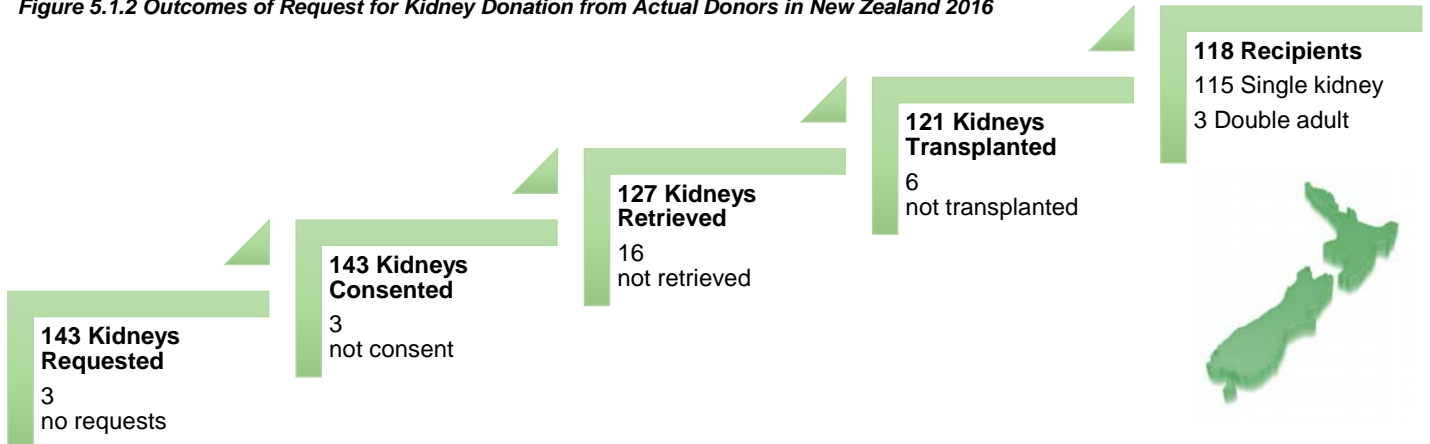


In New Zealand, there were 72 actual donors (98.6%) who consented to kidney donation. From these kidney donors, 127 kidneys were retrieved, of which 121 were transplanted into 118 recipients. There were 101 kidneys transplanted from donation from the brain death donation pathway and 20 kidneys transplanted following donation after circulatory death.

Of the 118 recipients, four received a combined kidney/pancreas, one received a combined kidney/liver transplant. There were 3 double adult kidney transplants and no en bloc kidney transplants in 2017.

There was an overall increase of 31.1% in the total number of kidney transplant recipients (118) in 2017 compared to the previous year (90); the rate of transplantation rose to 24.6 per million population from 19.2 pmp in 2016. Figure 5.1.2 shows the outcomes of requests for kidney donation in New Zealand.

Figure 5.1.2 Outcomes of Request for Kidney Donation from Actual Donors in New Zealand 2016



Figures 5.2 and 5.3 show the number of kidneys transplanted by donation pathway and the number of kidney recipients by jurisdiction. Figure 5.2 particularly shows an increase in DCD kidneys from 2006 to 2017, and DBD kidneys from 2010 to 2017 in Australia.

Figure 5.2.1 - Kidneys Transplanted by Donation Pathway Australia 1998-2017

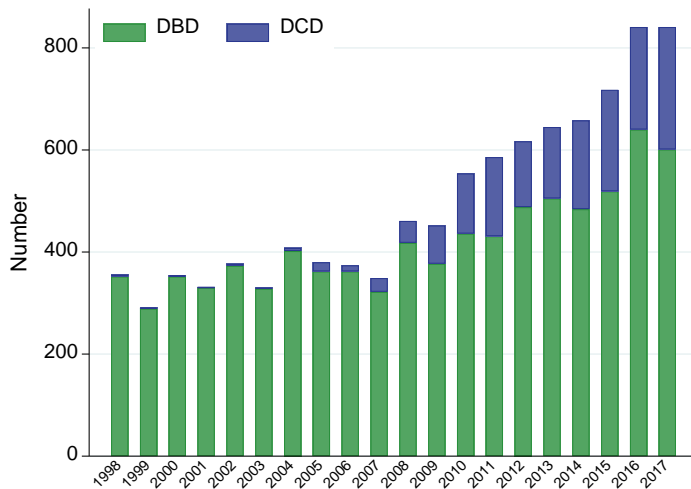


Figure 5.2.2 - Kidneys Transplanted by Donation Pathway New Zealand 1998-2017

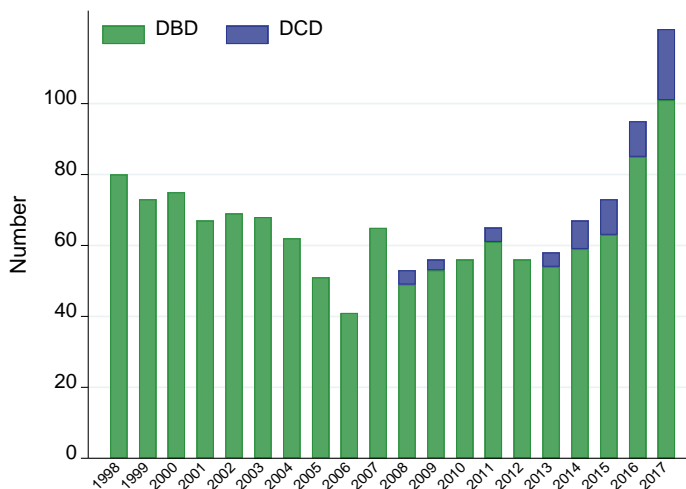
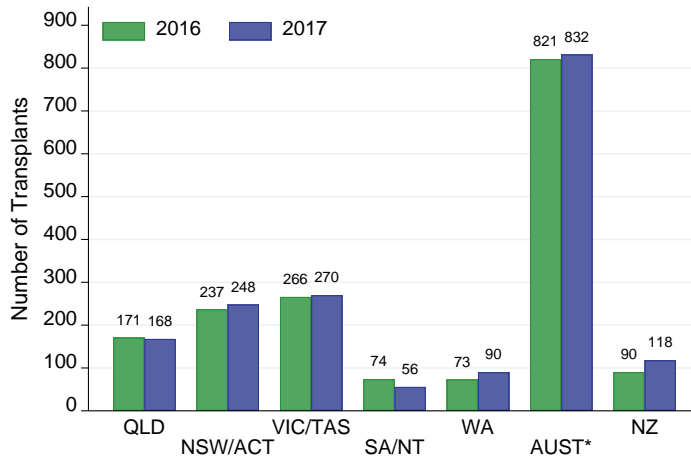


Figure 5.3 - Deceased Donor Kidney Transplant Recipients* by Transplant State, Australia and New Zealand, 2016-2017



* These numbers include the exchange of organ between States and Territories of Australia and New Zealand.

Age of Kidney Donors

The age distribution of donors providing retrieved kidneys for Australia and New Zealand is shown in Figure 5.4.

Figure 5.4.1 - Age of Donors Providing Retrieved Kidneys Australia 2017

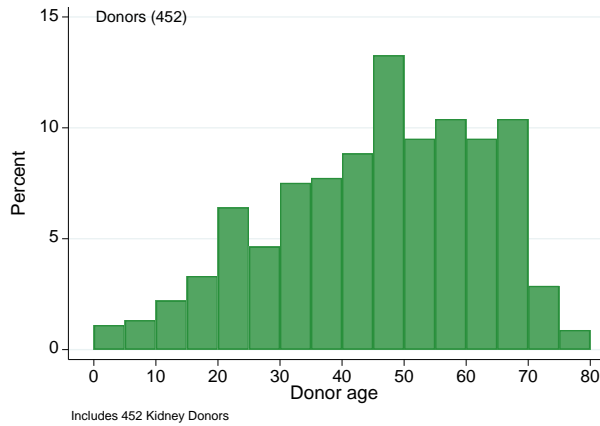
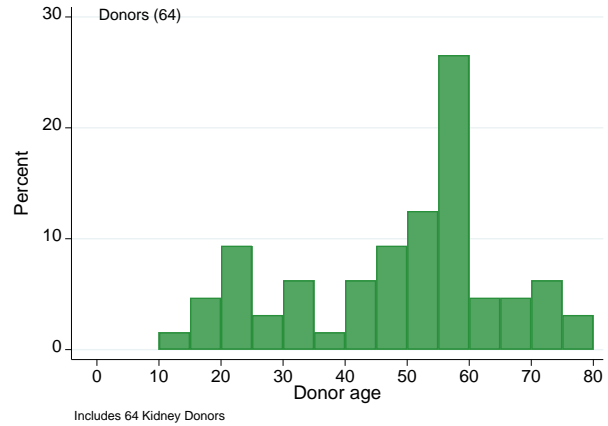


Figure 5.4.2 - Age of Donors Providing Retrieved Kidneys New Zealand 2017



Donor Kidney Function

In 2017 in Australia, 93 donors (18%) had a terminal serum creatinine concentration of ≥ 125 $\mu\text{mol/L}$ (Table 5.1). In 2017 in New Zealand, 5 donors (7%) had a terminal serum creatinine concentration of ≥ 125 $\mu\text{mol/L}$.

In Australia, 76 donors (15%) had a terminal serum urea concentration of ≥ 9 mmol/L and creatinine concentration of ≥ 125 $\mu\text{mol/L}$. In New Zealand, 4 donors (6%) had a terminal serum urea concentration of ≥ 9 mmol/L and creatinine concentration of ≥ 125 $\mu\text{mol/L}$.

Table 5.1 Terminal Serum Creatinine Concentration 2013-2017

Terminal Serum Levels	Australia					New Zealand				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
0-99	79%	77%	71%	74%	73%	81%	83%	88%	69%	91%
100-124	7%	7%	7%	8%	9%	6%	15%	10%	19%	2%
125-149	4%	4%	5%	4%	4%	6%	-	2%	4%	2%
150-174	3%	2%	3%	3%	3%	3%	-	-	4%	2%
175-199	2%	1%	3%	2%	2%	-	2%	-	-	-
200-224	1%	2%	1%	1%	1%	-	-	-	2%	2%
225-249	0%	0%	1%	1%	2%	3%	-	-	-	2%
≥ 250	4%	5%	9%	7%	7%	-	-	-	4%	2%

Kidneys Not Retrieved

In 2017, there were 93 kidneys not retrieved from 510 Australian donors and 16 not retrieved from 73 New Zealand donors.

For Australia, the main reason was due to the kidney not being medically suitable (77), followed by trauma to the organ (5). In New Zealand, there were 12 non-retrieved kidneys due to not being medically suitable and 4 due to no suitable recipient for the kidney.

Table 5.2 Reasons for Kidney Not Retrieved in 2017

Reason	Australia	New Zealand
Logistics	0	0
Not Medically Suitable	77	12
Surgically Unsuitable	0	0
Trauma to Organ	5	0
No Suitable Recipients	4	4
Age of Donor	4	0
DCD Donor	0	0
Consent Withdrawn	2	0
Others	1	0
Total	93	16

Kidneys Retrieved and Not Utilised for Transplantation

The reasons why kidneys were not utilised for organ transplantation are presented in Table 5.3.

Table 5.3 Reasons Kidneys Retrieved & Not Utilised for Transplantation, Australia (New Zealand) 2013-2017

Reason	2013	2014	2015	2016	2017
Logistics	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not Medically Suitable	32 (3)	32 (6)	41 (4)	32 (3)	34 (6)
Not Surgically Suitable	1 (0)	1 (1)	0 (0)	2 (0)	0 (0)
Trauma to Organ	7 (0)	2 (0)	2 (1)	2 (0)	3 (0)
No Suitable Recipients	3 (0)	5 (0)	0 (0)	6 (1)	10 (0)
Recipient Issue	1 (0)	1 (0)	2 (0)	0 (0)	2 (0)
Research	0 (0)	0 (0)	0 (0)	0 (0)	4 (0)
Other	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)
Total	46 (3)	42 (7)	45 (5)	42 (4)	53 (6)

Figure 5.5 shows the non-utilisation rate of retrieved kidneys – the proportion of kidneys that were retrieved for the purpose of solid organ transplantation, but not ultimately transplanted into a recipient (either due to an absence of suitable recipients, or the kidney being found to be medically or surgically unsuitable after retrieval). Of note, while the rate appears constant in Australia over the period 2013-2017, this rate is higher than that over the period prior to 2013.

Figure 5.5.1 - Non-utilisation Rate of Retrieved Kidneys - Australia 2013-2017

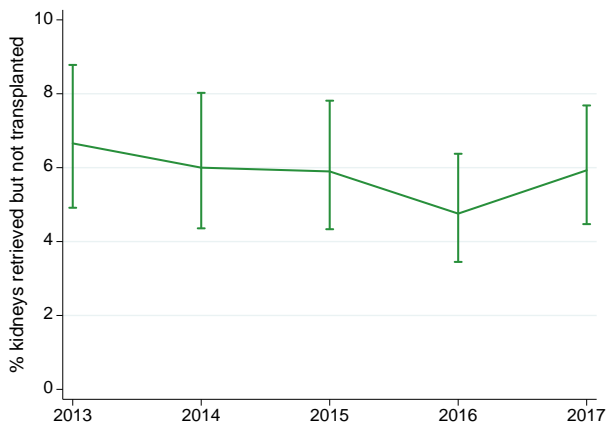
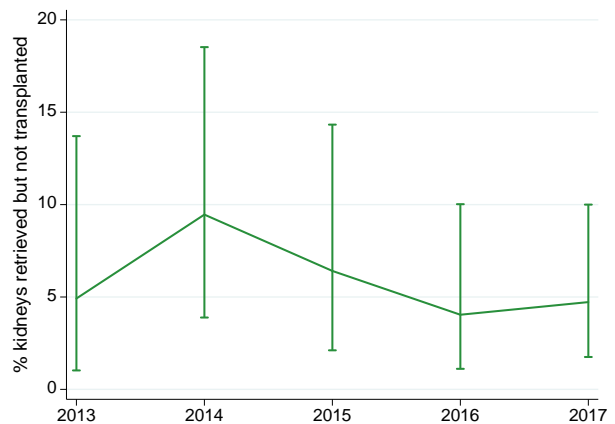


Figure 5.5.2 - Non-utilisation Rate of Retrieved Kidneys - New Zealand 2013-2017



Outcome of Kidney Donation

The outcome of kidney donation activity in Australia and New Zealand throughout the donation pathway is shown in table 5.4.

Table 5.4.1 Outcome of Request for Kidney Donation in Australia, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	391	378	435	503	510
Kidneys Requested for Donation	760	738	828	981	989
Kidneys Not Requested for Donation	22	18	42	25	31
Kidneys with Consent Given	758	738	824	977	987
Kidneys with Consent Not Given	2	0	4	4	2
Kidneys Retrieved	691	700	763	883	894
Kidneys Not Retrieved	67	38	61	94	93
Kidneys Transplanted	645	658	718	841	841
Left Kidney Transplanted	309	309	345	399	411
Right Kidney Transplanted	306	305	343	402	412
Double/Enbloc Kidney Transplanted	30	44	30	40	18
Total Kidneys Not Used for Transplantation	46	42	45	42	53
Left Kidney Not Used for Transplantation	23	20	21	19	26
Right Kidney Not Used for Transplantation	23	20	22	17	25
Double/Enbloc Kidney Not Used for Transplantation	0	2	2	6	2
Recipients Transplanted	630	636	703	821	832
Double Adult Kidney Procedures	9	17	9	11	4
En Bloc Kidney Procedures	6	5	6	9	5
Kidney Non-Utilisation Rate	6.66%	6.00%	5.90%	4.76%	5.93%
Kidney Utilised Rate	93.34%	94.00%	94.10%	95.24%	94.07%

Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	36	46	53	61	73
Kidneys Requested for Donation	68	88	100	120	143
Kidneys Not Requested for Donation	4	4	6	2	3
Kidneys with Consent Given	68	88	100	120	143
Kidneys with Consent Not Given	0	0	0	0	0
Kidneys Retrieved	61	74	78	99	127
Kidneys Not Retrieved	7	14	22	21	16
Kidneys Transplanted	58	67	73	95	121
Left Kidney Transplanted	26	33	37	42	58
Right Kidney Transplanted	26	32	36	43	57
Double/Enbloc Kidney Transplanted	6	2	0	10	6
Total Kidneys Not Used for Transplantation	3	7	5	4	6
Left Kidney Not Used for Transplantation	1	3	3	2	2
Right Kidney Not Used for Transplantation	2	4	2	2	4
Double/Enbloc Kidney Not Used for Transplantation	0	0	0	0	0
Recipients Transplanted	55	66	73	90	118
Double Adult Kidney Procedures	2	0	0	5	3
En Bloc Kidney Procedures	1	1	0	0	0
Kidney Non-Utilisation Rate	4.92%	9.46%	6.41%	4.04%	4.72%
Kidney Utilised Rate	95.08%	90.54%	93.59%	95.96%	95.28%



SECTION 6

Deceased Donor Liver Donation

This section summarises liver donation activity from deceased donors in 2017, compared with previous years. The rate of liver transplant procedures in 2017, was 11.4 pmp in Australia and 10.6 pmp in New Zealand.

