Chapter 5

Organ Data

Kidney Donation

In Australia, there were 630 kidney transplant recipients in 2013, an increase of 29.7% since 2009. Of the 630 kidney transplant procedures performed, there were nine double adult, six enbloc, thirty three combined kidney/ pancreas, one kidney/heart transplant and five kidney/liver recipients.

In New Zealand, there were 55 kidney recipients including two double adult and one enbloc kidney and two combined kidney/pancreas transplant procedures.

Figures 5.1 to 5.5 show the outcome of requests for kidney donation, the number of kidney transplants by donation pathway and the number of kidney recipients by jurisdiction, in Australia and New Zealand respectively. In particular figure 5.3 shows an increase in DCD kidneys from 2006 to 2011, and DBD kidneys from 2010 to 2013 in Australia.

Figure 5.1

Outcome of Request for Kidney Donation
Australia 2013

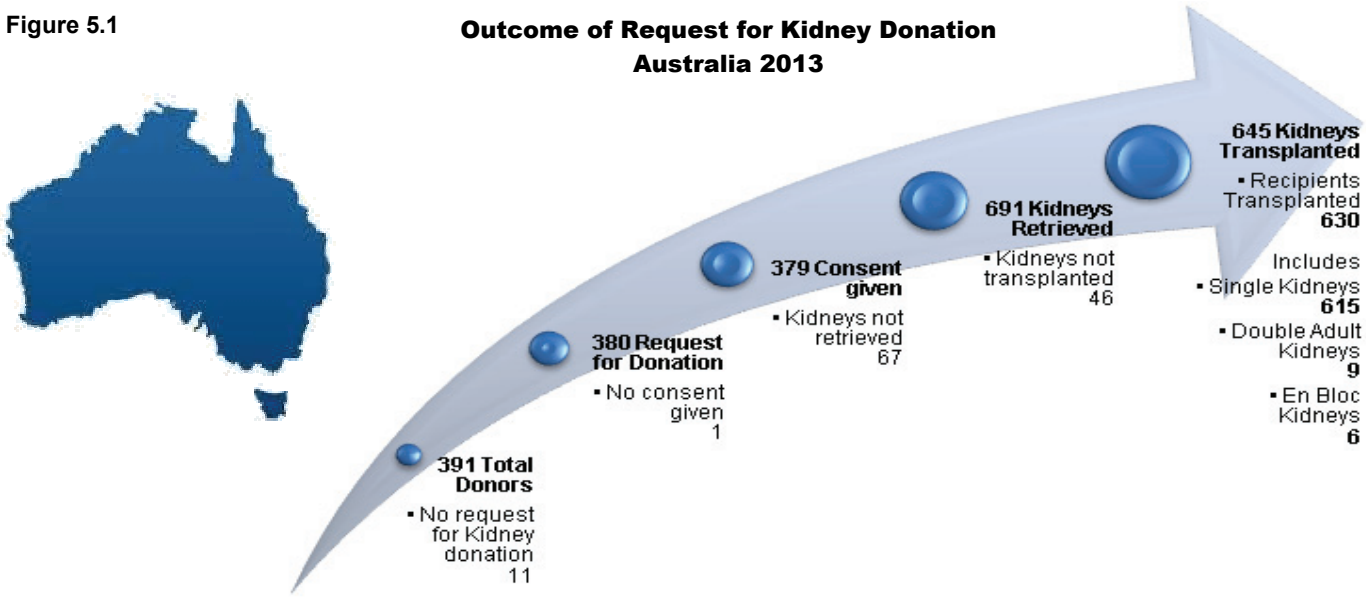


Figure 5.2

Outcome of Request for Kidney Donation
New Zealand 2013

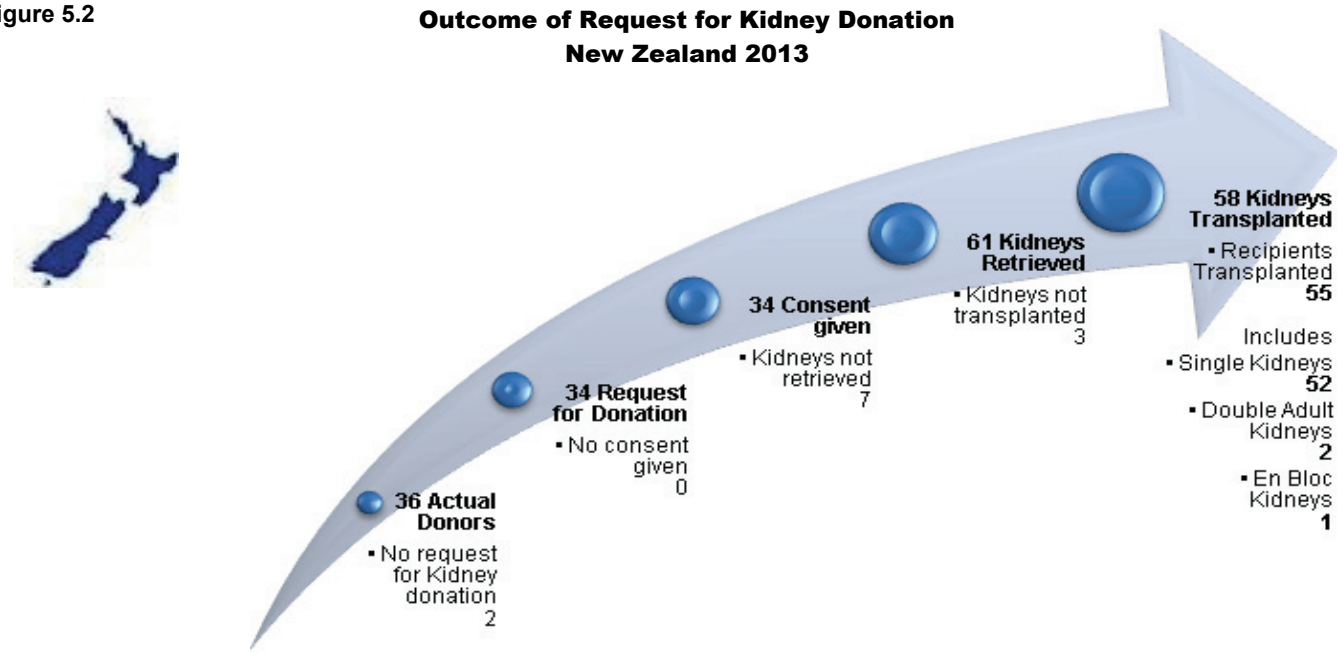


Figure 5.3

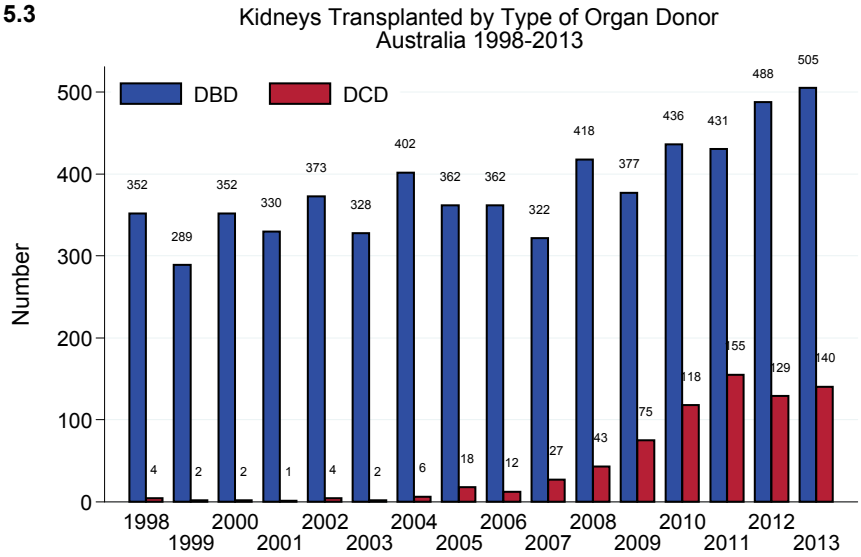


Figure 5.4

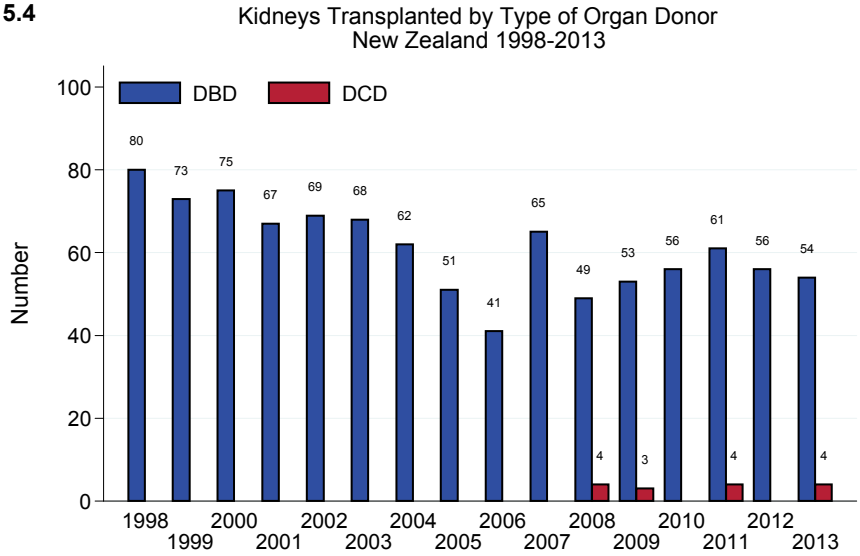
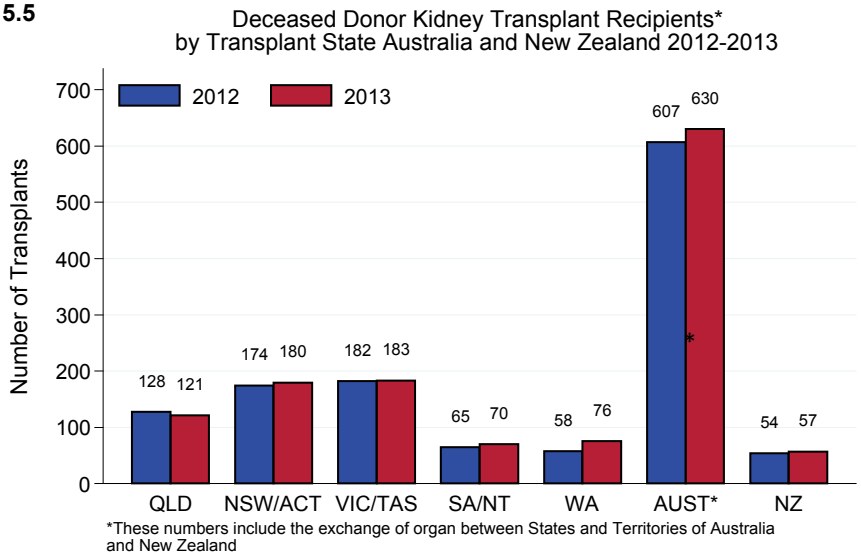


Figure 5.5



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

In 2013, there were 67 kidneys not retrieved from Australian donors and 7 from New Zealand donors. For Australia, the main reason was due to the kidney not being medically suitable (48), followed by no suitable recipient for the kidney(14). In New Zealand all non-retrieved kidneys were due to not being medically suitable.

