Australia and New Zealand Organ Donation Registry





Data to 31-December-2018



SECTION 1

Snapshot of Deceased Organ Donation Activity in Australia and New Zealand

SUMMARY

This section summarises some key messages from the report on organ donation and activity in Australia and New Zealand, in 2018.

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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.

The following provides a snapshot of deceased donation activity in 2018.

Suggested Citation

ANZOD Registry. 2019 Annual Report, Section 1: Summary of Organ Donation and Transplant Activity. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2019. Available at: https://www.anzdata.org.au/report/anzod-annual-report-2019/

Australian Donation and Transplant Snapshot

In Australia there were **554** actual deceased solid organ donors in 2018, an increase of 8.6% in the number of donors from 2017 (510 donors);

The deceased organ donors per million population (pmp) was **22.2** donors pmp in 2018, an increase from 20.7 donors pmp in 2017;

there was an 11.4% increase in the number of donors after brain death to **400** and a 2.0% increase in the number of donors after circulatory death to **154** in 2018;



A total number of 1,543 recipients, whose lives were saved or improved by an organ transplant;

The total number of recipients includes a number of recipients of various combinations of multi organ transplants. The following totals of organs represent the number of organs transplant indivivdually.



a total number of 897 kidney transplants (35.9 pmp);



a total number of 318 liver transplants (12.7 pmp);



a total number of 129 heart transplants (5.2 pmp)



a total number of 222 lung transplants (8.9 pmp);



a total number of 51 pancreas transplants (2.0 pmp)



and one intestine transplant performed.

In 2018, over 11,900 Australians benefited from eye and tissue donation from Australian donors. In addition, there were 3,881 living tissue donations.

New Zealand Donation and Transplant Snapshot

In New Zealand there were **62** actual deceased solid organ donors in 2018, a decrease of 15.1% in the number of donors from 2017 (73 donors);

A decrease in the deceased organ donors per million population (pmp) to **12.7** donors pmp in 2018; and a 13.1% decrease in the number of donors after brain death to 53 with a decrease in the number of donors after circulatory death to 9 in 2018;

A decrease of 11.2% in the total number of patients (**191**) whose lives were saved or improved by an organ transplant to recipients;

The total number of recipients includes a number of recipients of various combinations of multi organ transplants. The following totals of organs represent the number of organs transplant indivivdually.



the total number of **98** kidney transplants (**20.1pmp**);



a total number of 49 liver transplants (10.0pmp);



a total number of 19 heart transplants (3.9pmp)



a total number of 28 lung transplants (5.7pmp);



a total number of **six** pancreas transplants (**1.2pmp**)







SECTION 2

Overview of Organ Donation Activity in Australia and New Zealand

SUMMARY

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 2018 in comparison to previous years.

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Suggested Citation

ANZOD Registry. 2019 Annual Report, Section 2: Overview of Organ Donation Activity in Australia and New Zealand. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2019. Available at: <u>https://www.anzdata.org.au/report/anzod-annual-report-2019/</u>

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 where the operation commenced ('skin incision') for the purpose of organ or tissue retrieval for transplantation. These donors are termed "actual donors" and this is consistent with international reporting. (World Health Organisation - Human Organ and Tissue Transplantation. http://www.who.int/ethics/topics/human_transplant/en/).

The rate of deceased organ donors per million population (dpmp) rose in Australia to 22.2 dpmp in 2018, from 20.7 in 2017. In New Zealand, the rate fell to 12.7 dpmp in 2018, from 15.2 dpmp in 2017.

Figure 2.1 - Number of Actual Deceased Donors Per Million Population - Australia and New Zealand, 2014 - 2018



In Australia, there remains variation in organ donation rates between jurisdictions (Table 2.1). In 2018, rates varied from 15.8 dpmp in WA to 32.4 dpmp in ACT.

Table 2.1 Number of Actual Deceased Donors	(Rate Per Million Population) 2014 - 2018	
Tuble 2.1 Mulliber of Addul Dedeused Donors		

State*/Country	2014	2015	2016	2017	2018
QLD	71 (15.0)	72 (15.1)	106 (21.9)	105 (21.3)	94 (18.8)
NSW**	92 (12.6)	127 (17.2)	133 (17.7)	135 (17.7)	151 (19.5)
ACT**	11 (18.1)	13 (21.0)	20 (31.9)	14 (22.0)	21 (32.4)
VIC	117 (19.8)	126 (20.9)	140 (22.7)	148 (23.4)	193 (29.9)
TAS	9 (17.5)	9 (17.5)	11 (21.3)	19 (36.4)	14 (26.5)
SA	36 (21.3)	42 (24.7)	40 (23.4)	32 (18.6)	36 (20.7)
NT	7 (28.8)	4 (16.3)	6 (24.4)	3 (12.1)	4 (16.2)
WA	35 (13.9)	42 (16.5)	47 (18.4)	54 (21.0)	41 (15.8)
AUS	378 (16.1)	435 (18.3)	503 (20.8)	510 (20.7)	554 (22.2)
NZ	46 (10.2)	53 (11.5)	61 (13.0)	73 (15.2)	62 (12.7)

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.

^{*} Refers to retrieval State (i.e. Albury-NSW donors are retrieved by Victoria)

^{**} NSW population excludes residents of the NSW Southern Area Health Service (included in ACT population). Population Data - June 2018. Please refer to methodology section of this report for detail.

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

Figure 2.2.2 - Number of Actual Deceased Donors New Zealand,



Actual Donors



There has been a steady decline in overall death rates among most ages in Australia over recent years. In some respects, using the number of deaths as the denominator to illustrate organ donation outcomes may be a better comparator. Rates for various jurisdictions using this metric are shown in Figure 2.3 and Table 2.2 includes deaths aged < 75 years as the denominator.

Figure 2.3 - Number of Actual Deceased Donors Per 10,000 Deaths - Australian States/Territories and New Zealand, 2007 - 2017



^{*} NSW and ACT values are not adjusted for the NSW Southern Area Health Service, as death data were no available. Australian data on deaths 2017 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, 2013 - 201	7
() is the % Deaths < 75 years as a proportion of all deaths*	

Year	QLD	NSW	АСТ	VIC	TAS	SA	NT	WA	AUS	NZ
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%)
2017	90 (37%)	79 (32%)	179 (34%)	120 (31%)	112 (35%)	72 (32%)	37 (72%)	100 (37%)	94 (34%)	61 (36%)

*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 2017 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 as 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 - 2018





Year

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 - 2018



Figure 2.5.2 - Organ Donation Pathway New Zealand 1998 - 2018



Organ Donation Overview

Tables 2.3 and 2.4 show the number (and rate) of recipients who received various organs from donors in 2018.

Table 2.3 Australia Overview - 2018 (pmp) per million population

Population (million)	25.0
Actual Deceased Organ Donors - both DBD & DCD included (pmp)	554 (22.2)
Kidney Transplant Recipients from deceased donors- includes all combinations (pmp)	897 (35.9)
Liver Transplant Recipients from deceased donors- includes all combinations (pmp)	318 (12.7)
Heart Transplant Recipients from deceased donors- includes all combinations (pmp)	129 (5.2)
Lung Transplant Recipients from deceased donors- includes all combinations (pmp)	222 (8.9)
Pancreas Transplant Recipients from deceased donors- includes all combinations (pmp)	51 (2.0)
Intestine Transplant Recipients from deceased donors- includes all combinations (pmp)	1 (0.0)
Total Number of Transplanted Recipients (pmp)*	1,543 (61.8)
Total Number of Organs Transplanted (pmp)**	1,820 (72.9)

Table 2.4 New Zealand Overview - 2018 (pmp) per million population

Population (million)	4.9
Actual Deceased Organ Donors - both DBD & DCD included (pmp)	62 (12.7)
Kidney Transplant Recipients from deceased donors- includes all combinations (pmp)	98 (20.1)
Liver Transplant Recipients from deceased donors- includes all combinations (pmp)	49 (10.0)
Heart Transplant Recipients from deceased donors- includes all combinations (pmp)	19 (3.9)
Lung Transplant Recipients from deceased donors- includes all combinations (pmp)	28 (5.7)
Pancreas Transplant Recipients from deceased donors- includes all combinations (pmp)	6 (1.2)
Total Number of Transplanted Recipients (pmp)*	191 (39.1)
Total Number of Organs Transplanted (pmp)**	223 (45.6)

^{*}The total number of recipients includes all combinations of multi-organ transplants as a single count of transplantation.

**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 transplanted by jurisdiction of donation.

Fable 2.5 Number of Organs Transplanted in 2018 by State & Country (pmp) in Australia and New Zealand											
Organs	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUS	NZ	
Kidney	158	253	36	314	26	57	6	72	922 ¹ (36.9)	99² (20.3)	
Liver	58	75	13	96	8	20	1	26	297 ³ (11.9)	44 ⁴ (9.0)	
Heart	28	30	8	42	2	6	0	13	129 (5.2)	19 (3.9)	
Lung	89	82	15	152	10	27	6	39	420 ⁵ (16.8)	55 ⁶ (11.3)	
Pancreas	6	14	4	19	0	4	1	3	51 (2.0)	6 (1.2)	
Intestine	0	0	0	1	0	0	0	0	1 (0.0)	0 (0.0)	
Total	339	454	76	624	46	114	14	153	1820 (72.8)	223 (45.6)	

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

¹ Includes 872 single kidney, 20 double adult kidney and five en-bloc kidney transplant procedures in Australia.

² Includes 97 single kidney, one double adult kidney and zero en-bloc kidney transplant procedures in New Zealand.

³ Includes 270 whole liver, 42 split liver and six reduced size liver transplant procedures in Australia.

⁴ Includes 39 whole liver, 10 split liver and zero reduced size liver transplant procedures in New Zealand.

⁵ Includes 198 double lung and 24 single lung transplant procedures in Australia.

⁶ Includes 27 double lung and one 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 2004-2018 in Australia and New Zealand is shown in Figure 2.6. The mean number of transplant organs per deceased donor across Australia ranged from 3.0 in NSW to 3.7 in WA.

Figure 2.6 - Number of Organs Transplanted per Donor 2004 - 2018



Figure 2.7 shows the organ-specific transplant rates for Australia and New Zealand over the period 1998 - 2018 (rates are of organ transplants per million population).

Figure 2.7.1 - Organs Transplanted 1998-2018 Per Million Population, Australia

Heart

Intestine

Live

Dance

Kidnov

35



Figure 2.7.2 - Organs Transplanted 1998-2018 Per Million



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.







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 2014 - 2018 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 2018, there were fiveseven 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.

Area of Postcode	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUS
Major Cities of Australia	252 (56%)	461 (72%)	48 (62%)	496 (69%)	1 (2%)	127 (68%)	1 (4%)	170 (78%)	1556 (66%)
Inner Regional Australia	101 (23%)	131 (21%)	24 (31%)	185 (26%)	40 (65%)	29 (16%)	0 (0%)	18 (8%)	528 (22%)
Outer Regional Australia	75 (17%)	31 (5%)	5 (6%)	34 (5%)	19 (31%)	22 (12%)	17 (71%)	16 (7%)	219 (9%)
Remote Australia	4 (1%)	2 (<1%)	0 (0%)	0 (0%)	1 (2%)	4 (2%)	3 (13%)	5 (2%)	19 (1%)
Very Remote Australia	6 (1%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)	1 (4%)	4 (2%)	12 (1%)
Overseas	9 (2%)	12 (2%)	1 (1%)	6 (1%)	0 (0%)	4 (2%)	2 (8%)	6 (3%)	40 (2%)
Total	447	637	78	721	62	186	24	219	2374

Table 2.6 Location of Postcodes of Deceased Donors 2014 - 2018



SECTION 3

Deceased Organ Donor Pathway

SUMMARY

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 2018 in comparison to previous years.

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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 Register* 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.

			0	0	1 1				
	QLD	NSW	АСТ	VIC	TAS	SA	NT	WA	AUST
Registered as Yes	38 (35)	66 (55)	8 (5)	48 (40)	5 (8)	16 (13)	1 (1)	15 (17)	197 (174)
Registered as No	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Not Registered	50 (66)	78 (66)	13 (9)	139 (100)	7 (11)	18 (19)	3 (2)	25 (33)	333 (306)
Not Accessed	6 (4)	7 (14)	0 (0)	5 (8)	2 (0)	2 (0)	0 (0)	1 (4)	23 (30)
Total	94 (105)	151 (135)	21 (14)	193 (148)	14 (19)	36 (32)	4 (3)	41 (54)	554 (510)

Table 3.1 Actual Donors Enrolled in the Australian Organ Donor Register* 2018 (2017)

* 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.isp

Coroner's Cases

Table 3.2 shows the number of actual donors subject to Coronial inquiry. In Australia, 49% of donors in 2018 were subject to Coronial inquiry, compared to 50% in 2017. In New Zealand, it was 52% for 2018 and 29% in 2017.

			Australia			New Zealand				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Yes	166	211	235	253	272	23	25	20	21	32
No	212	224	268	257	282	23	28	41	52	30
Total	378	435	503	510	554	46	53	61	73	62

Table 3.2 Coroner's Cases 2014 - 2018

Table 3.3 shows the number of Australian Coroner's cases by jurisdiction and the number of Coroner's cases in New Zealand for 2018 compared to 2017.

Table 3.3 Coroner's Cases by State and Country 2018 (2017)

	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
Yes	56 (55)	68 (59)	11 (7)	87 (72)	6 (7)	20 (20)	4 (2)	20 (31)	272 (253)	32 (21)
No	38 (50)	83 (76)	10 (7)	106 (76)	8 (12)	16 (12)	0 (1)	21 (23)	282 (257)	30 (52)
Total	94 (105)	151 (135)	21 (14)	193 (148)	14 (19)	36 (32)	4 (3)	41 (54)	554 (510)	62 (73)

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 2014-2018, intracranial haemorrhage accounted for an overall 38% of donor deaths and traumatic brain injury for 16%; New Zealand had a greater proportion of intracranial haemorrhage (45%).