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Suggested citation

ANZOD Registry. 2018 Annual Report, Section 6: Deceased Donor Liver and Intestine Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at: <http://www.anzdata.org.au>

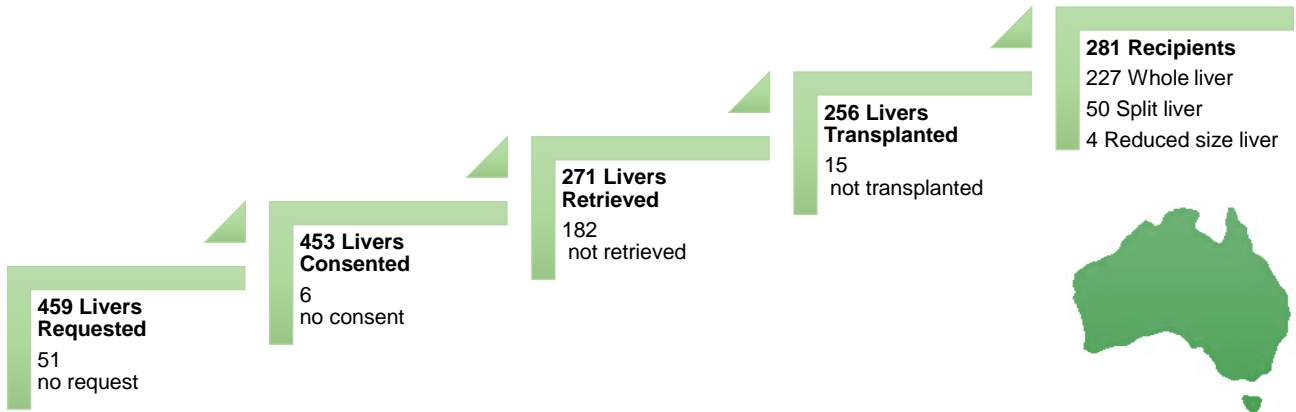
Liver Donation

Of the 510 deceased organ donors in Australia in 2017, 271 (53.1%) had liver retrieved. From these liver donors, there were 281 recipients in Australia. Eight recipients received a combined liver/kidney transplant, two received a combined liver/double lung and one a liver/kidney/pancreas/intestine transplant.

Fifty partial liver transplants were performed in Australia using 25 livers and the “split” liver technique (transplanting one liver into two recipients) and four recipients received a ‘reduced size’ liver.

The rate of liver transplants in Australia for 2017 was 11.4 per million population (pmp). Figure 6.1.1 shows the outcomes of requests for liver donation in Australia.

Figure 6.1.1 Outcomes of Request for Liver Donation in Australia 2017



In New Zealand there were 49 livers retrieved, and 48 utilised for transplantation into 51 liver recipients. Of these, there were six split liver transplants performed and 3 reduced size livers transplanted. One recipient received a combined liver/kidney transplant.

In 2017 in New Zealand, there was a rate of 10.6 liver transplant procedures per million of population (pmp). Figure 6.1.2 shows the outcomes of requests for liver donation in New Zealand.

Figure 6.1.2 Outcomes of Request for Liver Donation in New Zealand 2017



Figure 6.2 shows the number of recipients of liver transplants by donation pathway in Australia and New Zealand from 1998 to 2017. Figure 6.3 compares the number of deceased donor liver recipients by transplant region for 2016 and 2017.

Figure 6.2.1 - Recipients of Liver Transplantation by Donation Pathway Australia 1998-2017

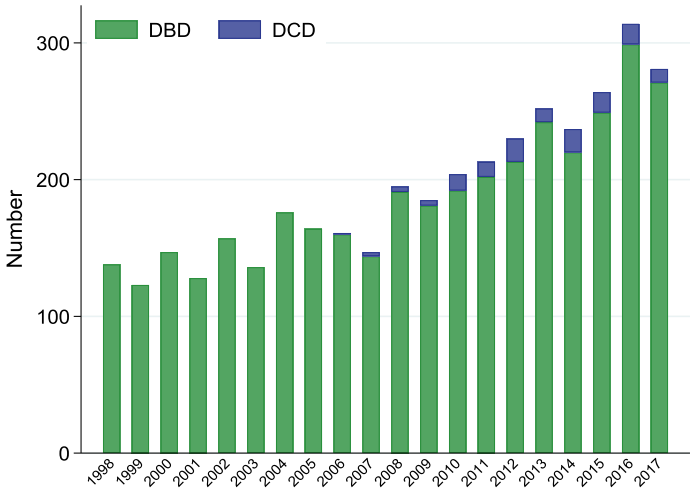


Figure 6.2.2 - Recipients of Liver Transplantation by Donation Pathway New Zealand 1998-2017

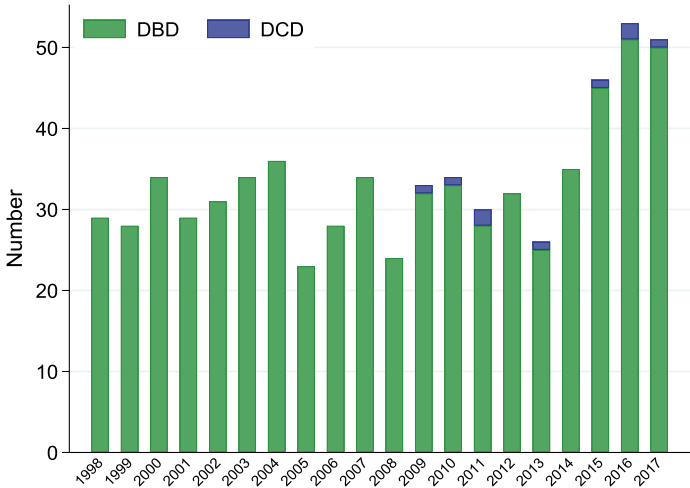
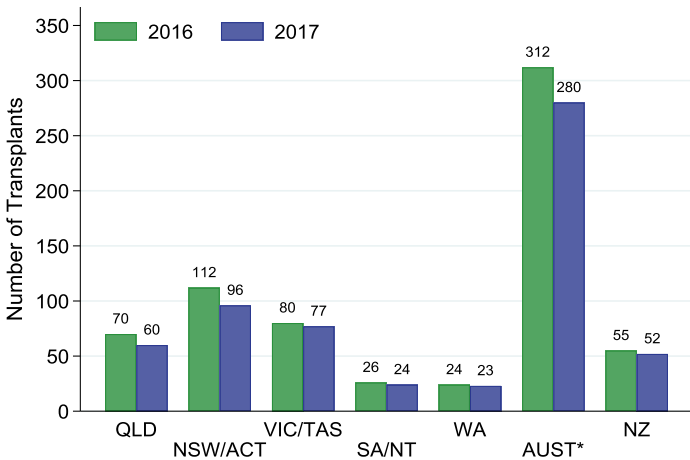


Figure 6.3 - Deceased Donor Liver Transplant Recipients* by Transplant State, Australia and New Zealand, 2016-2017



* These numbers include the exchange of organ between States and Territories of Australia and New Zealand

Age of Liver Donors

The age distribution of donors providing retrieved livers for Australia and New Zealand is shown in Figure 6.4.

Figure 6.4.1 - Age of Donors Providing Retrieved Livers Australia 2017

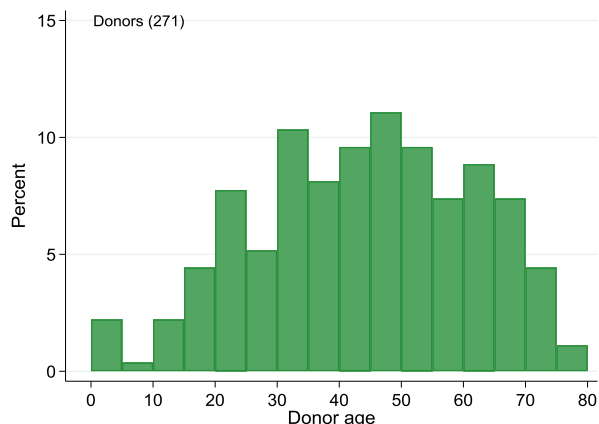
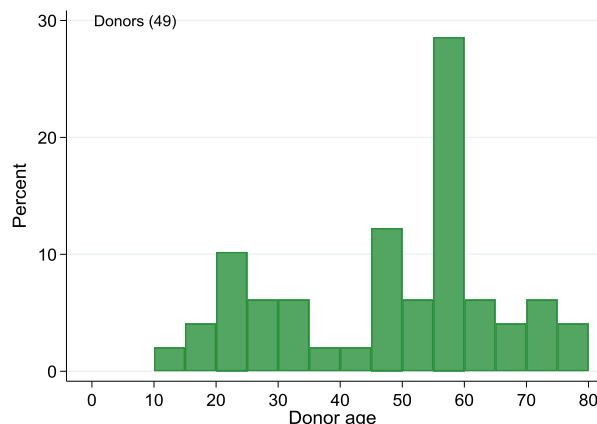


Figure 6.4.2 - Age of Donors Providing Retrieved Livers New Zealand 2017



Donor Liver Function

Table 6.1 shows the number of donors whose liver function was above the normal range prior to donation.

Table 6.1 Number of Donors with Liver Function Tests above Normal 2017

Liver Function Tests	Australia		New Zealand	
	Donors with value recorded*	Above Normal	Donors with value recorded*	Above Normal
Alanine Transaminase ALT > 40 µ/L	271	135	40	16
Aspartate Transaminase AST > µ/L	257	161	42	24
Gamma Glutamol Tranferase GGT > 60 µ/L	270	80	42	9
Alkaline Phosphatase > 116 {µ}/L	271	35	48	2
Total Bilirubin > 20 {µ}mol/L	271	30	49	1
All 5 tests completed	257	-	31	-
At least 1 test completed	271	-	49	-

*Not all donors have all tests

Livers Not Retrieved

Table 6.2 provides a breakdown of the reasons why livers were consented and not retrieved.

Table 6.2 Reasons for Liver Not Retrieved 2017

Reason	Australia	New Zealand
Logistics	4	0
Not Medically Suitable	127	18
Surgically Unsuitable	0	0
Trauma to Organ	2	1
No Suitable Recipients	9	0
Age of Donor	30	1
DCD Donor	9	0
Consent Withdrawn	1	0
Others	0	0
Total	182	20

Livers Retrieved and Not Utilised for Transplantation

Table 6.3 tabulates the reasons livers were not used after retrieval for the purpose of transplantation since 2013.

Of the reduced size liver transplants since 2013, 8 were orphaned split liver procedures due to the other split liver having no suitable recipients (4), trauma to the organ (1) or not being medically suitable (3).

Table 6.3 Reasons Liver Retrieved & Not Utilised for Transplantation, Australia (New Zealand) 2013 – 2017

Reason	2013	2014	2015	2016	2017
Logistics	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not Medically Suitable	6 (1)	6 (1)	13 (0)	12 (0)	13 (1)
Not Surgically Suitable	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Trauma to Organ	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
No Suitable Recipients	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Recipient Issue	0 (0)	1 (0)	0 (0)	2 (0)	2 (0)
Research	4 (0)	12 (0)	4 (0)	1 (0)	0 (0)
Other	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	10 (1)	19 (1)	17 (0)	15 (0)	15 (1)

Figure 6.5 shows the non-utilisation rate of retrieved livers – the proportion of livers that were retrieved for the purpose of solid organ transplantation, but not ultimately transplanted into a recipient (either due to an absence of suitable recipients, or the liver being found to be medically or surgically unsuitable after retrieval).

Figure 6.5.1 - Non-utilisation Rate of Retrieved Livers - Australia 2013-2017

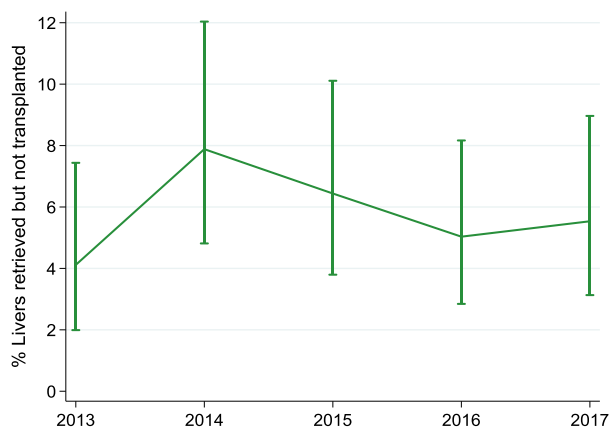
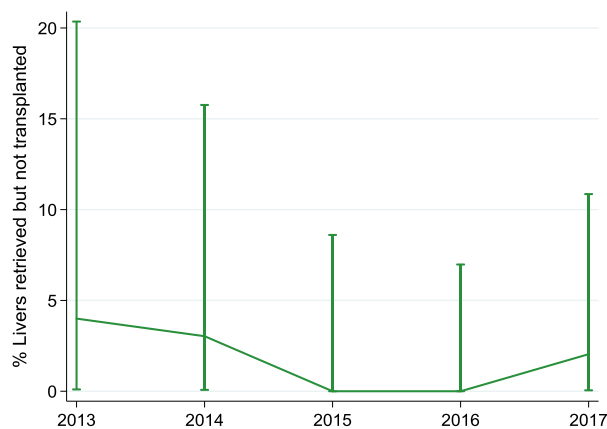


Figure 6.5.2 - Non-utilisation Rate of Retrieved Livers - New Zealand 2013-2017



Outcome of Liver Donation

The outcome of liver donation activity in Australia and New Zealand through the donation pathway is shown in table 6.4.

Table 6.4.1 Outcome of Request for Liver Donation in Australia, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	391	378	435	503	510
Liver Requested for Donation	360	354	389	464	459
Liver Not Requested for Donation	31	24	46	39	51
Liver Consent Given	357	347	377	456	453
Liver Consent Not Given	3	7	12	8	6
Liver Retrieved	243	241	264	298	271
Liver Not Retrieved	112	106	113	158	182
Total Livers Transplanted	233	222	247	283	256
Whole Liver Not Used for Transplantation	10	19	17	15	15
Intended Split Liver (L) Not Used for Transplantation	0	0	0	0	1
Intended Split Liver (R) Not Used for Transplantation	1	0	0	2	2
Recipients Transplanted	252	237	264	314	281
Whole Liver Transplants	207	207	229	246	227
Split Liver Transplants	38	30	34	62	50
Reduced Size Liver Transplants	7	0	1	6	4
Liver Non-Utilisation Rate	4.12%	7.88%	6.44%	5.03%	5.54%
Liver Utilised Rate	95.88%	92.12%	93.56%	94.97%	94.46%

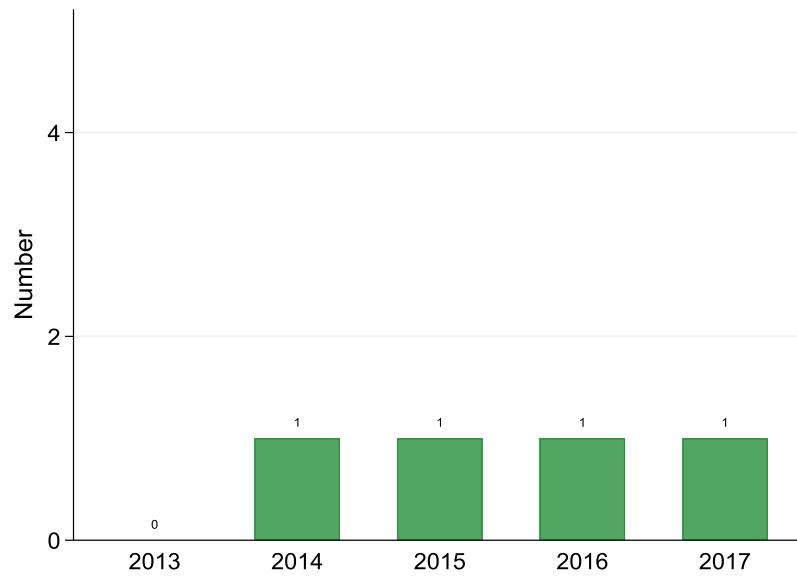
Table 6.4.2 Outcome of Request for Liver Donation in New Zealand, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	36	46	53	61	73
Liver Requested for Donation	35	41	50	60	69
Liver Not Requested for Donation	1	5	3	1	4
Liver Consent Given	35	41	50	60	69
Liver Consent Not Given	0	0	0	0	0
Liver Retrieved	25	33	41	51	49
Liver Not Retrieved	10	8	9	9	20
Total Livers Transplanted	24	32	41	51	48
Whole Liver Not Used for Transplantation	1	1	0	0	1
Intended Split Liver (L) Not Used for Transplantation	0	0	0	0	0
Intended Split Liver (R) Not Used for Transplantation	1	0	0	0	1
Recipients Transplanted	26	35	46	53	51
Whole Liver Transplants	21	29	36	49	42
Split Liver Transplants	4	6	10	4	6
Reduced Size Liver Transplants	1	0	0	0	3
Liver Non-Utilisation Rate	4.00%	3.03%	0.00%	0.00%	2.04%
Liver Utilised Rate	96.00%	96.97%	100.00%	100.00%	97.96%

Intestine Donation

Adult and paediatric patients with irreversible intestinal failure and developing severe complications from parenteral nutrition can benefit from intestinal transplantation. Only six intestinal transplants have been performed in Australia; Figure 6.6 shows intestine transplants since 2013. There has not been any intestine retrieved but not utilised for transplantation.

