



## SECTION 6

### Deceased Donor Liver and Intestine Donation

#### SUMMARY

*This section summarises liver donation activity from deceased donors in 2020, compared with previous years. The rate of liver transplant procedures in 2020 was 10.9 pmp in Australia and 9.6 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 25<sup>th</sup> 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 6: Deceased Donor Liver and Intestine Donation. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2021. Available at: [www.anzdata.org.au](http://www.anzdata.org.au).

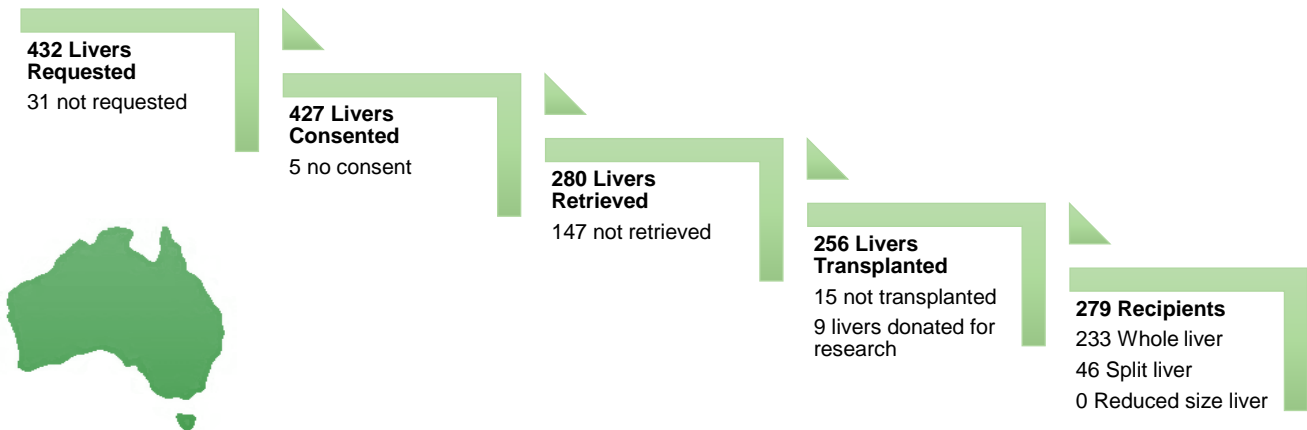
## Liver Donation

Of the 463 deceased organ donors in Australia in 2020, 280 (60.5%) had their liver retrieved. From these liver donors, there were 279 recipients in Australia. 8 recipients received a combined liver/kidney transplant.

46 partial liver transplants were performed in Australia using 23 livers and the 'split' liver technique (transplanting one liver into two recipients). There were 0 recipients that received a 'reduced size' liver.

The rate of liver transplants in Australia for 2020 was 10.9 per million population (pmp). Figure 6.1.1 shows the outcomes of requests for liver donation in Australia.

Figure 6.1.1 Outcomes of Request for Liver Donation from Actual Donors in Australia 2020



In New Zealand there were 42 livers retrieved, and 42 utilised for transplantation into 49 liver recipients. Of these, there were 14 split liver transplants performed and 0 reduced size livers transplanted. 1 recipient received a combined liver/pancreas transplant.

In 2020 in New Zealand, there was a rate of 9.6 liver transplant procedures per million population (pmp). Figure 6.1.2 shows the outcomes of requests for liver donation in New Zealand.