	2010(70)									
Cause of Death	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
Intracranial Haemorrhage	34%	40%	34%	36%	48%	39%	42%	38%	38%	45%
Traumatic Brain Injury	22%	14%	22%	15%	15%	15%	0%	13%	16%	22%
Cerebral Infarct	4%	5%	9%	7%	6%	9%	13%	8%	6%	7%
Cerebral Hypoxia / Ischaemia	38%	35%	32%	36%	26%	34%	46%	39%	36%	21%
Other Neurological Condition	1%	2%	1%	2%	5%	2%	0%	1%	2%	3%
Non-Neurological Condition	1%	3%	3%	5%	0%	2%	0%	0%	3%	2%

Table 3.4 Cause of Donor Death 2014 - 2018 (%)

Table 3.5 shows the cause of death of donors by age group in 2018 in Australia and New Zealand. In donors aged 55 years and older, intracranial haemorrhage accounted for 56% of deaths in Australia and 48% in New Zealand in 2018, 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 21% in New Zealand in 2018.

······································										
Cause of Death			Austra	lia		New Zealand				
Cause of Dealin	0-14	15-34	35-54	55+	n (%)	0-14	15-34	35-54	55+	n (%)
Intracranial Haemorrhage	1	9	68	121	199 (36%)	0	2	8	13	23 (37%)
Traumatic Brain Injury	5	34	23	26	88 (16%)	0	11	5	5	21 (34%)
Cerebral Infarct	1	3	14	15	33 (6%)	0	0	1	4	5 (8%)
Cerebral Hypoxia / Ischaemia	9	60	91	48	208 (38%)	1	4	1	2	8 (13%)
Other Neurological Condition	0	4	7	1	12 (2%)	0	2	0	0	2 (3%)
Non-Neurological Condition	0	2	6	6	14 (3%)	0	0	0	3	3 (5%)
Total	16	112	209	217	554	1	19	15	27	62

Table 3.5 Cause of Donor Death by Age Group 2018

Table 3.6 Cause of Death by Age Group and Australian State 2018

State of Donation	Cause of Death	0-14	15-34	35-54	55+	Total
	Intracranial Haemorrhage	0	1	11	15	27
	Traumatic Brain Injury	2	9	8	5	24
	Cerebral Infarct	0	0	2	2	4
QLD	Cerebral Hypoxia / Ischaemia	3	17	14	2	36
	Other	0	1	2	0	3
	Total	5	28	37	24	94
	Intracranial Haemorrhage	0	3	13	34	50
	Traumatic Brain Injury	1	4	5	11	21
1014	Cerebral Infarct	1	1	1	6	9
NSW	Cerebral Hypoxia / Ischaemia	3	16	23	22	64
	Other	0	0	3	4	7
	Total	5	24	45	77	151
	Intracranial Haemorrhage	0	2	2	2	6
	Traumatic Brain Injury	1	2	0	0	3
4.07	Cerebral Infarct	0	0	2	2	4
ACT	Cerebral Hypoxia / Ischaemia	0	4	1	1	6
	Other	0	0	2	0	2
	Total	1	8	7	5	21
	Intracranial Haemorrhage	1	2	26	45	74
	Traumatic Brain Injury	1	10	6	9	26
N#0	Cerebral Infarct	0	1	3	5	9
VIC	Cerebral Hypoxia / Ischaemia	1	12	41	19	73
	Other	0	5	4	2	11
	Total	3	30	80	80	193
	Intracranial Haemorrhage	0	1	1	5	7
	Traumatic Brain Injury	0	5	0	0	5
тае	Cerebral Infarct	0	0	1	0	1
TAS	Cerebral Hypoxia / Ischaemia	0	0	0	1	1
	Other	0	0	0	0	0
	Total	0	6	2	6	14
	Intracranial Haemorrhage	0	0	8	11	19
	Traumatic Brain Injury	0	3	0	0	3
64	Cerebral Infarct	0	1	4	0	5
ЭА	Cerebral Hypoxia / Ischaemia	0	5	3	0	8
	Other	0	0	1	0	1
	Total	0	9	16	11	36
	Intracranial Haemorrhage	0	0	1	0	1
	Traumatic Brain Injury	0	0	0	0	0
NT	Cerebral Infarct	0	0	0	0	0
NI	Cerebral Hypoxia / Ischaemia	0	1	1	1	3
	Other	0	0	0	0	0
	Total	0	1	2	1	4
	Intracranial Haemorrhage	0	0	6	9	15
	Traumatic Brain Injury	0	1	4	1	6
14/ 4	Cerebral Infarct	0	0	1	0	1
WA	Cerebral Hypoxia / Ischaemia	2	5	8	2	17
	Other	0	0	1	1	2
	Total	2	6	20	13	41

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 2014 to 2018.

Table 3.7 Cardiopulmonary Resuscitation 2014 - 2018

	Australia					New Zealand				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Yes	170	212	236	239	262	15	25	23	27	19
No	207	223	266	271	292	31	28	38	46	42
Unknown	1	0	1	0	0	0	0	0	0	1
Total	378	435	503	510	554	46	53	61	73	62

Table 3.8 Cardiopulmonary Resuscitation by Australian State 2018 (2017)

	QLD	NSW	ACT	VIC	TAS	SA	NT	WA
Yes	49 (46)	74 (64)	9 (7)	93 (61)	3 (6)	14 (19)	3 (2)	17 (34)
No	45 (59)	77 (71)	12 (7)	100 (87)	11 (13)	22 (13)	1 (1)	24 (20)
Unknown	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	94 (105)	151 (135)	21 (14)	193 (148)	14 (19)	36 (32)	4 (3)	41 (54)

Initial Mention of Organ Donation

In 2018, organ donation was predominantly raised by Intensive Care Clinicians and Donor Specialists; 43% of cases in Australia and 71% in New Zealand, as shown in Table 3.9. In Australia, organ donation was raised by a Donor Specialist on 144 (26%) occasions which is an increase from 15% in 2017. Organ donation in New Zealand was initially mentioned by a Donor Coordinator in 4 cases. In 2018, 28% of families raised the subject of organ donation in Australia, compared to 29% in 2017. In New Zealand, 18% of families raised donation in 2018 (8% in 2017).

Table 3.10 shows the category of person who initially mentioned organ donation for Australian states and territories in 2017 and 2018.

Table 3.9 Initial Mention of Organ Donation 2014 - 2018

		Australia New Zealand					d			
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Donor Specialist	45	29	51	76	144	2	0	1	1	4
ICU Consultant	186	228	246	241	217	35	37	48	60	44
ICU Trainee (E.g. Registrar)	24	25	21	25	22	2	3	2	0	0
Social Worker	1	0	0	1	1	0	0	0	0	0
Emergency Clinician	9	8	7	9	10	0	0	0	0	0
Family	112	142	169	148	153	5	8	5	6	11
Nursing Staff	1	1	1	3	5	1	2	3	3	0
Other	0	2	8	7	2	1	3	2	3	3
TOTAL	378	435	503	510	554	46	53	61	73	62

Table 3.10 Initial Mention of Organ Donation by Australian State 2018 (2017)

	QLD	NSW	ACT	VIC	TAS	SA	NT	WA
Donor Specialist	9 (10)	29 (14)	4 (4)	91 (36)	5 (5)	4 (4)	0 (1)	2 (2)
ICU Consultant	45 (59)	70 (69)	8 (5)	42 (63)	3 (3)	27 (16)	3 (1)	19 (25)
ICU Trainee (E.g. Registrar)	3 (3)	8 (5)	1 (0)	8 (10)	0 (1)	1 (2)	0 (0)	1 (4)
Social Worker	0 (1)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Emergency Clinician	3 (1)	2 (4)	0 (0)	0 (2)	1 (1)	0 (0)	0 (0)	4 (1)
Family	33 (30)	39 (42)	8 (4)	50 (36)	5 (5)	4 (9)	1 (1)	13 (21)
Nursing Staff	1 (0)	1 (1)	0 (1)	2 (1)	0 (0)	0 (0)	0 (0)	1 (0)
Other	0 (1)	1 (0)	0 (0)	0 (0)	0 (4)	0 (1)	0 (0)	1 (1)
TOTAL	94 (105)	151 (135)	21 (14)	193 (148)	14 (19)	36 (32)	4 (3)	41 (54)

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 between withdrawal of support and cessation of circulation exceeded the limits set. This was the main reason donors did not proceed to organ donation in 2018.

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 162 donors who did not proceed down the pathway of solid organ donation, of which 49 (30%) were DBD and 111 (69%) were DCD and in New Zealand there 0 DCD intended donors and no DBD intended donors.

	DE	BD	D	CD	То	otal
	Actual	Intended	Actual	Intended	Actual	Intended
QLD	73 (81%)	17 (19%)	21 (66%)	11 (34%)	94 (77%)	28 (23%)
NSW	105 (89%)	13 (11%)	46 (71%)	19 (29%)	151 (83%)	32 (17%)
ACT	15 (94%)	1 (6%)	6 (55%)	5 (45%)	21 (78%)	6 (22%)
VIC	130 (92%)	12 (8%)	63 (55%)	52 (45%)	193 (75%)	64 (25%)
TAS	11 (92%)	1 (8%)	3 (75%)	1 (25%)	14 (88%)	2 (13%)
SA	26 (90%)	3 (10%)	10 (38%)	16 (62%)	36 (64%)	20 (36%)
NT	3 (100%)	-	1 (100%)	-	4 (100%)	-
WA	37 (95%)	2 (5%)	4 (36%)	7 (64%)	41 (80%)	10 (20%)
AUSTRALIA	400 (89%)	49 (11%)	154 (58%)	111 (42%)	554 (77%)	162 (23%)
NEW ZEALAND	53 (100%)	-	9 (75%)	3 (25%)	62 (95%)	3 (5%)

Table 3.11 Actual vs Intended (Non-Proceeding) Donors 2018

The reasons for donations not proceeding in Australia in 2018 are shown by donation pathway in Table 3.12.

Table 3.12 Reasons Why Donation Did Not Proceed 2018, Australia

Reason	Planned DBD	Planned DCD	Not Determined	Total
Planned Donation After Circulatory Death Who Died Outside Time Limit	0	64	0	64
Medical Contraindication Discovered During Consideration for Donation	34	24	0	58
No Suitable Recipients	10	11	1	22
Declined by Family After Initially Giving Consent	3	5	1	9
Failed Physiological Support	0	5	0	5
Improved Neurology	0	2	0	2
Refusal by Coroner / Pathologist	1	0	0	1
Did Not Progress to Brain Death	1	0	0	1
TOTAL	49	111	2	162

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 1109 donors for Australia and 49 DCD donors for New Zealand.

In Australia, in 2018, there were 154 DCD donors and in New Zealand there were 9 DCD donors.

Table 3.13 shows the number of DCD Donors by jurisdiction for 2014 - 2018.

Year	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
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
2018	21	46	6	63	3	10	1	4	154	9

Table 3.13 Donation After Circulatory Death by Jurisdiction 2014 - 2018

In 2018 in Australia, the mean age for a DCD donor was 47.7 years and the ages ranged from 3.2 to 73.6 years.

In New Zealand, the mean age of DCD was 52.6 years and the ages ranged from 21.1 to 61.0 years.

Causes of death leading to DCD in Australia in 2018 were intracranial haemorrhage (29), cerebral hypoxia/ischaemia (71), traumatic brain injury (26), cerebral infarct (11), other neurological conditions (3) and non-neurological conditions (14).

Causes of death leading to DCD in New Zealand in 2018 were intracranial haemorrhage (2), cerebral hypoxia/ischaemia (1), traumatic brain injury (3), cerebral infarct (1) and non-neurological conditions (2).

Time from Admission to Brain Death

In 2018, 22% of Australian donors were declared brain dead within 24 hours of hospital admission. 64% of donors were declared brain dead between 1 - 5 days of hospital admission. 13% of donors (53) were in hospital for more than 5 days before being declared brain dead.

In 2018, 1% of New Zealand donors were declared brain dead within 24 hours of hospital admission. 34% of donors were declared brain dead between 1 - 5 days of hospital admission. 55% of donors (29) were in hospital for more than 5 days before being declared brain dead.



Time from Admission to Circulatory Death

As shown in Figure 3.2, in 2018, 3% of Australian DCD donors died within 24 hours of hospital admission. 55% of DCD donors died between 1 - 5 days of hospital admission. 42% of DCD donors (64) were in hospital for more than 5 days prior to death.

In New Zealand, 33% of DCD donors died between 1-5 days of hospital admission. 56% of DCD donors (5) were in hospital for more than five days prior to death.





Time from Ventilation to Brain Death

n=315

40.7

2015

n=271

2014

175 -

150

125 100

75

50

25

Hours

Figure 3.3 shows the time from commencement of ventilation to brain death in Australia and New Zealand for 2014-2018.

Figure 3.3.1 - Time from Ventilation to Brain Death (hours) DBD Donors - Australia 2014-2018

n=375

42.8

2016

n=359



Time from Ventilation to Circulatory Death

Figure 3.4 shows the time from commencement of ventilation to circulatory death in Australia for 2014-2018. The median time in New Zealand in 2018 from ventilation to circulatory death was 149.1 hours.



2017



Time from Brain Death to Donation

Figure 3.5 shows the time from ventilation to brain death in Australia and New Zealand for 2014-2018.

In 2018, 10% (41) of Australian DBD donors underwent aortic cross clamp within twelve hours of the certification of brain death. Cross clamp did not proceed in 4 Australian donors.

In 2018, 23% (12) of New Zealand DBD donors underwent aortic cross clamp within twelve hours of the certification of brain death. Cross clamp did not proceed in 1 New Zealand donors.

Figure 3.5.2 - Time from Brain Death to Donation (hours) DBD





Time from Circulatory Death to Donation

As shown in Figure 3.6, in 2018, 55% (84) of Australian DCD donors underwent cold perfusion within ten minutes of the certification of circulatory death. Cold perfusion did not proceed in 4 Australian donors.

Figure 3.6 - Time from Circulatory Death to Donation (minutes) DCD Donors - Australia 2014-2018



In 2018, 56% (5) 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 10 minutes.

Summary – Organs Requested, Consent Given, Retrieved and Transplanted

Table 3.14 shows the outcome of organs requested in 2018 (2017). 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.

