



SECTION 8

Deceased Donor Lung Donation

SUMMARY

This section summarises lung donation activity from deceased donors in 2020, compared with previous years. The rate of lungs transplanted in 2020 was 6.1 pmp in Australia and 4.7 pmp in New Zealand.

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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 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 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.

Of importance for this reporting period was the emergence of COVID-19 that spread across the world, with the first reported case in Australia on 25th January 2020. Rapid evolution of the pandemic saw precautionary steps taken by the transplant sector which effected the organ donation programs in Australia and New Zealand. During the peak emergence of COVID-19 (late-March through to mid-May 2020) the COVID-19 National Transplantation and Donation Rapid Response Taskforce was established, comprised of members from the Transplantation Society of Australia and New Zealand (TSANZ) and Organ Tissue Authority (OTA). Recommendations from the Taskforce saw transplant programs for kidney, pancreas and islets transplants suspended and restrictions placed on liver, heart, lung, pediatric and multi-organ transplant programs to consider only recipients likely to die within four months if not transplanted. This was subject to case-by-case review of donor-recipient characteristics at a unit level. Limitations on movement of organs between states was also observed during this period due to challenges faced including border closures, flight restrictions and COVID-19 restrictions.

Consideration of the effect of the COVID-19 pandemic should be given when analysing the data included in this chapter.

Suggested Citation

ANZOD Registry. 2021 Annual Report, Section 8: Deceased Donor Lung Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2021. Available at: www.anzdata.org.au

Lung Donation

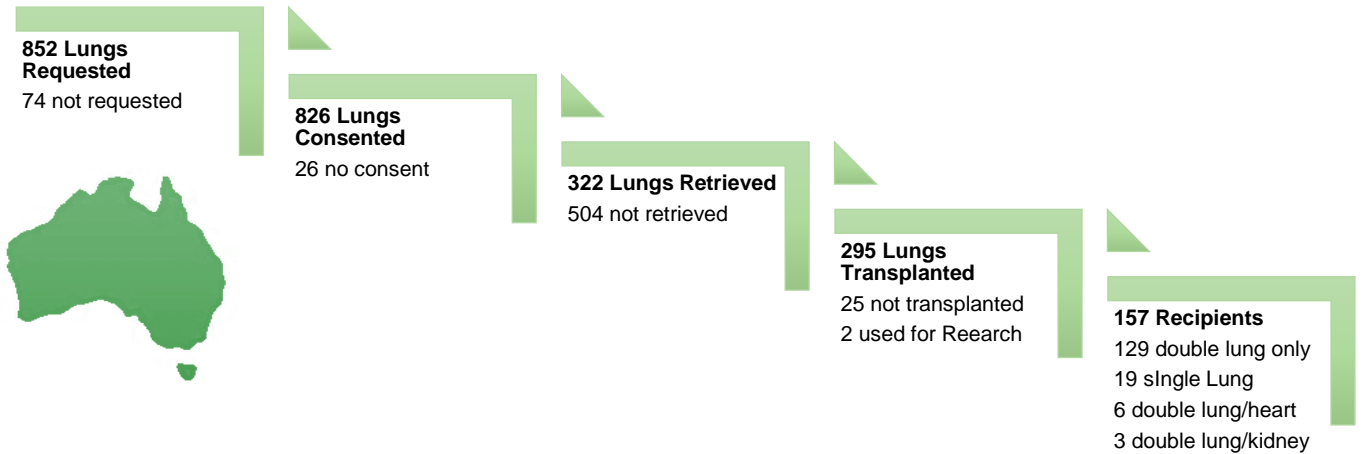
Of the 463 deceased organ donors in 2020 in Australia, 413 donors consented to lung donation. From these donors, 322 lungs were retrieved with 295 lungs transplanted.

There were 157 lung transplant recipients (6.1 pmp), a decrease of 14.2% compared to the previous year.