Figure 6.1.2 Outcomes of Request for Liver Donation from Actual Donors in New Zealand 2019

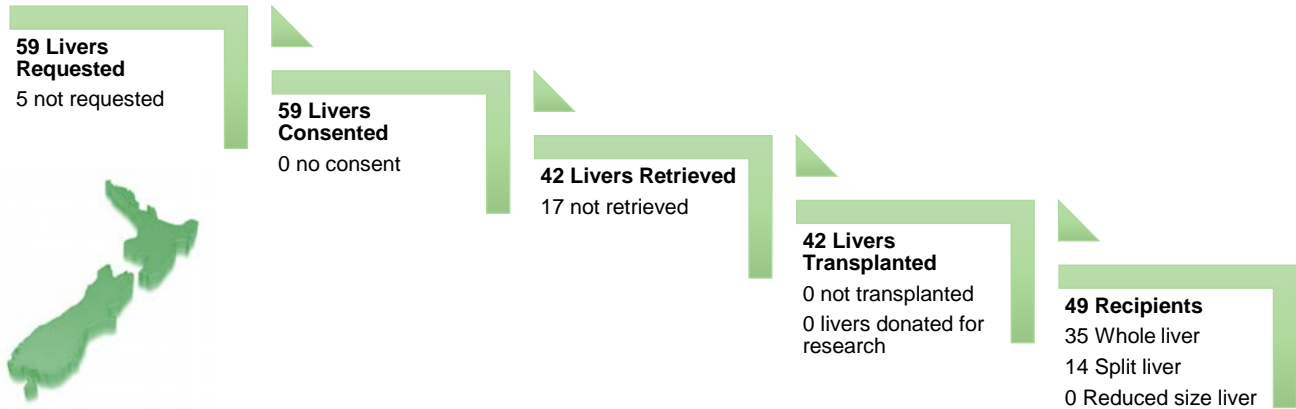
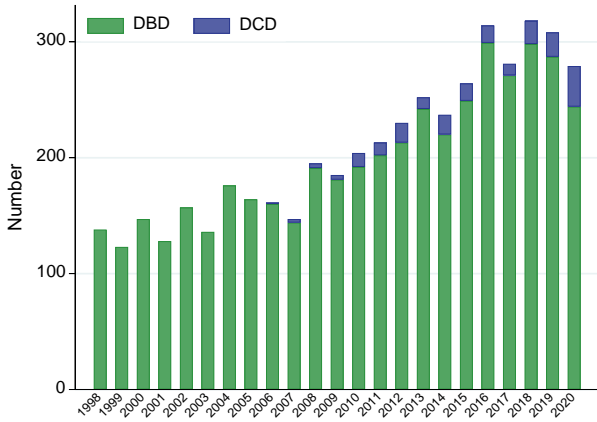


Figure 6.2 shows the number of recipients of liver transplants by donation pathway in Australia and New Zealand from 1998 to 2020.

**Figure 6.2.1 - Recipients of Liver Transplantation by Donation Pathway Australia 1998–2020**



**Figure 6.2.2 - Recipients of Liver Transplantation by Donation Pathway New Zealand 1998–2020**

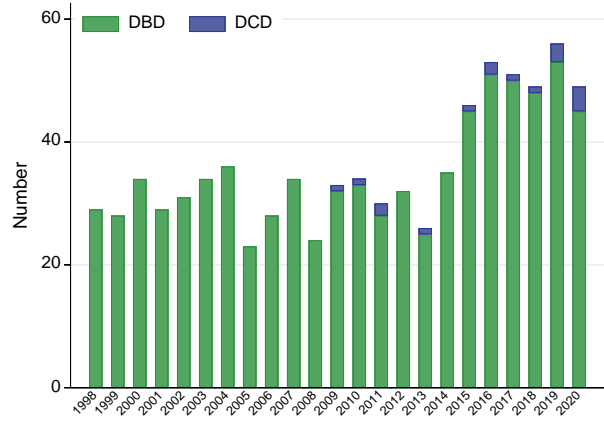
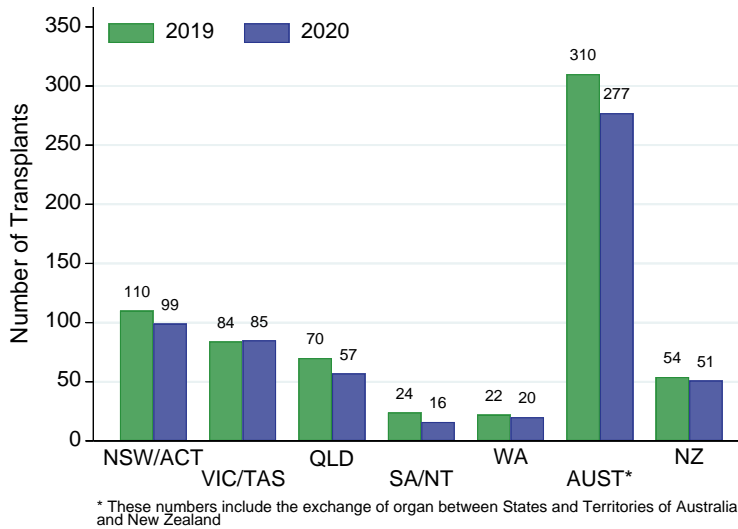


