



SECTION 8

Deceased Donor Lung Donation

SUMMARY

This section summarises lung donation activity from deceased donors in 2022, compared with previous years. The rate of lungs transplanted in 2022 was 5.5 per million population (pmp) in Australia and 3.1 pmp in New Zealand.

Contents

Lung Donation	3
Age of Lung Donors	4
Donor Lung Function.....	4
Australia	4
New Zealand	5
Lungs Not Retrieved	5
Lungs Retrieved and Not Utilised for Transplantation	5
Outcome of Lung Donation	6

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 the care of donors, informing on the quality of transplant organs and transplant recipient outcomes.

One organ donor can benefit a number of recipients suffering from end stage organ disease. One donor could donate up to nine 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 impact of the COVID-19 pandemic continued to be felt across the health sector in 2022, causing a decrease in organ and tissue donation activity across the last 3 years. However, a small increase in organ donors and the number of people receiving transplants in 2022 points to early signs of recovery from the impacts of COVID-19.

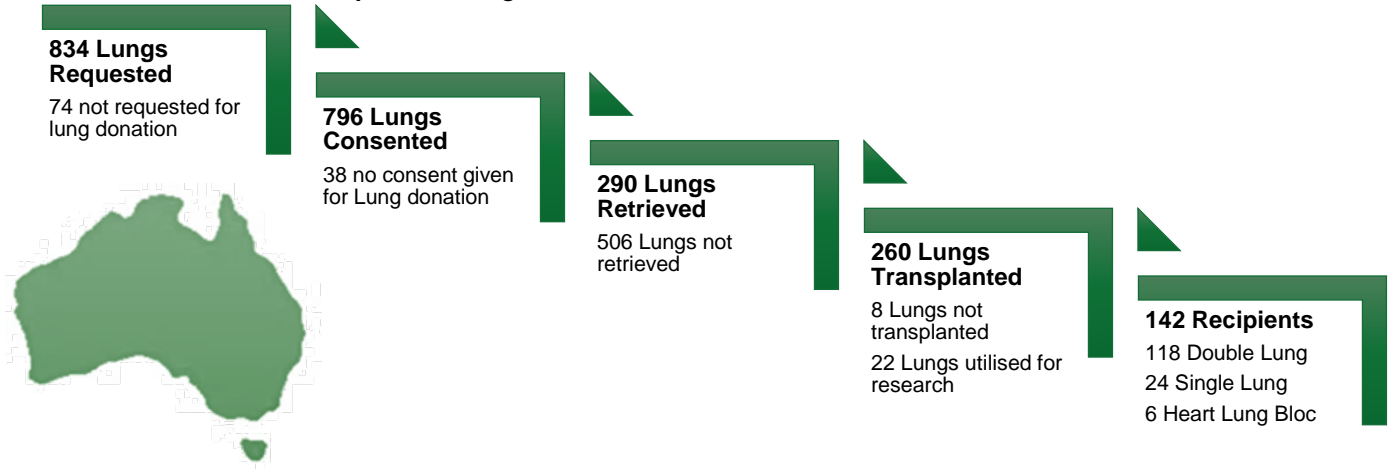
Suggested Citation

ANZOD Registry. 2023 Annual Report, Section 8: Deceased Donor Lung Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2023. Available at: www.anzdata.org.au

Lung Donation

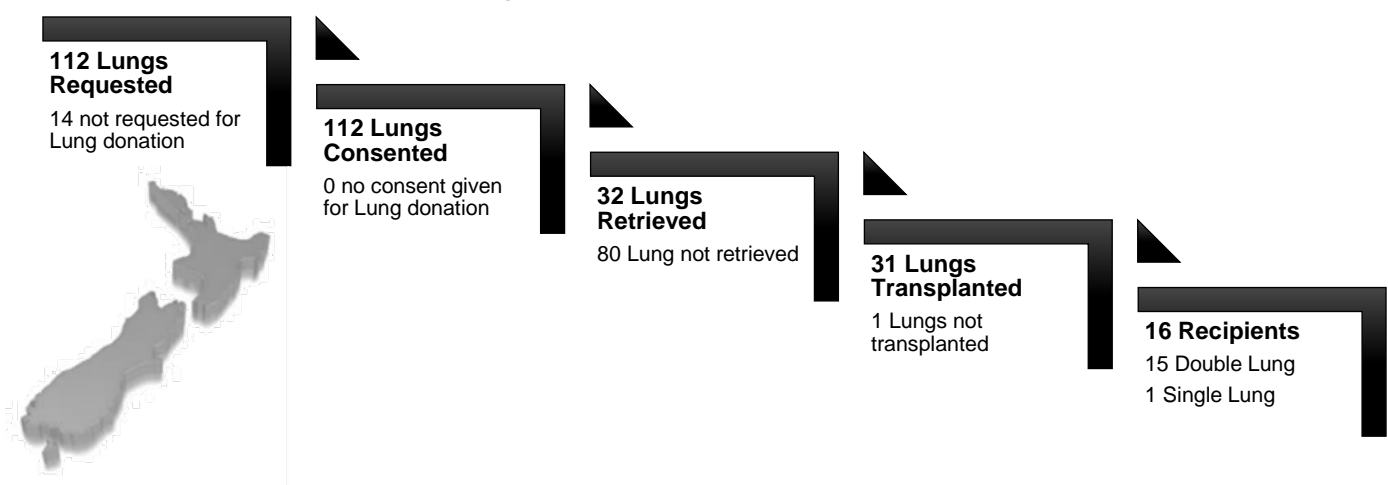
Of the 454 deceased organ donors in 2022 in Australia, 398 donors consented to lung donation. From these donors, 290 lungs were retrieved with 260 lungs transplanted. There were 142 lung transplant recipients (5.5 pmp), a decrease of 15.0% from the previous year. Of these 142 lung transplant recipients, 6 received heart/double lung transplants. Figure 8.1.1 shows the outcomes of requests for lung donation in Australia for 2022.