Figure 6.6 - Intestine Transplants Australia 2013-2017





SECTION 7

Deceased Donor Heart Donation

This section summarises heart donation activity from deceased donors in 2017, compared with previous years.

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Suggested citation

ANZOD Registry. 2018 Annual Report, Section 7: Deceased Donor Heart Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at:

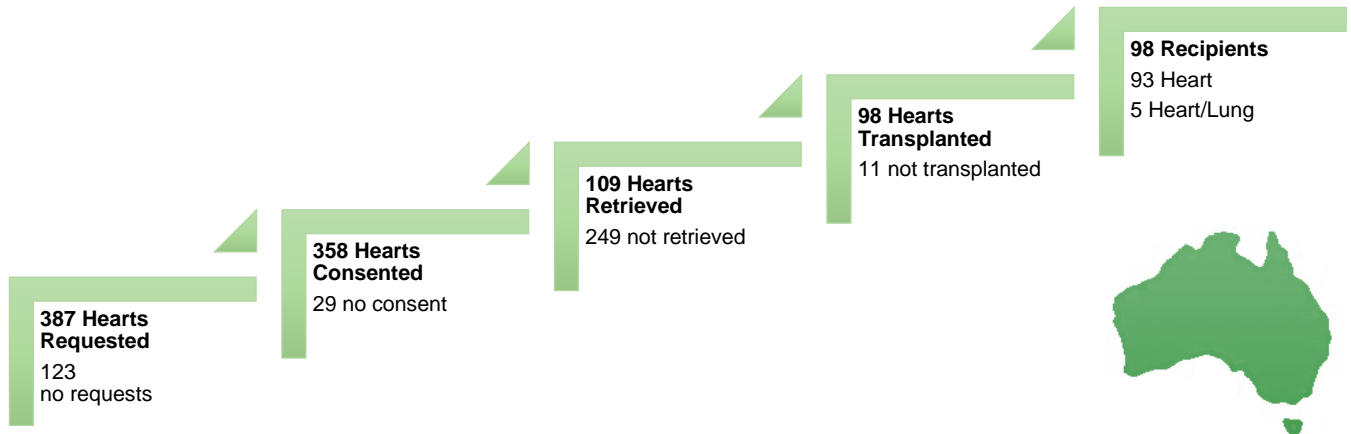
<http://www.anzdata.org.au>

Heart Donation

Of the 510 deceased organ donors in 2017 in Australia, 109 (21.4%) had heart retrieved. From these heart donors there were 98 heart transplant recipients (4.0 pmp). Of these 98 heart transplant recipients, five received heart/double lung transplants and one received a combined heart/kidney transplant.

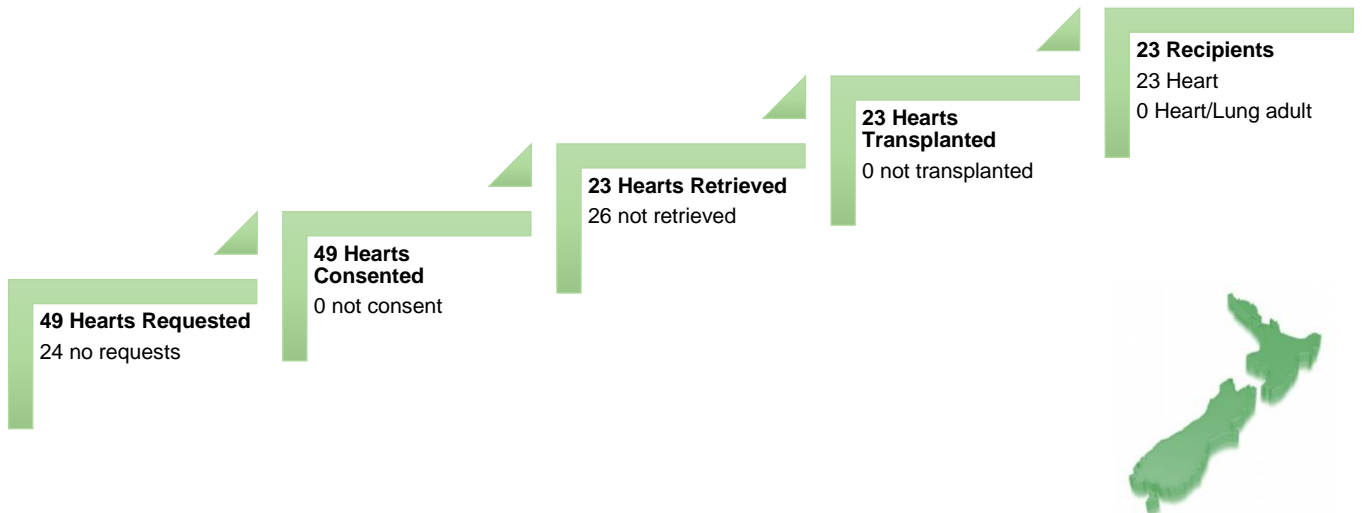
Figures 7.1 and 7.2 show the outcomes of requests for heart donation in Australia and New Zealand for 2017 respectively.

Figure 7.1 Outcomes of Request for Heart Donation from Actual Donors in Australia 2016



In New Zealand, there were 49 donors (67.1%) who consented to heart donation. From these consented donors, 23 hearts were retrieved and transplanted in 2017 (4.8 pmp). This was an increase of 109.1% in the total number of heart transplants compared with 2016 (11).

Figure 7.2 Outcomes of Request for Heart Donation from Actual Donors in New Zealand 2016



Figures 7.3 and 7.4 show the number of hearts transplanted by donation pathway and the number of heart recipients by jurisdiction.

Figure 7.3.1 - Hearts Transplanted by Donation Pathway Australia 1998-2017

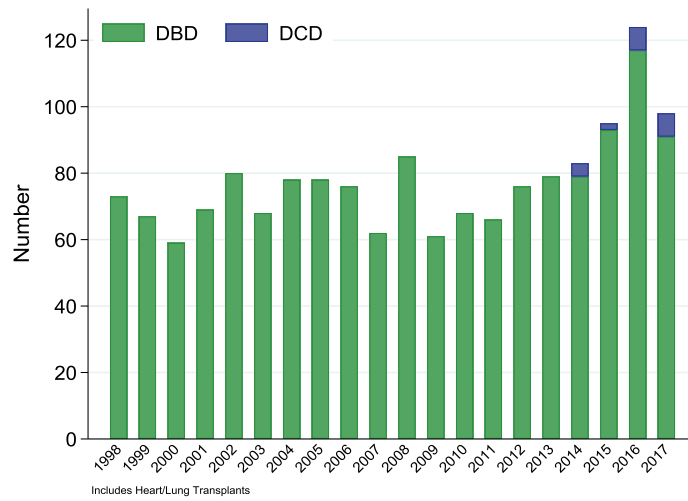


Figure 7.3.2 - Hearts Transplanted by Donation Pathway New Zealand 1998-2017

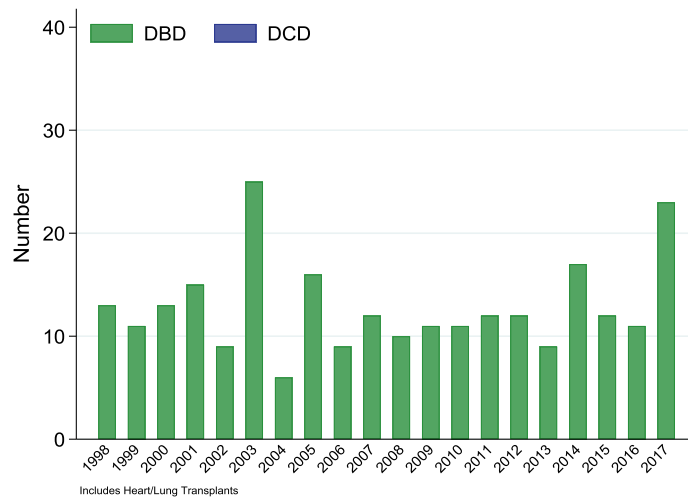
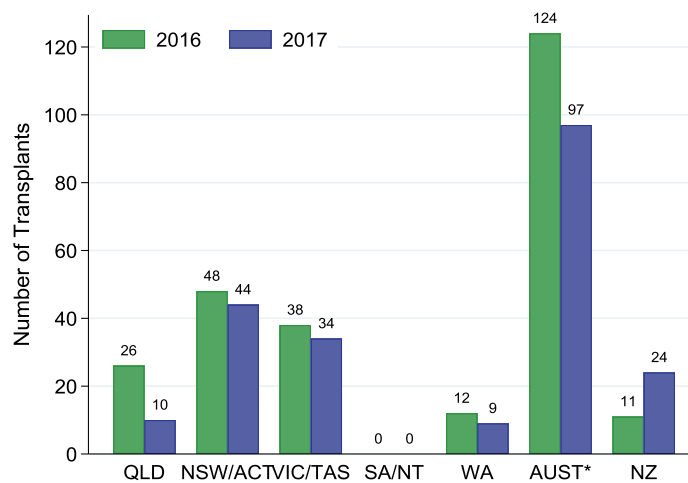


Figure 7.4 - Deceased Donor Heart Transplant Recipients* by Transplant State, Australia and New Zealand, 2016-2017



Age of Heart Donors

The age distribution of donors providing retrieved hearts for Australia and New Zealand is shown in Figure 7.5.

Figure 7.5.1 - Age of Donors Providing Retrieved Hearts Australia 2017

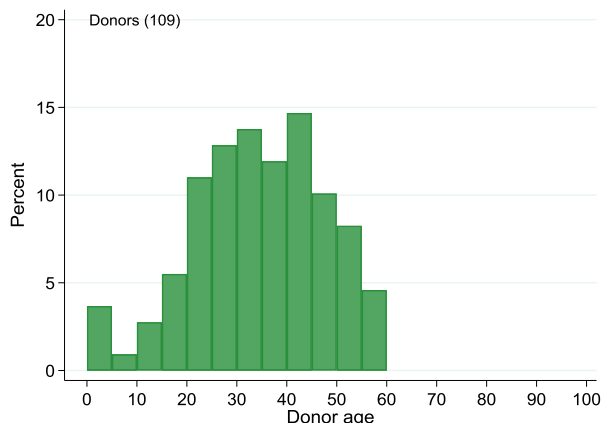
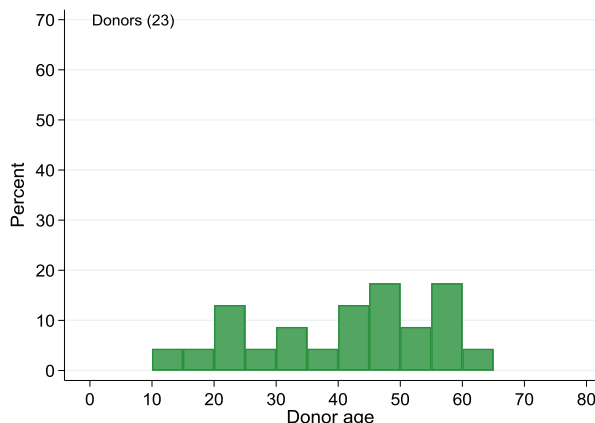


Figure 7.5.2 - Age of Donors Providing Retrieved Hearts New Zealand 2017



Donor Heart Function

In Australia, 80 (73.4%) donors with hearts retrieved had a normal ECG and 90 (82.6%) had a normal echocardiogram, prior to heart donation. In New Zealand, 21 out of the 23 heart donors had a normal ECG and 22 had a normal echocardiogram.

Hearts Not Retrieved

In 2017, there were 249 hearts not retrieved from Australian donors and 26 not retrieved from New Zealand donors.

For Australia, the main reason was due to the heart not being medically suitable (120), followed by the age of the donor (56). In New Zealand, there were 18 non-retrieved hearts due to not being medically suitable and 4 due to no suitable recipient for the heart.

Table 7.1 Reasons for Heart Not Retrieved 2017

Reason	Australia	New Zealand
Logistics	9	1
Not Medically Suitable	120	18
Surgically Unsuitable	0	0
Trauma to Organ	2	2
No Suitable Recipients	43	4
Age of Donor	56	0
DCD Donor	8	1
Consent Withdrawn	7	0
Others	4	0
Total	249	26

Hearts Retrieved and Not Utilised for Transplantation

Table 7.2 tabulates the reasons hearts were not used after retrieval for the purpose of transplantation since 2013.

Table 7.2 Reasons Heart Retrieved & Not Utilised for Transplantation, Australia (New Zealand) 2013 – 2017

Reason	2013	2014	2015	2016	2017
Logistics	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not Medically Suitable	0 (0)	2 (0)	4 (0)	0 (0)	8 (0)
Not Surgically Suitable	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Trauma to Organ	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
No Suitable Recipients	1 (0)	0 (0)	1 (0)	0 (0)	0 (0)
Recipient Issue	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Research	12 (0)	5 (0)	1 (0)	1 (0)	0 (0)
Other	0 (0)	0 (0)	2 (0)	0 (0)	3 (0)
Total	13 (0)	7 (0)	8 (0)	1 (0)	11 (0)

Figure 7.6 shows the non-utilisation rate of retrieved hearts – the proportion of hearts that were retrieved for the purpose of solid organ transplantation, but not ultimately transplanted into a recipient (either due to an absence of suitable recipients, or the heart being found to be medically or surgically unsuitable after retrieval).

In Australia, the non-utilisation rate of Hearts has increased from 0.8% in 2016 to 10.09% in 2017.

In New Zealand, all hearts retrieved for transplantation have been successfully transplanted.

Figure 7.6.1 - Non-utilisation Rate of Retrieved Heart - Australia 2013-2017

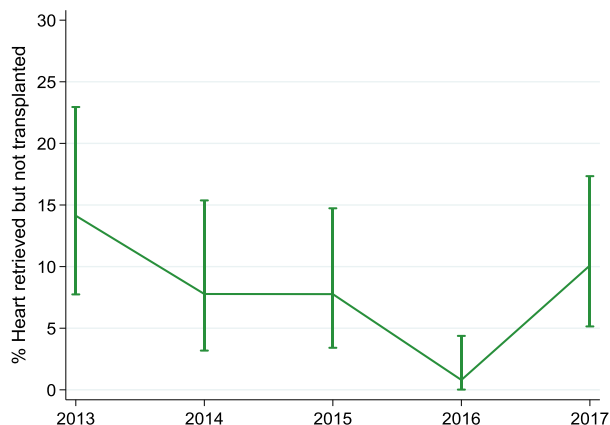
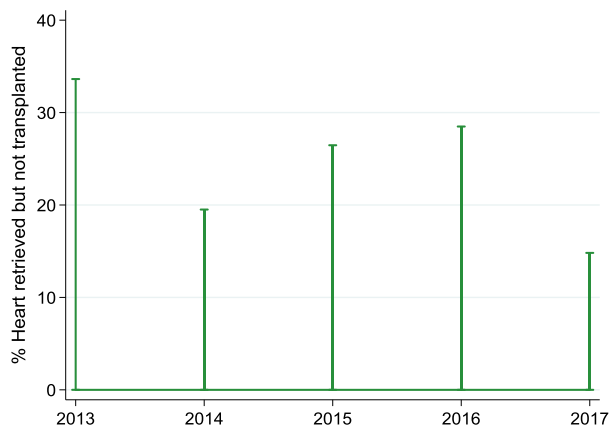


Figure 7.6.2 - Non-utilisation Rate of Retrieved Heart - New Zealand 2013-2017



Outcome of Heart Donation

The outcome of heart donation activity in Australia and New Zealand throughout the donation pathway is shown in table 7.3.

Table 7.3.1 Outcome of Request for Heart Donation in Australia, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	391	378	435	503	510
Heart Requested for Donation	270	279	306	393	387
Heart Not Requested for Donation	121	99	129	110	123
Heart with Consent Given	257	249	281	370	358
Heart with Consent Not Given	13	30	25	23	29
Heart Retrieved	92	90	103	125	109
Heart Not Retrieved	165	159	178	245	249
Heart Transplanted	79	83	95	124	98
Heart Not Used for Transplantation	13	7	8	1	11
Recipients Transplanted	79	83	95	124	98
Heart/Double Lung Procedures	2	4	2	7	5
Heart Non-Utilisation Rate	14.13%	7.78%	7.77%	0.80%	10.09%
Heart Utilised Rate	85.87%	92.22%	92.23%	99.20%	89.91%

Table 7.3.2 Outcome of Request for Heart Donation in New Zealand, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	36	46	53	61	73
Heart Requested for Donation	20	29	40	50	49
Heart Not Requested for Donation	16	17	13	11	24
Heart with Consent Given	19	27	39	50	49
Heart with Consent Not Given	1	2	1	0	0
Heart Retrieved	9	17	12	11	23
Heart Not Retrieved	10	10	27	39	26
Heart Transplanted	9	17	12	11	23
Heart Not Used for Transplantation	0	0	0	0	0
Recipients Transplanted	9	17	12	11	23
Heart/Double Lung Procedures	0	1	0	0	0
Heart Non-Utilisation Rate	0.00%	0.00%	0.00%	0.00%	0.00%
Heart Utilised Rate	100.00%	100.00%	100.00%	100.00%	100.00%



SECTION 8

Deceased Donor Lung Donation

This section summarises deceased donor lung donation activity from deceased donors in 2017, compared with previous years.