Country		Kidneys ¹	Liver	Heart	Lungs ¹	Pancreas	Intestines
	Organs for donation	1108 (1020)	554 (510)	554 (510)	1108 (1020)	554 (510)	554 (510)
	Organs Requested	1090 (989)	497 (459)	421 (387)	1008 (936)	443 (407)	267 (275)
	Organs Consented	1086 (987)	493 (453)	390 (358)	966 (910)	416 (393)	218 (242)
AUSTRALIA	Organs Retrieved	985 (894)	312 (271)	134 (109)	435 (421)	96 (95)	1 (1)
	Utilised organs for transplantation	922 (841)	297 (256)	129 (98)	420 (396)	52 (49)	1 (1)
	Recipients transplanted ²	897 (832)	318 (281)	129 (98)	222 (206)	51 (49)	1 (1)
	Organs for donation	124 (146)	62 (73)	62 (73)	124 (146)	62 (73)	62 (73)
	Organs Requested	122 (143)	61 (69)	42 (49)	110 (112)	44 (40)	0 (0)
	Organs Consented	122 (143)	61 (69)	41 (49)	110 (112)	43 (40)	0 (0)
NEW ZEALAND	Organs Retrieved	104 (127)	46 (49)	20 (23)	56 (47)	8 (4)	0 (0)
	Utilised organs for transplantation	99 (121)	44 (48)	19 (23)	55 (44)	6 (4)	0 (0)
	Recipients transplanted ³	98 (118)	49 (51)	19 (23)	28 (24)	6 (4)	0 (0)

Table 3.14 Summary for Organ Donation Pathway by Organ Type 2018 (2017)

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

² For Australia 2018 (2017), includes 25 (9) Double adult/Enbloc Kidneys, 42 (50) Split Livers, 6 (4) Reduced Size Livers, 24 (16) Single Lung and 198 (190) Double Lung Transplants.

³ For New Zealand 2018 (2017), includes 1 (3) Double-adult/Enbloc Kidneys, 10 (6) Split Livers, 0 (3) Reduced Size Livers, 1 (4) Single Lung and 27 (20) Double Lung Transplants.

Multiple Organ Retrieval

For Australia, there were 554 actual deceased organ donors in 2018. Of those donors, 540 donors had at least one organ retrieved; and 531 resulted in at least one organ transplanted. There were 168 (30%) Australian donors in 2018 who had a single organ retrieved. Kidney only donation occurred in 136 cases, 20 donating a liver, 1 donating a heart and 11 donating lungs. In 2018, 372 (67%) donors had two or more organs retrieved for the purpose of transplantation. (Table 3.15)

Similarly, for New Zealand, there were 62 actual deceased organ donors in 2018. Of those donors, 60 had at least one organ retrieved; and 58 resulted in at least one organ transplanted. There were 16 (26%) single organ donors in 2018, 8 donating kidneys and 8 donating a liver. In 2018, 44 (71%) of donors had two or more organs retrieved for the purpose of transplantation. (Table 3.15)

Organs Retrieved*			Austral	ia		New Zealand						
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018		
0	8 (2%)	8 (2%)	14 (3%)	15 (3%)	14 (3%)	3 (7%)	3 (6%)	2 (3%)	4 (5%)	2 (3%)		
1	86 (23%)	118 (27%)	123 (24%)	155 (30%)	168 (30%)	12 (26%)	11 (21%)	13 (21%)	18 (25%)	16 (26%)		
2	107 (28%)	114 (26%)	166 (33%)	141 (28%)	161 (29%)	8 (17%)	14 (26%)	25 (41%)	21 (29%)	14 (23%)		
3	91 (24%)	95 (22%)	99 (20%)	116 (23%)	107 (19%)	12 (26%)	19 (36%)	13 (21%)	18 (25%)	14 (23%)		
4	51 (13%)	62 (14%)	62 (12%)	60 (12%)	67 (12%)	10 (22%)	5 (9%)	6 (10%)	10 (14%)	12 (19%)		
5	35 (9%)	37 (9%)	39 (8%)	23 (5%)	36 (6%)	1 (2%)	1 (2%)	2 (3%)	2 (3%)	4 (6%)		
6	0 (0%)	1 (0%)	0 (0%)	0 (0%)	1 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)		

Table 3.15 Multiple Organs Retrieved per donor 2014 - 2018

* 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 2018

Organs Retrieved*	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
0	2 (2%)	7 (5%)	1 (5%)	4 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	14 (3%)	2 (3%)
1	17 (18%)	54 (36%)	5 (24%)	66 (34%)	4 (29%)	11 (31%)	2 (50%)	9 (22%)	168 (30%)	16 (26%)
2	33 (35%)	39 (26%)	3 (14%)	55 (28%)	4 (29%)	11 (31%)	1 (25%)	15 (37%)	161 (29%)	14 (23%)
3	24 (26%)	28 (19%)	4 (19%)	33 (17%)	3 (21%)	9 (25%)	0 (0%)	6 (15%)	107 (19%)	14 (23%)
4	15 (16%)	13 (9%)	6 (29%)	19 (10%)	3 (21%)	3 (8%)	1 (25%)	7 (17%)	67 (12%)	12 (19%)
5	3 (3%)	10 (7%)	2 (10%)	15 (8%)	0 (0%)	2 (6%)	0 (0%)	4 (10%)	36 (6%)	4 (6%)
6	0 (0%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0%)	0 (0%)

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



SECTION 4

Deceased Organ Donor Profile

SUMMARY

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

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Donor Demographics

Table 4.1 contains a description of actual donors in Australia and New Zealand in 2018 compared to 2017. 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 2017 - 2018

Australian Denera		2017		2018			
Australian Donors	DBD	DCD	Total	DBD	DCD	Total	
Gender							
Male	185 (52%)	90 (60%)	275 (54%)	226 (57%)	99 (64%)	325 (59%)	
Female	174 (48%)	61 (40%)	235 (46%)	174 (44%)	55 (36%)	229 (41%)	
Age							
0-4	6 (2%)	2 (1%)	8 (2%)	5 (1%)	1 (1%)	6 (1%)	
5-14	12 (3%)	5 (3%)	17 (3%)	10 (3%)	-	10 (2%)	
15-24	30 (8%)	16 (11%)	46 (9%)	37 (9%)	17 (11%)	54 (10%)	
25-34	50 (14%)	12 (8%)	62 (12%)	41 (10%)	17 (11%)	58 (10%)	
35-44	60 (17%)	24 (16%)	84 (16%)	62 (16%)	25 (16%)	87 (16%)	
45-54	77 (21%)	31 (21%)	108 (21%)	87 (22%)	35 (23%)	122 (22%)	
55-64	60 (17%)	41 (27%)	101 (20%)	70 (18%)	34 (22%)	104 (19%)	
65-74	55 (15%)	20 (13%)	75 (15%)	73 (18%)	25 (16%)	98 (18%)	
75+	9 (3%)	-	9 (2%)	15 (4%)	-	15 (3%)	
BMI (kg/m2)							
Underweight (<18.5)	20 (6%)	10 (7%)	30 (6%)	20 (5%)	6 (4%)	26 (5%)	
Normal (18.5-<25)	130 (36%)	42 (28%)	172 (34%)	159 (40%)	45 (29%)	204 (37%)	
Overweight (25-<30)	120 (33%)	60 (40%)	180 (35%)	134 (34%)	53 (34%)	187 (34%)	
Obese (>=30)	89 (25%)	38 (25%)	127 (25%)	87 (22%)	50 (32%)	137 (25%)	
Unknown	-	1 (1%)	1 (0%)	-	-	-	
Blood Group							
Α	129 (36%)	51 (34%)	180 (35%)	151 (38%)	65 (42%)	216 (39%)	
AB	10 (3%)	5 (3%)	15 (3%)	21 (5%)	4 (3%)	25 (5%)	
В	34 (9%)	13 (9%)	47 (9%)	52 (13%)	13 (8%)	65 (12%)	
0	186 (52%)	82 (54%)	268 (53%)	176 (44%)	72 (47%)	248 (45%)	
Ethnicity							
Australian Non-indigenous	266 (74%)	119 (79%)	385 (75%)	295 (74%)	117 (76%)	412 (74%)	
Australian Indigenous	10 (3%)	2 (1%)	12 (2%)	15 (4%)	3 (2%)	18 (3%)	
New Zealand European	4 (1%)	1 (1%)	5 (1%)	8 (2%)	1 (1%)	9 (2%)	
New Zealand Māori	4 (1%)	1 (1%)	5 (1%)	1 (0%)	1 (1%)	2 (0%)	
Pacific Islander	1 (0%)	1 (1%)	2 (0%)	1 (0%)	1 (1%)	2 (0%)	
European	44 (12%)	16 (11%)	60 (12%)	32 (8%)	17 (11%)	49 (9%)	
North African and Middle Eastern	1 (0%)	2 (1%)	3 (1%)	5 (1%)	1 (1%)	6 (1%)	
Asian	24 (7%)	8 (5%)	32 (6%)	37 (9%)	11 (7%)	48 (9%)	
American	2 (1%)	1 (1%)	3 (1%)	4 (1%)	1 (1%)	5 (1%)	
Sub-Saharan African	3 (1%)	-	3 (1%)	2 (1%)	1 (1%)	3 (1%)	

*Ethnicity categories listed in Table 4.1 are based on the Australian Bureau of Statistics (ABS) and Stats NZ ethnicity classifications below: Australian Non-indigenous: Oceanian - Australian

Australian Indigenous: 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 2017 - 2018

New Zeeley J Dever		2017		2018			
New Zealand Donors	DBD	DCD	Total	DBD	DCD	Total	
Gender							
Male	28(46%)	8(67%)	36 (49%)	28(53%)	4(44%)	32 (52%)	
Female	33(54%)	4(33%)	37 (51%)	25(47%)	5(56%)	30 (48%)	
Age							
5-14	1(2%)	-	1 (1%)	1(2%)	-	1 (2%)	
15-24	7(11%)	2(17%)	9 (12%)	9(17%)	1(11%)	10 (16%)	
25-34	8(13%)	1(8%)	9 (12%)	9(17%)	-	9 (15%)	
35-44	6(10%)	-	6 (8%)	7(13%)	1(11%)	8 (13%)	
45-54	9(15%)	6(50%)	15 (21%)	7(13%)	-	7 (11%)	
55-64	18(30%)	3(25%)	21 (29%)	7(13%)	7(78%)	14 (23%)	
65-74	9(15%)	-	9 (12%)	10(19%)	-	10 (16%)	
75+	3(5%)	-	3 (4%)	3(6%)	-	3 (5%)	
BMI (kg/m2)							
Underweight (<18.5)	-	-	-	1(2%)	-	1 (2%)	
Normal (18.5-<25)	28(46%)	3(25%)	31 (42%)	19(36%)	2(22%)	21 (34%)	
Overweight (25-<30)	22(36%)	3(25%)	25 (34%)	23(43%)	3(33%)	26 (42%)	
Obese (>=30)	11(18%)	6(50%)	17 (23%)	10(19%)	4(44%)	14 (23%)	
Blood Group							
A	20(33%)	3(25%)	23 (32%)	22(42%)	1(11%)	23 (37%)	
AB	2(3%)	1(8%)	3 (4%)	3(6%)	1(11%)	4 (6%)	
В	5(8%)	4(33%)	9 (12%)	5(9%)	4(44%)	9 (15%)	
0	34(56%)	4(33%)	38 (52%)	23(43%)	3(33%)	26 (42%)	
Ethnicity							
Australian Non-indigenous	1(2%)	-	1 (1%)	-	-	-	
New Zealand European	38(62%)	4(33%)	42 (58%)	35(66%)	8(89%)	43 (69%)	
New Zealand Māori	7(11%)	-	7 (10%)	6(11%)	1(11%)	7 (11%)	
Pacific Islander	-	4(33%)	4 (5%)	4(8%)	-	4 (6%)	
European	10(16%)	1(8%)	11 (15%)	1(2%)	-	1 (2%)	
Asian	1(2%)	3(25%)	4 (5%)	4(8%)	-	4 (6%)	
American	1(2%)	-	1 (1%)	2(4%)	-	2 (3%)	
Sub-Saharan African	3(5%)	-	3 (4%)	1(2%)	-	1 (2%)	

*Ethnicity categories listed in Table 4.1 are based on the Australian Bureau of Statistics (ABS) and Stats NZ ethnicity classifications below: Australian Non-indigenous: Oceanian - Australian

Australian Indigenous: 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 2018, 17.7% of donors (98) were 65-74 years of age and 2.7% of donors (15) were aged 75 years or older. The oldest donor was 81.4 years and the youngest was less than one year. In New Zealand in 2018, 21.0% of donors (13) were 65 years or older. The age range was from 14.5 years to 81.2 years.

The mean age of donors in Australia in 2018 was 48.2 years. The mean age in New Zealand was 46.8 years.

Figure 4.1 shows 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 groups.









The median age for Australian donors in 2018 was 50.2 years (Figure 4.2). The median age across Australian jurisdictions in 2018 ranged from 38.5 years in ACT to 55.9 years in NSW.

The median age for New Zealand was 48.6 years in 2018.





Figure 4.2.2 - Age of Male and Female Donors 2010-2018 New Zealand



Figure 4.1.2 - Age and Gender of Deceased Donors 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 2010-2018



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).

Donor racial / ethnic origin*			Australia			New Zealand					
Donor racial / ethnic origin	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	
Australian	286 (76%)	326 (75%)	385 (77%)	385 (75%)	412 (74%)	4 (9%)	-	1 (2%)	1 (1%)	-	
Australian Aboriginal/Torres Strait Islander	9 (2%)	11 (3%)	20 (4%)	12 (2%)	18 (3%)	-	-	-	-	-	
New Zealand European	7 (2%)	5 (1%)	4 (1%)	5 (1%)	9 (2%)	27 (59%)	41 (77%)	41 (67%)	42 (58%)	43 (69%)	
New Zealand Māori	1 (0%)	1 (0%)	5 (1%)	5 (1%)	2 (0%)	6 (13%)	5 (9%)	5 (8%)	7 (10%)	7 (11%)	
Pacific Islander	2 (1%)	4 (1%)	3 (1%)	2 (0%)	2 (0%)	1 (2%)	-	1 (2%)	4 (5%)	4 (6%)	
European	31 (8%)	44 (10%)	43 (9%)	60 (12%)	49 (9%)	4 (9%)	2 (4%)	5 (8%)	11 (15%)	1 (2%)	
North African and Middle Eastern	2 (1%)	4 (1%)	2 (0%)	3 (1%)	6 (1%)	-	-	1 (2%)	-	-	
Asian	25 (7%)	32 (7%)	34 (7%)	32 (6%)	48 (9%)	1 (2%)	2 (4%)	6 (10%)	4 (5%)	4 (6%)	
American	10 (3%)	5 (1%)	4 (1%)	3 (1%)	5 (1%)	2 (4%)	3 (6%)	1 (2%)	1 (1%)	2 (3%)	
Sub-Saharan African	5 (1%)	3 (1%)	3 (1%)	3 (1%)	3 (1%)	1 (2%)	-	-	3 (4%)	1 (2%)	

Table 4.2 Ethnic Origin of Donors, 2014-2018

*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

Sub-Saharan African: Sub-Saharan African

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

Donor Religion

Table 4.3 shows the reported religion of donors.