Figure 6.3 compares the number of deceased donor liver recipients by transplant region for 2019 and 2020

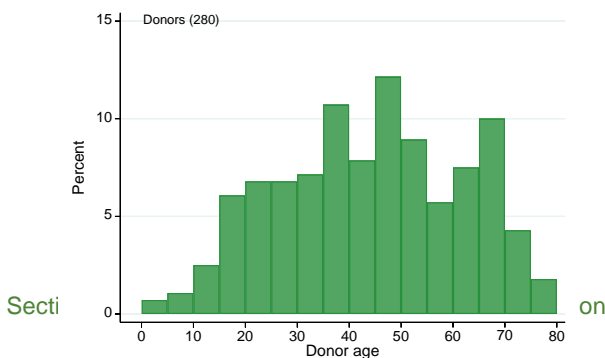
**Figure 6.3 - Deceased Donor Liver Transplant Recipients\* by Transplant Region, Australia and New Zealand, 2019–2020**



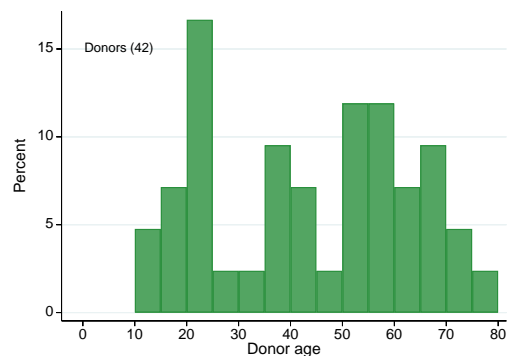
## Age of Liver Donors

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

**Figure 6.4.1 - Age of Donors Providing Retrieved Livers Australia 2020**



**Figure 6.4.2 - Age of Donors Providing Retrieved Livers New Zealand 2020**



## Donor Liver Function

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

**Table 6.1 Number of Donors with Liver Function Tests above Normal 2020**

| Liver Function Tests                    | Australia                   |              | New Zealand                 |              |
|---|-----------------------------|--------------|-----------------------------|--------------|
|   | Donors with value recorded* | Above Normal | Donors with value recorded* | Above Normal |
| Alanine Transaminase ALT > 40 µ/L       | 280                         | 152          | 39                          | 13           |
| Aspartate Transaminase AST > µ/L        | 253                         | 158          | 33                          | 15           |
| Gamma Glutamyl Transferase GGT > 60 µ/L | 280                         | 88           | 39                          | 9            |
| Alkaline Phosphatase > 116 µ/L          | 280                         | 38           | 42                          | 5            |
| Total Bilirubin > 20 µmol/L             | 280                         | 30           | 42                          | 8            |
| All 5 tests completed                   | 253                         | .            | 29                          | .            |
| At least 1 test completed               | 280                         | .            | 42                          | .            |