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Suggested citation

ANZOD Registry. 2018 Annual Report, Section 8: Deceased Donor Lung Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at:

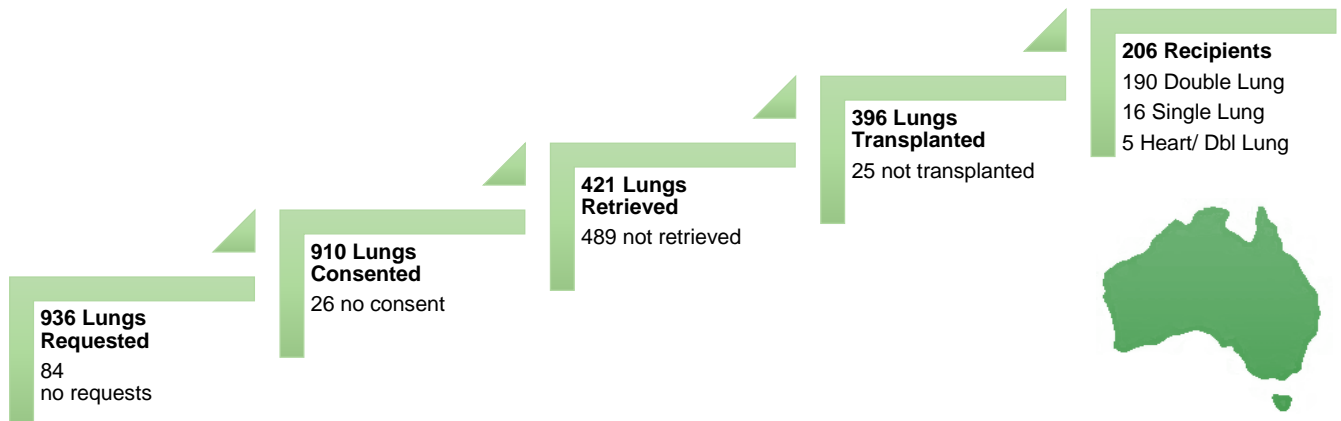
<http://www.anzdata.org.au>

Lung Donation

Of the 510 deceased organ donors in 2017 in Australia, 936 lungs were requested for donation. Of these, 421 lungs were retrieved with 396 lungs transplanted. There were 206 lung transplant recipients (8.4 pmp) an increase of 5.1%. Of these 206 lung transplant recipients, five received heart/double lung transplants, two received a double lung/liver and one received a double lung kidney transplant.

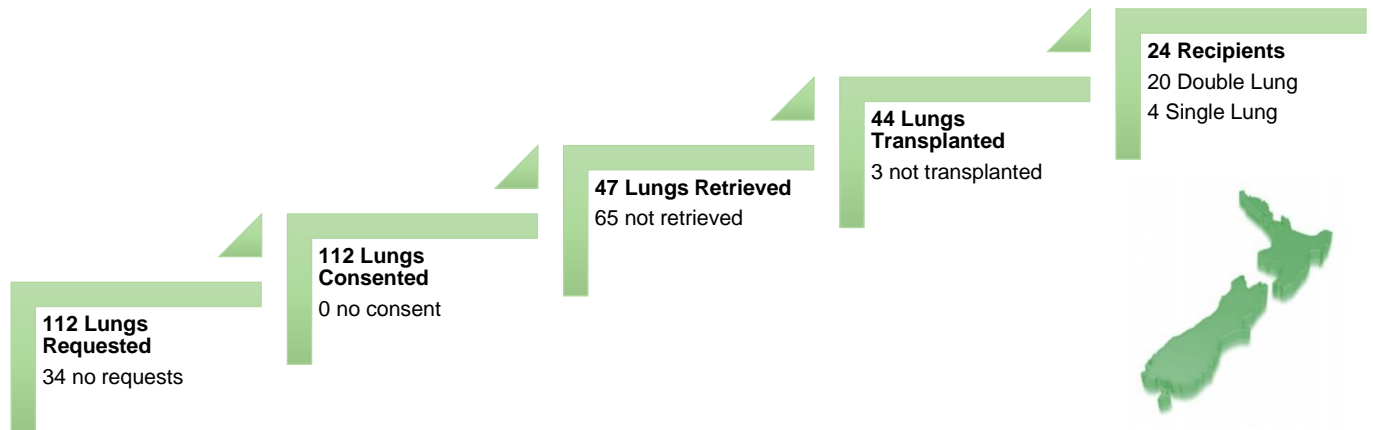
Figures 8.1.1 and 8.1.2 show the outcomes of requests for Lung donation in Australia and New Zealand for 2017 respectively.

Figure 8.1.1 Outcomes of Request for Lung Donation from Actual Donors in Australia 2017



In New Zealand in 2017, 112 lungs were requested for donation. From these, 47 lungs were retrieved and 44 were transplanted into 24 recipients (5.0 pmp).

Figure 8.1.2 Outcomes of Request for Lung Donation from Actual Donors in New Zealand 2017



Figures 8.2 to 8.3 show the number of lung transplants by donation pathway and the number of lung recipients by jurisdiction. Figure 8.3 particularly shows an increase in DCD lungs from 2006 to 2017, and DBD lungs from 2010 to 2017 in Australia.

Figure 8.2.1 - Recipients of Lung Transplants by Donor Pathway Australia 1998-2017

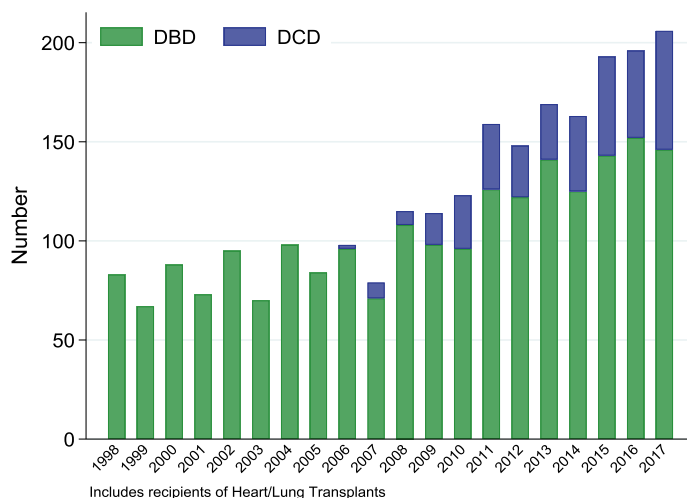


Figure 8.2.2 - Recipients of Lung Transplants by Donor Pathway New Zealand 1998-2017

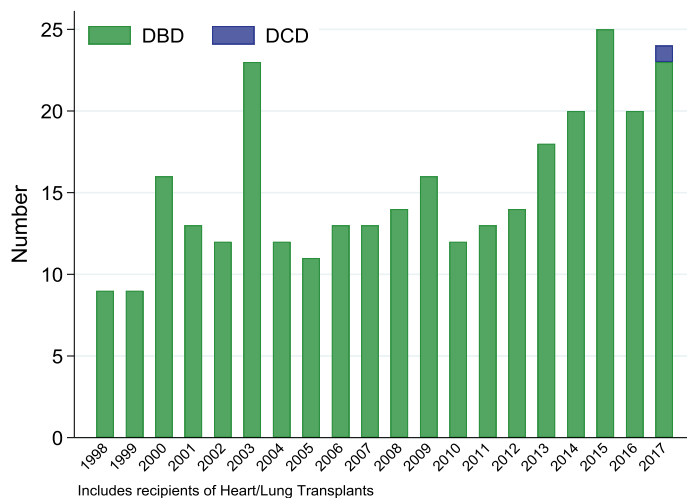
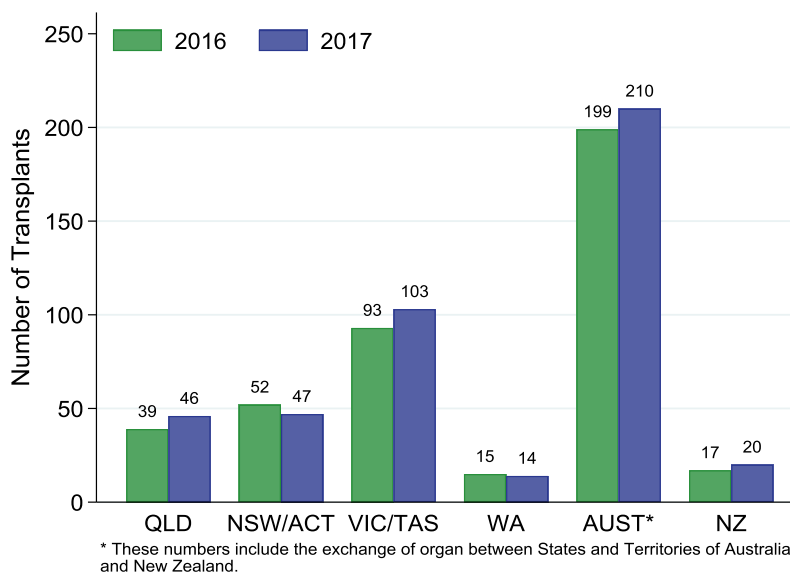


Figure 8.3 - Deceased Donor Lung Transplant Recipients* by Transplant State, Australia and New Zealand, 2016-2017



Age of Lung Donors

The age distribution of donors providing retrieved lungs for Australia and New Zealand is shown in Figure 8.4.

Figure 8.4.1 - Age of Donors Providing Retrieved Lungs Australia 2017

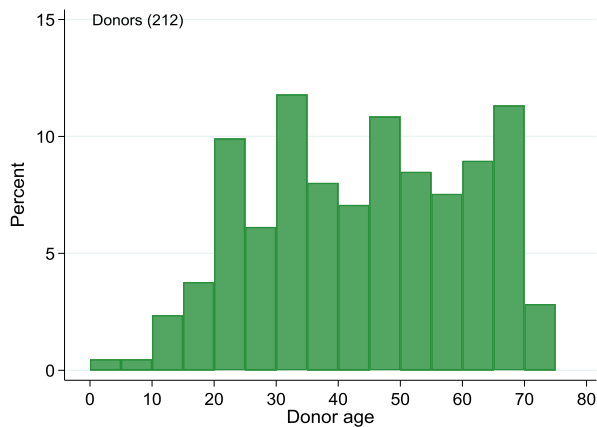
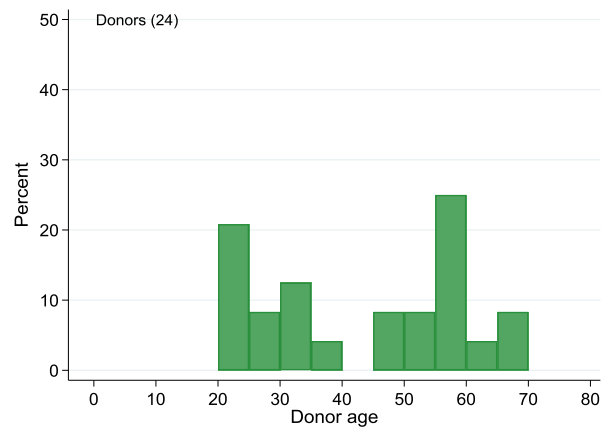


Figure 8.4.2 - Age of Donors Providing Retrieved Lungs New Zealand 2017



Donor Lung Function

In Australia, 118 (55.7%) donors with lungs retrieved had a bronchoscopy in 2017. 19 donors had chest trauma; these included chest drains, pneumothoraces, fractures and haemopneumothorax.

In Australian donors, the arterial blood gases were taken on 100% FiO₂ and PEEP 5cm for 475 actual donors. Sixty-one percent (291) had a PEEP greater than 5cm. Of those donors with lungs retrieved, 59.9% (127) had a PEEP greater than 5cm.

The results from 485 donors with a pH measurement show 19.8 % to be acidotic (pH <7.35) and 19.8 % to be alkalotic (pH>7.45). Of those donors with lungs retrieved, 12.7% were acidotic and 22.6% were alkalotic.

For the 485 donors with measurements, oxygenation measured as PaO₂ ranged from 52 to 627 mmHg with a median of 359 mmHg. PaCO₂ ranged from 18.5 to 150 with a median of 39.3 mmHg. For donors with lungs retrieved, oxygenation measured as PaO₂ ranged from 75 to 605 mmHg with a median of 431 mmHg. PaCO₂ ranged from 19 to 62.1 with a median of 39 mmHg.

In New Zealand, there were six (25%) lung donors who had a bronchoscopy in 2017. Two donors had chest trauma.

All 24 donors with lung retrieved had 100% FiO₂; 9 had a PEEP greater than 5cm.

The arterial blood gas results from these donors with lung retrieved show 4.2% (1) to be acidotic (pH < 7.35) and six (24%) were alkalotic (pH > 7.45).

Oxygenation measured as PaO₂ ranged from 255 - 538 mmHg with a median of 429 mmHg. PaCO₂ ranged from 26.8 – 56.2 mmHg with a median of 38.5 mmHg.

Lungs Not Retrieved

In 2017, there were 489 Lungs not retrieved from Australian donors and 65 not retrieved from New Zealand donors.

For Australia, the main reason was due to the Lung not being medically suitable (372), followed by no suitable recipient for the lung (63).

In New Zealand, there were 50 non-retrieved Lungs due to not being medically suitable and 13 due to no suitable recipient.

Table 8.1 Reasons for Lung Not Retrieved in 2017

Reason	Australia	New Zealand
Logistics	14	0
Not Medically Suitable	372	50
Surgically Unsuitable	0	0
Trauma to Organ	14	2
No Suitable Recipients	63	13
Age of Donor	14	0
DCD Donor	2	0
Consent Withdrawn	10	0
Others	0	0
Total	489	65

Lungs Retrieved and Not Utilised for Transplantation

Table 8.2 tabulates the reasons lungs were not used after retrieval for the purpose of transplantation since 2013.

Table 8.2 Reasons Lung Retrieved & Not Utilised for Transplantation, Australia (New Zealand) 2013 – 2017

Reason	2013	2014	2015	2016	2017
Logistics	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not Medically Suitable	4 (0)	10 (1)	3 (0)	13 (0)	15 (0)
Not Surgically Suitable	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Trauma to Organ	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
No Suitable Recipients	0 (0)	2 (0)	0 (0)	0 (0)	1 (0)
Recipient Issue	0 (0)	0 (0)	0 (0)	1 (0)	3 (2)
Research	0 (0)	0 (0)	16 (0)	10 (0)	4 (0)
Other	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	4 (0)	12 (1)	19 (0)	24 (0)	25 (3)

Figure 8.5 shows the non-utilisation rate of retrieved lungs – the proportion of lungs that were retrieved for the purpose of solid organ transplantation, but not ultimately transplanted into a recipient (either due to an absence of suitable recipients, or the lung being found to be medically or surgically unsuitable after retrieval).

Figure 8.5.1 - Non-utilisation Rate of Retrieved Lungs - Australia 2013-2017

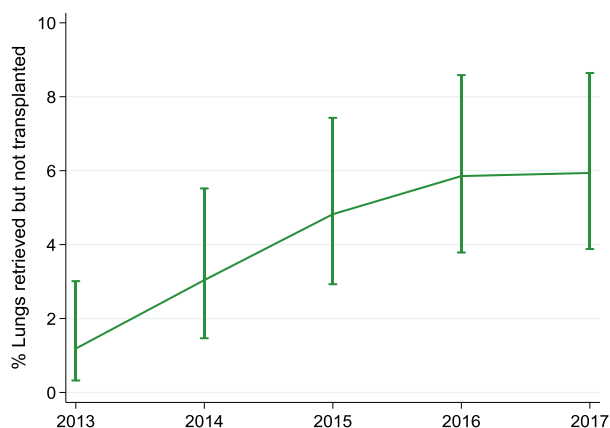
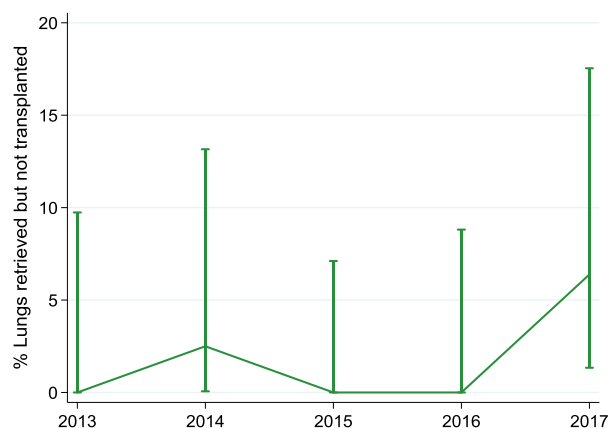


Figure 8.5.2 - Non-utilisation Rate of Retrieved Lungs - New Zealand 2013-2017



Outcome of Lung Donation

The outcome of lung donation activity in Australia and New Zealand throughout the donation pathway is shown in table 8.3.