Figures 5.6 and 5.7 show 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). In Australia the non-utilisation rate remained steady at around 3% over 2004-2012, but increased to 6.7% (95% CI 4.9 to 8.8) in 2013. In New Zealand these rates have historically been generally higher than in Australia and rose to 4.9% in 2013 from its lowest rate 1.5% in 2011 (note the different y-axis scales). By way of comparison, reported international non-utilisation rates were 23.5% in Spain[1] for 2013 and 19% in 2012 in the United States of America[2] . The reasons why kidneys were not utilised for organ transplant is presented in Figure 5.9. (For the purpose of reliable reporting, re-categorisation of reasons has meant that previously reported values differ in some categories in past years reports.)

Figure 5.6

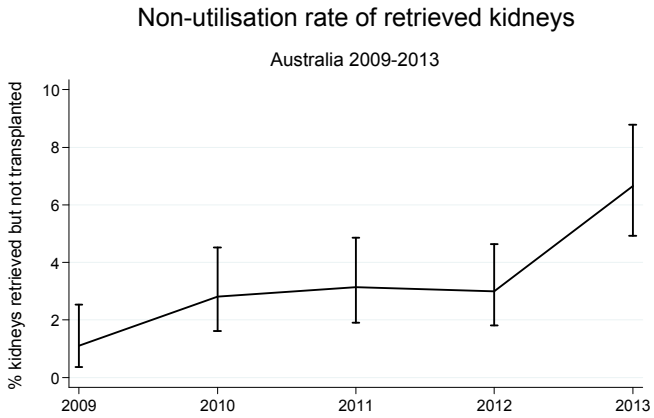


Figure 5.7

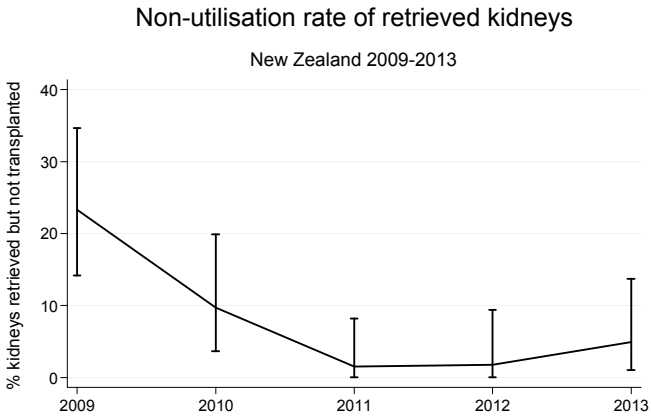


Figure 5.9

Reasons Kidneys Retrieved and Not Utilised for Organ Transplantation in Australia (New Zealand) 2009 - 2013

Year	Logistics	Medically Unsuitable	Surgically Unsuitable	No Suitable Recipient	Other	Total
2009	1	1(16)	1(1)	0	3	5 (17)
2010	0	8 (6)	2	1	5	16 (6)
2011	1	9	3	4 (1)	2	19 (1)
2012	0	8 (1)	7	2	2	19 (1)
2013	3	31(3)	7	2	3	46 (3)

Footnotes: 1 Memorias de acividad - ONT 2013
2 OPTN/SRTR 2012 Annual Data Report

Age of Kidney Donors

The age distribution of donors providing transplanted kidneys for Australia and New Zealand is shown in Figures 5.10 and 5.11 respectively.

Figure 5.10

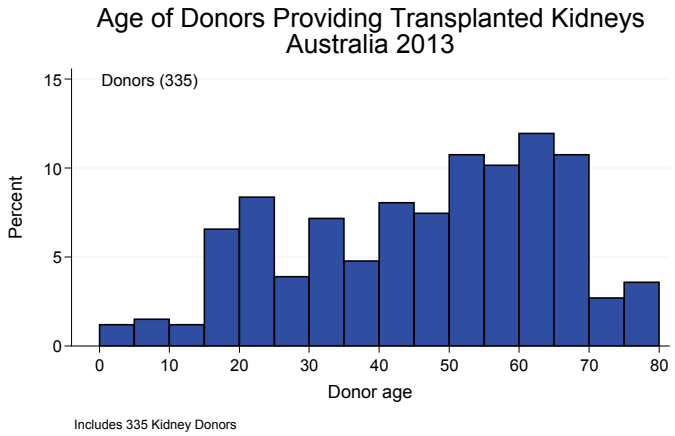
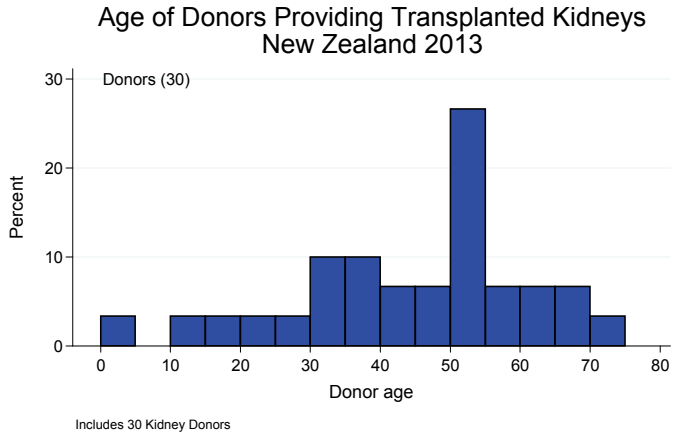


Figure 5.11



Donor Kidney Function

Australia

In 2013, in Australia, 49 donors (14%) had a terminal serum creatinine concentration of ≥ 125 µmol/L and 33 donors (9%) had a terminal serum urea concentration of ≥ 9 mmol/L, shown in Figure 5.12.

New Zealand

There were four donors (12%) in New Zealand with a terminal serum creatinine concentration of ≥ 125 µmol/L and no donors with a terminal serum urea concentration of ≥ 9 mmol/L in 2013.

Figure 5.12

Terminal Serum Creatinine Levels 2009 - 2013

Creatinine (µmol/L)	Australia					New Zealand				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
00-99	77%	78%	76%	75%	79%	87%	90%	81%	87%	81%
100-124	9%	6%	11%	9%	7%	5%	3%	9%	10%	6%
125-149	5%	4%	5%	5%	4%	5%	3%	6%	3%	6%
150-174	2%	4%	3%	2%	3%	3%	3%	-	-	3%
175-199	1%	2%	1%	2%	2%	-	-	-	-	-
200-224	1%	1%	1%	1%	1%	-	-	3%	-	-
225-249	1%	1%	1%	1%	0%	-	-	-	-	3%
>= 250	4%	3%	2%	4%	4%	-	-	-	-	-

Donor Kidney Biopsy

In 41 donors (11.7%) a biopsy of the kidneys was taken at the time of retrieval in 2013 in Australia and ten donors (42%) in New Zealand. Since 2000, there have been 399 (12.2%) biopsies from 3,247 kidney donors in Australia and 160 (34.8%) from 460 kidney donors in New Zealand.

Liver Donation

In 2013, there were 243 livers retrieved providing 252 recipients with transplanted livers from Australian donors and 25 retrievals in New Zealand providing for 26 recipients, as shown in Figure 5.13 and 5.14. This was an increase of 26.5% for liver transplant procedures since 2009. There were five combined liver/kidney transplants and one liver/lung transplant in Australia.

Thirty eight partial liver transplants, from 19 donors, were performed in Australia using the "split" liver technique (transplanting one liver into two recipients) and there were seven reduced size livers transplanted into paediatric recipients.