Donor		,	Australia			New Zealand					
Religion	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	
Christianity	96 (25%)	136 (31%)	150 (30%)	178 (35%)	163 (29%)	4 (9%)	3 (6%)	4 (7%)	2 (3%)	8 (13%)	
Judaism	2 (1%)	2 (0%)	1 (0%)	-	3 (1%)	-	-	1 (2%)	-	-	
Islam	-	1 (0%)	3 (1%)	3 (1%)	3 (1%)	-	-	-	-	-	
Buddhism	7 (2%)	6 (1%)	8 (2%)	6 (1%)	13 (2%)	-	-	-	-	1 (2%)	
Hinduism	2 (1%)	3 (1%)	4 (1%)	1 (0%)	5 (1%)	-	-	-	1 (1%)	1 (2%)	
Others	3 (1%)	4 (1%)	6 (1%)	1 (0%)	1 (0%)	-	-	-	-	-	
No religion	87 (23%)	92 (21%)	123 (24%)	123 (24%)	167 (30%)	1 (2%)	-	-	-	-	
Unknown	181 (48%)	191 (44%)	208 (41%)	198 (39%)	199 (36%)	41 (89%)	50 (94%)	56 (92%)	70 (96%)	52 (84%)	

Table 4.3 Religion of Donors, 2014-2018 n (%)

Donor Weight

The allocation of heart, lungs and livers are based in part on the matching of recipient and donor size and weight. In 2018 there were 11 donors in Australia and no donors in New Zealand who weighed less than 40 kilograms. There were 99 donors 100 kilograms and over in Australia and 12 donors in New Zealand. (Table 4.4)

Country	Year	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	Total
	2014	4	4	2	4	29	53	104	86	54	38	378
	2015	7	4	3	8	33	70	93	86	63	68	435
AUSTRALIA	2016	9	6	4	10	34	82	115	113	73	57	503
	2017	8	6	4	8	41	91	97	102	80	73	510
	2018	4	2	5	15	36	113	113	98	69	99	554
	2014	1	0	0	0	3	8	7	16	7	4	46
	2015	0	1	0	0	3	12	12	11	10	4	53
NEW ZEALAND	2016	0	0	0	1	8	9	17	12	5	9	61
ZEALAND	2017	0	0	0	1	5	13	19	13	11	11	73
	2018	0	0	0	1	5	13	5	16	10	12	62

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 2018 by donor type.

 Table 4.5 Comorbid Medical Conditions of Actual Deceased Donors by Jurisdiction 2018 n (%)

Donor Type	Medical Condition	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUS	NZ
DBD	Diabetes Type I	-	1 (1%)	1 (7%)	1 (1%)	1 (9%)	1 (4%)	-	1 (3%)	6 (2%)	-
DBD	Diabetes Type II	2 (3%)	10 (10%)	-	9 (7%)	-	2 (8%)	-	2 (5%)	25 (6%)	3 (6%)
DBD	Hypertension	15 (21%)	38 (36%)	3 (20%)	36 (28%)	5 (45%)	9 (35%)	-	11 (30%)	117 (29%)	12 (23%)
DBD	Smoking-Current	31 (42%)	35 (33%)	5 (33%)	57 (44%)	5 (45%)	14 (54%)	1 (33%)	22 (59%)	170 (43%)	14 (26%)
DBD	Cancer	5 (7%)	16 (15%)	2 (13%)	8 (6%)	-	1 (4%)	-	1 (3%)	33 (8%)	4 (8%)
DBD	Total	73	105	15	130	11	26	3	37	400	53
DCD	Diabetes Type I	-	-	-	1 (2%)	-	-	-	-	1 (1%)	-
DCD	Diabetes Type II	-	5 (11%)	-	5 (8%)	-	1 (10%)	1 (100%)	-	12 (8%)	-
DCD	Hypertension	3 (14%)	9 (20%)	1 (17%)	17 (27%)	-	4 (40%)	1 (100%)	2 (50%)	37 (24%)	3 (33%)
DCD	Smoking-Current	13 (62%)	21 (46%)	2 (33%)	23 (37%)	2 (67%)	4 (40%)	-	1 (25%)	66 (43%)	1 (11%)
DCD	Cancer	-	4 (9%)	-	8 (13%)	-	-	-	1 (25%)	13 (8%)	2 (22%)
DCD	Total	21	46	6	63	3	10	1	4	154	9
Total	Diabetes Type I	-	1 (1%)	1 (5%)	2 (1%)	1 (7%)	1 (3%)	-	1 (2%)	7 (1%)	-
Total	Diabetes Type II	2 (2%)	15 (10%)	-	14 (7%)	-	3 (8%)	1 (25%)	2 (5%)	37 (7%)	3 (5%)
Total	Hypertension	18 (19%)	47 (31%)	4 (19%)	53 (27%)	5 (36%)	13 (36%)	1 (25%)	13 (32%)	154 (28%)	15 (24%)
Total	Smoking-Current	44 (47%)	56 (37%)	7 (33%)	80 (41%)	7 (50%)	18 (50%)	1 (25%)	23 (56%)	236 (43%)	15 (24%)
Total	Cancer	5 (5%)	20 (13%)	2 (10%)	16 (8%)	-	1 (3%)	-	2 (5%)	46 (8%)	6 (10%)
Total	Total	94	151	21	193	14	36	4	41	554	62

Diabetes

There were 44 donors with diabetes in Australia in 2018. The 37 Australian Type 2 donors provided 112 organ and tissue grafts which were transplanted or stored. This included three double adult kidneys, 47 single kidneys, 11 livers, nine double lungs, two single lungs and two hearts. The seven Type 1 diabetic donors provided 17 organs that were transplanted; nine single kidneys, five livers, one double lung, one single lung and one heart.

In New Zealand, the three Type 2 diabetic donors provided two livers which were transplanted.

Cancer in Donor

In Australia, 46 actual donors had a history of cancer prior to donation. Of the 45 actual donors who had organs retrieved, there were 17 donors with skin only cancers, 25 with non-skin only cancers and three with skin and non-skin cancers. One actual donor did not have organs retrieved. In New Zealand, six donors had a history of cancer, with two donors with skin only cancers and four with non-skin only cancers.

Virology Screening

Table 4.6 lists the cytomegalovirus (CMV) status of donors by country from 2013 to 2018.

CMV IgG			Aust	ralia			New Zealand					
	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Positive	242	228	268	332	309	361	21	23	26	33	47	33
Negative	148	148	167	169	200	192	15	23	27	26	26	29
Not Done	0	2	0	2	1	1	0	0	0	2	0	0
Indeterminate	0	0	0	0	0	0	0	0	0	0	0	0
Not Reported	1	0	0	0	0	0	0	0	0	0	0	0
Total	391	378	435	503	510	554	36	46	53	61	73	62

Table 4.6 Cytomegalovirus (CMV IgG) Status of Donors, 2013 - 2018

Table 4.7 shows the Epstein-Barr Virus (EBV) status of donors from 2013 to 2018.

Table 4.7 Epstein-Barr Virus (EBV IgG) Status of Donors, 2013 - 2018

EBV IgG			Aust	ralia			New Zealand					
EBV Igo	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Positive	356	339	404	462	459	511	27	37	36	53	63	53
Negative	33	30	28	38	48	41	4	5	13	6	5	3
Not Done	2	5	1	2	2	1	0	3	2	2	5	5
Indeterminate	0	1	0	1	1	1	0	1	0	0	0	1
Not Reported	0	3	2	0	0	0	5	0	2	0	0	0
Total	391	378	435	503	510	554	36	46	53	61	73	62

Table 4.8 shows the Hepatitis C Antibody status of donors from 2013 to 2018.

Table 4.8 Hepatitis C Antibody Status of Donors (Anti-HCV), 2013 - 2018

Anti-HCV	Australia							New Zealand					
	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018	
Positive	13	8	11	17	12	17	1	2	1	1	2	0	
Negative	378	364	420	482	496	534	35	44	52	59	70	61	
Not Done	0	5	4	4	2	3	0	0	0	1	1	1	
Indeterminate	0	0	0	0	0	0	0	0	0	0	0	0	
Not Reported	0	1	0	0	0	0	0	0	0	0	0	0	
Total	391	378	435	503	510	554	36	46	53	61	73	62	

Table 4.9 shows the Hepatitis B Core Antibody status of actual donors from 2013 to 2018.

Table 1.0 Henatitis B Core Antibod	v Status of Donors	(Anti-HBcAb) 2013 - 2018
Table 4.9 nepallus D Cole Allubou	y Status of Donors	(AIIII-HDCAD), 2013 - 2010

Anti-HBcAb	Australia							New Zealand					
	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018	
Positive	17	21	20	19	22	26	2	3	3	7	11	5	
Negative	374	337	394	473	475	517	34	42	50	54	62	57	
Not Done	0	19	21	11	13	11	0	1	0	0	0	0	
Indeterminate	0	0	0	0	0	0	0	0	0	0	0	0	
Not Reported	0	1	0	0	0	0	0	0	0	0	0	0	
Total	391	378	435	503	510	554	36	46	53	61	73	62	

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 2013 to 2018.

Table 4.10 Hepatitis B Surface Antigen Status of Donors (HBsAg), 2013 - 2018

HBsAg	Australia							New Zealand					
	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018	
Positive	2	1	0	2	1	0	2	1	0	1	0	0	
Negative	389	375	431	499	507	551	34	45	53	60	73	62	
Not Done	0	2	4	2	1	3	0	0	0	0	0	0	
Indeterminate	0	0	0	0	1	0	0	0	0	0	0	0	
Not Reported	0	0	0	0	0	0	0	0	0	0	0	0	
Total	391	378	435	503	510	554	36	46	53	61	73	62	


SECTION 5

Deceased Donor Kidney Donation

SUMMARY

This section summarises kidney donation activity from deceased donors in 2018, compared with previous years. The rate of kidneys transplanted in 2018 was 35.9 pmp in Australia and 20.1 pmp in New Zealand.

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Kidney Donation

Of the 554 actual deceased organ donors in 2018 in Australia, kidney donation occurred from 544 (98.2%) donors. From these kidney donors, 985 kidneys were retrieved and transplanted into 897 recipients. Of these 897 kidney transplant recipients, there were 47 kidney/pancreas recipients, 20 double adult kidney recipients, five en bloc kidney recipients, nine combined kidney/liver recipients, five combined kidney heart transplant recipients and three combined kidney double lung transplant recipients.

There were 667 kidneys from the brain death donation pathway and 255 kidneys following donation after circulatory death in 2018, compared with 601 and 240 respectively in 2017.

There was an overall increase of 7.8% in the total number of kidney transplant recipients (897) in 2018 compared to the previous year (832); and an increase to 35.9 per million population (pmp) from 33.8 (pmp). Figure 5.1.1 shows the outcomes of requests for kidney donation in Australia.





In New Zealand, there were 61 actual donors (98.4%) who consented to kidney donation. From these kidney donors, 104 kidneys were retrieved, of which 99 were transplanted into 98 recipients. There were 83 kidneys transplanted from donation from the brain death donation pathway and 16 kidneys transplanted following donation after circulatory death.

Of the 98 recipients, six received a combined kidney/pancreas, two received a combined kidney/liver transplant. There was one double adult kidney transplant and no en bloc kidney transplants in 2018.

There was an overall decrease of 16.9% in the total number of kidney transplant recipients (98) in 2018 compared to the previous year (118); the rate of transplantation fell to 20.1 per million population in 2018 from 24.6 pmp in 2017. 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 2018



Figures 5.2 and 5.3 show the number of kidneys transplanted by donation pathway and the number of kidney recipients by transplant region. Figure 5.2 particularly shows an increase in DCD kidneys from 2006 to 2018, and DBD kidneys from 2010 to 2018 in Australia.

Figure 5.2.1 - Kidneys Transplanted by Donation Pathway Australia 1998-2018



Figure 5.2.2 - Kidneys Transplanted by Donation Pathway New Zealand 1998-2018



Figure 5.3 - Deceased Donor Kidney Transplant Recipients* by Transplant Region, Australia and New Zealand, 2017-2018



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 2018



Figure 5.4.2 - Age of Donors Providing Retrieved Kidneys New Zealand 2018



Donor Kidney Function

In 2018 in Australia, 102 donors (18%) had a terminal serum creatinine concentration of \geq 125 µmol/L (Table 5.1). In 2018 in New Zealand, eight donors (15%) had a terminal serum creatinine concentration of \geq 125 µmol/L.

In Australia, 89 donors (16%) had a terminal serum urea concentration of \geq 9 mmol/L and creatinine concentration of \geq 125 µmol/L. In New Zealand, four donors (8%) had a terminal serum urea concentration of \geq 9 mmol/L and creatinine concentration of \geq 125 µmol/L.

	Australia			New Zealand						
Terminal Serum Creatinine (µmol/L)	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
0-99	77%	71%	74%	73%	75%	83%	88%	69%	91%	75%
100-124	7%	7%	8%	9%	7%	15%	10%	19%	2%	10%
125-149	4%	5%	4%	4%	5%	-	2%	4%	2%	8%
150-174	2%	3%	3%	3%	2%	-	-	4%	2%	4%
175-199	1%	3%	2%	2%	2%	2%	-	-	-	-
200-224	2%	1%	1%	1%	1%	-	-	2%	2%	2%
225-249	0%	1%	1%	2%	1%	-	-	-	2%	-
≥ 250	5%	9%	7%	7%	8%	-	-	4%	2%	2%

Table 5.1 Terminal Serum Creatinine Concentration 2014-2018

Kidneys Not Retrieved

Total

The reasons why kidneys were not retrieved for organ transplantation are presented in Table 5.2.

able 5.2 Reasons for Kidney Not Retrieved in 2018					
Reason	Australia	New Zealand			
Logistics	1	0			
Not Medically Suitable	78	16			
Surgically Unsuitable	0	0			
Trauma to Organ	4	0			
No Suitable Recipients	13	0			
Age of Donor	2	2			
DCD Donor	2	0			
Consent Withdrawn	0	0			
Others	1	0			

T

Kidneys Retrieved and Not Utilised for Transplantation

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 2014-2018, this rate is higher than that over the period prior to 2013.