Table 8.1.1 Outcomes of Request for Lung Donation from Actual Donors in Australia 2022



Of the 63 deceased organ donors in New Zealand in 2022, 56 donors consented to lung donation. From these donors, 32 lungs were retrieved and 31 were transplanted. There were 16 lung transplant recipients (3.1 pmp), a decrease of 46.7% from the previous year. Figure 8.1.2 shows the outcomes of requests for lung donation in New Zealand for 2022.

Table 8.1.2 Outcomes of Request for Lung Donation from Actual Donors in New Zealand 2022



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 1998–2022

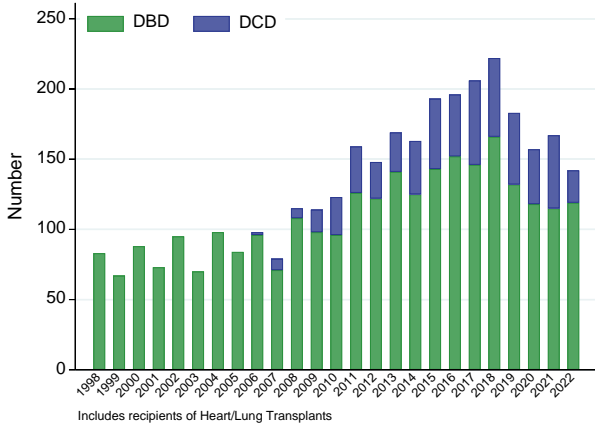


Figure 8.2.2 - Recipients of Lung Transplants by Donor Pathway New Zealand 1998–2022

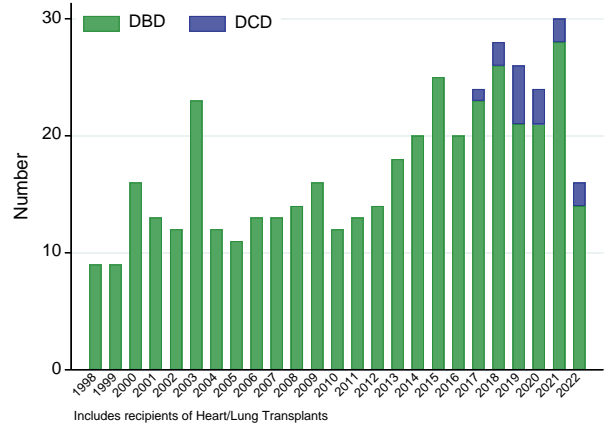
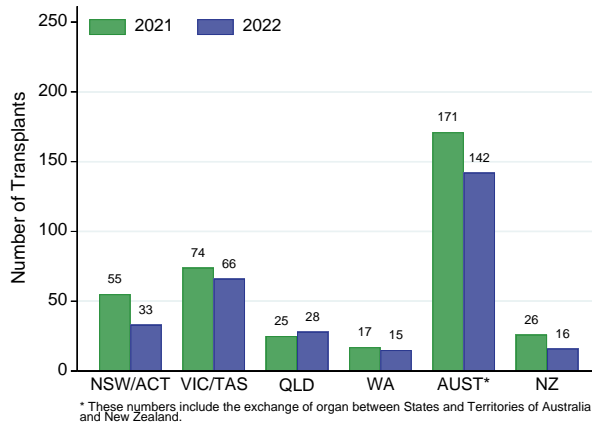