Figure 5.13 **Outcome of Request for Liver Donation Australia 2013**

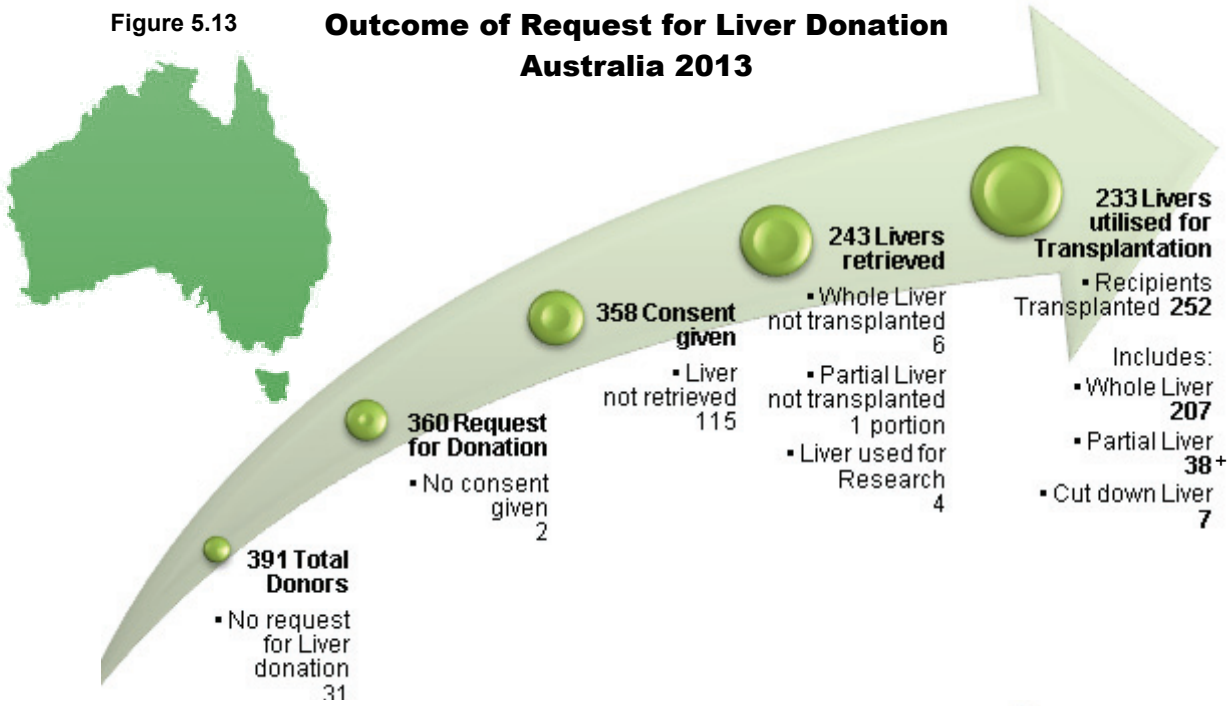
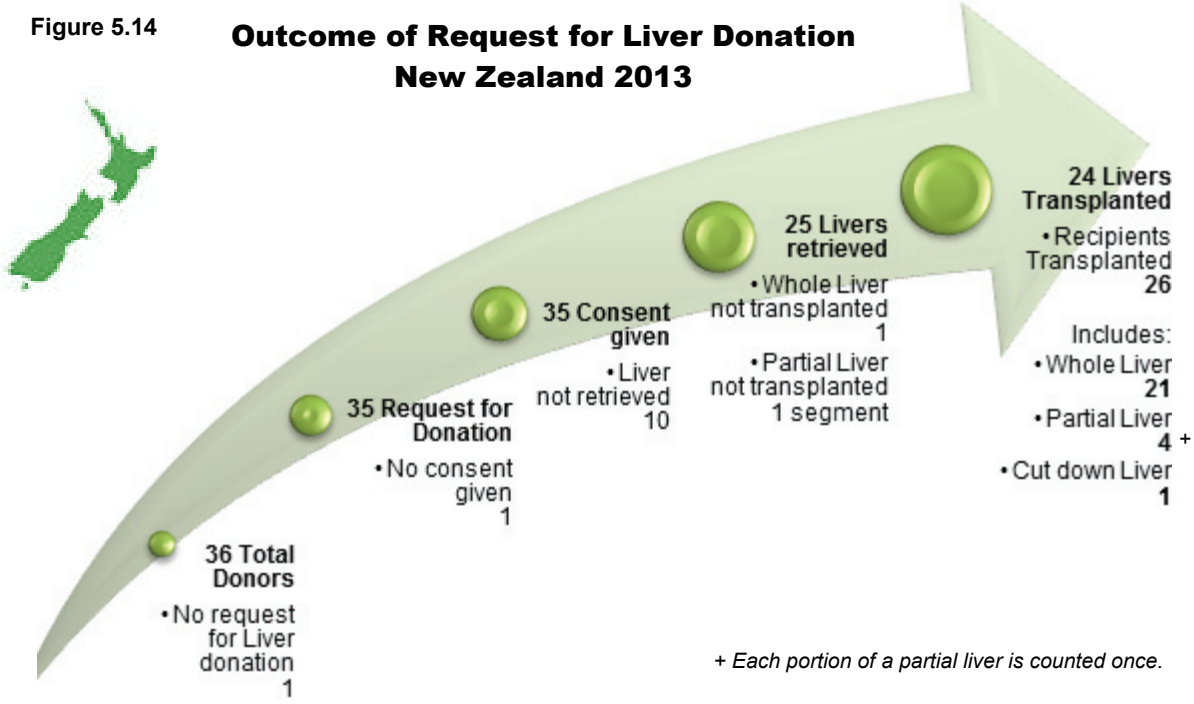


Figure 5.14 **Outcome of Request for Liver Donation New Zealand 2013**



+ Each portion of a partial liver is counted once.

Figures 5.15 and 5.16 show the number of recipients of liver transplants by type of organ donor pathway in Australia and New Zealand respectively from 1998 to 2013.

Figure 5.15

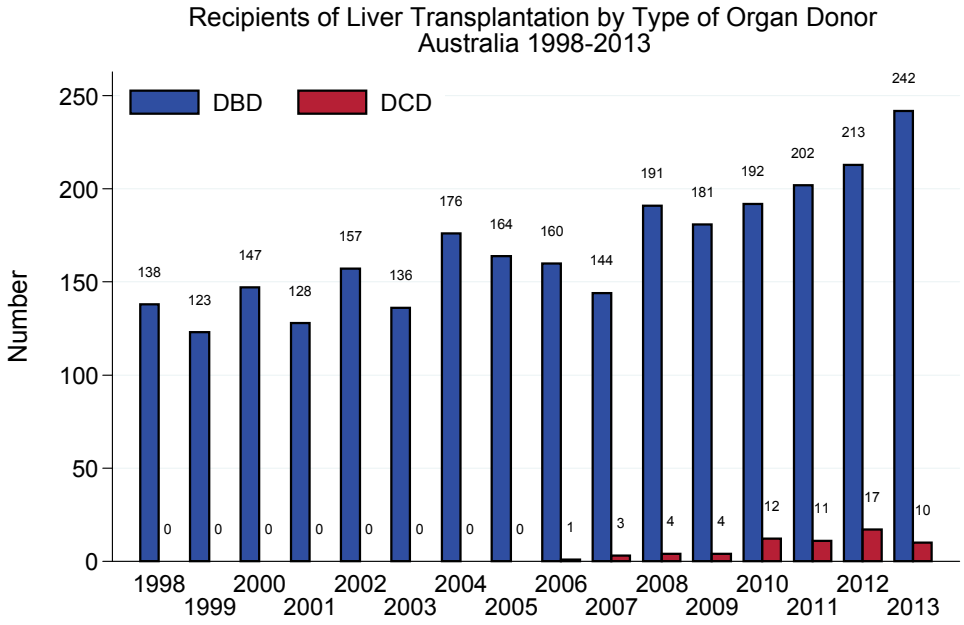


Figure 5.16

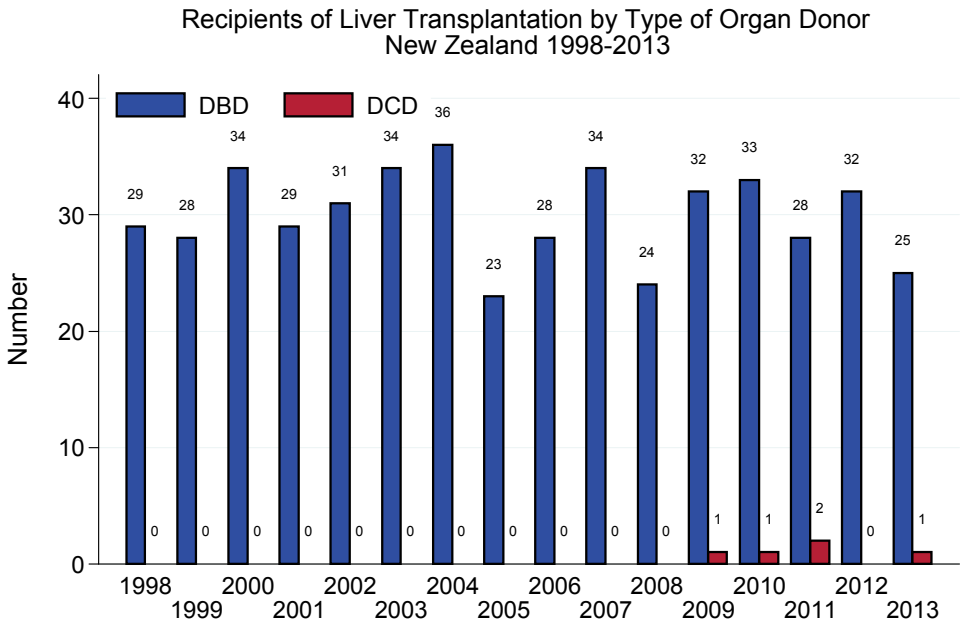
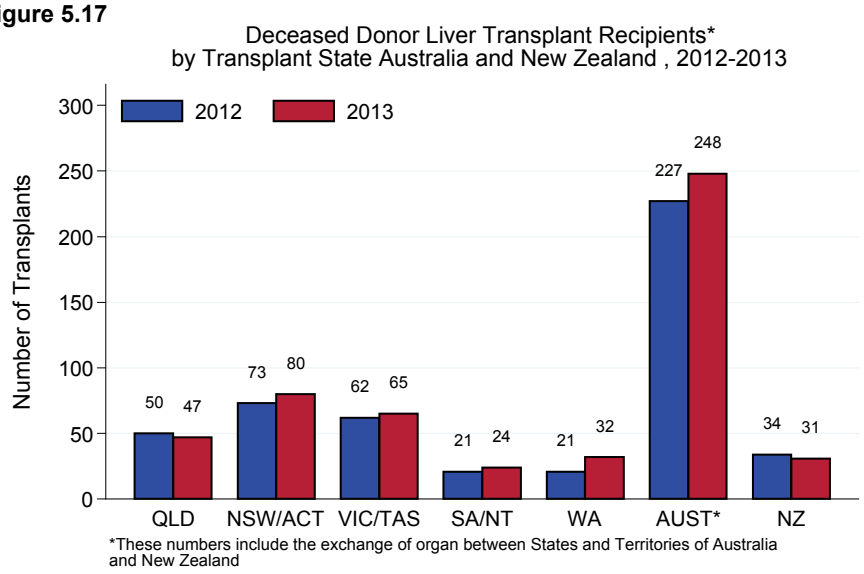


Figure 5.17 compares the number of deceased donor liver recipients, by state and country, for 2012 and 2013.