Table 8.3.1 Outcome of Request for Lung Donation in Australia, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	391	378	435	503	510
Lungs Requested for Donation	690	684	784	912	936
Lungs Not Requested for Donation	92	72	86	94	84
Lungs with Consent Given	660	660	752	886	910
Lungs with Consent Not Given	30	24	32	26	26
Lungs Retrieved	337	329	394	410	421
(Single Lung Retrieved)	1	3	2	2	3
(Double Lung Retrieved)	168	163	196	204	209
Lungs Not Retrieved	323	331	358	476	489
Lungs Transplanted	333	319	375	386	396
Total Lungs Not Used for Transplantation	4	10	19	24	25
Recipient Transplanted	169	163	193	196	206
Double Lung Recipient	164	156	182	190	190
Single Lung(L) Recipients	3	4	6	5	5
Single Lung(R) Recipients	2	3	5	1	11
(Heart/Lung Recipients)	2	4	2	7	5
Lung Non-Utilisation Rate	1.19%	3.04%	4.82%	5.85%	5.94%
Lung Utilised Rate	98.81%	96.96%	95.18%	94.15%	94.06%

Table 8.3.2 Outcome of Request for Lung Donation in New Zealand, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	36	46	53	61	73
Lungs Requested for Donation	54	66	92	110	112
Lungs Not Requested for Donation	18	26	14	12	34
Lungs with Consent Given	54	66	92	110	112
Lungs with Consent Not Given	0	0	0	0	0
Lungs Retrieved	36	40	50	40	47
(Single Lung Retrieved)	0	0	0	0	1
(Double Lung Retrieved)	18	20	25	20	23
Lungs Not Retrieved	18	26	42	70	65
Lungs Transplanted	36	39	50	40	44
Total Lungs Not Used for Transplantation	0	1	0	0	3
Recipient Transplanted	18	20	25	20	24
Double Lung Recipient	18	19	25	20	20
Single Lung(L) Recipients	0	1	0	0	3
Single Lung(R) Recipients	0	0	0	0	1
(Heart/Lung Recipients)	0	1	0	0	0
Lung Non-Utilisation Rate	0.00%	2.50%	0.00%	0.00%	6.38%
Lung Utilised Rate	100.00%	97.50%	100.00%	100.00%	93.62%

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SECTION 9

Deceased Donor Pancreas Donation

This section summarises pancreas donation activity from deceased donor in 2017, compared with previous years. Both countries reached their highest rate of pancreas transplants in 2017, with 2.0 pmp in Australia and 0.8 pmp in New Zealand.

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Suggested citation

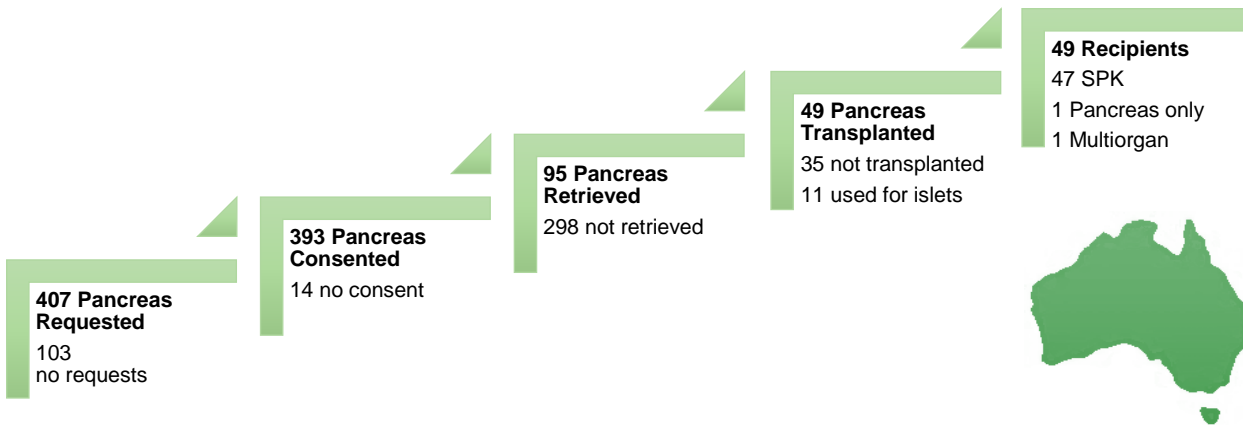
ANZOD Registry. 2018 Annual Report, Section 9: Deceased Donor Pancreas Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at:
<http://www.anzdata.org.au>

Pancreas Donation

In Australia, there were 49 pancreas transplants in 2017. Forty-eight pancreas were transplanted simultaneously with another organ resulting in 47 simultaneous pancreas/kidney transplant recipients and one pancreas/liver/kidney/intestine transplant recipient. There was a rate of 2.0 per million population (pmp) pancreas transplants in 2017.

Figure 9.1 and 9.2 show the outcome of request for Pancreas donation from actual donors in 2017.

Figure 9.1 Outcomes of Request for Pancreas Donation from Actual Donors in Australia 2017

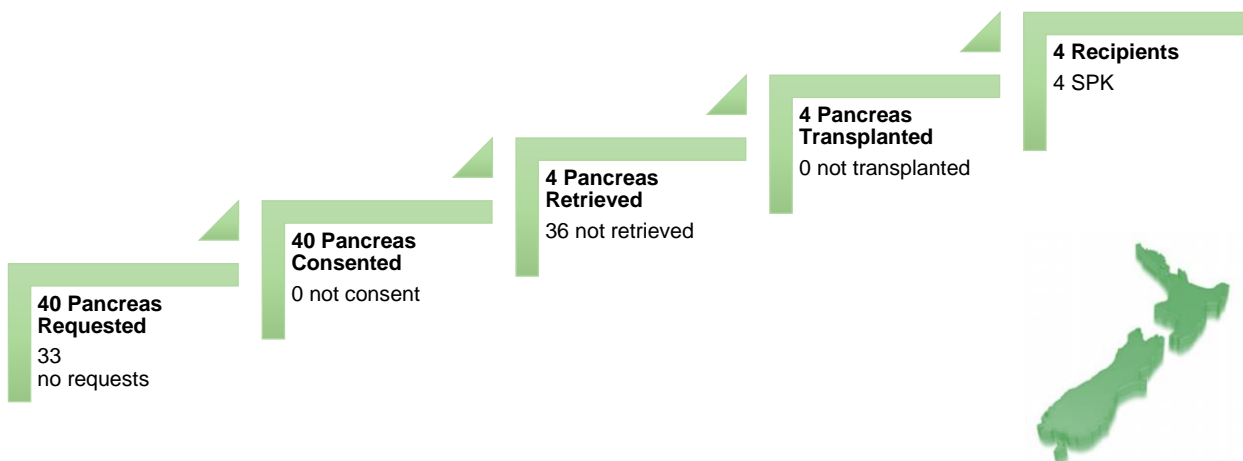


In New Zealand, there were four pancreas transplants (0.8 pmp) in 2017. All four transplants were a combined pancreas/kidney transplant.

The total number of pancreas transplant recipients (4) in 2017 compared to the previous year remains stable.

Figure 9.2 shows the outcomes of requests for pancreas donation, in New Zealand.

Figure 9.2 Outcomes of Request for Pancreas Donation from Actual Donors in New Zealand 2017



SPK = Simultaneous Pancreas Kidney transplant
 SPL = Simultaneous Pancreas Liver transplant

Figure 9.3 to 9.4 show the number of pancreas transplants by donation pathway and the number of pancreas recipients by jurisdiction.

Figure 9.3.1 - Recipients of Whole Pancreas Transplant by Donation Pathway, Australia 1998-2017

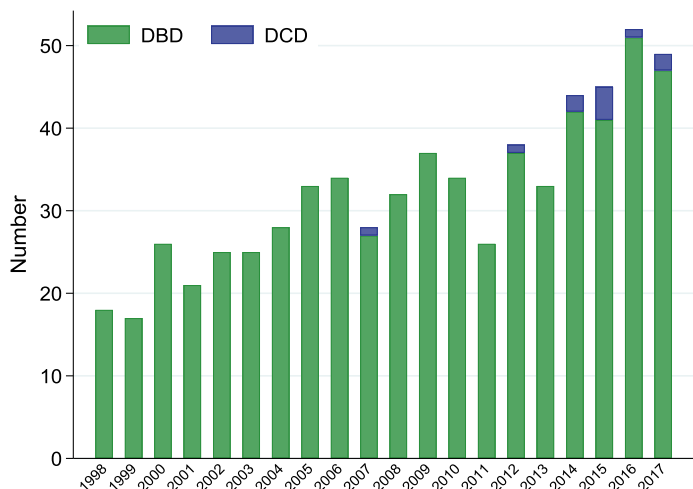


Figure 9.3.2 - Recipients of Whole Pancreas Transplant by Donation Pathway, New Zealand 1998-2017

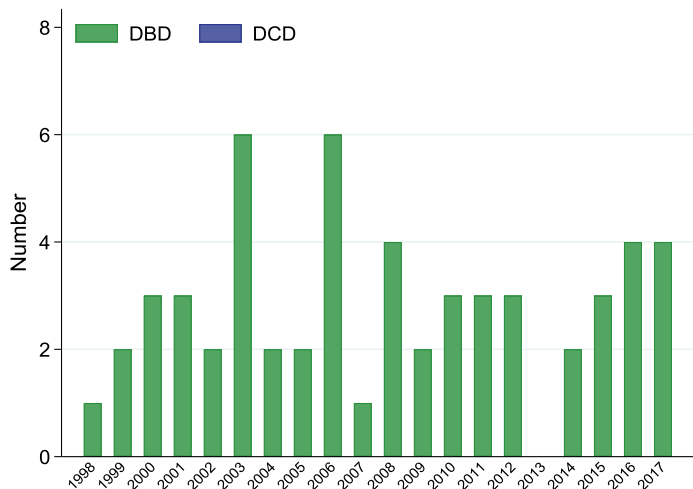
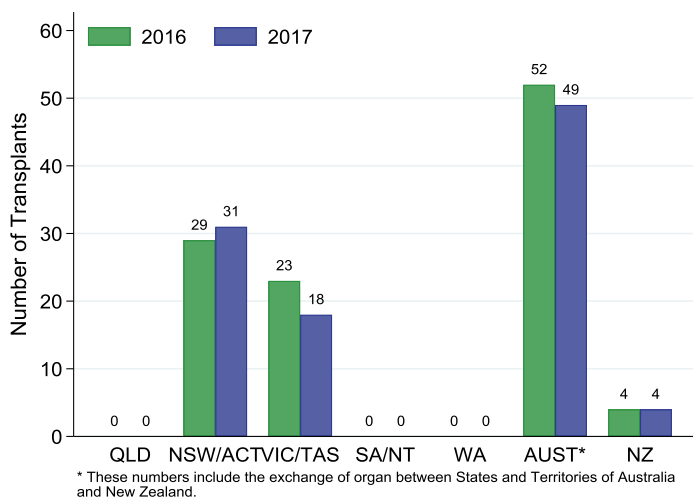


Figure 9.4 - Deceased Donor Pancreas Transplant Recipients* by Transplant State, Australia and New Zealand, 2016-2017



Age of Pancreas Donors

The age distribution of donors providing retrieved pancreas for Australia and New Zealand is shown in Figure 9.5.

Figure 9.5.1 - Age of Donors Providing Retrieved Pancreas Australia 2017

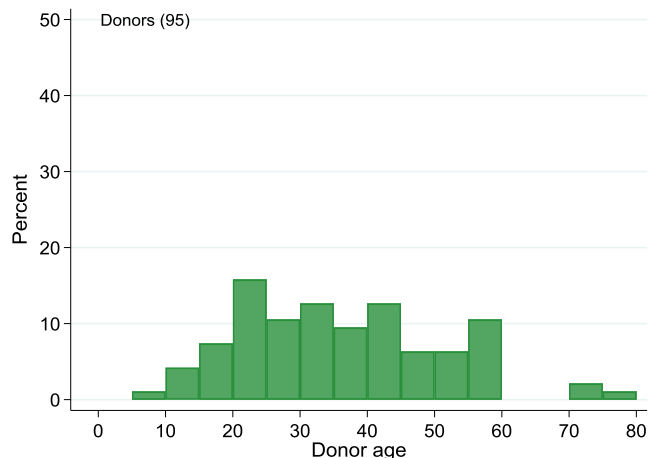
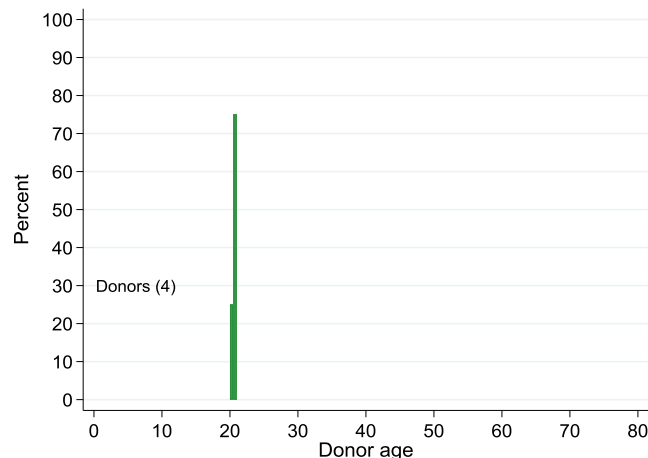


Figure 9.5.2 - Age of Donors Providing Retrieved Pancreas New Zealand 2017



Donor Pancreas Function

Tests for pancreas function of deceased donors include blood sugar levels, serum amylase and serum lipase tests.

Australia

In Australia, of the 426 donors in 2017 with a measurement taken, 84.0% had blood sugar levels greater than 8mmol/L. Of those 95 donors with pancreas retrieved, 87.4% had blood sugar levels greater than 8mmol/L.

Of the 330 donors with a measurement taken, 87.6% had normal amylase levels or lipase less than 80 U/L. Of the 88 donors with pancreas retrieved and a measurement taken, 95.5% had normal amylase levels or lipase less than 80 U/L.

New Zealand

In New Zealand, of the 4 donors in 2017 with pancreas retrieved, 75.0% had blood sugar levels greater than 8mmol/L.

Of the 3 donors in 2017 with pancreas retrieved and a measurement taken, 100.0% had normal amylase levels or lipase less than 80 U/L.

Pancreas Not Retrieved

In 2017, there were 298 pancreas not retrieved from Australian donors and 36 not retrieved from New Zealand donors.

For Australia, the main reason was due to the pancreas not being medically suitable (120), followed by the age of the donor (87). In New Zealand, there were 21 non-retrieved pancreas due to age of donor and 11 due to not being medically suitable.

Table 9.1 Reasons for Pancreas Not Retrieved 2017

Reason	Australia	New Zealand
Logistics	18	0
Not Medically Suitable	120	11
Surgically Unsuitable	11	0
Trauma to Organ	2	3
No Suitable Recipients	40	1
Age of Donor	87	21
DCD Donor	16	0
Consent Withdrawn	1	0
Others	3	0
Total	298	36

Pancreas Retrieved and Not Utilised for Transplantation

Table 9.2 tabulates the reasons pancreas were not used after retrieval for the purpose of transplantation since 2013.

Table 9.2 Reasons Pancreas Retrieved & Not Utilised for Transplantation, Australia (New Zealand) 2013 - 2017

Year	Logistics	Not Medically Suitable	Surgically Unsuitable	Trauma to Organ	No Suitable Recipients	Recipient Issue	Research	Insufficient Islets	Others	Total
2013	0 (0)	1 (0)	0 (0)	1 (0)	0 (0)	0 (0)	26 (0)	6 (0)	0 (0)	34 (0)
2014	0 (0)	2 (0)	1 (0)	0 (0)	0 (0)	0 (0)	38 (0)	6 (0)	0 (0)	47 (0)
2015	1 (0)	4 (0)	0 (0)	1 (0)	0 (0)	0 (0)	42 (0)	12 (0)	0 (0)	60 (0)
2016	1 (0)	2 (0)	0 (0)	1 (0)	0 (0)	0 (0)	48 (0)	7 (0)	1 (0)	60 (0)
2017	0 (0)	4 (0)	0 (0)	0 (0)	0 (0)	0 (0)	22 (0)	9 (0)	0 (0)	35 (0)

Figure 9.5 shows the non-utilisation rate of retrieved pancreas – the proportion of pancreas that were retrieved for the purpose of solid organ transplantation, but not ultimately transplanted into a recipient (either due to an absence of suitable recipients, or the pancreas being found to be medically or surgically unsuitable after retrieval).