Zealand 2014-2018

101

18

Figure 5.5.2 - Non-utilisation Rate of Retrieved Kidneys - New





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

Table 5.3 Reasons Kidne	vs Retrieved & Not Utilised f	or Transplantation	Australia (New)	Zealand) 2014-2018

Reason	2014	2015	2016	2017	2018		
Logistics	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)		
Not Medically Suitable	32 (6)	41 (4)	32 (3)	34 (6)	34 (5)		
Not Surgically Suitable	1 (1)	0 (0)	2 (0)	0 (0)	4 (0)		
Trauma to Organ	2 (0)	2 (1)	2 (0)	3 (0)	3 (0)		
No Suitable Recipients	5 (0)	0 (0)	6 (1)	10 (0)	9 (0)		
Recipient Issue	1 (0)	2 (0)	0 (0)	2 (0)	2 (0)		
Other	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)		
Total	42 (7)	45 (5)	42 (4)	49 (6)	52 (5)		

Outcome of Kidney Donation

Kidneys are counted as a separate organ. The information relating to the request for kidney donation refers only to those patients who became a kidney donor. If consent was sought and not obtained for transplantation, the Registry has no record of these potential donors. The difference between a request and a consent is a known objection by the donor or family refusal for a specific organ to be donated for transplantation. Organ donation for the purpose of research are excluded when calculating a specific organs ultilsation rate for transplantation.

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

Table E 4 1	Outcome of	Doguact for	Kidnov	Donation in	Australia	2011 2010
Table 5.4.1	Outcome or	Request for	rianey i	Donation III	Australia,	2014-2016

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	378	435	503	510	554
Kidneys Requested for Donation	738	828	981	989	1090
Kidneys Not Requested for Donation	18	42	25	31	18
Kidneys with Consent Given	738	824	977	987	1086
Kidneys with Consent Not Given	0	4	4	2	4
Kidneys Retrieved	700	763	883	894	985
Kidneys Not Retrieved	38	61	94	93	101
Kidneys Transplanted	658	718	841	841	922
Left Kidney Transplanted	309	345	399	411	446
Right Kidney Transplanted	305	343	402	412	426
Double/En bloc Kidney Transplanted	44	30	40	18	50
Total Kidneys Not Used	42	45	42	53	63
Left Kidney Not Used for Transplantation	20	21	19	24	20
Right Kidney Not Used for Transplantation	20	22	17	23	32
Double/En bloc Kidney Not Used for Transplantation	2	2	6	2	0
Kidneys Retrieved for Research and Not for Transplantation	0	0	0	4	11
Recipients Transplanted	636	703	821	832	897
Double Adult Kidney Procedures	17	9	11	4	20
En Bloc Kidney Procedures	5	6	9	5	5
Kidney Non-Utilisation Rate	6.0%	5.9%	4.8%	5.5%	5.3%
Kidney Htilicetion Dete	04.09/	04 49/	05 29/	04 49/	02 69/
Kidney Offilsation Rate	94.0%	54.170	95.2%	34.170	93.0%
Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 201	94.0%	94.170	95.2 /0	54.1%	53.0%
Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request	94.0% 4-2018 2014	2015	2016	2017	2018
Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors	94.0% 4-2018 2014 46	2015 53	2016 61	2017 73	2018 62
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation	94.0% 4-2018 2014 46 88	2015 53 100	2016 61 120	2017 73 143	2018 62 122
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation	34.0% 4-2018 2014 46 88 4	2015 53 100 6	2016 61 120 2	2017 73 143 3	2018 62 122 2
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given	4-2018 2014 46 88 4 88	2015 53 100 6 100	2016 61 120 2 120	2017 73 143 3 143	2018 62 122 2 122
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys with Consent Not Given	4-2018 2014 46 88 4 88 0	2015 53 100 6 100 0	2016 61 120 2 120 0	2017 73 143 3 143 0	2018 62 122 2 122 0
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved	4-2018 2014 46 88 4 88 0 74	2015 53 100 6 100 0 78	2016 61 120 2 120 0 99	2017 73 143 3 143 0 127	2018 62 122 2 122 0 104
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved	4-2018 2014 46 88 4 88 0 74 14	2015 53 100 6 100 0 78 22	2016 61 120 2 120 0 99 21	2017 73 143 3 143 0 127 16	2018 62 122 2 122 0 104 18
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted	4-2018 2014 46 88 4 88 0 74 14 67	2015 53 100 6 100 0 78 22 73	2016 61 120 2 120 0 99 21 95	2017 73 143 3 143 0 127 16 121	2018 62 122 2 122 0 104 18 99
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted	34.0% 4-2018 2014 46 88 4 88 0 74 14 67 33	2015 53 100 6 100 0 78 22 73 37	2016 61 120 2 120 0 99 21 95 42	2017 73 143 3 143 0 127 16 121 58	2018 62 122 2 122 0 104 18 99 48
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Right Kidney Transplanted	34.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32	2015 53 100 6 100 0 78 22 73 37 36	2016 61 120 2 120 0 99 21 95 42 43	2017 73 143 3 143 0 127 16 121 58 57	2018 62 122 2 122 0 104 18 99 48 49
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Right Kidney Transplanted Double/En bloc Kidney Transplanted	34.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32 2	2015 53 100 6 100 0 78 22 73 37 36 0	2016 61 120 2 120 0 99 21 95 42 43 10	34.1% 2017 73 143 3 143 0 127 16 121 58 57 6	2018 62 122 2 122 0 104 18 99 48 49 2
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Double/En bloc Kidney Transplanted Total Kidneys Not Used for Transplantation	34.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32 2 7	2015 53 100 6 100 0 78 22 73 37 36 0 5	2016 61 120 2 120 0 99 21 95 42 43 10 4	2017 73 143 3 143 0 127 16 121 58 57 6 6	2018 62 122 2 122 0 104 18 99 48 49 2 5
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Double/En bloc Kidney Transplanted Total Kidneys Not Used for Transplantation Left Kidney Not Used for Transplantation	94.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32 2 7 3	2015 53 100 6 100 0 78 22 73 37 36 0 5 3	2016 61 120 2 120 0 99 21 95 42 43 10 4 2	2017 73 143 3 143 0 127 16 121 58 57 6 6 6 2	2018 62 122 2 122 0 104 18 99 48 49 2 5 3
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Double/En bloc Kidney Transplanted Total Kidneys Not Used for Transplantation Left Kidney Not Used for Transplantation Right Kidney Not Used for Transplantation	94.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32 2 7 3 4	34.1% 2015 53 100 6 100 0 78 22 73 37 36 0 5 3 2	2016 61 120 2 120 0 99 21 95 42 43 10 4 2 2 2	2017 73 143 3 143 0 127 16 121 58 57 6 6 6 2 4	2018 62 122 2 122 0 104 18 99 48 49 2 5 3 2
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys with Consent Not Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Double/En bloc Kidney Transplanted Total Kidneys Not Used for Transplantation Left Kidney Not Used for Transplantation Right Kidney Not Used for Transplantation Recipients Transplanted	94.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32 2 2 7 3 4 66	2015 53 100 6 100 0 78 22 73 37 36 0 5 3 2 73	2016 61 120 2 120 0 99 21 95 42 43 10 4 2 2 90	2017 73 143 3 143 0 127 16 121 58 57 6 6 2 4 118	2018 62 122 2 122 0 104 18 99 48 49 2 5 3 2 98
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Double/En bloc Kidney Transplanted Total Kidneys Not Used for Transplantation Left Kidney Not Used for Transplantation Right Kidney Not Used for Transplantation	94.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32 2 7 3 4 66 0	34.1% 2015 53 100 6 100 0 78 22 73 37 36 0 5 3 2 73 0	2016 61 120 2 120 0 99 21 95 42 43 10 4 2 2 90 5	2017 73 143 3 143 0 127 16 121 58 57 6 6 6 2 4 118 3	2018 62 122 2 122 0 104 18 99 48 49 2 5 3 2 98 1
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Double/En bloc Kidney Transplanted Total Kidneys Not Used for Transplantation Left Kidney Not Used for Transplantation Right Kidney Not Used for Transplantation Right Kidney Not Used for Transplantation Right Kidney Not Used for Transplantation Recipients Transplanted Double Adult Kidney Procedures En Bloc Kidney Procedures	94.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32 2 7 3 4 66 0 1	34.1% 2015 53 100 6 100 0 78 22 73 37 36 0 5 3 2 73 0 0 0 0 0 0 0	2016 61 120 2 120 0 99 21 95 42 43 10 4 2 2 90 5 0	34.1% 2017 73 143 3 143 0 127 16 121 58 57 6 6 2 4 118 3 0	2018 62 122 2 122 0 104 18 99 48 49 2 5 3 2 98 1 0
Kidney Utilisation Rate Table 5.4.2 Outcome of Request for Kidney Donation in New Zealand, 2014 Outcome of Request Total Donors Kidneys Requested for Donation Kidneys Not Requested for Donation Kidneys with Consent Given Kidneys Not Retrieved Kidneys Not Retrieved Kidneys Transplanted Left Kidney Transplanted Double/En bloc Kidney Transplanted Total Kidneys Not Used for Transplantation Right Kidney Not Used for Transplantation Right Kidney Not Used for Transplantation Right Kidney Not Used for Transplantation Recipients Transplanted Double Adult Kidney Procedures En Bloc Kidney Procedures Kidney Non-Utilisation Rate	94.0% 4-2018 2014 46 88 4 88 0 74 14 67 33 32 2 7 3 4 66 0 1 9.5%	2015 53 100 6 100 0 78 22 73 37 36 0 5 3 2 73 0 0 6 6 78 73 73 73 73 73 73 73 73	2016 61 120 2 120 0 99 21 95 42 43 10 4 2 2 90 5 0 4.0%	2017 73 143 3 143 0 127 16 121 58 57 6 6 2 4 118 3 0 4.7%	2018 62 122 2 122 0 104 18 99 48 49 2 5 3 2 98 1 0 4.8%



SECTION 6

Deceased Donor Liver and Intestine Pathway

SUMMARY

This section summarises liver donation activity from deceased donors in 2018, compared with previous years. The rate of liver transplant procedures in 2018 was 12.7 pmp in Australia and 10.0 pmp in New Zealand.

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Liver Donation

Of the 554 deceased organ donors in Australia in 2018, 312 (56.3%) had their liver retrieved. From these liver donors, there were 318 recipients in Australia. Nine recipients received a combined liver/kidney transplant, one received a combined liver/double lung and one received a combined liver/pancreas/intestine.

42 partial liver transplants were performed in Australia using 21 livers and the 'split' liver technique (transplanting one liver into two recipients), and six recipients received a 'reduced size' liver.

The rate of liver transplants in Australia for 2018 was 12.7 per million population (pmp). Figure 6.1.1 shows the outcomes of requests for liver donation in Australia.





In New Zealand there were 46 livers retrieved, and 44 utilised for transplantation into 49 liver recipients. Of these, there were 10 split liver transplants performed. Two recipients received a combined liver/kidney transplant and one received a combined liver/heart.

In 2018 in New Zealand, there was a rate of 10.0 liver transplant procedures per million population (pmp). Figure 6.1.2 shows the outcomes of requests for liver donation in New Zealand.





Figure 6.2 shows the number of recipients of liver transplants by donation pathway in Australia and New Zealand from 1998 to 2018. Figure 6.3 compares the number of deceased donor liver recipients by transplant region for 2017 and 2018.



Figure 6.2.1 - Recipients of Liver Transplantation by Donation Pathway Australia 1998-2018





Figure 6.3 - Deceased Donor Liver Transplant Recipients* by Transplant Region, Australia and New Zealand, 2017-2018



* 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.









Donor Liver Function

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

	Australia		New Zealand		
Liver Function Tests	Donors with value recorded*	Above Normal	Donors with value recorded*	Above Normal	
Alanine Transaminase ALT > 40 μ /L	312	144	38	15	
Aspartate Transaminase AST > 40 μ /L	282	146	35	18	
Gamma Glutamol Tranferase GGT > 60 μ/L	312	93	38	10	
Alkaline Phosphatase > 116 μ/L	312	41	45	8	
Total Bilirubin > 20 μmol/L	312	42	45	6	
All 5 tests completed	282		26		
At least 1 test completed	312		45		

Table 6.1 Number of Donors with Liver Function Tests above Normal 2018

*Not all donors have all tests reported reported

Livers Not Retrieved

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

Reason	Australia	New Zealand
Logistics	4	0
Not Medically Suitable	139	9
Surgically Unsuitable	0	0
Trauma to Organ	1	2
No Suitable Recipients	10	2
Age of Donor	24	1
DCD Donor	3	1
Consent Withdrawn	0	0
Others	0	0
Total	181	15

Table 6.2 Reasons for Liver Not Retrieved 2018

Section 6

Livers Retrieved and Not Utilised for Transplantation

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). Organ donation for the purpose of research is excluded when calculating a specific organ's non-utilisation rate for transplantation.



Table 6.3 tabulates the reasons livers were not used after retrieval for the purpose of transplantation since 2014.

Of the reduced size liver transplants since 2014, nine were orphaned split liver procedures due to the other split liver having no suitable recipients (five) or not being medically suitable (four).