Figure 5.17



There were 115 livers not retrieved from Australian donors in 2013 and 10 from New Zealand donors.

For Australia, the main reasons were the liver not being medically suitable (73), followed by age of donor (17) and DCD (11). In New Zealand mostly non-retrieved livers were due to being not medically suitable (9).

Figure 5.20 tabulates the reasons livers were not used after retrieval for the purpose of transplantation since 2009.

Figure 5.20

Reasons Liver Retrieved and Not Utilised for Organ Transplantation in Australia (New Zealand) 2009 - 2013

	Year	Logistics	Medically unsuitable	Surgically unsuitable	No Suitable Recipient	Other	Total
Whole Liver	2009	1	2	0	0	0	3
	2010	0	2	0	0	1	3
	2011	0	1	0	0	0	1
	2012	0	5 (1)	0	0	1	6 (1)
	2013	0	6 (1)	0	0	4	10 (1)

Age of Liver Donors

The age of donors providing transplanted livers for Australia and New Zealand are shown in Figures 5.21 and 5.22 respectively.

Figure 5.21

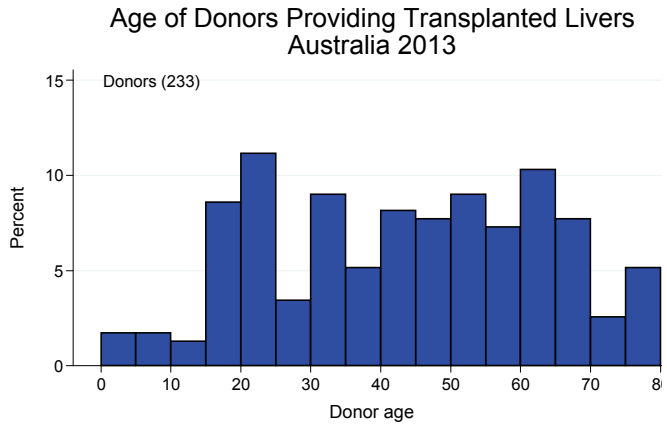
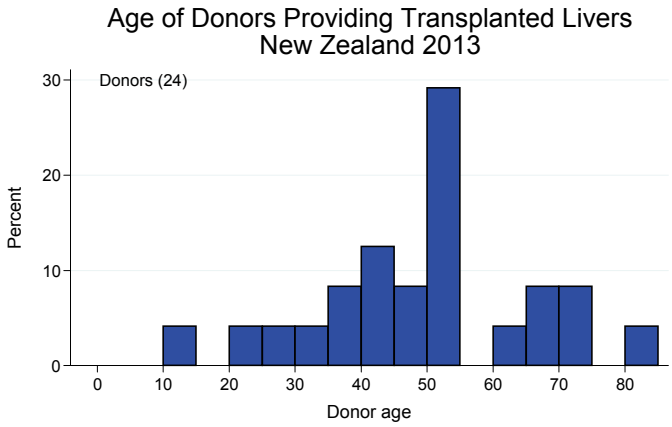


Figure 5.22



Donor Liver Function

The results of the serum tests for liver function for 243 Australian and 22 New Zealand donors in 2013 who had livers retrieved, are shown below. There were 80% of donors in Australia (195) and 86% of donors in New Zealand (19) who had all five tests performed. Figure 5.23 shows the number of donors whose liver function was above the normal range.

Figure 5.23

Number of Donors with Liver Function Tests above Normal Range 2013

Liver Function Tests	Australia		New Zealand	
	Donors with value recorded *	Above Normal	Donors with value recorded *	Above Normal
Alanine Transaminase ALT > 40 u/L	243	97	22	9
Aspartate Transaminase AST > 40 u/L	195	105	19	8
Gamma Glutamol Transferase GGT > 60 u/L	241	60	19	7
Alkaline Phosphatase > 116 u/L	242	33	25	0
Total Bilirubin > 20 umol/L	242	32	25	2

* Not all donors have all tests

Heart Donation

In 2013, there were 77 heart transplant recipients and two heart/double lung transplant recipients. This was an increase of almost 30% for heart transplants since 2009.

New Zealand performed nine heart transplants in 2013. This number has been relatively stable since 2011.

Figures 5.25 and 5.26 show the outcome of request for heart donation in Australia and New Zealand for 2013 respectively.

Figure 5.25 **Outcome of Request for Heart Donation Australia 2013**

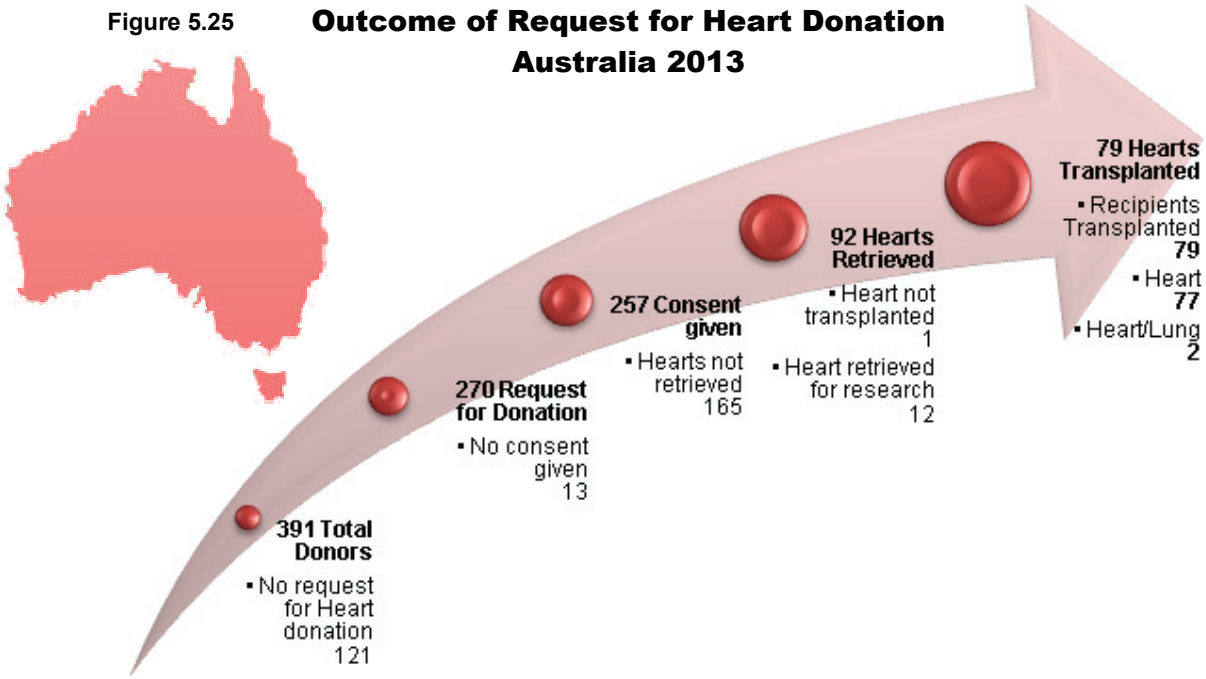
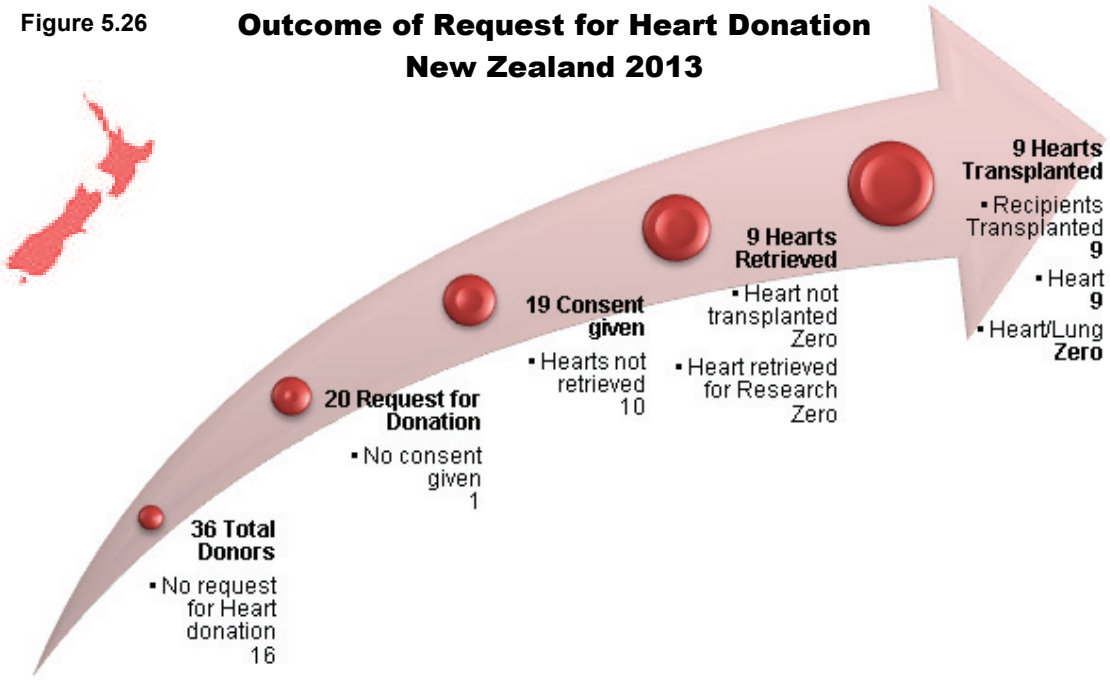


Figure 5.26 **Outcome of Request for Heart Donation New Zealand 2013**



Figures 5.27 and 5.28 show the number of recipients of heart transplants in Australia and New Zealand respectively from 1998 to 2013.