Of these 157 lung transplant recipients, 6 received heart/double lung transplants and 3 received double lung/kidney transplants.

Figure 8.1.1 shows the outcomes of requests for lung donation in Australia for 2020.

Figure 8.1.1 Outcomes of Request for Lung Donation from Actual Donors in Australia 2020



Of the 64 deceased organ donors in New Zealand in 2020, 52 donors consented to lung donation.

From these donors, 51 lungs were retrieved and 43 were transplanted.

There were 24 lung transplant recipients (4.7 pmp), a decrease of 7.7% on the previous year.

Figure 8.1.2 Outcomes of Request for Lung Donation from Actual Donors in New Zealand 2020

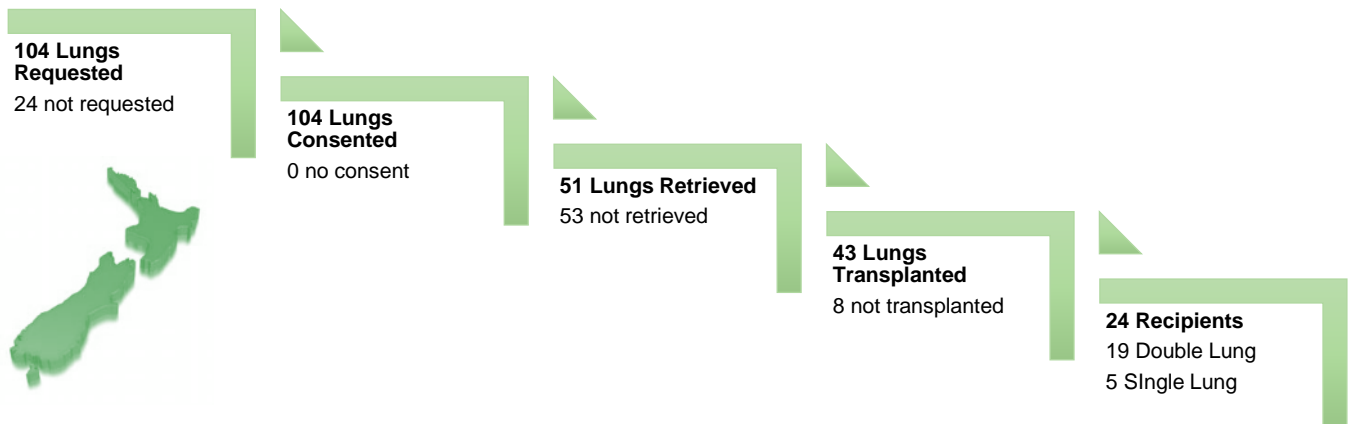


Figure 8.2 below shows the number of lung recipients in Australia and New Zealand by donation pathway, and Figure 8.3 shows the number of lung recipients in Australia and New Zealand by transplant State/Territory/Country.

Figure 8.2.1 - Recipients of Lung Transplants by Donor Pathway Australia 1998–2020

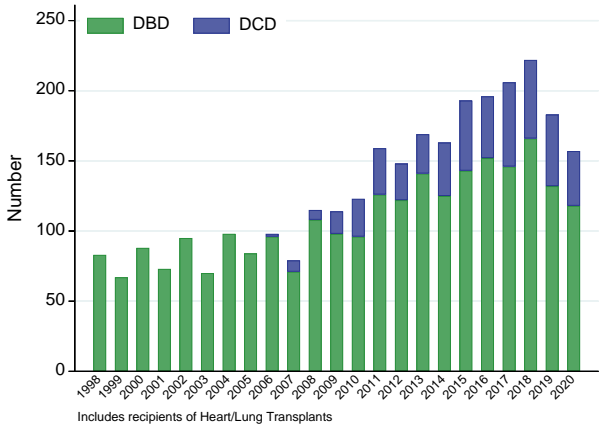


Figure 8.2.2 - Recipients of Lung Transplants by Donor Pathway New Zealand 1998–2020