Figure 9.5.1 - Non-utilisation Rate of Pancreas Retrieved for Organ Transplantation - Australia 2013-2017

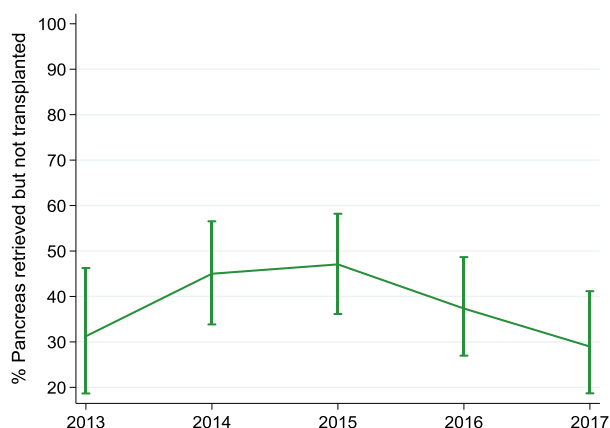
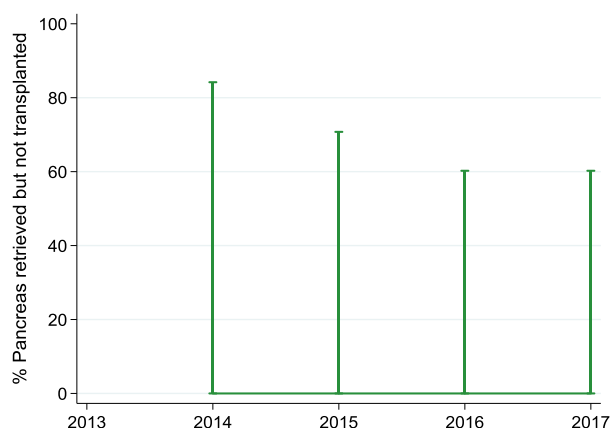


Figure 9.5.2 - Non-utilisation Rate of Pancreas Retrieved for Organ Transplantation - New Zealand 2013-2017



Outcome of Pancreas Donation

The outcome of pancreas donation activity in Australia and New Zealand throughout the donation pathway is shown in table 9.3.

Table 9.3.1 Outcome of Request for Pancreas Donation in Australia, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	391	378	435	503	510
Pancreas Requested for Donation	299	301	328	406	407
Pancreas Not Requested for Donation	92	77	107	97	103
Pancreas with Consent Given	289	285	314	394	393
Pancreas with Consent Not Given	10	16	14	12	14
Pancreas Retrieved	68	101	121	120	95
Pancreas Not Retrieved	221	184	193	274	298
Whole Pancreas Transplanted	33	44	45	52	49
Pancreas Only Transplanted	0	0	2	5	1
Pancreas Transplanted with Other Organ	33	44	43	47	48
Pancreas Islets Transplanted	1	10	16	8	11
Pancreas Not Used for Transplantation	34	47	60	60	35
Whole Pancreas Recipients	33	44	45	52	49
Pancreas Only Recipients	0	0	2	5	1
Pancreas with Other Organ Recipients	33	44	43	47	48
Pancreas Islets Recipients	1	10	15	8	11
Pancreas (including Islets) Non-utilisation Rate	50.00%	46.53%	49.59%	50.00%	36.84%
Pancreas (Whole, no Islets) Utilised Rate	48.53%	43.56%	37.19%	43.33%	51.58%

Table 9.3.2 Outcome of Request for Pancreas Donation in New Zealand, 2013-2017

Outcome of Request	2013	2014	2015	2016	2017
Total Donors	36	46	53	61	73
Pancreas Requested for Donation	12	22	39	45	40
Pancreas Not Requested for Donation	23	24	14	16	33
Pancreas with Consent Given	12	22	38	45	40
Pancreas with Consent Not Given	0	0	1	0	0
Pancreas Retrieved	0	2	3	4	4
Pancreas Not Retrieved	12	20	35	41	36
Whole Pancreas Transplanted	0	2	3	4	4
Pancreas Transplanted with Other Organ	0	2	3	4	4
Pancreas Islets Transplanted	0	0	0	0	0
Pancreas Not Used for Transplantation	0	0	0	0	0
Whole Pancreas Recipients	0	2	3	4	4
Pancreas with Other Organ Recipients	0	2	3	4	4
Pancreas Islets Recipients	0	0	0	0	0
Pancreas (including Islets) Non-utilisation Rate	-	0.00%	0.00%	0.00%	0.00%
Pancreas (Whole, no Islets) Utilised Rate	-	100.00%	100.00%	100.00%	100.00%



SECTION 10

Tissue and Eye Donation

This chapter summarises the data on tissue and eye donation and transplant outcome. The data presented here is provided by Tissue and Eye Banks across Australia, in conjunction with data collected within the solid organ donation sector, DonateLife.

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Suggested citation

ANZOD Registry. 2018 Annual Report, Section 10: Eye and Tissue Donation and Outcome Data. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at: <http://www.anzdata.org.au>

Eye and Tissue Reporting

The collaboration between the Australian Organ and Tissue Authority (OTA), jurisdictional tissue and eye banks and the ANZOD Registry continues to strengthen the national reporting of tissue data. Reported datasets and analyses produced by the Registry inform the discussions held by health care professionals, policy makers, consumers and individual agencies to optimise every potential donation opportunity and to increase access to life-transforming transplantation for Australians - See more at: <http://www.donatelife.gov.au/organ-and-tissue-authority-ota>

Tissue and Eye Banks

Tissue and Eye banks across Australia provide data for cardiovascular, musculoskeletal and skin tissue donations.

Musculoskeletal donations can be in the form of bone, tendon and ligaments and are utilised for knee and hip replacements, reconstructive orthopaedic surgery following trauma or disease and spinal deformities and can aid in prevention of limb loss following tumour removal. Just one musculoskeletal donation can aid many recipients and greatly improve their quality of life.

Cardiovascular tissue incorporates donations of heart valves, pericardium and thoracic aorta. Heart valves are necessary to regulate the flow of blood to and from the heart, whereas pericardium can be used during neurosurgery or, like the thoracic aorta, can also be used for vascular repair of defects or injury.

Donated skin contributes to saving lives and improving long term outcomes for patients who suffer severe burns. Donated skin is essential when a patient's own skin cannot be used for grafting. Using donated skin as a wound "dressing" helps reduce infection, fluid loss and pain, promotes wound healing and minimises scarring. Often recipients will require more than one donated graft for their wounds to heal. Skin grafts are also used to treat wounds resulting from trauma and serious infection.

Eye banks in Australia provide data for eye donation including corneal and sclera tissue donations.

Tissue Donors

Figure 10.2 shows the number of tissue donors across each jurisdiction from 2016 to 2017.

Figure 10.2 - Number of Tissue Donors by Jurisdiction, 2016-2017

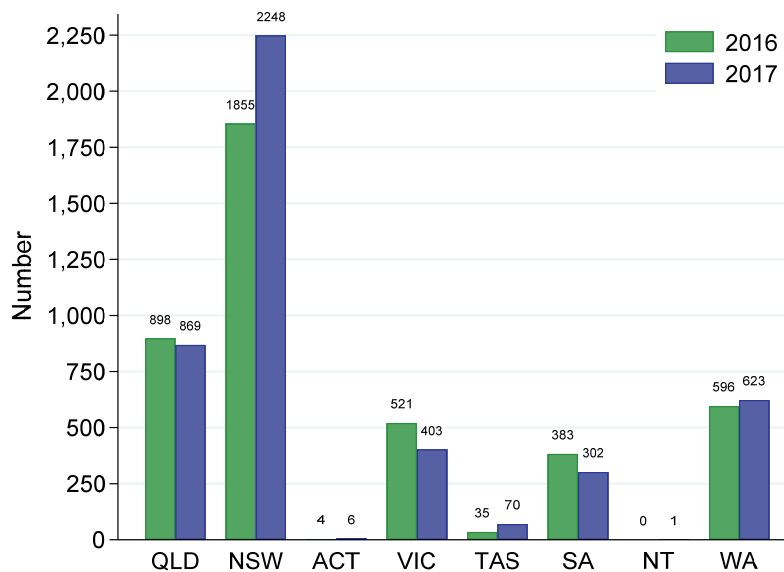


Table 10.1 summarises the number of tissue donors, by donation pathway, by jurisdiction and the percentage change in donor numbers from 2016 to 2017.

Table 10.1 Number of Tissue Donors by Donation Pathway and Jurisdiction 2016-2017

Donation Type	Jurisdiction	2016	2017	Percent change
Living Donor	QLD	731 (18.9%)	742 (17.8%)	2%
	NSW	1738 (44.9%)	2139 (51.5%)	23%
	ACT	0 (0%)	0 (0%)	-
	VIC	407 (10.5%)	309 (7.4%)	-24%
	TAS	33 (.9%)	67 (1.6%)	103%
	SA	376 (9.7%)	292 (7%)	-22%
	NT	0 (0%)	0 (0%)	-
	WA	583 (15.1%)	608 (14.6%)	4%
	AUS	3868 (100%)	4157 (100%)	7%
Deceased Donor	QLD	167 (39.4%)	127 (34.8%)	-24%
	NSW	117 (27.6%)	109 (29.9%)	-7%
	ACT	4 (.9%)	6 (1.6%)	50%
	VIC	114 (26.9%)	94 (25.8%)	-18%
	TAS	2 (.5%)	3 (.8%)	50%
	SA	7 (1.7%)	10 (2.7%)	43%
	NT	0 (0%)	1 (.3%)	-
	WA	13 (3.1%)	15 (4.1%)	15%
	AUS	424 (100%)	365 (100%)	-14%
Total Donors	QLD	898 (20.9%)	869 (19.2%)	-3%
	NSW	1855 (43.2%)	2248 (49.7%)	21%
	ACT	4 (.1%)	6 (.1%)	50%
	VIC	521 (12.1%)	403 (8.9%)	-23%
	TAS	35 (.8%)	70 (1.5%)	100%
	SA	383 (8.9%)	302 (6.7%)	-21%
	NT	0 (0%)	1 (0%)	-
	WA	596 (13.9%)	623 (13.8%)	5%
	AUS	4292 (100%)	4522 (100%)	5%

Figures 10.3 to 10.5 show the breakdown of tissue donor numbers by donation pathway and jurisdiction for 2017 compared to 2016.

Figure 10.3 - Living Tissue Donors by Jurisdiction, 2016-2017

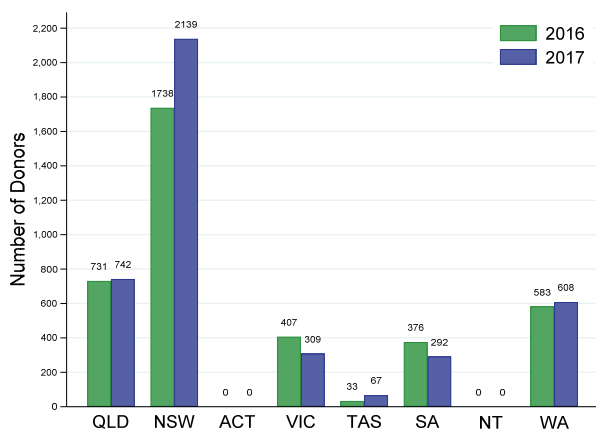
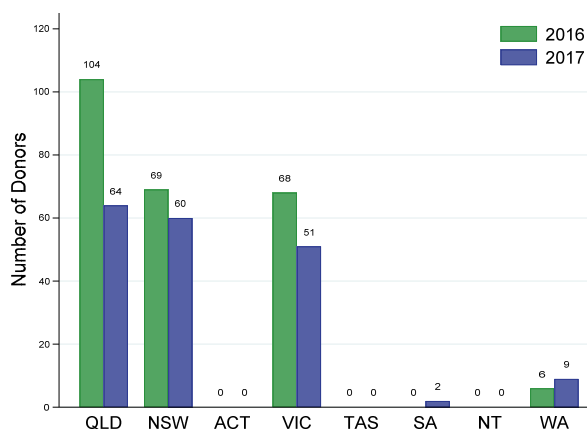


Figure 10.4 - Deceased Tissue Donors by Jurisdiction, 2016-2017



Tissue Donation

Figure 10.5 - Total Tissue Donation by Jurisdiction, 2016-2017

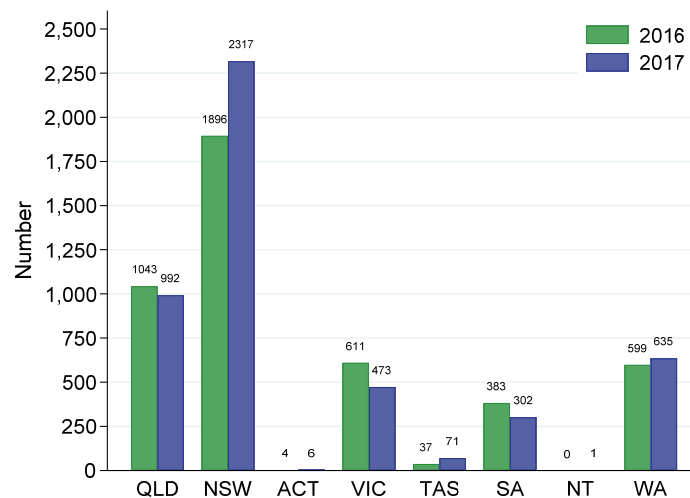


Table 10.2 shows the total number and proportion of tissue donations, by donation pathway, jurisdiction and the percentage change in tissue donation from 2016 to 2017.

Table 10.2 Number of Tissue Donations by Donor Type and Jurisdiction 2016-2017

Donation Type	Jurisdiction	2016	2017	Percent change
Living Donor	QLD	746 (19%)	763 (18%)	2%
	NSW	1772 (45.2%)	2197 (51.7%)	24%
	ACT	0 (0%)	0 (0%)	-
	VIC	408 (10.4%)	309 (7.3%)	-24%
	TAS	35 (.9%)	68 (1.6%)	94%
	SA	376 (9.6%)	292 (6.9%)	-22%
	NT	0 (0%)	0 (0%)	-
	WA	586 (14.9%)	619 (14.6%)	6%
	AUS	3923 (100%)	4248 (100%)	8%
Deceased Donor	QLD	297 (45.7%)	229 (41.7%)	-23%
	NSW	124 (19.1%)	120 (21.9%)	-3%
	ACT	4 (.6%)	6 (1.1%)	50%
	VIC	203 (31.2%)	164 (29.9%)	-19%
	TAS	2 (.3%)	3 (.5%)	50%
	SA	7 (1.1%)	10 (1.8%)	43%
	NT	0 (0%)	1 (.2%)	-
	WA	13 (2%)	16 (2.9%)	23%
	AUS	650 (100%)	549 (100%)	-16%
Total Donors	QLD	1043 (22.8%)	992 (20.7%)	-5%
	NSW	1896 (41.5%)	2317 (48.3%)	22%
	ACT	4 (.1%)	6 (.1%)	50%
	VIC	611 (13.4%)	473 (9.9%)	-23%
	TAS	37 (.8%)	71 (1.5%)	92%
	SA	383 (8.4%)	302 (6.3%)	-21%
	NT	0 (0%)	1 (0%)	-
	WA	599 (13.1%)	635 (13.2%)	6%
	AUS	4573 (100%)	4797 (100%)	5%

Figure 10.7 - Donation by Donation Pathway: Overall Australia, 2016-2017

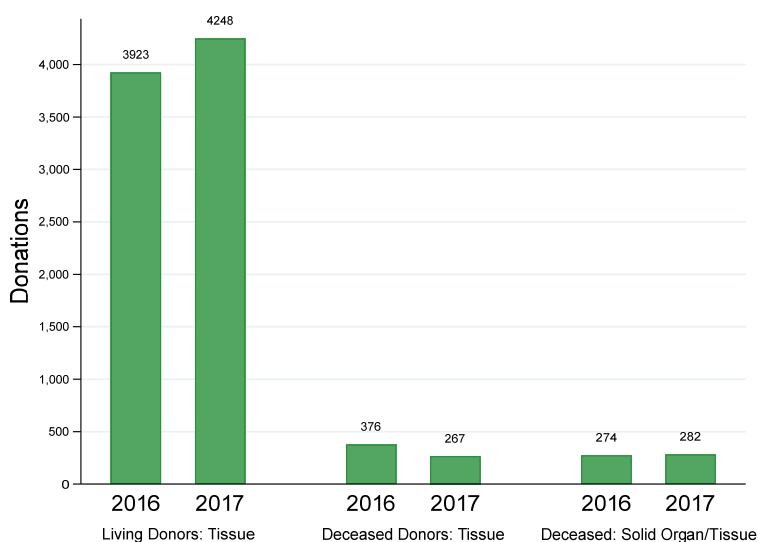


Figure 10.8 - Tissue Donation by Living Donors by Jurisdiction, 2016-2017

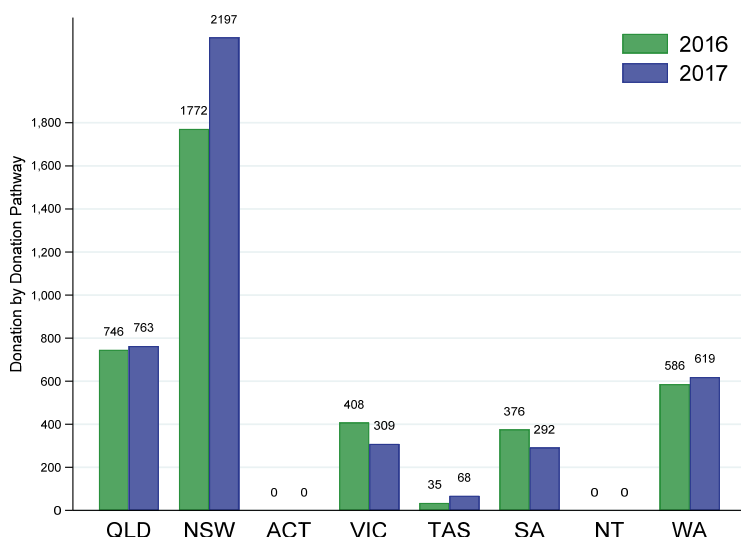


Table 10.3 shows the breakdown of donation from living donors, by tissue type and donation.