Figure 5.27

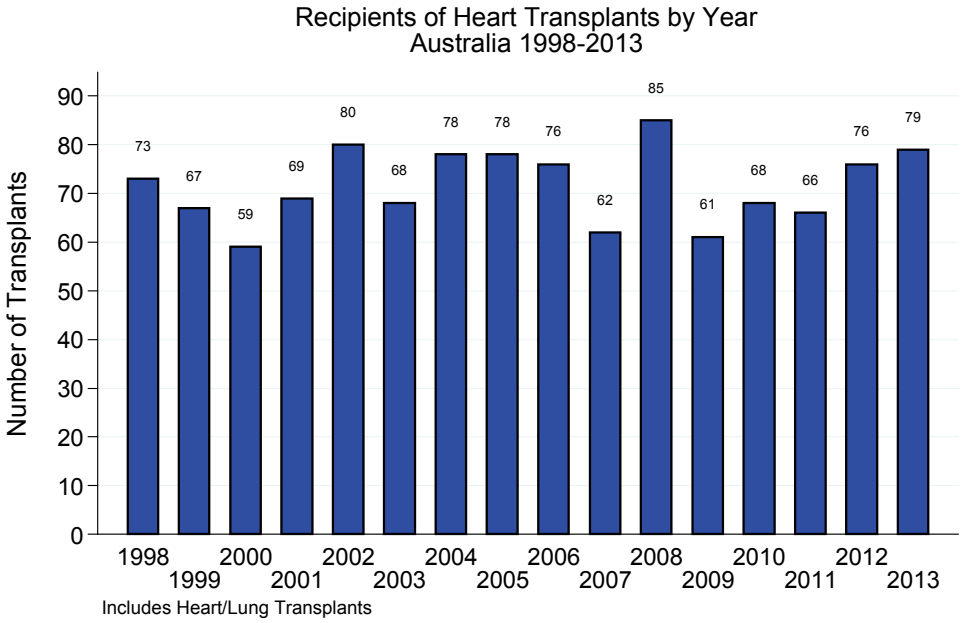


Figure 5.28

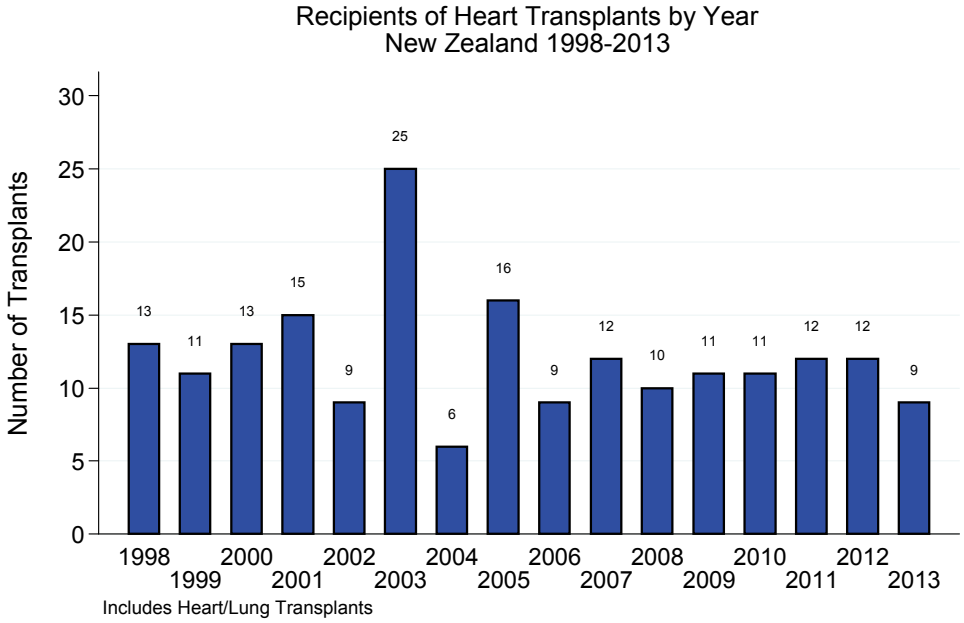


Figure 5.29

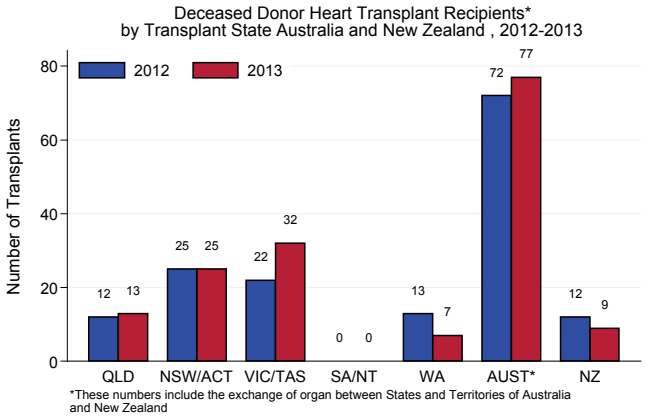
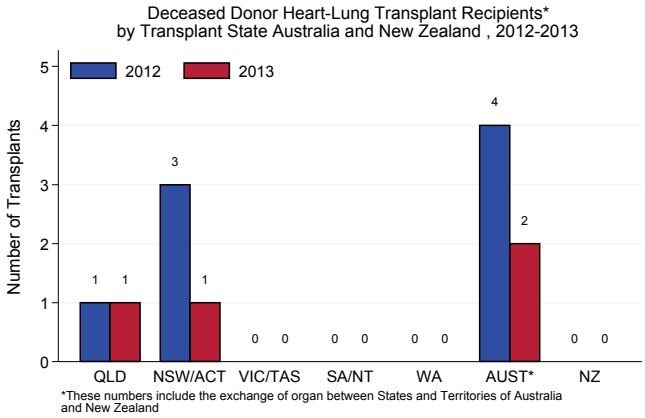


Figure 5.30



In 2013, there were 165 hearts not retrieved from Australian donors and 10 from New Zealand donors. For Australia, the main reason was due to the heart not being medically suitable (76), followed by no suitable recipient for the heart (35) and age of donor (28).

In New Zealand, eight hearts were not retrieved as they were medically unsuitable and two due to no suitable.

Age of Heart Donors

The age of donors providing transplanted hearts for Australia and New Zealand are shown in Figures 5.33 and 5.34 respectively.

Figure 5.33

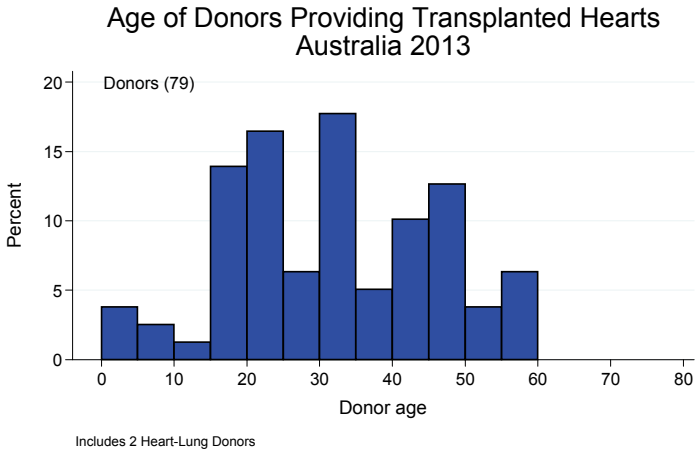
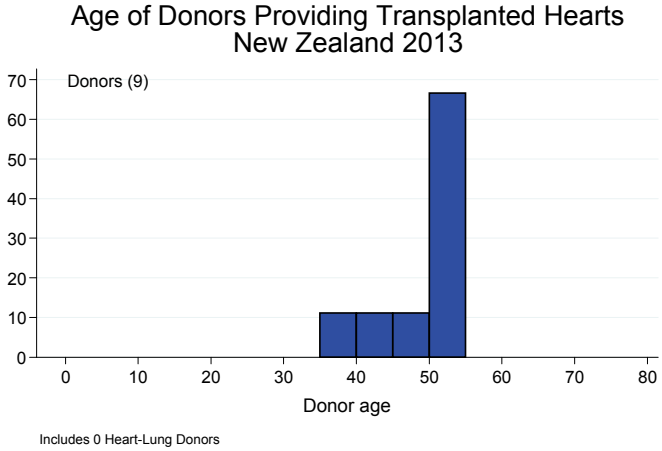


Figure 5.34



ECG and Echocardiogram

In Australia, 69 donors (74%) had a normal ECG and 76 of the 92 heart donors (82%), had a normal echocardiogram. In New Zealand, eight of the nine heart donors had a normal ECG and all nine had normal echocardiogram.

Lung Donation

In 2013, in Australia, there were 169 lung transplant recipients, 162 double lung, five single lung recipients and two heart/double lung recipients. This represents a 48% increase in lung transplants since 2009. In New Zealand 18 double lung transplants occurred in 2013.