Reason	2014	2015	2016	2017	2018
Logistics	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not Medically Suitable	6 (1)	13 (0)	12 (0)	13 (1)	11 (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)	1 (0)
Recipient Issue	1 (0)	0 (0)	2 (0)	2 (0)	1 (1)
Other	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	7 (1)	13 (0)	14 (0)	15 (1)	13 (2)

Table 6 3 Reasons I iver I	Retrieved & Not I Itilised fo	r Transplantation Australia	(Now Zoaland) 2014 - 2018
	Realeved & Not Dallacu lo	Transplantation, Australia	(New Zealand) 2014 - 2010

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, 2014-2018

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	378	435	503	510	554
Liver Requested for Donation	354	389	464	459	497
Liver Not Requested for Donation	24	46	39	51	57
Liver Consent Given	347	377	456	453	493
Liver Consent Not Given	7	12	8	6	4
Liver Retrieved	241	264	298	271	312
Liver Not Retrieved	106	113	158	182	181
Total Livers Transplanted	222	247	283	256	297
Whole Liver Not Used	7	13	14	15	13
Intended Split Liver (L) Not Used	0	0	0	1	2
Intended Split Liver (R) Not Used	0	0	2	2	1
Liver Retrieved for Research and Not for Transplantation	12	4	1	0	2
Recipients Transplanted	237	264	314	281	318
Whole Liver Transplants	207	229	246	227	270
Split Liver Transplants	30	34	62	50	42
Reduced Size Liver Transplants	0	1	6	4	6
Liver Non-Utilisation Rate	2.9%	4.9%	4.7%	5.5%	4.2%
Liver Utilisation Rate	92.1%	93.6%	95.0%	94.5%	95.2%

Table 6.4.2 Outcome of Request for Liver Donation in New Zealand, 2014-2018

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	46	53	61	73	62
Liver Requested for Donation	41	50	60	69	61
Liver Not Requested for Donation	5	3	1	4	1
Liver Consent Given	41	50	60	69	61
Liver Consent Not Given	0	0	0	0	0
Liver Retrieved	33	41	51	49	46
Liver Not Retrieved	8	9	9	20	15
Total Livers Transplanted	32	41	51	48	44
Whole Liver Not Used	1	0	0	1	2
Intended Split Liver (L) Not Used	0	0	0	0	0
Intended Split Liver (R) Not Used	0	0	0	1	0
Recipients Transplanted	35	46	53	51	49
Whole Liver Transplants	29	36	49	42	39
Split Liver Transplants	6	10	4	6	10
Reduced Size Liver Transplants	0	0	0	3	0
Liver Non-Utilisation Rate	3.0%	0.0%	0.0%	2.0%	4.3%
Liver Utilisation Rate	97.0%	100.0%	100.0%	98.0%	95.7%

Intestine Donation

Patients with irreversible intestinal failure and who are developing severe complications from parenteral nutrition can benefit from intestinal transplantation. Only 7 intestinal transplants have been performed in Australia. Figure 6.6 shows intestine transplants since 2014. There has not been any intestine retrieved but not utilised for transplantation.

Figure 6.6 - Intestine Transplants Australia 2014-2018





SECTION 7

Deceased Donor Heart Donation

SUMMARY

This section summarises heart donation activity from deceased donors in 2018, compared with previous years. The rate of hearts transplanted in 2018 was 5.2 pmp in Australia and 3.9 pmp in New Zealand

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Heart Donation

Of the 554 deceased organ donors in 2018 in Australia, 390 (70.4%) consented to heart donation. From these heart donors, 134 hearts were retrieved and transplanted into 129 recipients. Of these 129 heart transplant recipients, seven received heart/double lung transplants and five received a combined heart/kidney transplant.

There was an overall increase in the total number of heart transplant recipients (129) compared to the previous year (98), and an increase to 5.2 per million population (pmp) in 2018 from 4.0 (pmp) the previous year. Figure 7.1.1 shows the outcomes of requests for heart donation in Australia.

Figure 7.1.1 Outcomes of Request for Heart Donation from Actual Donors in Australia 2018



In New Zealand, there were 41 donors (66.1%) who consented to heart donation. From these consented donors, 20 hearts were retrieved and 19 recipients received a heart transplant in 2018 (3.9 pmp). This was a decrease of 17.4% in the total number of heart transplants compared with 2017 (23). Figure 7.1.2 shows the outcomes of requests for heart donation in New Zealand.





Figures 7.2 and 7.3 show the number of hearts transplanted by donation pathway and the number of heart recipients by jurisdiction.



Figure 7.2.1 - Hearts Transplanted by Donation Pathway Australia 1998-2018





Figure 7.3 - Deceased Donor Heart Transplant Recipients* by Transplant State, Australia and New Zealand, 2017-2018



Age of Heart Donors

The age distribution of donors providing retrieved hearts for Australia and New Zealand is shown in Figure 7.4.

Figure 7.4.1 - Age of Donors Providing Retrieved Hearts Australia 2018





Figure 7.4.2 - Age of Donors Providing Retrieved Hearts New Zealand 2018

Donor Heart Function

In Australia, 108 (80.6%) donors with hearts retrieved had a normal ECG and 114 (85.1%) had a normal echocardiogram, prior to heart donation. In New Zealand, 20 out of the 20 heart donors had a normal ECG and 19 had a normal echocardiogram.

Hearts Not Retrieved

In 2018, there were 256 hearts not retrieved from Australian donors and 21 not retrieved from New Zealand donors. The reasons why hearts were not retrieved for organ transplantation are presented in Table 7.1.

Table 7.1 Reasons for Heart Not Retrieved 2018

Reason	Australia	New Zealand
Logistics	8	2
Not Medically Suitable	134	6
Surgically Unsuitable	0	0
Trauma to Organ	3	1
No Suitable Recipients	40	5
Age of Donor	54	4
DCD Donor	3	3
Consent Withdrawn	11	0
Others	3	0
Total	256	21

Hearts Retrieved and Not Utilised for Transplantation

Figure 7.5 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). Organ donation for the purpose of research is excluded when calculating a specific organ's non-utilisation rate for transplantation.

In Australia, the non-utilisation rate of Hearts decreased from 10.1% in 2017 to 3.7% in 2018.

In New Zealand, the non-utilisation rate of Hearts was 5.0% in 2018 which represents one heart.



Figure 7.5.1 - Non-utilisation Rate of Retrieved Hearts -

Australia 2014-2018





Table 7.2 tabulates the reasons hearts were not used for transplantation after retrieval for that purpose since 2014.

Reason	2014	2015	2016	2017	2018	
Logistics	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	
Not Medically Suitable	2 (0)	4 (0)	0 (0)	8 (0)	4 (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	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	
Recipient Issue	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Other	0 (0)	2 (0)	0 (0)	3 (0)	0 (0)	
Total	2 (0)	7 (0)	0 (0)	11 (0)	5 (1)	

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 Red	nuest for Heart Do	nation in Australia.	2014-2018

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	378	435	503	510	554
Heart Requested for Donation	279	306	393	387	421
Heart Not Requested for Donation	99	129	110	123	133
Heart with Consent Given	249	281	370	358	390
Heart with Consent Not Given	30	25	23	29	31
Heart Retrieved	90	103	125	109	134
Heart Not Retrieved	159	178	245	249	256
Heart Transplanted	83	95	124	98	129
Heart Not Used	2	7	0	11	5
Heart Retrieved for Research and Not for Transplantation	5	1	1	0	0
Recipients Transplanted	83	95	124	98	129
Heart/Double Lung Procedures	4	2	7	5	7
Heart Non-Utilisation Rate	2.2%	6.8%	0.0%	10.1%	3.7%
Heart Utilisation Rate	92.2%	92.2%	99.2%	89.9%	96.3%

Table 7.3.2 Outcome of Request for Heart Donation in New Zealand, 2014-2018

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	46	53	61	73	62
Heart Requested for Donation	29	40	50	49	42
Heart Not Requested for Donation	17	13	11	24	20
Heart with Consent Given	27	39	50	49	41
Heart with Consent Not Given	2	1	0	0	1
Heart Retrieved	17	12	11	23	20
Heart Not Retrieved	10	27	39	26	21
Heart Transplanted	17	12	11	23	19
Heart Not Used	0	0	0	0	1
Recipients Transplanted	17	12	11	23	19
Heart/Double Lung Procedures	1	0	0	0	0
Heart Non-Utilisation Rate	0.0%	0.0%	0.0%	0.0%	5.0%
Heart Utilisation Rate	100.0%	100.0%	100.0%	100.0%	95.0%



SECTION 8

Deceased Donor Lung Donation

SUMMARY

This section summarises lung donation activity from deceased donors in 2018, compared with previous years. The rate of lungs transplanted in 2018 was 8.9 pmp in Australia and 5.7 pmp in New Zealand.

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Lung Donation

Of the 554 deceased organ donors in 2018 in Australia, 483 donors consented to lung donation. From these donors, 435 lungs were retrieved with 420 lungs transplanted. There were 222 lung transplant recipients (8.9 pmp), an increase of 7.8% on the previous year. Of these 222 lung transplant recipients, seven received heart/double lung transplants, one received a double lung/liver transplant and three received a double lung kidney transplant.

Figure 8.1.1 shows the outcomes of requests for lung donation in Australia for 2018.

Figure 8.1.1 Outcomes of Request for Lung Donation from Actual Donors in Australia 2018



Of the 62 deceased organ donors in New Zealand in 2018, 55 donors consented to lung donation. From these donors, 56 lungs were retrieved and 55 were transplanted. There were 28 lung transplant recipients (5.7 pmp), an increase of 16.7% on the previous year.

Figure 8.1.2 shows the outcomes of requests for lung donation in New Zealand for 2018.

Figure 8.1.2 Outcomes of Request for Lung Donation from Actual Donors in New Zealand 2018



Figures 8.2 and 8.3 show the number of lung recipients by donation pathway and transplant region.



Figure 8.2.1 - Recipients of Lung Transplants by Donor Pathway Australia 1998-2018





Figure 8.3 - Deceased Donor Lung Transplant Recipients* by Transplant Region, Australia and New Zealand, 2017-2018



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 2018



Figure 8.4.2 - Age of Donors Providing Retrieved Lungs New Zealand 2018



Donor Lung Function

Australia

In Australia, 112 (50.7%) donors with lungs retrieved had a bronchoscopy in 2018. 27 donors had chest trauma; these included chest drains and pneumothoraces.

The arterial blood gases were taken on 100% FiO_2 and PEEP of 5cm for 511 actual donors. 63.6% (325) had a PEEP greater than 5cm. Of those donors with lungs retrieved, 61.1% (135) had a PEEP greater than 5cm.

The results from the 518 actual donors with a pH measurement show 18.5% to be acidotic (pH <7.35) and 19.1% to be alkalotic (pH>7.45). Of those donors with lungs retrieved, 10.9% were acidotic and 22.2% were alkalotic.

For the 518 actual donors with measurements, oxygenation measured as PaO₂ ranged from 38 to 609 mmHg with a median of 341.5 mmHg. PaCO₂ ranged from 4 to 92 with a median of 40 mmHg. For donors with lungs retrieved, oxygenation measured as PaO₂ ranged from 80 to 609 mmHg with a median of 422 mmHg. PaCO₂ ranged from 20.7 to 58 with a median of 39 mmHg.

New Zealand

In New Zealand, there were eight (28.6%) lung donors who had a bronchoscopy in 2018. Five donors had chest trauma.

All 28 donors with lungs retrieved had 100% FiO₂; 10 had a PEEP greater than 5cm.

The arterial blood gas results from these donors with lungs retrieved show 32.1% (nine donors) to be acidotic (pH < 7.35) and five (17.9%) were alkalotic (pH > 7.45).

For these donors with lungs retrieved, oxygenation measured as PaO₂ ranged from 61 to 586 mmHg with a median of 391.5 mmHg. PaCO₂ ranged from 5.4 to 56 mmHg with a median of 37.8 mmHg.

Lungs Not Retrieved

In 2018, there were 531 lungs not retrieved from Australian donors and 54 not retrieved from New Zealand donors. The reasons why lungs were not retrieved for organ transplantation are presented in Table 8.1.

Table 8.1 Reasons for Lungs Not Retrieved in 2018

Reason	Australia	New Zealand
Logistics	18	4
Not Medically Suitable	388	25
Surgically Unsuitable	2	0
Trauma to Organ	6	6
No Suitable Recipients	89	12
Age of Donor	16	4
DCD Donor	0	2
Consent Withdrawn	12	1
Others	0	0
Total	531	54

Lungs Retrieved and Not Utilised for Transplantation

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). Organ donation for the purpose of research is excluded when calculating a specific organ's non-utilisation rate for transplantation.



Figure 8.5.1 - Non-utilisation Rate of Retrieved Lungs -Australia 2014-2018



Figure 8.5.2 - Non-utilisation Rate of Retrieved Lungs - New Zealand 2014-2018

Table 8.2 tabulates the reasons lungs were not used for transplantation after retrieval for that purpose since 2014.

Reason	2014	2015	2016	2017	2018
Logistics	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not Medically Suitable	10 (1)	3 (0)	13 (0)	15 (0)	12 (0)
Not Surgically Suitable	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)
Trauma to Organ	0 (0)	0 (0)	0 (0)	1 (0)	1 (1)
No Suitable Recipients	2 (0)	0 (0)	0 (0)	1 (0)	1 (0)
Recipient Issue	0 (0)	0 (0)	1 (0)	3 (2)	0 (0)
Other	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Total	12 (1)	3 (0)	14 (0)	21 (3)	15 (1)

Table 8.2 Reasons Lung Retrieved & Not Utilised for Transplantation, Australia (New Zealand) 2014 - 2018

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, 2014-2018

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	378	435	503	510	554
Lungs Requested for Donation	684	784	912	936	1008
Lungs Not Requested for Donation	72	86	94	84	100
Lungs with Consent Given	660	752	886	910	966
Lungs with Consent Not Given	24	32	26	26	42
Lungs Retrieved	329	394	410	421	435
Single Lung Retrieved	3	2	2	3	7
Double Lung Retrieved	163	196	204	209	214
Lungs Not Retrieved	331	358	476	489	531
Lungs Transplanted	319	375	386	396	420
Total Lungs Not Used	10	3	14	21	15
Lungs Retrieved for Research and Not for Transplantation	0	16	10	4	0
Recipient Transplanted	163	193	196	206	222
Double Lung Recipient	156	182	190	190	198
Single Lung (L) Recipients	4	6	5	5	12
Single Lung (R) Recipients	3	5	1	11	12
Heart/Lung Recipients	4	2	7	5	7
Lung Non-Utilisation Rate	3.0%	0.8%	3.4%	5.0%	3.4%
Lung Utilisation Rate	97.0%	95.2%	94.1%	94.1%	96.6%

Table 8.3.2 Outcome of Regu	lest for Lung Donation	in New Zealand. 2014-2018	

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	46	53	61	73	62
Lungs Requested for Donation	66	92	110	112	110
Lungs Not Requested for Donation	26	14	12	34	14
Lungs with Consent Given	66	92	110	112	110
Lungs with Consent Not Given	0	0	0	0	0
Lungs Retrieved	40	50	40	47	56
Single Lung Retrieved	0	0	0	1	0
Double Lung Retrieved	20	25	20	23	28
Lungs Not Retrieved	26	42	70	65	54
Lungs Transplanted	39	50	40	44	55
Total Lungs Not Used	1	0	0	3	1
Recipient Transplanted	20	25	20	24	28
Double Lung Recipient	19	25	20	20	27
Single Lung (L) Recipients	1	0	0	3	1
Single Lung (R) Recipients	0	0	0	1	0
Heart/Lung Recipients	1	0	0	0	0
Lung Non-Utilisation Rate	2.5%	0.0%	0.0%	6.4%	1.8%
Lung Utilisation Rate	97.5%	100.0%	100.0%	93.6%	98.2%



SECTION 9

Deceased Donor Pancreas Donation

SUMMARY

This section summarises pancreas donation activity from deceased donors in 2018, compared with previous years. The rate of pancreas transplantation in 2018 was 2.0 pmp in Australia and 1.2 pmp in New Zealand.