Table 10.3 Tissue Donation from Living Donors in 2017 by Jurisdiction and Donation Sector

Jurisdiction	Musculoskeletal	Cardiovascular	Total
QLD	763	0	763
NSW	2183	14	2197
ACT	0	0	0
VIC	307	2	309
TAS	68	0	68
SA	292	0	292
NT	0	0	0
WA	619	0	619
AUS	4232	16	4248

Table 10.4 shows the breakdown of donation from deceased donors, by tissue type and donation.

Table 10.4 Tissue Donation from Deceased Donors in 2017 by Jurisdiction and Donation Sector

State	Tissue Only Sector				Solid Organ/Tissue Sector				Tissue Total			
	ms	cv	skin	pi	ms	cv	skin	pi	ms	cv	skin	pi
QLD	39	19	52	0	38	42	37	2	77	61	89	2
NSW	58	2	0	0	29	29	0	2	87	31	0	2
ACT	0	0	0	0	0	6	0	0	0	6	0	0
VIC	27	23	36	0	21	28	23	6	48	51	59	6
TAS	0	0	0	0	0	3	0	0	0	3	0	0
SA	0	2	0	0	0	8	0	0	0	10	0	0
NT	0	0	0	0	0	1	0	0	0	1	0	0
WA	9	0	0	0	6	0	0	1	15	0	0	1
AUS	133	46	88	0	94	117	60	11	227	163	148	11

ms = musculoskeletal tissue | cv = cardiovascular tissue | pi = pancreas islets

Figures 10.9 and 10.10 show the breakdown deceased tissue only and solid organ and tissue donation, by jurisdiction, for the period 2016 to 2017.

Figure 10.9 - Tissue Donation by Deceased Donors by Jurisdiction, 2016-2017

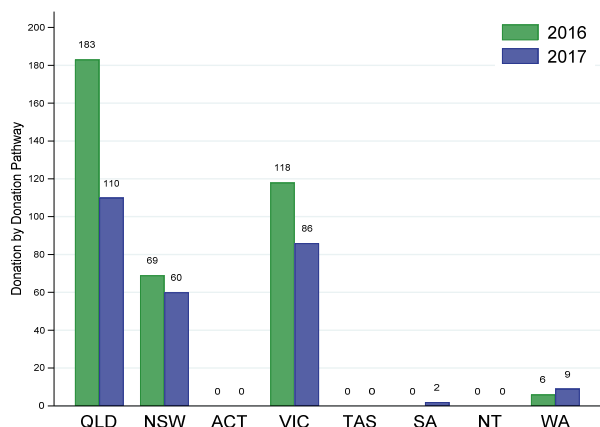


Figure 10.10 - Solid Organ & Tissue Donation by Deceased Donors by Jurisdiction, 2016-2017



Type of Tissue Donation

Tissue Donations reported here are by donation pathway for musculoskeletal, cardiovascular, skin and pancreas islet tissue.

Musculoskeletal Donation

Figures 10.11 and 10.12 show the number of musculoskeletal tissue donations by jurisdiction for 2017 compared with 2016, from Living donors and Deceased donors.

Figure 10.11 - Musculoskeletal Tissue Donation by Living Donors by Jurisdiction, 2016-2017

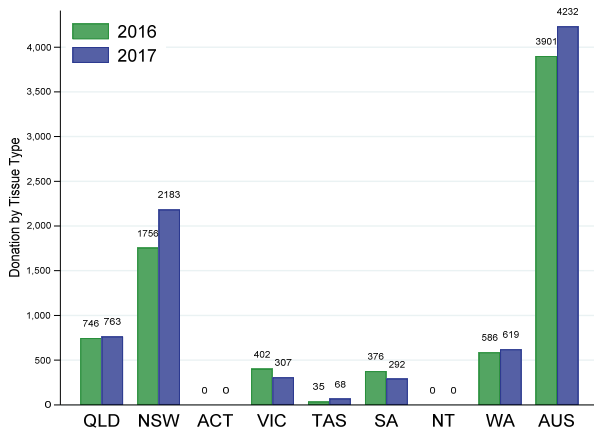
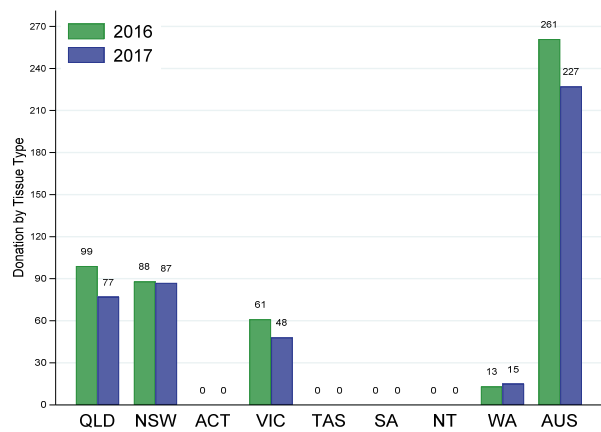


Figure 10.12 - Musculoskeletal Tissue Donation by Deceased Donors by Jurisdiction, 2016-2017



Cardiovascular Donation

Figures 10.13 and 10.14 show the breakdown by jurisdiction of cardiovascular tissue donation for 2017 compared to 2016.

Figure 10.13 - Cardiovascular Tissue Donation by Living Donors by Jurisdiction, 2016-2017

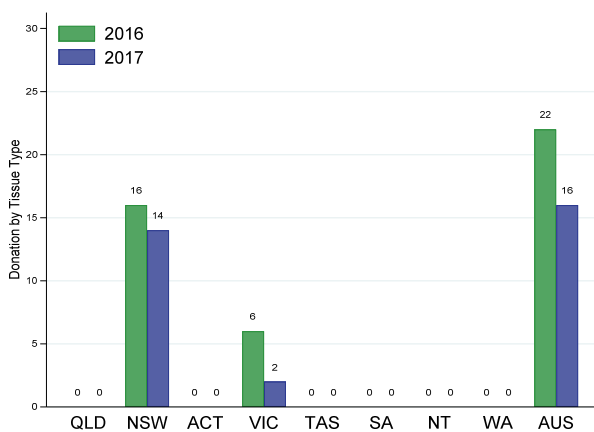
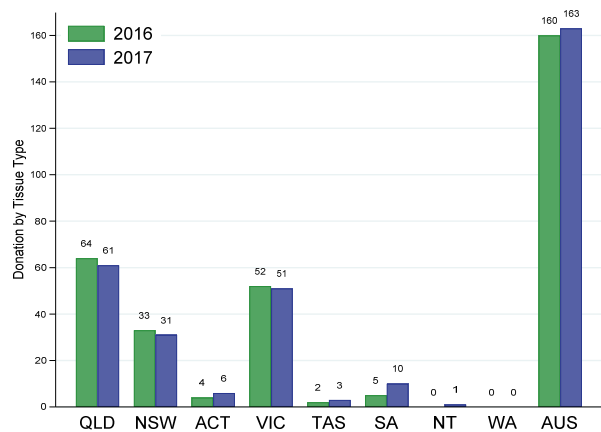


Figure 10.14 - Cardiovascular Tissue Donation by Deceased Donors by Jurisdiction, 2016-2017



Skin Donation

Figure 10.15 shows the breakdown of skin donations between the two jurisdictions for 2017 compared to 2016.

Figure 10.15 - Skin Tissue Donation by Deceased Donors by Jurisdiction, 2016-2017

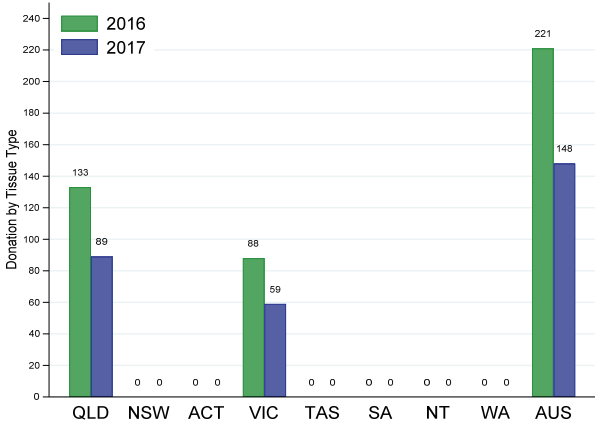
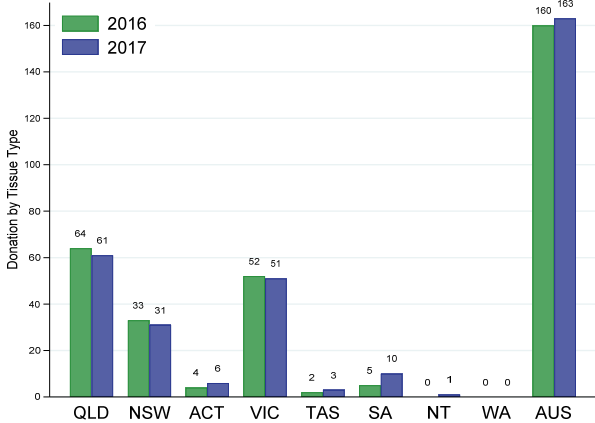


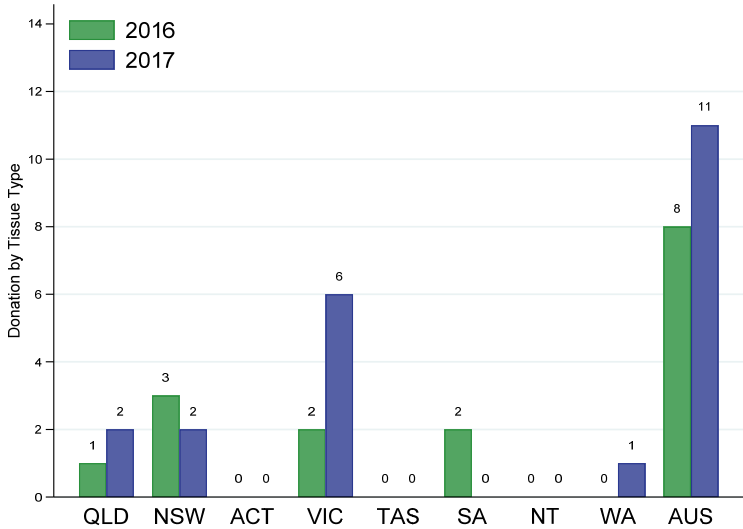
Figure 10.14 - Cardiovascular Tissue Donation by Deceased Donors by Jurisdiction, 2016-2017



Pancreas Islets Donation

Figure 10.16 shows the breakdown of pancreas islets donations for 2017 compared to 2016.

Figure 10.16 - Pancreas Islets Donation by Deceased Donors by Jurisdiction, 2016-2017



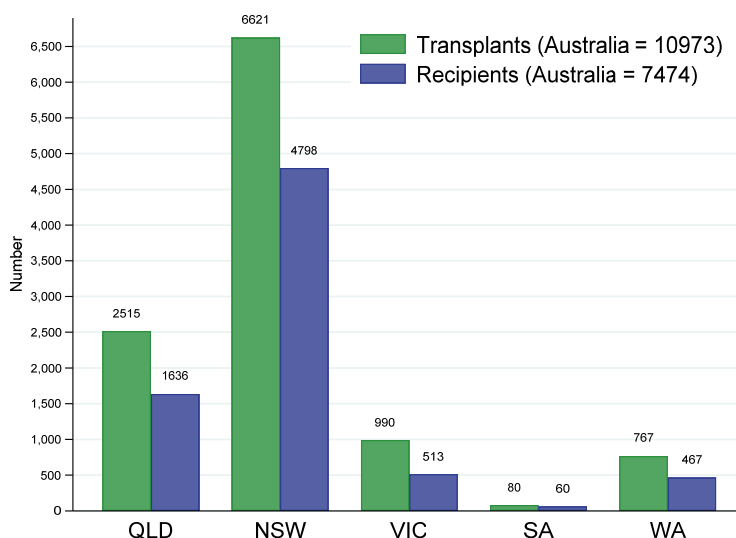
Outcome of Tissue Donation

Musculoskeletal, cardiovascular and skin tissue donated for the purpose of transplantation can be stored for a period of time before a transplant occurs. Therefore, the numbers reported for grafts and recipients of tissue, in this section, represent transplantation outcomes for the reporting period only, not the outcome of donations for the reporting period.

A tissue transplant recipient can receive one or more tissue grafts in one or more transplant events. Tissue transplantation counts are reported by tissue banks as the number of notified transplants and notified recipients from tissue retrieved by that tissue bank.

Figure 10.17 shows the number of notified^(1,2) tissue transplants (grafts) and recipients by jurisdiction for 2017.

Figure 10.17 - Number of Notified Tissue Transplants and Recipients (ms,cv,sk) by Jurisdiction, 2017

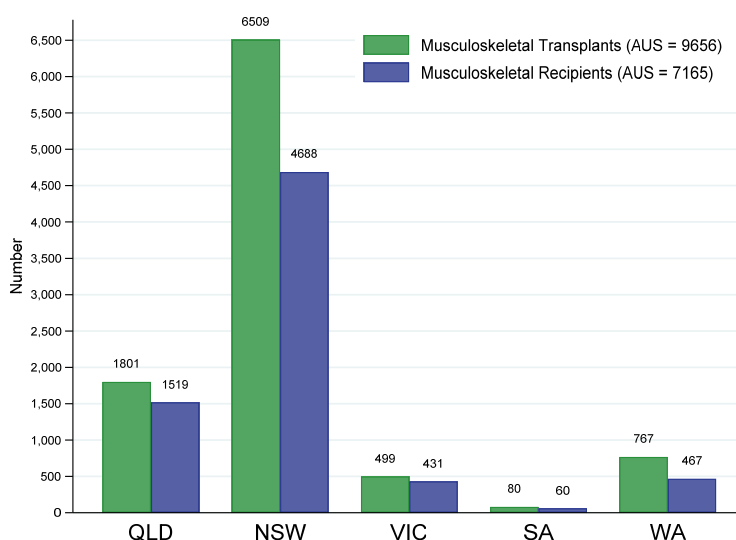


Outcome of Tissue Donation by Tissue Type

The following graphs represent the outcome of tissue donation by tissue type and the number of recipients who received tissue graft transplant by tissue type. (Figures 10.18 to Figure 10.21)

Figure 10.18 shows the number of notified^(1,2) musculoskeletal tissue transplants and recipients by jurisdiction for 2017.

Figure 10.18 - Number of Notified Musculoskeletal Transplants and Recipients by Jurisdiction, 2017



⁽¹⁾ Notified tissue transplant is defined as the “Number of grafts implanted into recipients, that banks have been notified of”.

⁽²⁾ Notified tissue recipient is defined as the “Number of recipients notified to the bank, who receive one or more graft implants during a single transplant event”.

Figure 10.19 shows the number of notified^(1,2) cardiovascular tissue transplants and recipients by jurisdiction for 2017.

Figure 10.19 - Number of Notified Cardiovascular Transplants and Recipients by Jurisdiction, 2017

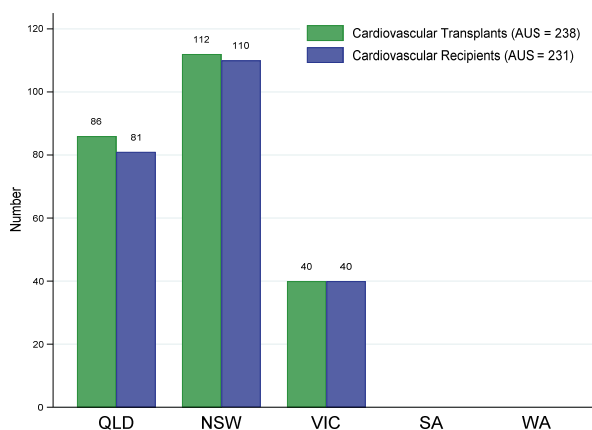
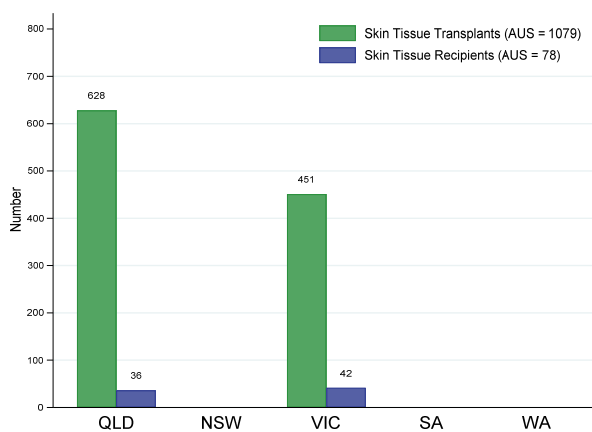


Figure 10.20 shows the number of notified^(1,2) skin tissue transplants and recipients by jurisdiction for 2017.