Figure 5.35

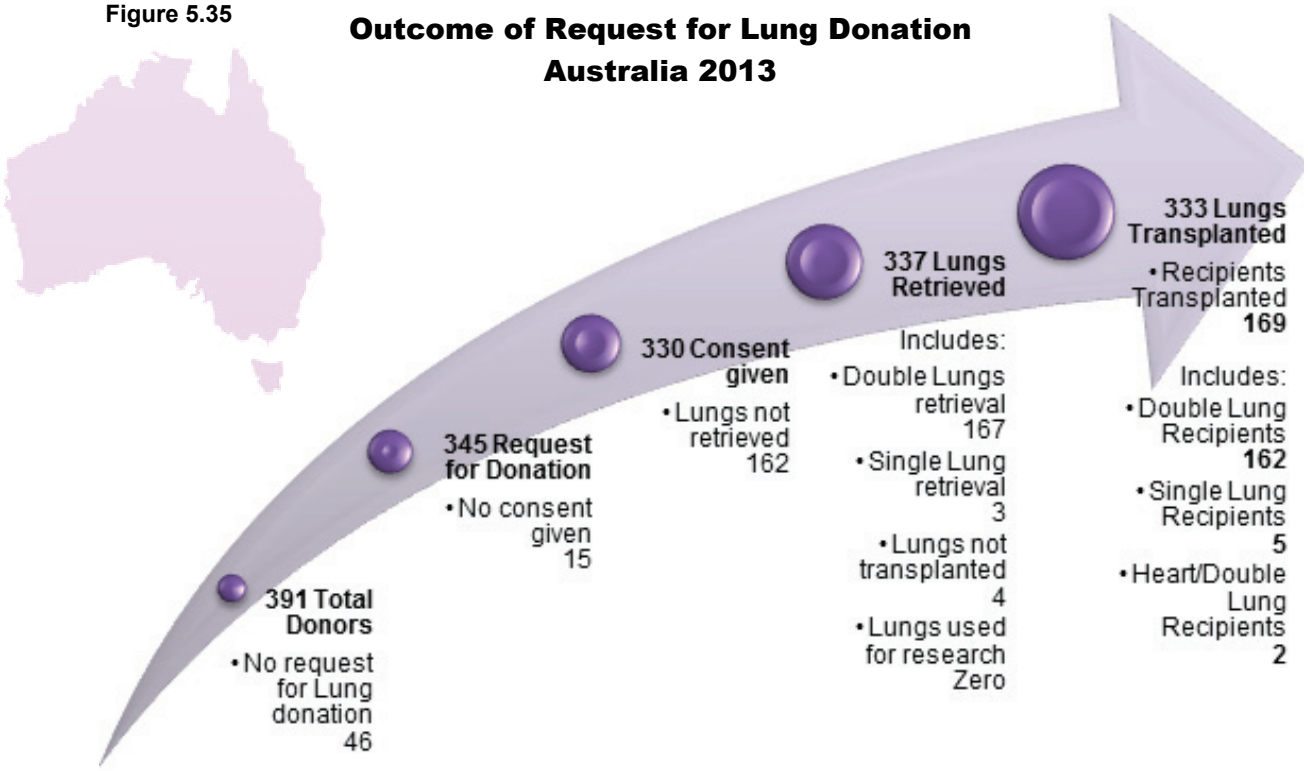
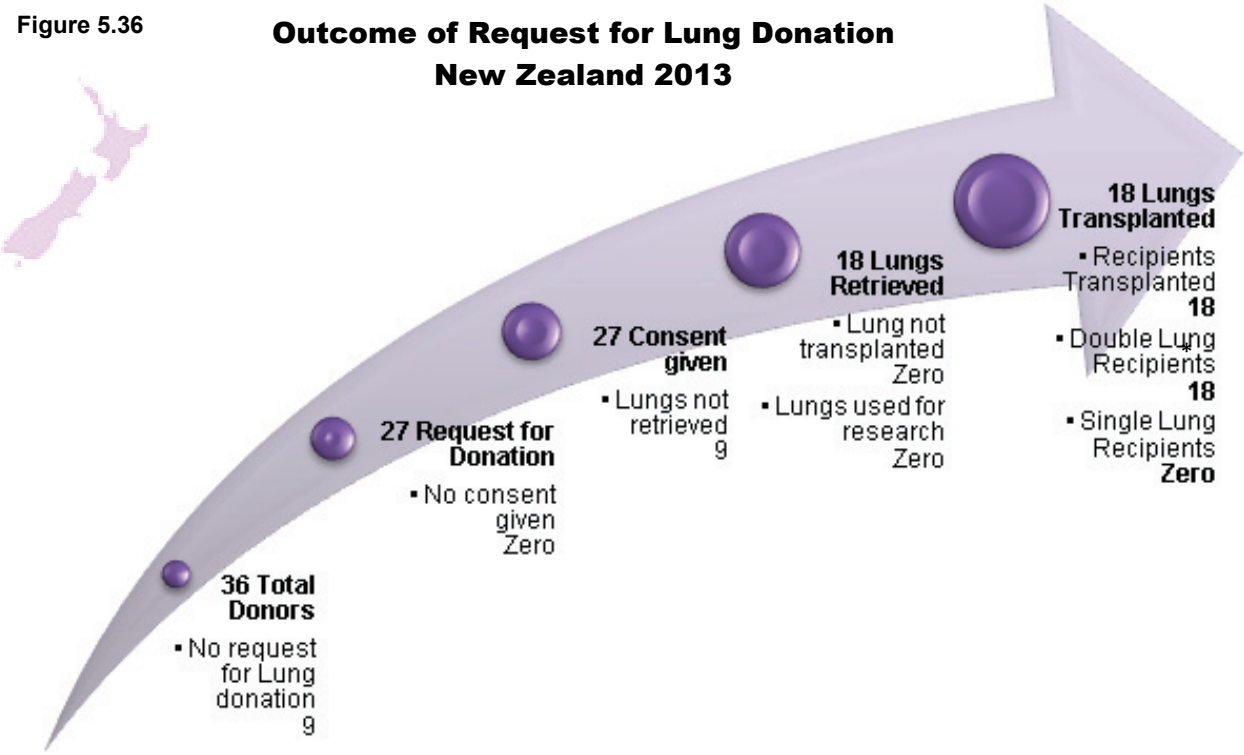


Figure 5.36



Figures 5.37 and 5.38 show the number of recipients of lung transplants by type of organ donor pathway in Australia and New Zealand respectively from 1998 to 2013.

Figure 5.37

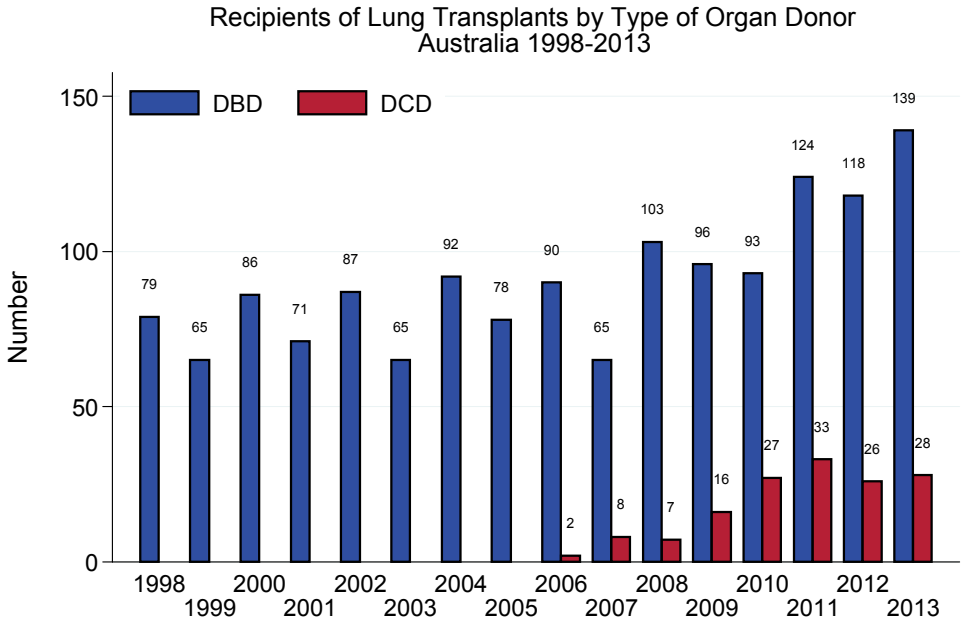


Figure 5.38

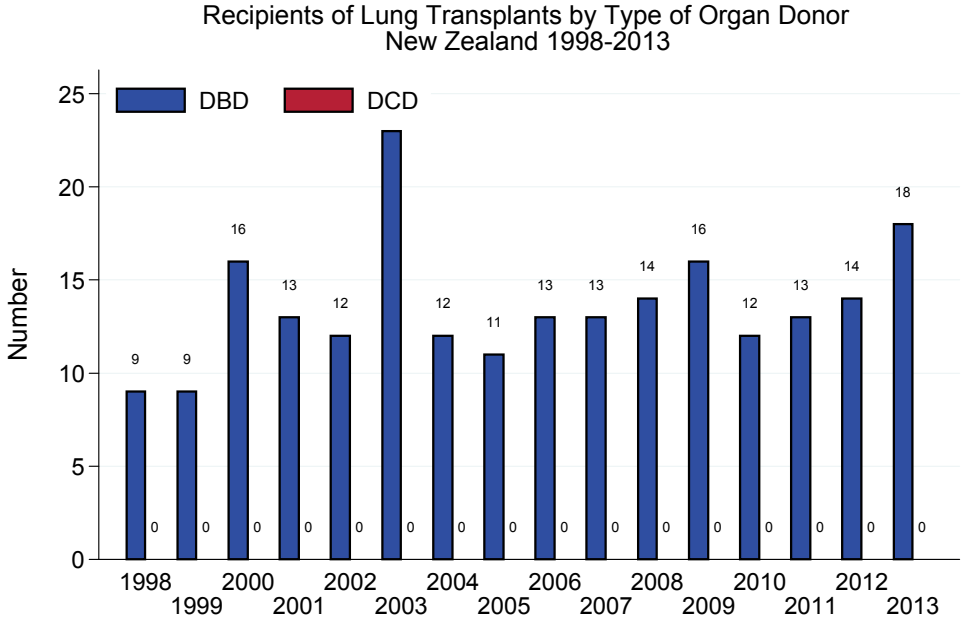
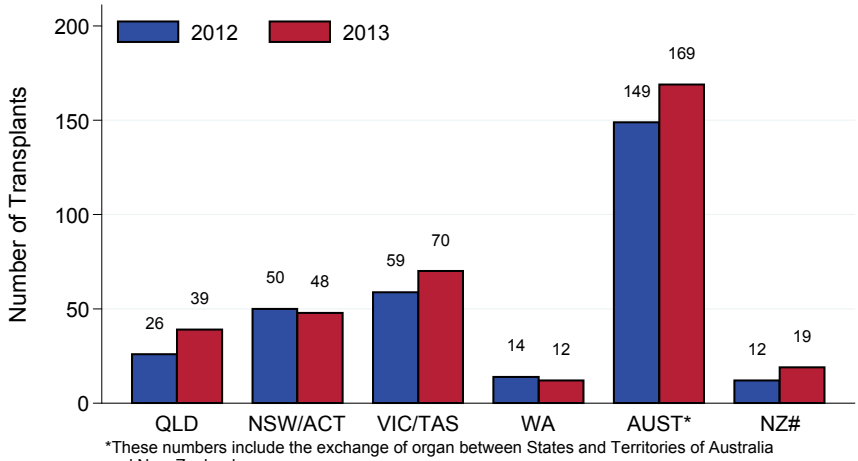


Figure 5.39

Deceased Donor Lung Transplant Recipients*
by Transplant State Australia and New Zealand , 2012-2013



*These numbers include the exchange of organ between States and Territories of Australia and New Zealand.
#One recipient was transplanted on 01-Jan-2013 and donated on 31-Dec-2012.