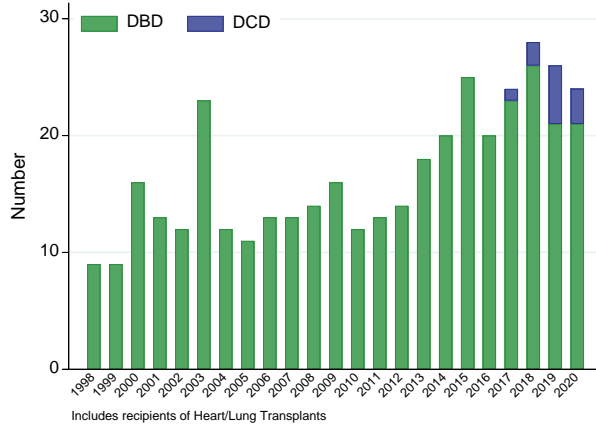
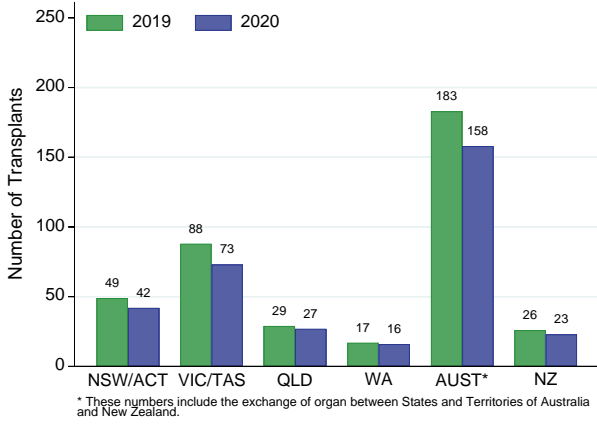


Figure 8.3 - Deceased Donor Lung Transplant Recipients* by Transplant Region, Australia and New Zealand, 2019–2020



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 2020

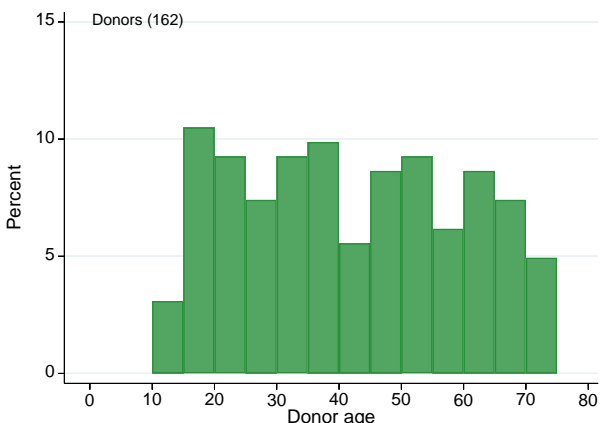
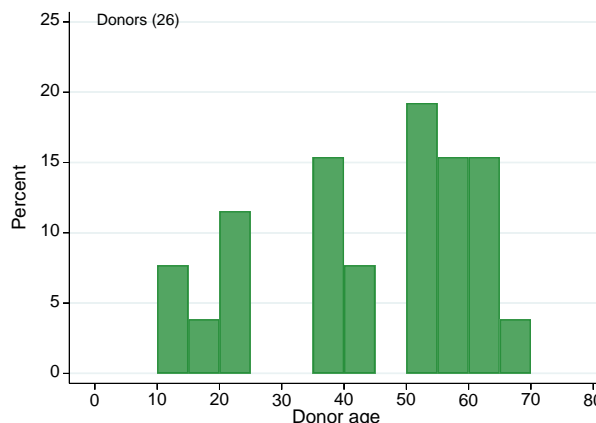


Figure 8.4.2 - Age of Donors Providing Retrieved Lungs New Zealand 2020



Donor Lung Function

Australia

In Australia, 68 (42.0%) donors with lungs retrieved in 2020 had a bronchoscopy and 22 donors had chest trauma; these included chest drains and pneumothoraces.