Figure 10.20 - Number of Notified Skin Tissue Transplants and Recipients by Jurisdiction, 2017



In Australia, there are three pancreas islets transplanting units (Westmead in New South Wales, Monash in Victoria and Royal Adelaide Hospital in South Australia). Figure 10.21 shows the number of notified^(1,2) pancreas islet transplants and recipients by jurisdiction for 2017.

Figure 10.21 - Number of Pancreas Islet Tissue Transplants and Recipients by Jurisdiction, 2017



⁽¹⁾ Notified tissue transplant is defined as the "Number of grafts implanted into recipients, that banks have been notified of".

⁽²⁾ Notified tissue recipient is defined as the "Number of recipients notified to the bank, who receive one or more graft implants during a single transplant event".

Eye Donors

The total numbers reported in this section may include duplicate counts of donors that are also multi-organ and tissue donors or multi-tissue donors, where the donor coordination was performed by another donation agency. Where there is no eye bank in a jurisdiction, eye donation is managed from a satellite jurisdiction.

This data is sourced from Australian eye banks in conjunction with EBAANZ.

Figure 10.22 represents the number of eye donors from each Australian Jurisdiction for the reporting period 2016 to 2017.

Figure 10.22 - Number of Eye Donors by Jurisdiction, 2016-2017

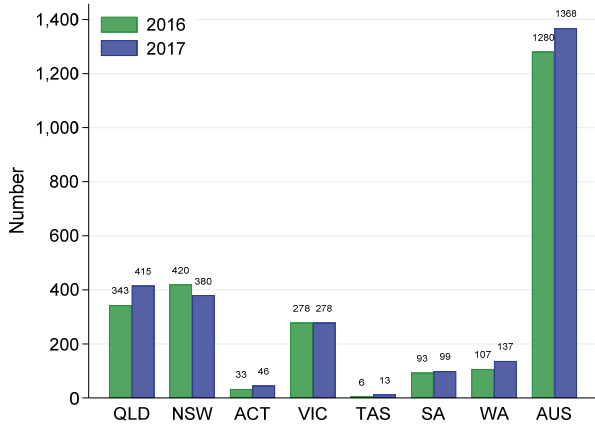
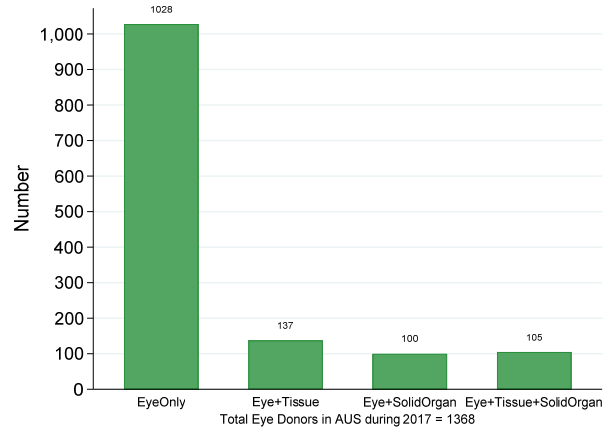


Figure 10.23 - Number of Eye Donors by Donation Pathway, Australia, 2017



Figures 10.24 to Figure 10.27 represent the number of donors by donor type and jurisdiction, for 2017.

Figure 10.24 - Number of Eye Donors Only by Jurisdiction, 2017



Figure 10.25 - Number of Eye and Tissue Donors by Jurisdiction, 2017

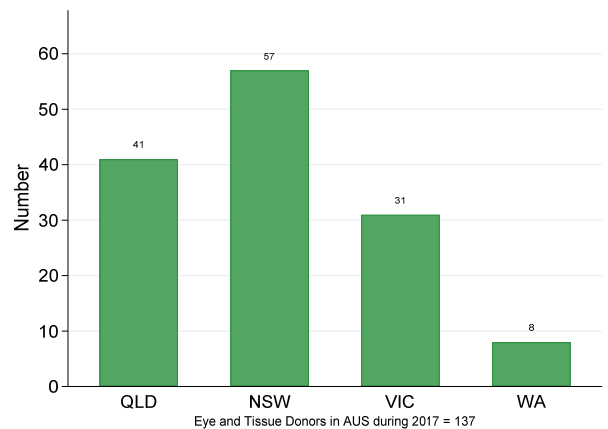


Figure 10.26 - Number of Eye and Solid Organ Donors by Jurisdiction, 2017

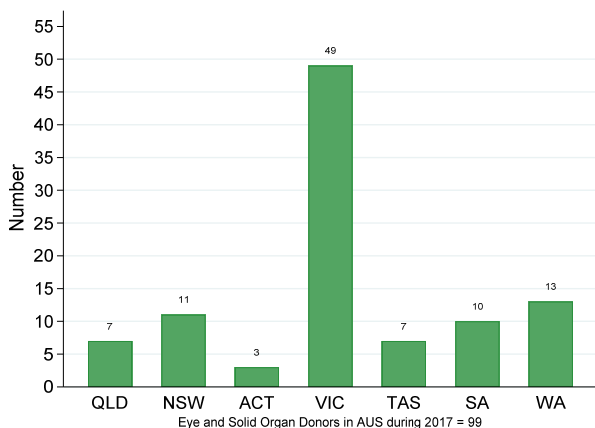
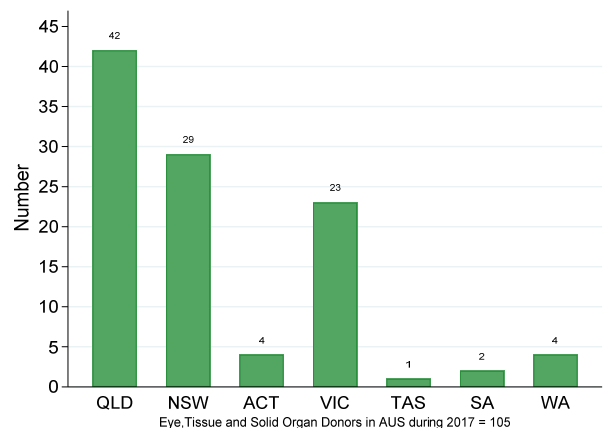


Figure 10.27 - Number of Eye, Tissue and Solid Organ Donors by Jurisdiction, 2017



Eye Donation Outcome

Figures 10.28 and Figure 10.29) show the number of notified ⁽¹⁾ corneal transplants and sclera units transplanted by jurisdiction for 2017.

Figure 10.28 - Number of Corneas transplanted by Jurisdiction, 2017

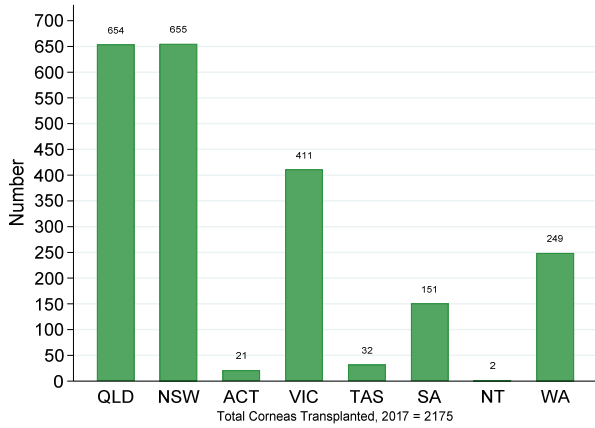
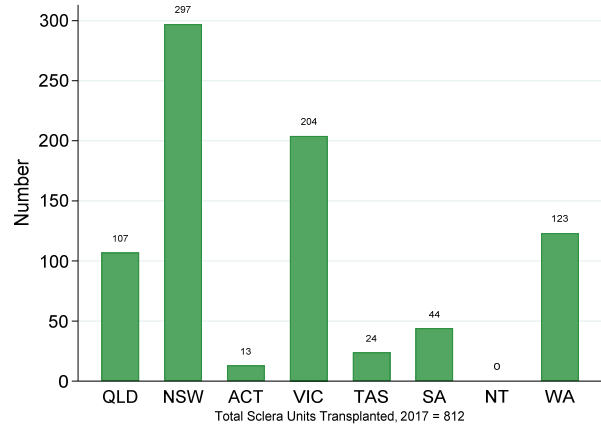


Figure 10.29 - Number of Sclera Units transplanted by Jurisdiction, 2017



⁽¹⁾ Notified tissue transplant is defined as the "Number of grafts implanted into recipients, that banks have been notified of".



SECTION 11

Deceased Organ Transplant Waiting List

This chapter brings together waiting list data for the various organs. This data is not directly collected by ANZOD, but has been provided by the relevant transplant outcome Registries. In many cases more detailed information is contained in the annual reports of the relevant transplant outcome Registries.

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Suggested Citation

ANZOD Registry, 2017 Annual Report, Section 11: Deceased Organ Transplant Waiting List. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2018. Available at <http://www.anzdata.org.au>

Waiting List Dynamics

There are some important caveats to consider when interpreting the waiting list data presented in this report.

Firstly, waiting list data is not necessarily a good indicator of actual demand for transplantation. Due to the limited availability of organs for transplantations not all people with end stage organ disease are able to be treated with transplantation and therefore each organ waiting list employs criteria for listing in order to prioritise the use of organs.

There are many rules guiding eligibility for transplantation, for example, listing on the kidney transplant waiting list requires an 80% expected survival at 5 years post transplantation. For further information please see the organ transplantation from deceased donor consensus statement on eligibility criteria and allocation protocols. (www.tsanz.com.au/organallocationprotocols/index.asp).

Secondly, the reasons for removal from the waiting list also vary. In some cases, an individual may pass away before receiving an organ. In other cases (particularly cardiothoracic and liver waiting lists) they may be removed due to improving health; conversely removal may reflect deteriorating health such that the risks of transplantation outweigh benefits. Data regarding whether these people subsequently return to the waiting list, remain off the list, or die without returning to the list is not collected at this stage.

Thirdly, the waiting list data refers only to people on the “active” waiting list who would be transplanted immediately if an organ were available. For some organs, there are groups of patients who have been assessed but not yet activated on the waiting list, or who are temporarily removed or made “inactive”. For example, patients may develop a medical problem that makes them temporarily or permanently unfit for transplantation.

Residents of Australia or New Zealand who have transplants performed abroad may not be reported to local transplant outcome Registries and may not impact on the wait list stock and flow.

For all organs, data is presented in a “stock and flow” format, examining the transitions on and off the waiting list over the period of a calendar year. It is possible those removed from the waiting list are subsequently re-listed. For organs that have criteria for urgent transplant (i.e. liver, heart, lung) patients may be placed on the waiting list and removed very quickly and therefore annual census numbers do not represent the activity and readers should refer to the “made active” number to get an idea of overall activity.

The figures in the tables refer to the lists at 1 January and 31 December of each year.

In the tables presented in this chapter, the rows describe:

- Number on the active list at the beginning of each year
- Number added to the active list during the year
- Number removed from the active list during the year
- Number of deceased donor (DD) transplants to people on the waiting list
- Number of living donor (LD) transplants to people on the waiting list
- Number of transplants performed outside Australia / New Zealand to people on the waiting list
- Number who died while on the active waiting list
- Number on the active waiting list at the end of the year

Kidney Waiting List

Data for these waiting lists are derived from the from National Organ Matching System (NOMS) of Australia combined with material from the ANZDATA Registry. Some people in the deceased donor (DD) kidney waiting lists may receive a kidney from a living donor (LD), though the majority of living kidney donor recipients are not on the waiting lists. A patient is deemed fit for transplantation and activated on the deceased donor transplant list but a living donor kidney can be made available prior to a deceased donor transplant taking place. These two groups are illustrated separately.

Data is currently only available for Australia. Negotiations are continuing to also include New Zealand data in future reports.

Further material is available in the ANZDATA Annual Report at www.anzdata.org.au

Table 11.1 Deceased Donor Kidney Waiting List -Stock and Flow, 2010 - 2016

	Event	2011	2012	2013	2014	2015	2016	2017
Australia	Active start of year	1185	1088	1078	1077	1145	1070	953
	Made active	708	747	779	854	767	824	963
	Taken off list	199	155	141	148	156	135	144
	DD graft	532	552	581	573	633	760	751
	LD graft	62	44	54	56	42	37	45
	Overseas graft	2	0	1	0	2	1	1
	Died on list	9	6	3	9	8	9	10
	Active end of year	1089	1078	1077	1145	1070	952	964

Data may differ to that previously published as data is updated in subsequent years in NOMS and ANZDATA

Liver Waiting List

This table includes the waiting lists for both Australia and New Zealand. For liver transplantation, the waiting list is extracted from the Australia and New Zealand Liver Transplant Registry (ANZLTR) Annual Report, based on returns from transplanting centres. More detailed analyses can be found in the Report, at <http://www.anzltr.org/>.

Table 12.2 Deceased Donor Liver Waiting List Activity, 2013-2016

Country	Event	2013	2014	2015	2016	2017
Australia	Active start of year	168	152	190	187	140
	Made active	314	342	337	337	345
	Taken off list	59	54	54	61	43
	DD graft	249	234	267	312	281
	LD graft	1	1	2	2	2
	Died on List	21	16	18	9	12
	Active end of year	152	189	186	140	147
New Zealand	Active start of year	21	19	21	24	23
	Made active	43	56	61	70	72
	Taken off list	5	14	7	11	26
	DD graft	31	38	45	55	52
	LD graft		5	3	4	3
	Died on list	5	2	3	4	2
	Active end of year	19	18	24	24	24

Data may differ to that previously published as data is updated in subsequent years in ANZLTR.

Cardiothoracic Organ Waiting List

Waiting lists for heart transplants: lung transplants and heart-lung transplants are collated by the Australia and New Zealand Cardiothoracic Organ Transplant Registry (ANZCOTR), based on reports from transplant units. The data in the tables are supplied by the ANZCOTR, and include both Australia and New Zealand waiting list data. Further material for each organ is available in the ANZCOTR Annual Report at <http://www.anzcotr.org.au/>.

Heart

Table 12.3 Deceased Donor Heart Waiting List Activity, 2011 - 2017

	Event	2011	2012	2013	2014	2015	2016	2017
Australia	Active start of year	46	65	64	48	60	44	44
	Made active	107	92	91	127	98	142	143
	Taken off list	16	13	19	32	15	13	14
	DD graft	65	73	77	78	93	124	92
	LD graft	0	0	0	0	0	1	1
	Died on list	7	7	11	5	5	4	8
	Active end of year	65	64	48	60	44	44	72
New Zealand	Active start of year	11	13	14	10	8	13	14
	Made active	20	19	18	18	19	18	20
	Taken off list	5	5	9	3	4	4	2
	DD graft	11	12	9	17	10	11	24
	LD graft	0	0	0	0	0	0	0
	Died on list	2	1	4	0	0	2	0
	Active end of year	13	14	10	8	13	14	8

Lung

Table 11.3 Deceased Donor Lung Waiting List Activity, 2011 - 2017

	Event	2011	2012	2013	2014	2015	2016	2017
Australia	Active start of year	116	99	94	96	111	85	77
	Made active	182	171	206	223	211	234 ¹	252
	Taken off list	24	11	23	29	33	32 ¹	10
	DD graft	162	149	169	166	195	199	210
	Died on list	13	11	13	14	9	11	9
	Active end of year	99	99	95	110	85	77	100
New Zealand	Active start of year	8	13	13	13	13	5	8
	Made active	17	24	21	18	19	24	23
	Taken off list	2	9	1	0	4	2	3
	DD graft	10	12	19	17	23	17	0
	Died on list	0	4	1	1	0	2	0
	Active end of year	13	13	13	13	5	8	8

¹These values were corrected from a previously published version on 15 January 2018.

Pancreas Waiting List

Data for the pancreas transplant waiting list is derived from data supplied by hospitals to the Australian and New Zealand Pancreas and Islets Transplant Registry (ANZPITR). It includes both people waiting for a combined kidney-pancreas transplant (the majority) and those waiting for a pancreas transplant alone. It does not include people waiting for pancreas islet cell transplants.

Table 12.5 Deceased Donor Pancreas Transplant Waiting List Activity, 2014 – 2017

Country	Event	2014	2015	2016	2017
Australia	Active start of year	63	59	40	41
	Made active	38	42	69	53
	Taken off list	14	12	24	6
	DD graft	43	45	51	28
	Died on List	4	4	4	4
	Active end of year	59	40	41	60
New Zealand	Active start of year	7	4	4	4
	Made active	3	4	7	6
	Taken off list	3	1	3	2
	DD graft	2	3	4	2
	Died on list	1	0	0	1
	Active end of year	4	4	4	5

Intestine Waiting List

Data for the intestine transplant waiting list is derived from data supplied by hospitals to the Australian and New Zealand Liver Transplant Registry. It includes both people waiting for a combined organ and intestine transplant (the majority) and those waiting for an intestine only transplant.

Data included in this report is on 2016 activity only.

Table 12.6 Deceased Donor Intestine Waiting List Activity, 2016

Country	Event	2016	2017
Australia	Active start of year	5	4
	Made active	0	1
	Taken off list	0	0
	DD graft	1	1
	Died on List	0	1
	Active end of year	4	3