In 2013, there were 162 lungs not retrieved from Australian donors and nine from New Zealand donors. For Australia, 106 lungs were not medically suitable, 28 had no suitable recipient, eight due to trauma to the organ and seven were not used due to age of donor. In New Zealand, seven were not medically suitable, one each of no suitable recipient and trauma to organ.

Figure 5.42 shows the reason lungs were not used from Australian deceased donors since 2005. In New Zealand only one lung in 2009 was not transplanted, due to no suitable recipient being available.

Figure 5.42

Reasons Lungs Retrieved and Not Utilised for Organ Transplantation in Australia (New Zealand) 2009 - 2013

Year	Logistics	Medically Unsuitable	Surgically Unsuitable	No Suitable Recipient	Other	Total
2004	0	0	0	0	0	0
2005	0	1	0	1	0	2
2006	0	0	0	0	0	0
2007	0	2	2	0	0	4
2008	0	1	0	0	3	4
2009	0	0	0	0	0	0
2010	0	1	2	0	2	5
2011	0	1	0	0	1	2
2012	0	0	0	0	3	3
2013	0	4	0	0	0	4

Age of Lung Donors

The age distribution of donors providing transplanted lungs for Australia and New Zealand is shown in Figures 5.43 and 5.44 respectively.

Figure 5.43

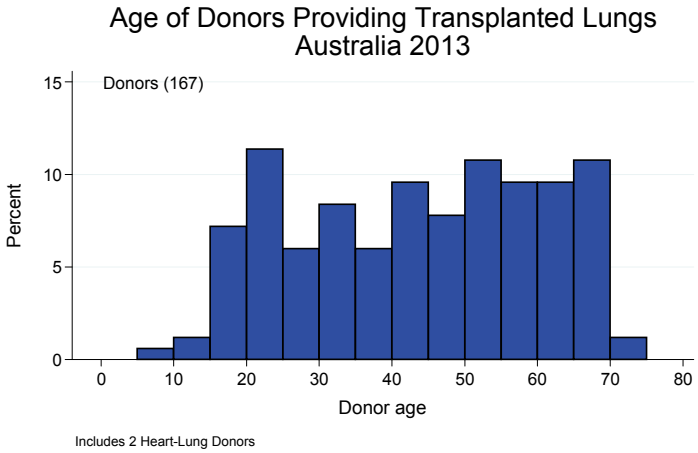
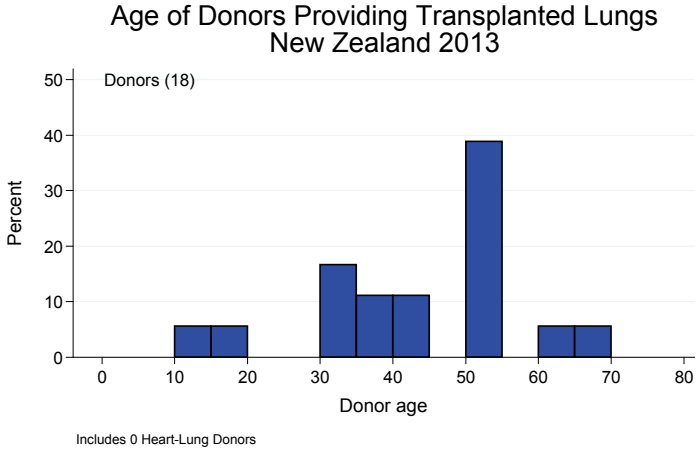


Figure 5.44



Donor Lung Function

Australia

There were 108 Australian lung donors (64%) who had a bronchoscopy in 2013. Sixteen donors had chest trauma; these included nine pneumothorax, four with a chest drain, two with fractured ribs and one with an effusion.

The arterial blood gases were taken on 100% FiO2 and PEEP of 5 cm. Fifty six donors had a PEEP > 5 cm (33%).

The results from 169 lung donors in 2013 show 11% (18) to be acidotic (pH < 7.35) and 17% (28) to be alkalotic (pH > 7.45).

Oxygenation measured as PaO2 ranged from 43-930 mmHg with a median of 40 mmHg.

PaCO2 ranged from 4.70 - 54.0 mmHg with a median of 37.9 mmHg.

New Zealand

There were four (22%) New Zealand lung donors who had a bronchoscopy in 2013. No donors had chest trauma.

All 18 lung donors had 100% FiO2; six had a PEEP greater than 5cm.

The arterial blood gas results from nine lung donors in 2013 show 39% (7) to be acidotic (pH < 7.35) and two donors (11%) to be alkalotic (pH > 7.45).

Oxygenation measured as PaO2 ranged from 39 - 539 mmHg with a median of 379 mmHg.

PaCO2 ranged from 30.0 - 329.00 mmHg with a median of 38.0 mmHg.

PANCREAS DONATION

There were 33 whole pancreas recipients in 2013, all as combined kidney/pancreas transplants (20 in New South Wales and 13 in Victoria). In addition, there was one pancreas islets transplant performed in New South Wales.

In New Zealand in 2013, there were no pancreas retrieved for transplantation.