The arterial blood gases were taken on 100% FiO₂ and PEEP of 5cm for 417 actual donors. 68.3% (285) had a PEEP greater than 5cm. Of those donors with lungs retrieved, 64.2% (104) had a PEEP greater than 5cm.

The results from the 432 actual donors with a pH measurement show 16.7% to be acidotic (pH <7.35) and 16.7% to be alkalotic (pH >7.45). Of those donors with lungs retrieved, 11.7% were acidotic and 20.4% were alkalotic.

For the 432 actual donors with measurements, oxygenation (measured as PaO₂) ranged from 51 to 624 mmHg with a median of 336.5 mmHg. PaCO₂ ranged from 20 to 478 with a median of 40 mmHg. For donors with lungs retrieved, oxygenation measured as PaO₂ ranged from 75 to 624 mmHg with a median of 434 mmHg. PaCO₂ ranged from 24 to 478 with a median of 39 mmHg.

New Zealand

In New Zealand, there were 7 (26.9%) lung donors in 2020 who had a bronchoscopy and 1 donor had chest trauma.

For 24 of the donors the arterial blood gases were taken on 100% FiO₂. 2 had FiO₂ recorded as 50%. 12 had a PEEP greater than 5cm.

The arterial blood gas results from these donors with lungs retrieved show 3.8% (1 donors) to be acidotic (pH < 7.35) and 7 (26.9%) were alkalotic (pH > 7.45). For these donors with lungs retrieved, oxygenation measured as PaO₂ ranged from 307 to 479 mmHg with a median of 382 mmHg. PaCO₂ ranged from 23.7 to 373 mmHg with a median of 39.5 mmHg.

Lungs Not Retrieved

In 2020, there were 504 lungs not retrieved from Australian donors and 53 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 2020

Reason	Australia	New Zealand
Logistics	6	0
Not Medically Suitable	220	40
Surgically Unsuitable	0	0
Trauma to Organ	9	4
No Suitable Recipients	249	5
Age of Donor	6	4
DCD Donor	0	0
Consent Withdrawn	14	0
Others	0	0
Total	504	53

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 2016–2020

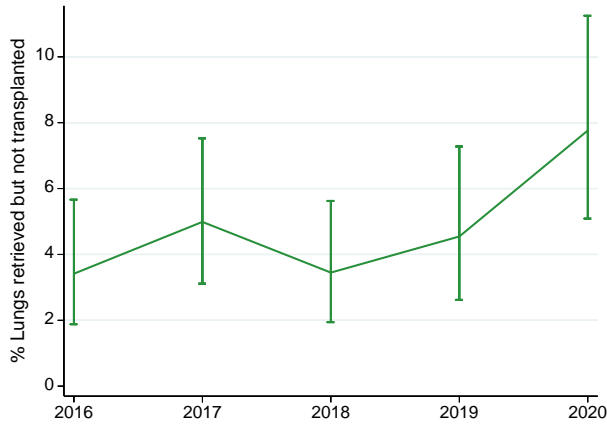


Figure 8.5.2 - Non-utilisation Rate of Retrieved Lungs - New Zealand 2016–2020

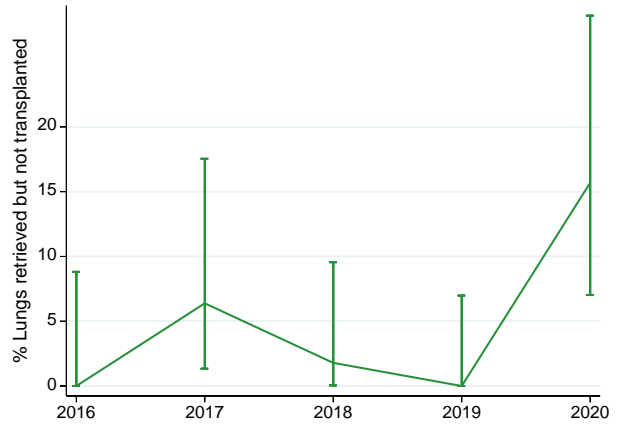


Table 8.2 tabulates the reasons lungs were not used for transplantation after retrieval for that purpose since 2016.