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Suggested Citation:

ANZOD Registry, 2019 Annual Report, Section 9: Deceased Donor Pancreas Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2019. Available at https://www.anzdata.org.au/report/anzod-annual-report-2019/

Pancreas Donation

Of the 554 deceased organ donors in 2018 in Australia, 416 donors consented to pancreas donation. From these donors, 96 pancreases were retrieved with 51 subsequently transplanted (2.0 pmp). Of these 51 pancreas transplant recipients, 48 were transplanted simultaneously with another organ resulting in 47 pancreas/kidney transplants and one combined pancreas/liver/intestine transplant. Figure 9.1.1 shows the outcomes of requests for pancreas donation in Australia for 2018.





Of the 62 deceased organ donors in New Zealand in 2018, 43 donors consented to pancreas donation. From these donors, eight pancreases were retrieved and six were subsequently transplanted (1.2 pmp). All six recipients that were transplanted received a simultaneous pancreas/kidney transplant. Figure 9.1.2 shows the outcomes of requests for pancreas donation in New Zealand for 2018.

Figure 9.1.2 Outcomes of Request for Pancreas Donation from Actual Donors in Australia 2018



SPK = Simultaneous Pancreas Kidney transplant

Figures 9.2 and 9.3 show the number of pancreas recipients by donation pathway and transplant region.



Figure 9.2.1 - Recipients of Whole Pancreas Transplant by Donation Pathway, Australia 1998-2018





Figure 9.3 - Deceased Donor Pancreas Transplant Recipients* by Transplant Region, Australia and New Zealand, 2017-2018



Age of Pancreas Donors

Donors (96)

The age distribution of donors providing retrieved pancreases for Australia and New Zealand is shown in Figure 9.4.







Donor Pancreas Function

10

20

30

40

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

Australia

20-

15

5

0

ò

Percent 10

In Australia, of the 447 donors in 2018 with a measurement taken, 81.4% had blood sugar levels greater than 8mmol/L. Of those 96 donors with pancreas retrieved and a measurement taken, 86.5% had blood sugar levels greater than 8mmol/L.

Of the 341 donors with a measurement taken, 87.4% had normal amylase levels or lipase less than 80 U/L. Of the 93 donors with pancreas retrieved and a measurement taken, 96.8% had normal amylase levels or lipase less than 80 U/L.

New Zealand

In New Zealand, of the eight donors in 2018 with pancreas retrieved, 66.7% had blood sugar levels greater than 8mmol/L.

Of the seven donors in 2018 with pancreas retrieved and a measurement taken, 85.7% had normal amylase levels or lipase less than 80 U/L.

Pancreas Not Retrieved

In 2018, there were 320 pancreases not retrieved from Australian donors and 35 not retrieved from New Zealand donors. The reasons why pancreas was not retrieved for organ transplantation are presented in Table 9.1.

Table 9.1 Reasons for Pancreas Not Retrieved 2018						
Reason	Australia	New Zealand				
Logistics	21	0				
Not Medically Suitable	155	8				
Surgically Unsuitable	5	0				
Trauma to Organ	4	1				
No Suitable Recipients	31	7				
Age of Donor	90	16				
DCD Donor	14	3				
Consent Withdrawn	0	0				
Others	0	0				
Total	320	35				

Pancreas Retrieved and Not Utilised for Transplantation

Figure 9.5 shows the non-utilisation rate of retrieved pancreases – the proportion of pancreases 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). Organ donation for the purpose of research is excluded when calculating a specific organ's non-utilisation rate for transplantation.





Figure 9.5.2 - Non-utilisation Rate of Pancreas Retrieved for Organ Transplantation - New Zealand 2014-2018



Table 9.2 tabulates the reasons pancreas were not used for transplantation after retrieval for that purpose since 2014.

Table 0.2 Decem	Donoroo Dotriovad	9 Not Hilliood for	Trananlantation	Augtralia /May	Zaaland) 2011 2010
Table 9.2 Reasons	s Pancreas Retrieved		Transplantation.	Australia (New	Zealand) 2014 - 2010

Reason	2014	2015	2016	2017	2018
Logistics	0 (0)	1 (0)	1 (0)	0 (0)	0 (0)
Not Medically Suitable	2 (0)	4 (0)	2 (0)	4 (0)	5 (1)
Not Surgically Suitable	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Trauma to Organ	0 (0)	1 (0)	1 (0)	0 (0)	0 (0)
No Suitable Recipients	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Recipient Issue	0 (0)	0 (0)	0 (0)	0 (0)	0 (1)
Insufficient Islets	6 (0)	12 (0)	7 (0)	9 (0)	10 (0)
Others	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)
Total	9 (0)	18 (0)	12 (0)	13 (0)	16 (2)
Outcome of Pancreas Donation

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

Table 9.3.1 Outcome	of Request for	Pancreas Donation	in Australia,	2014-2018
---------------------	----------------	-------------------	---------------	-----------

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	378	435	503	510	554
Pancreas Requested for Donation	301	328	406	407	443
Pancreas Not Requested for Donation	77	107	97	103	111
Pancreas with Consent Given	285	314	394	393	416
Pancreas with Consent Not Given	16	14	12	14	27
Pancreas Retrieved	101	121	120	95	96
Pancreas Not Retrieved	184	193	274	298	320
Whole Pancreas Transplanted	44	45	52	49	51
Pancreas Only Transplanted	0	2	5	1	3
Pancreas Transplanted with Other Organ	44	43	47	48	48
Pancreas Islets Transplanted	10	16	8	11	14
Pancreas Not Used	9	18	12	13	16
Pancreas Retrieved for Research and Not for Transplantation	38	42	48	22	15
Whole Pancreas Recipients	44	45	52	49	51
Pancreas Only Recipients	0	2	5	1	3
Pancreas with Other Organ Recipients	44	43	47	48	48
Pancreas Islets Recipients	10	15	8	11	14
Pancreas (including Islets) Non-utilisation Rate	8.9%	14.9%	10.0%	13.7%	16.7%
Pancreas (Whole, no Islets) Utilisation Rate	43.6%	37.2%	43.3%	51.6%	53.1%

Table 9.3.2 Outcome of Request for Pancreas Donation in New Zealand, 2014-2018

Outcome of Request	2014	2015	2016	2017	2018
Total Donors	46	53	61	73	62
Pancreas Requested for Donation	22	39	45	40	44
Pancreas Not Requested for Donation	24	14	16	33	18
Pancreas with Consent Given	22	38	45	40	43
Pancreas with Consent Not Given	0	1	0	0	1
Pancreas Retrieved	2	3	4	4	8
Pancreas Not Retrieved	20	35	41	36	35
Whole Pancreas Transplanted	2	3	4	4	6
Pancreas Only Transplanted	0	0	0	0	0
Pancreas Transplanted with Other Organ	2	3	4	4	6
Pancreas Islets Transplanted	0	0	0	0	0
Pancreas Not Used for Transplantation	0	0	0	0	2
Whole Pancreas Recipients	2	3	4	4	6
Pancreas Only Recipients	0	0	0	0	0
Pancreas with Other Organ Recipients	2	3	4	4	6
Pancreas Islets Recipients	0	0	0	0	0
Pancreas (including Islets) Non-utilisation Rate	0.0%	0.0%	0.0%	0.0%	25.0%
Pancreas (Whole, no Islets) Utilisation Rate	100.0%	100.0%	100.0%	100.0%	75.0%



SECTION 10

Tissue and Eye Donation

Summarising 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. 2019 Annual Report, Section 10: Eye and Tissue Donation and Outcome Data. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2019. Available at: 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 2017 to 2018.

Figure 10.2 - Number of Tissue Donors by Jurisdiction, 2017-2018



Table 10.1 summarises the number of tissue donors, by donation pathway, by jurisdiction and the percentage change in donor numbers from 2017 to 2018.

Donation Type	Jurisdiction	2017	2018	Percent change
	QLD	741 (17.8%)	419 (11%)	-43%
	NSW	2139 (51.5%)	2303 (60.4%)	8%
Living Donor	ACT	0 (0%)	0 (0%)	-
	VIC	309 (7.4%)	323 (8.5%)	5%
	TAS	67 (1.6%)	32 (.8%)	-52%
	SA	292 (7%)	155 (4.1%)	-47%
Living Donor	NT	0 (0%)	0 (0%)	-
	WA	608 (14.6%)	578 (15.2%)	-5%
Living Donor	AUS	4156 (100%)	3810 (100%)	-8%
	QLD	127 (34.8%)	100 (29.5%)	-21%
	NSW	109 (29.9%)	120 (35.4%)	10%
	ACT	6 (1.6%)	5 (1.5%)	-17%
Deceased Donor	VIC	94 (25.8%)	79 (23.3%)	-16%
Deceased Donor	TAS	3 (.8%)	4 (1.2%)	33%
	SA	10 (2.7%)	11 (3.2%)	10%
	NT	1 (.3%)	1 (.3%)	0%
	WA	15 (4.1%)	19 (5.6%)	27%
Deceased Donor	AUS	365 (100%)	339 (100%)	-7%
	QLD	868 (19.2%)	519 (12.5%)	-40%
	NSW	2248 (49.7%)	2423 (58.4%)	8%
	ACT	6 (.1%)	5 (.1%)	-17%
Total Donors	VIC	403 (8.9%)	402 (9.7%)	0%
	TAS	70 (1.5%)	36 (.9%)	-49%
	SA	302 (6.7%)	166 (4%)	-45%
	NT	1 (0%)	1 (0%)	0%
	WA	623 (13.8%)	597 (14.4%)	-4%
Total Donors	AUS	4521 (100%)	4149 (100%)	-8%

Table 10.1 Number of Tissue Donors by Donation Pathway and Jurisdiction 2017-2018

Figures 10.3 to 10.5 show the breakdown of tissue donor numbers by donation pathway and jurisdiction for 2018 compared to 2017.

Figure 10.3 - Living Tissue Donors by Jurisdiction, 2017-2018



Figure 10.4 - Deceased Tissue Donors by Jurisdiction, 2017-2018



Figure 10.5 - Deceased Solid Organ and Tissue Donors by Jurisdiction, 2017-2018



Tissue Donation

Figure 10.6 - Total Tissue Donation by Jurisdiction, 2017-2018



Table 10.2 shows the total number and proportion of tissue donations, by donation pathway, jurisdiction and the percentage change in tissue donation from 2017 to 2018.

Table 10.2 Number of Tissue Donations by Donor Type and Jurisdiction 2017-2018										
Donation Type	Jurisdiction	2017	2018	Percent change						
	QLD	763 (18%)	431 (11.1%)	-44%						
	NSW	2197 (51.7%)	2357 (60.7%)	7%						
	ACT	0 (0%)	0 (0%)	-						
Living dependenctions	VIC	309 (7.3%)	324 (8.3%)	5%						
Living donor donations	TAS	68 (1.6%)	32 (.8%)	-53%						
	SA	292 (6.9%)	155 (4%)	-47%						
	NT	0 (0%)	0 (0%)	-						
	WA	619 (14.6%)	582 (15%)	-6%						
Living donor donations	AUS	4248 (100%)	3881 (100%)	-9%						
	QLD	229 (41.7%)	153 (32.8%)	-33%						
	NSW	120 (21.9%)	135 (29%)	13%						
	ACT	6 (1.1%)	5 (1.1%)	-17%						
Dessend dense densitions	VIC	164 (29.9%)	138 (29.6%)	-16%						
Deceased donor donations	TAS	3 (.5%)	4 (.9%)	33%						
	SA	10 (1.8%)	11 (2.4%)	10%						
	NT	1 (.2%)	1 (.2%)	0%						
	WA	16 (2.9%)	19 (4.1%)	19%						
Deceased donor donations	AUS	549 (100%)	466 (100%)	-15%						
	QLD	992 (20.7%)	584 (13.4%)	-41%						
	NSW	2317 (48.3%)	2492 (57.3%)	8%						
	ACT	6 (.1%)	5 (.1%)	-17%						
Total denotions	VIC	473 (9.9%)	462 (10.6%)	-2%						
Total donations	TAS	71 (1.5%)	36 (.8%)	-49%						
	SA	302 (6.3%)	166 (3.8%)	-45%						
	NT	1 (0%)	1 (0%)	0%						
	WA	635 (13.2%)	601 (13.8%)	-5%						
Total donations	AUS	4797 (100%)	4347 (100%)	-9%						



Figure 10.8 - Tissue Donation by Living Donors by Jurisdiction, 2017-2018



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

Juris	diction	Musculoskeletal	Cardiovascular		Total
QLD		431		0	431
NSW		2349		8	2357
ACT		0		0	0
VIC		324		0	324
TAS		32		0	32
SA		155		0	155
NT		0		0	0
WA		582		0	582
AUS		3873	•	8	3881

Table 10.3 Tissue Donation from Living Donors by Jurisdiction and Donation Sector, 2018

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

	Tissue C	only Sec	tor		Solid Orga	n/Tissue	Sector		Tissue T	otal		
State	ms	cv	skin	рі	ms	cv	skin	pi	ms	cv	skin	рі
QLD	34	1	31	0	39	24	23	1	73	25	54	1
NSW	57	4	4	0	28	35	2	5	85	39	6	5
АСТ	2	0	0	0	0	2	0	1	2	2	0	1
VIC	14	6	20	0	35	24	35	4	49	30	55	4
TAS	0	0	0	0	0	4	0	0	0	4	0	0
SA	0	0	0	0	0	9	0	2	0	9	0	2
NT	0	0	0	0	0	1	0	0	0	1	0	0
WA	6	0	0	0	13	0	0	0	19	0	0	0
AUS	113	11	55	0	115	99	60	13	228	110	115	13

Table 10.4 Tissue Donation from Deceased Donors by Jurisdiction and Donation Sector, 2018

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 2017 to 2018.