\*Not all donors have all tests reported

## Livers Not Retrieved

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

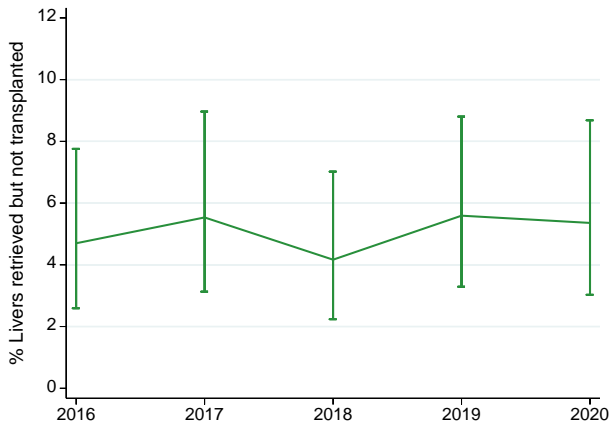
**Table 6.2 Reasons for Liver Not Retrieved 2020**

| Reason                 | Australia  | New Zealand |
|------------------------|------------|-------------|
| Logistics              | 0          | 0           |
| Not Medically Suitable | 61         | 16          |
| Surgically Unsuitable  | 0          | 0           |
| Trauma to Organ        | 1          | 1           |
| No Suitable Recipients | 53         | 0           |
| Age of Donor           | 15         | 0           |
| DCD Donor              | 16         | 0           |
| Consent Withdrawn      | 0          | 0           |
| Others                 | 1          | 0           |
| <b>Total</b>           | <b>147</b> | <b>17</b>   |

## 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.

**Figure 6.5.1 - Non-utilisation Rate of Retrieved Livers - Australia 2016–2020**



**Figure 6.5.2 - Non-utilisation Rate of Retrieved Livers - New Zealand 2016–2020**

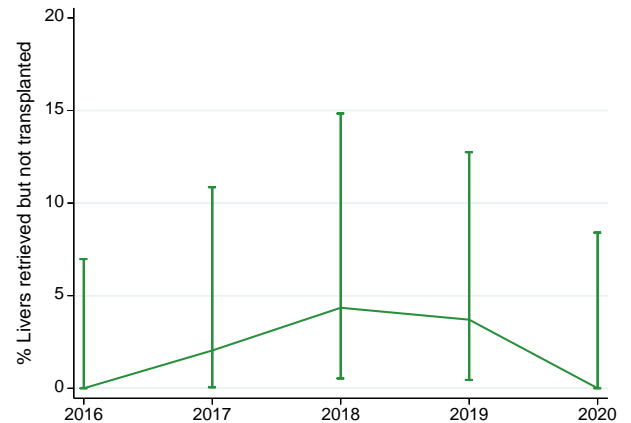


Table 6.3 tabulates the reasons livers were not used after retrieval for the purpose of transplantation since 2016.

Of the reduced size liver transplants since 2016, 10 were orphaned split liver procedures due to the other split liver having no suitable recipients (5), not being medically suitable (4) or not being surgically suitable (1).

**Table 6.3 Reasons Liver 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 (0)         |
| Not Medically Suitable  | 12 (0)        | 13 (1)        | 11 (1)        | 14 (2)        | 14 (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)         | 1 (0)         |
| No Suitable Recipients  | 0 (0)         | 0 (0)         | 1 (0)         | 0 (0)         | 0 (0)         |
| Recipient Issue         | 2 (0)         | 2 (0)         | 1 (1)         | 3 (0)         | 0 (0)         |
| Other                   | 0 (0)         | 0 (0)         | 0 (0)         | 0 (0)         | 0 (0)         |
| <b>Total</b>            | <b>14 (0)</b> | <b>15 (1)</b> | <b>13 (2)</b> | <b>17 (2)</b> | <b>15 (0)</b> |