Table 8.2 Reasons Lung Retrieved & Not Utilised for Transplantation, Australia (New Zealand) 2016–2020

Reason	2016	2017	2018	2019	2020
Logistics	0 (0)	0 (0)	0 (0)	0 (0)	0 (1)
Not Medically Suitable	8 (0)	9 (0)	7 (0)	5 (0)	10 (5)
Not Surgically Suitable	0 (0)	1 (1)	0 (0)	1 (0)	3 (0)
Trauma to Organ	0 (0)	1 (0)	1 (1)	0 (0)	0 (0)
No Suitable Recipients	0 (0)	1 (0)	1 (0)	5 (0)	3 (1)
Recipient Issue	1 (0)	2 (1)	0 (0)	0 (0)	1 (0)
Other	0 (0)	0 (0)	1 (0)	1 (0)	0 (0)
Total	9 (0)	14 (2)	10 (1)	12 (0)	17 (7)

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, 2016–2020

Outcome of Request	2016	2017	2018	2019	2020
Total Donors	503	510	554	548	463
Lungs Requested for Donation	912	936	1008	988	852
Lungs Not Requested for Donation	94	84	100	108	74
Lungs with Consent Given	886	910	966	956	826
Lungs with Consent Not Given	26	26	42	32	26
Lungs Retrieved	410	421	435	352	322
Single Lung Retrieved	2	3	7	6	2
Double Lung Retrieved	204	209	214	173	160
Lungs Not Retrieved	476	489	531	604	504
Lungs Transplanted	386	396	420	329	295
Total Lungs Not Used	14	21	15	16	25
Lungs Retrieved for Research and Not for Transplantation	10	4	0	7	2
Recipient Transplanted	196	206	222	183	157
Double Lung Recipient	190	190	198	146	138
Single Lung (L) Recipients	5	5	12	18	7
Single Lung (R) Recipients	1	11	12	19	12
Heart/Lung Recipients	7	5	7	3	6
Lung Non-Utilisation Rate	3.4%	5.0%	3.4%	4.5%	7.8%
Lung Utilisation Rate	94.1%	94.1%	96.6%	93.5%	91.6%

Table 8.3.2 Outcome of Request for Lung Donation in New Zealand, 2016–2020

Outcome of Request	2016	2017	2018	2019	2020
Total Donors	61	73	62	74	64
Lungs Requested for Donation	110	112	110	124	104
Lungs Not Requested for Donation	12	34	14	24	24
Lungs with Consent Given	110	112	110	124	104
Lungs with Consent Not Given	0	0	0	0	0
Lungs Retrieved	40	47	56	51	51
Single Lung Retrieved	0	1	0	1	1
Double Lung Retrieved	20	23	28	25	25
Lungs Not Retrieved	70	65	54	73	53
Lungs Transplanted	40	44	55	51	43
Total Lungs Not Used	0	3	1	0	8
Lungs Retrieved for Research and Not for Transplantation	0	0	0	0	0
Recipient Transplanted	20	24	28	26	24
Double Lung Recipient	20	20	27	25	19
Single Lung (L) Recipients	0	3	1	1	1
Single Lung (R) Recipients	0	1	0	0	4
Lung Non-Utilisation Rate	0.0%	6.4%	1.8%	0.0%	15.7%
Lung Utilisation Rate	100.0%	93.6%	98.2%	100.0%	84.3%