Figure 10.10 - Solid Organ & Tissue Donation by Deceased Donors by Jurisdiction, 2017-2018



Type of Tissue Donation

Tissue Donations are reported 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 2018 compared with 2017 from living and deceased donors.

Figure 10.11 - Musculoskeletal Tissue Donation by Living Donors by Jurisdiction, 2017-2018



Figure 10.12 - Musculoskeletal Tissue Donation by Deceased Donors by Jurisdiction, 2017-2018



Cardiovascular Donation

Figures 10.13 and 10.14 show the breakdown of jurisdiction of cardiovascular tissue donation for 2018 compared to 2017.

Figure 10.13 - Cardiovascular Tissue Donation by Living Donors by Jurisdiction, 2017-2018



Figure 10.14 - Cardiovascular Tissue Donation by Deceased Donors by Jurisdiction, 2017-2018



Skin Donation

Figure 10.15 shows the breakdown of skin donations between the two jurisdictions for 2018 compared to 2017.

Figure 10.15 - Skin Tissue Donation by Deceased Donors by Jurisdiction, 2017-2018



Pancreas Islets Donation

Figure 10.16 shows the breakdown of pancreas islets donations for 2018 compared to 2017.

Figure 10.16 - Pancreas Islets Donation by Deceased Donors by Jurisdiction, 2017-2018



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 2018.

Figure 10.17 - Number of Notified Tissue Transplants and Recipients (ms,cv,sk) by Jurisdiction, 2018



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".

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 2018.





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 2018.





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 10.20 shows the number of notified^{1,2} skin tissue transplants and recipients by jurisdiction for 2018.

Figure 10.20 - Number of Notified Skin Tissue Transplants and Recipients by Jurisdiction, 2018



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".

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 2018.





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 2017 to 2018

Figure 10.22 - Number of Eye Donors by Jurisdiction, 2017-2018



Figure 10.23 - Number of Eye Donors by Donation Pathway, Australia, 2018



Figures 10.24 to Figure 10.27 represent the number of donors by donor type and jurisdiction for 2018.

Figure 10.24 - Number of Eye Donors Only by Jurisdiction, 2018



Figure 10.25 - Number of Eye and Tissue Donors by Jurisdiction, 2018



Figure 10.26 - Number of Eye and Solid Organ Donors by Jurisdiction, 2018





Eye Donation Outcome

Figures 10.28 and Figure 10.29 show the number of notified* corneal transplants and sclera units transplanted by jurisdiction for 2018.

Figure 10.28 - Number of Corneas Transplanted by Jurisdiction, 2018



Figure 10.29 - Number of Sclera Units Transplanted by Jurisdiction, 2018





Transplant Waiting Lists

Deceased Organ

SUMMARY

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. There are, however, important general considerations in interpretation of waiting list data.

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Suggested Citation

ANZOD Registry. 2019 Annual Report, Section 11: Deceased Organ Transplant Wait List. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2019. Available at: <u>https://www.anzdata.org.au/report/anzod-annual-report-2019/</u>

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 further information please see the Transplantation Society of Australia and New Zealand (TSANZ) website "Organ Allocation Guidelines". www.tsanz.com.au

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 available at this stage, consistently across all organs.

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 point prevalent 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 "made active"
- 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 Service (NOMS), 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 Only Waiting List - Stock and Flow, 2014 - 2018¹

	Event	2014	2015	2016	2017	2018		
	Active start of year	1076	1145	1071	954	965		
	Made active	854	767	824	963	1014		
	Taken off list	148	156	135	145	147		
Australia	DD graft	572	633	759	751	811		
Australia	LD graft	56	42	37	45	33		
	Overseas graft	0	2	1	1	0		
	Died on list	9	8	9	10	6		
	Active end of year	1145	1071	954	965	982		

¹Data 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/.

Country	Event	2014	2015	2016	2017	2018
	Active start of year	152	190	187	140	147
	Made active	342	337	337	345	362
Australia	Taken off list	54	54	61	43	46
	DD graft	234	267	312	281	320
	LD graft	1	2	2	2	0
	Died on List	16	18	9	12	6
	Active end of year	189	186	187 140 337 345 61 43 312 281 2 2 9 12 140 147 24 23 70 72 11 26 55 52 4 3	147	137
	Active start of year	19	21	24	23	28
	Made active	56	61	70	72	65
New Zealand	Taken off list	14	7	11	26	8
New Zealand	DD graft	38	45	55	52	47
	LD graft	5	3	4	3	2
	Died on list	2	3	4	2	1
	Active end of year	18	24	24	24	35

Table 11.2 Deceased Donor Liver Waiting List Activity, 2014-2018

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 <u>http://www.anzcotr.org.au/</u>.

Heart

Table 11.3 Deceased Donor Heart Waiting List Activity, 2014 - 2018¹

	Event	2014	2015	2016	2017	2018
	Active start of year	48	60	44	44	72
	Made active	127	98	142	143	153
	Taken off list	32	15	13	14	20
Australia	DD graft	78	93	124	92	121
	LD graft ²	0	0	1	1	0
	Died on list	5	5	4	8	8
	Active end of year	60	44	44	72	74
	Active start of year	10	8	13	14	8
	Made active	18	19	18	20	23
	Taken off list	3	4	4	2	0
New Zealand	DD graft	17	10	11	24	20
	LD graft	0	0	0	0	0
	Died on list	0	0	2	0	1
	Active end of year	8	13	14	8	10

²Hearts from a living donor are identified as a domino transplant. A procedure in which the heart is removed from one transplant candidate and immediately transplanted into a second patient, with the first patient receiving a new organ from a deceased donor.

Lung

Table 11.4 Deceased Donor Lung Waiting List Activity, 2014 - 2018¹

	Event	2014	2015	2016	2017	2018
Australia	Active start of year	96	111	85	77	100
	Made active	223	211	234 ¹	252	245
	Taken off list	29	33	32 ¹	10	12
	DD graft	166	195	199	210	222
	Died on list	14	9	11	9	14
	Active end of year	110	85	77	100	97
	Active start of year	13	13	5	8	8
	Made active	18	19	24	23	33
	Taken off list	0	4	2	3	0
New Zealand	DD graft	17	23	17	0	28
	Died on list	1	0	2	0	1
	Active end of year	13	5	8	8	12

¹Data may differ to that previously published as data is updated in subsequent years in ANZCOTR.

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.

Registry data is dynamic and corrections and updates are made continually. Since 2017, ANZIPTR has undergone extensive data-audit and worked to compile data from all transplant centers into a central database to facilitate realtime data entry. This process of data checking and cleaning has meant changes as some historical data have been superseded. For this reason, those comparing current and previous years may notice differences particularly for waitlist activity.

Country	Event	2014	2015	2016	2017	2018
Australia	Active start of year	9	18	30	49	71
	Made active	54	60	74	81	32
	Taken off list	2	1	3	9	11
	DD graft	43	57	42	48	50
	Died on List	0	0	0	2	3
	Active end of year	18 ¹	30	49	71	39
	Active start of year	7	4	4	4	5
	Made active	3	4	7	6	4
New Zeeland	Taken off list	3	1	3	2	2
New Zealand	DD graft	2	3	4	2	6
	Died on list	1	0	0	1	0
	Active end of year	4	4	4	5	1

Table 11.5 Deceased Donor Pancreas Transplant Waiting List Activity, 2014 – 2018

¹Data may differ to that previously published as data is updated in subsequent years in ANZIPTR.

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.

		U 27				
	Event	2014	2015	2016	2017	2018
Australia	Active start of year	4	4	5	4	3
	Made active	0	2	0	1	0
	Taken off list	0	0	0	0	1
	DD graft	0	1	1	1	1
	Died on list	0	0	0	1	0
	Active end of year	4	5	4	3	1

Table 11.6 Deceased Donor Intestine Waiting List Activity, 2014 - 2018



Deceased Organ Transplant Outcome Data

SUMMARY

This chapter reports graft survival at one and five years of solid organ transplants performed in Australia and New Zealand. Data provided here is supplied by each of the transplant outcome registries.

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Transplant Outcomes

Graft survival is defined as having sufficient function from a transplanted organ to maintain life without other organ replacement therapy. The tables below give the percentage of patients at 1-year and 5-years post-transplant who are alive and have not undergone re-transplantation or recommenced organ replacement therapy. For kidney transplant recipients return to dialysis indicates a loss of graft function. For pancreas transplant recipients, the recommencement of insulin therapy is considered loss of graft function.

All tables show the percentage of grafts functioning at 1-year and 5-years post-transplant. Kidney graft survival is calculated using the Kaplan Meier method. Graft survival is censored at date of last follow up but not for death and is unadjusted.

Further information on transplant outcomes is available for each organ at the websites of the relevant transplant outcome registries.



www.anzdata.org.au

ANZDATA collects and reports the incidence, prevalence and outcome of dialysis treatment and kidney transplantation for patients with end stage kidney disease across Australia and New Zealand.



www.anzltr3.org

ANZLTR are the collection, collation and reporting of data relating to activity and outcomes of liver transplantation in Australia and New Zealand. Data is collected on all patients listed for liver and intestine transplantation in Australia and New Zealand



www.anzcotr.org.au

ANZCOTR contains information on every heart, heart/lung and lung transplant performed in Australia and New Zealand.





www.anziptr.org

ANZIPTR registry is responsible for recording and maintaining the islet and pancreas transplants performed in Australia and New Zealand.

Kidney Graft Survival

Table 12.1 refers to all primary kidney-only transplants from deceased donors performed in Australia and New Zealand by era. Data is sourced from the Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry.

Country	Era	Number at risk at 1 year	Graft Survival at 1 year	Number at risk at 5 years	Graft Survival at 5 years
	2009-2014	2638	94.6%	1434	82.6%
Australia	2010-2015	2844	94.4%	1158	82.8%
Australia	2011-2016	3030	94.1%	794	82.4%
	2012-2017	2579	94.4%	411	83.6%
	2009-2014	288	95.3%	158	82.4%
New Zeeland	2010-2015	303	95.9%	115	80.1%
New Zealanu	2011-2016	331	95.4%	80	79.9%
	2012-2017	282	96.1%	34	76.2%

Table 12.1 Graft survival rates following primary kidney-only transplantation, by era of transplant performed

Note: Survivor function is calculated over full data and evaluated at indicated times.

For more information regarding graft and patient survival, refer to the ANZDATA website www.anzdata.org.au

Liver Graft Survival

Table 12.2 refers to all primary liver-only transplants performed in Australia and New Zealand by era. Data is sourced from the Australia and New Zealand Liver Transplant (ANZLTR) Registry.

Table 12.2 Graft survival rates following primary liver-only transplantation, by era of transplant performed

Country	Era	Number at risk at 1 year	Graft Survival at 1 year	Number at risk at 5 years	Graft Survival at 5 years
	2009-2014	1086	89.4%	805	81.2%
Australia	2010-2015	1169	90.5%	669	82.7%
Ausualid	2011-2016	1257	91.1%	524	83.9%
	2012-2017	1335	91.8%	379	84.6%
	2009-2014	207	92.4%	156	83.8%
Now Zooland	2010-2015	211	91.7%	120	81.1%
	2011-2016	225	91.8%	83	78.9%
	2012-2017	233	91.0%	49	78.4%

Note: Survivor function is calculated over full data and evaluated at indicated times. Primary (first) graft survival data only.

For more information regarding graft and patient survival, refer to the ANZLTR website www.anzltr3.org.au

Cardiothoracic Graft Survival

Table 12.3 and 12.4 refer to all heart and lung transplants performed in Australia and New Zealand by era. Data is sourced from the Australia and New Zealand Cardiothoracic (ANZCOTR) Registry.

Heart

Table 12.3 Graft survival rates following heart transplantation, by era of transplant performed

Country	Era	Number at risk at 1 year	Graft Survival at 1 year	Number at risk at 5 years	Graft Survival at 5 years
	2009-2014	418	87.6%	343	81.0%
Australia	2010-2015	452	87.8%	312	81.9%
Australia	2011-2016	505	89.5%	260	84.7%
	2012-2017	533	90.6%	207	85.4%
	2009-2014	71	88.7%	54	76.1%
Now Zooland	2010-2015	72	87.5%	47	74.9%
New Zealand	2011-2016	72	87.5%	39	75.7%
	2012-2017	85	89.4%	31	79.9%

Note: Survivor function is calculated over full data and evaluated at indicated times.

Lung

Table 12.4 Graft survival rates following lung transplantation, by era of transplant performed

Country	Era	Number at risk at 1 year	Graft Survival at 1 year	Number at risk at 5 years	Graft Survival at 5 years
	2009-2014	894	92.4%	650	68.1%
Australia	2010-2015	967	92.5%	603	70.4%
Australia	2011-2016	1040	91.9%	519	72.2%
	2012-2017	1088	92.3%	408	73.5%
	2009-2014	75	84.0%	49	60.9%
New Zeeland	2010-2015	90	84.4%	47	58.5%
New Zealand	2011-2016	98	84.7%	42	57.7%
	2012-2017	108	84.3%	33	55.3%

Note: Survivor function is calculated over full data and evaluated at indicated times.

For more information regarding graft and patient survival, refer to the ANZCOTR website www.anzcotr.org.au

Pancreas Graft Survival

Table 12.5 refers to all pancreas transplants performed in Australia and New Zealand by era. Islet cell transplants are not included. Data is sourced from the Australia and New Zealand Islets and Pancreas (ANZIPTR) Registry.

Country	Era	Number at risk at 1 year	Graft Survival at 1 year	Number at risk at 5 years	Graft Survival at 5 years
	2009-2014	188	91.3%	138	85.2%
Australia	2010-2015	197	91.7%	104	85.7%
Australia	2011-2016	216	92.0%	76	85.6%
	2012-2017	237	93.4%	55	87.2%
	2009-2014	13	92.3%	9	92.3%
New Zeeland	2010-2015	14	92.7%	8	92.9%
New Zealand	2011-2016	15	93.3%	7	93.3%
	2012-2017	18	93.8%	4	93.8%

Table 12.5 Graft survival rates following pancreas transplantation, by era of transplant performed

Note: Survivor function is calculated over full data and evaluated at indicated times.

For more information regarding graft and patient survival, refer to the ANZIPTR website www.anziptr.org.au