## 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, 2016–2020*

| Outcome of Request                                       | 2016       | 2017       | 2018       | 2019       | 2020       |
|--|------------|------------|------------|------------|------------|
| <b>Total Donors</b>                                      | <b>503</b> | <b>510</b> | <b>554</b> | <b>548</b> | <b>463</b> |
| Liver Requested for Donation                             | 464        | 459        | 497        | 499        | 432        |
| Liver Not Requested for Donation                         | 39         | 51         | 57         | 49         | 31         |
| Liver Consent Given                                      | 456        | 453        | 493        | 491        | 427        |
| Liver Consent Not Given                                  | 8          | 6          | 4          | 8          | 5          |
| <b>Liver Retrieved</b>                                   | <b>298</b> | <b>271</b> | <b>312</b> | <b>304</b> | <b>280</b> |
| Liver Not Retrieved                                      | 158        | 182        | 181        | 187        | 147        |
| <b>Total Livers Transplanted</b>                         | <b>283</b> | <b>256</b> | <b>297</b> | <b>283</b> | <b>256</b> |
| Whole Liver Not Used                                     | 14         | 15         | 13         | 17         | 15         |
| Intended Split Liver (L) Not Used                        | 0          | 1          | 2          | 0          | 0          |
| Intended Split Liver (R) Not Used                        | 2          | 2          | 1          | 1          | 0          |
| Liver Retrieved for Research and Not for Transplantation | 1          | 0          | 2          | 4          | 9          |
| <b>Recipients Transplanted</b>                           | <b>314</b> | <b>281</b> | <b>318</b> | <b>308</b> | <b>279</b> |
| Whole Liver Transplants                                  | 246        | 227        | 270        | 253        | 233        |
| Split Liver Transplants                                  | 62         | 50         | 42         | 50         | 46         |
| Reduced Size Liver Transplants                           | 6          | 4          | 6          | 5          | 0          |
| Liver Non-Utilisation Rate                               | 4.7%       | 5.5%       | 4.2%       | 5.6%       | 5.4%       |
| Liver Utilisation Rate                                   | 95.0%      | 94.5%      | 95.2%      | 93.1%      | 91.4%      |

*Table 6.4.2 Outcome of Request for Liver Donation in New Zealand, 2016–2020*

| Outcome of Request                | 2016      | 2017      | 2018      | 2019      | 2020      |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|
| <b>Total Donors</b>               | <b>61</b> | <b>73</b> | <b>62</b> | <b>74</b> | <b>64</b> |
| Liver Requested for Donation      | 60        | 69        | 61        | 72        | 59        |
| Liver Not Requested for Donation  | 1         | 4         | 1         | 2         | 5         |
| Liver Consent Given               | 60        | 69        | 61        | 72        | 59        |
| Liver Consent Not Given           | 0         | 0         | 0         | 0         | 0         |
| <b>Liver Retrieved</b>            | <b>51</b> | <b>49</b> | <b>46</b> | <b>54</b> | <b>42</b> |
| Liver Not Retrieved               | 9         | 20        | 15        | 18        | 17        |
| <b>Total Livers Transplanted</b>  | <b>51</b> | <b>48</b> | <b>44</b> | <b>52</b> | <b>42</b> |
| Whole Liver Not Used              | 0         | 1         | 2         | 2         | 0         |
| Intended Split Liver (L) Not Used | 0         | 0         | 0         | 0         | 0         |
| Intended Split Liver (R) Not Used | 0         | 1         | 0         | 0         | 0         |
| <b>Recipients Transplanted</b>    | <b>53</b> | <b>51</b> | <b>49</b> | <b>56</b> | <b>49</b> |
| Whole Liver Transplants           | 49        | 42        | 39        | 47        | 35        |
| Split Liver Transplants           | 4         | 6         | 10        | 8         | 14        |
| Reduced Size Liver Transplants    | 0         | 3         | 0         | 1         | 0         |
| Liver Non-Utilisation Rate        | 0.0%      | 2.0%      | 4.3%      | 3.7%      | 0.0%      |
| Liver Utilisation Rate            | 100.0%    | 98.0%     | 95.7%     | 96.3%     | 100.0%    |

## Intestine Donation

Patients with irreversible intestinal failure and who are developing severe complications from parenteral nutrition can benefit from intestinal transplantation.

Intestinal transplants are infrequent in Australia. Only 8 intestinal transplants have been performed in Australia since 2010.

Figure 6.6 shows intestinal transplants since 2016. There have been no intestines retrieved but not utilised for transplantation.

**Figure 6.6 - Intestine Transplants Australia 2016–2020**