Figure 8.3 - Deceased Donor Lung Transplant Recipients* by Transplant Region, Australia and New Zealand, 2021–2022



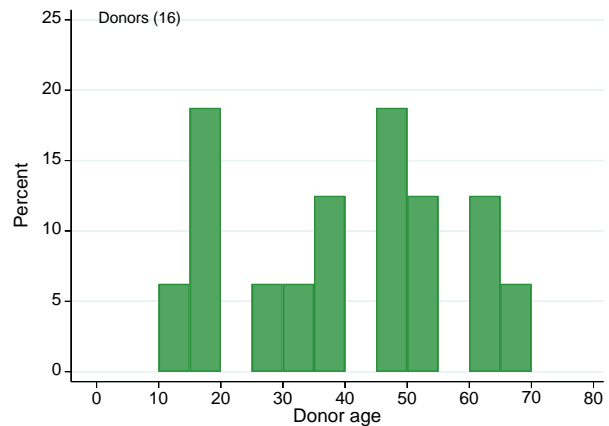
Age of Lung Donors

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

Figure 8.4.1 - Age of Donors Providing Retrieved Lungs Australia 2022



Figure 8.4.2 - Age of Donors Providing Retrieved Lungs New Zealand 2022



Donor Lung Function

Australia

In Australia, 83 (56.8%) donors with lungs retrieved had a bronchoscopy in 2022. 29 donors had chest trauma; these included chest drains and pneumothoraces.

The arterial blood gases were taken on 100% Fraction of Inspired Oxygen (FiO₂) and Positive End Expiratory Pressure (PEEP) of 5cm for 416 actual donors. 71.6% (298) had a PEEP greater than 5cm. Of those donors with lungs retrieved, 67.8% (99) had a PEEP greater than 5cm.

The results from the 426 actual donors with a pH measurement show 17.8% to be acidotic (pH <7.35) and 17.1% to be alkalotic (pH>7.45). Of those donors with lungs retrieved, 14.4% were acidotic and 17.8% were alkalotic.

For the 426 actual donors with measurements, oxygenation measured as Partial Pressure of Oxygen (PaO₂) ranged from 56 to 581 mmHg with a median of 342.5 mmHg. PaCO₂ ranged from 18 to 94 with a median of 40 mmHg. For donors with lungs retrieved, oxygenation measured as PaO₂ ranged from 96 to 581 mmHg with a median of 423 mmHg. The partial Pressure of Carbon Dioxide (PaCO₂) ranged from 26.3 to 52 with a median of 38.1 mmHg.

New Zealand

In New Zealand, there were 4 (25.0%) lung donors who had a bronchoscopy in 2022. 3 donors had chest trauma.

Of the 16 donors with lungs retrieved, 15 had 100% FiO₂; 11 had a PEEP greater than 5cm.

The arterial blood gas results from these donors with lungs retrieved show 12.5% (2 donors) to be acidotic (pH < 7.35) and 4 (25.0%) were alkalotic (pH > 7.45).

For these donors with lungs retrieved, oxygenation measured as PaO₂ ranged from 279 to 562 mmHg with a median of 407.5 mmHg. PaCO₂ ranged from 28.9 to 44.6 mmHg with a median of 40.5 mmHg.

Lungs Not Retrieved

In 2022, there were 506 lungs not retrieved from Australian donors and 80 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 2022

Reason	Australia	New Zealand
Intraoperative assessment	20	2
Post WCRS did not die in timeframe	2	0
Cardiac arrest prior to WCRS/X- Clamp	0	0
Surgical retrieval injury	0	0
Declined in offer process	333	66
Organ not offered - pathway	2	0
Organ not offered - age of donor	4	4
Organ not offered - not medically suitable	131	4
No consent from Coroner	14	0
Family withdrew consent	0	4
Total	506	80

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 2018–2022

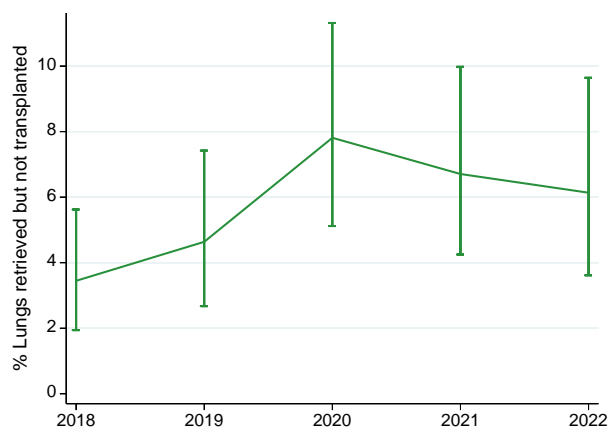


Figure 8.5.2 - Non-utilisation Rate of Retrieved Lungs - New Zealand 2018–2022

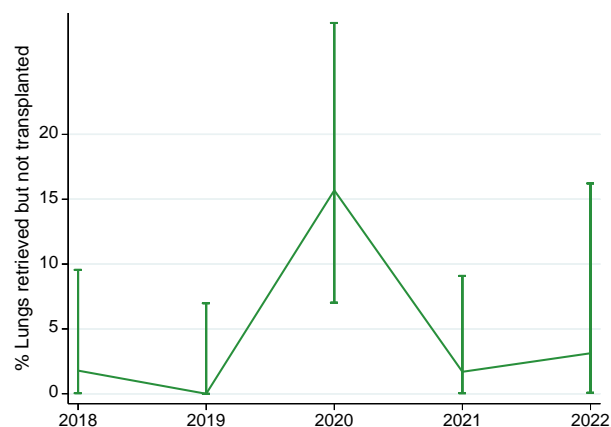


Table 8.2 tabulates the reasons lungs were not used for transplantation after retrieval for that purpose since 2021.

Table 8.2 Reasons Lung Retrieved & Not Utilised for Transplantation, 2021 – 2022

Country	Reason	2021	2022
Australia	Intraoperative assessment	6	2
	Assessment at transplant unit	6	2
	Surgical retrieval injury	0	0
	Other	3	1
Total		15	5
New Zealand	Intraoperative assessment	0	0
	Assessment at transplant unit	0	0
	Surgical retrieval injury	0	0
	Other	1	1
Total		1	1

Outcome of Lung Donation

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

Table 8.3.1 Outcome of Request for Lung Donation in Australia, 2018–2022

Outcome of Request	2018	2019	2020	2021	2022
Total Donors	554	548	463	421	454
Lungs Requested for Donation	1008	988	852	768	834
Lungs Not Requested for Donation	100	108	74	74	74
Lungs with Consent Given	966	956	826	748	796
Lungs with Consent Not Given	42	32	26	20	38
Lungs Retrieved	435	352	322	335	290
Single Lung Retrieved	7	6	2	5	10
Double Lung Retrieved	214	173	160	165	140
Lungs Not Retrieved	531	604	504	413	506
Lungs Transplanted	420	329	295	306	260
Total Lungs Not Used	15	16	25	21	8

Lungs Used for Research*	0	7	2	0	0
Lungs Retrieved for Research**	0	0	0	7	13
Lungs Retrieved for Transplantation and Used for Research***	0	0	0	1	9
Recipient Transplanted	222	183	157	167	142
Double Lung Recipient	198	146	138	139	118
Single Lung (L) Recipients	12	18	7	11	10
Single Lung (R) Recipients	12	19	12	17	14
Heart/Lung Recipients	7	3	6	4	6
Lung Non-Utilisation Rate	3.4%	4.6%	7.8%	6.7%	6.1%
Lung Utilisation Rate	96.6%	95.4%	92.2%	93.3%	93.9%

*Primary/Secondary Intention not recorded prior to Nov 2020

**Use for research primary intention of retrieval

**Use for research secondary intention of retrieval

Table 8.3.2 Outcome of Request for Lung Donation in New Zealand, 2018–2022

Outcome of Request	2018	2019	2020	2021	2022
Total Donors	62	74	64	66	63
Lungs Requested for Donation	110	124	104	112	112
Lungs Not Requested for Donation	14	24	24	20	14
Lungs with Consent Given	110	124	104	112	112
Lungs with Consent Not Given	0	0	0	0	0
Lungs Retrieved	56	51	51	59	32
Single Lung Retrieved	0	1	1	1	0
Double Lung Retrieved	28	25	25	29	16
Lungs Not Retrieved	54	73	53	53	80
Lungs Transplanted	55	51	43	58	31
Total Lungs Not Used	1	0	8	1	1
Lungs Used for Research*	0	0	0	0	0
Lungs Retrieved for Research**	0	0	0	0	0
Lungs Retrieved for Transplantation and Used for Research***	0	0	0	0	0
Recipient Transplanted	28	26	24	30	16
Double Lung Recipient	27	25	19	28	15
Single Lung (L) Recipients	1	1	1	0	1
Single Lung (R) Recipients	0	0	4	2	0
Lung Non-Utilisation Rate	1.8%	0.0%	15.7%	1.7%	3.1%
Lung Utilisation Rate	98.2%	100.0%	84.3%	98.3%	96.9%

*Primary/Secondary Intention not recorded prior to Nov 2020

**Use for research primary intention of retrieval

**Use for research secondary intention of retrieval