Figure 5.45 **Outcome of Request for Pancreas Donation Australia 2013**

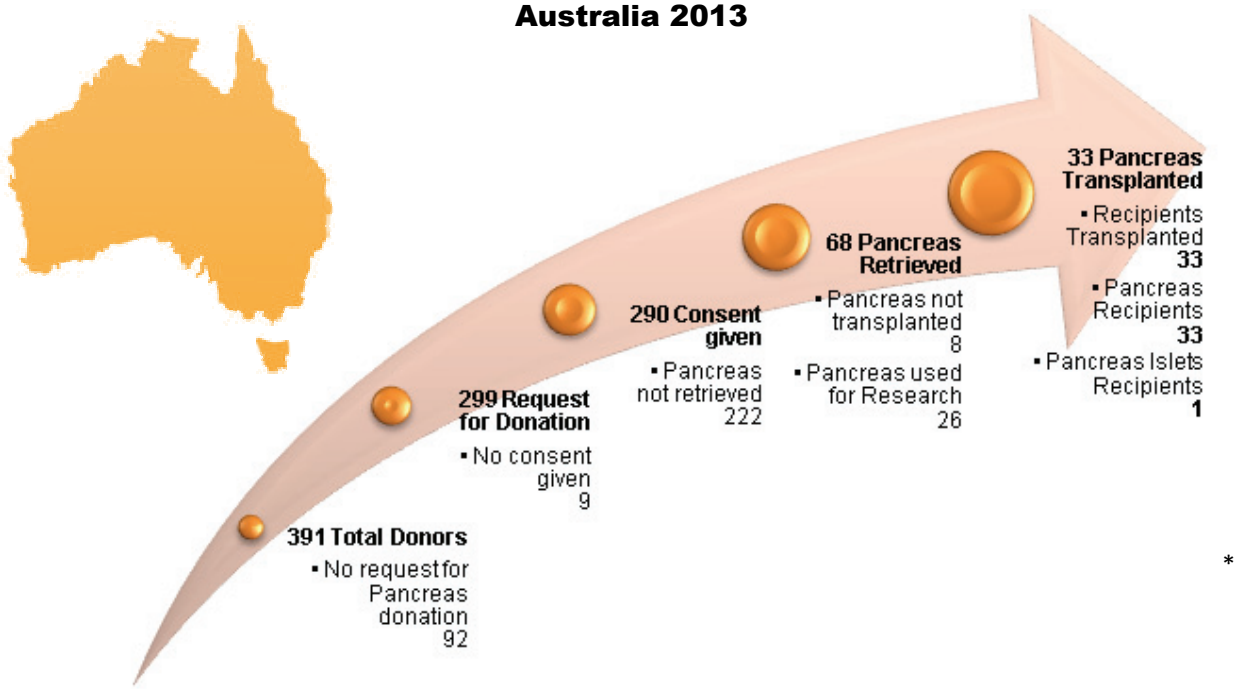


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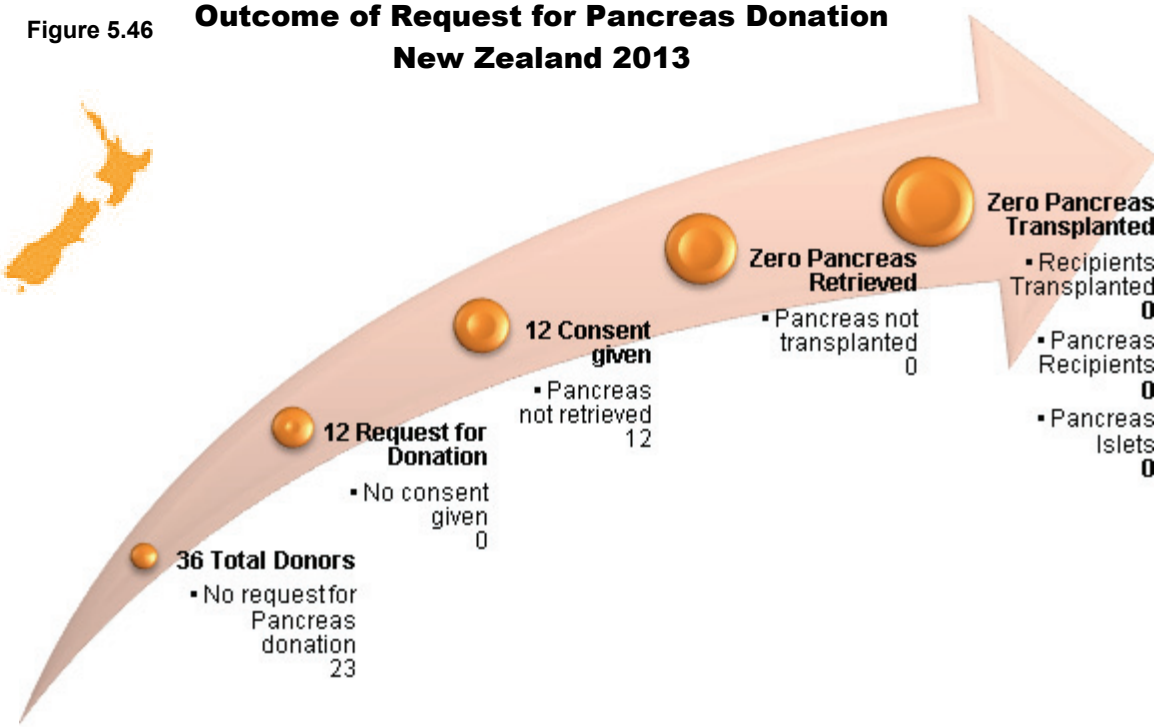
Figure 5.46 **Outcome of Request for Pancreas Donation New Zealand 2013**



Figures 5.47 and 5.48 show the number of recipients of Pancreas transplants by type of organ donor pathway in Australia and New Zealand respectively from 1998 to 2013.

Figure 5.47

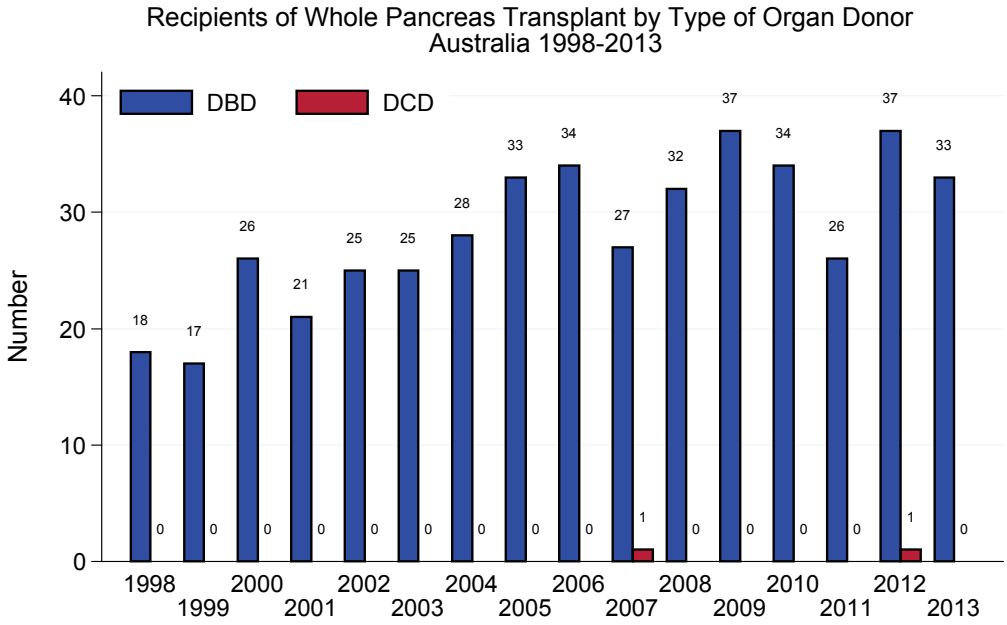


Figure 5.48

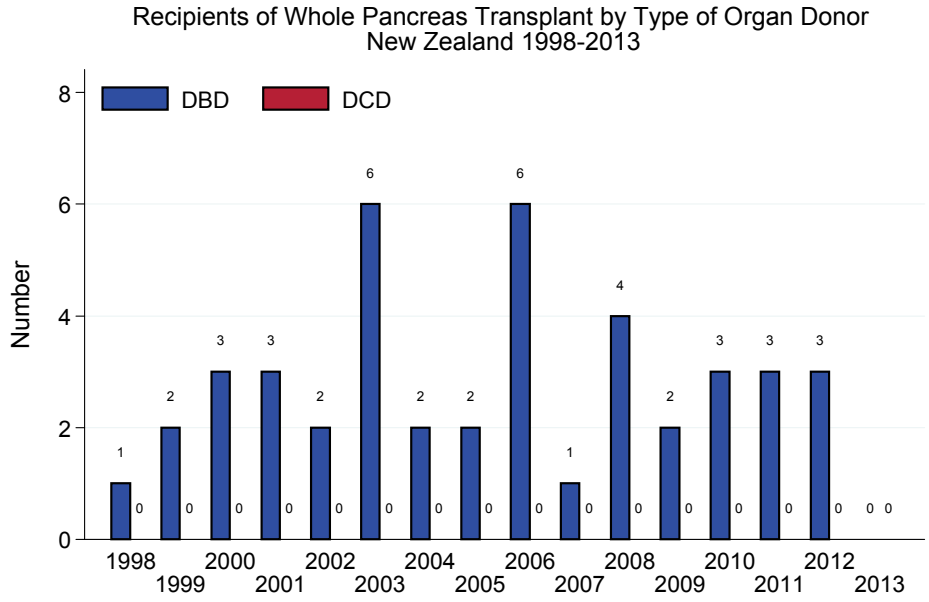
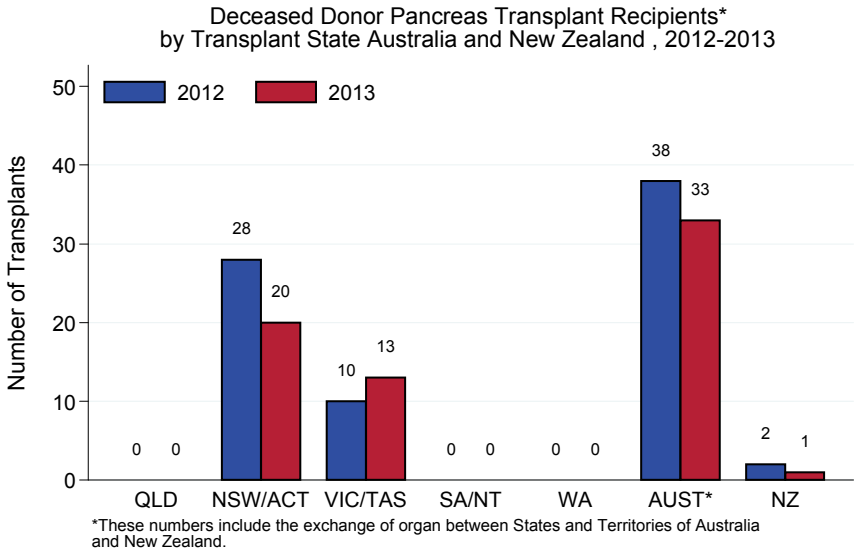


Figure 5.49



In 2013, there were 222 pancreas not retrieved from Australian donors and 12 from New Zealand donors. For those pancreas not retrieved in Australia, 70 were not medically suitable, 49 due to age of donor, 31 due to logistical issues, 25 due to no suitable recipient being available, 24 a result of DCD donation, four due to trauma to organ and two surgically unsuitable. In New Zealand, it was mostly due to no suitable recipient being available (6) and age of donor (4).

Sixty-eight donors in 2013 had pancreas retrieved, however 26 of those were not for the purpose of organ transplantation but rather retrieved for research purposes.

Figure 5.52 shows the reasons pancreas were not used from Australian deceased donors since 2005. In New Zealand only one pancreas in 2009 was not transplanted, due to no suitable recipient being available.

Figure 5.52

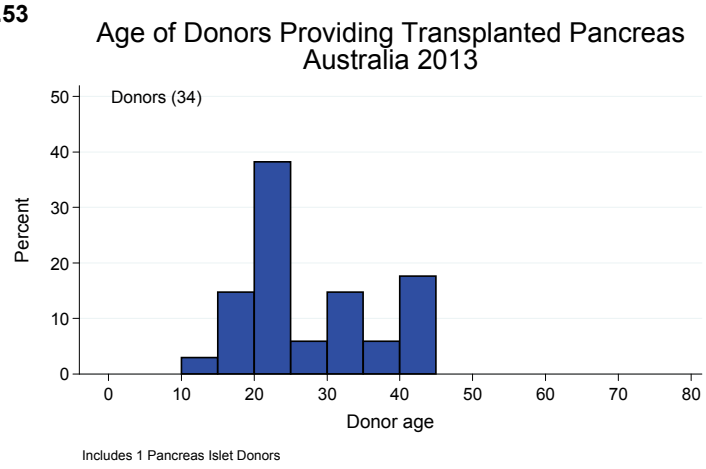
Reasons Pancreas Retrieved and Not Utilised for Organ Transplantation in Australia 2009 - 2013

Year	Logistics	Medically Unsuitable	Surgically Unsuitable	No Suitable Recipient	Other	Total
2009	0	0	1	0	0	1
2010	0	2	0	0	0	2
2011	0	0	0	1	1	1
2012	2	1	0	1	0	2
2013	0	2	0	0	1	3

Age of Pancreas Donors

The age of donors providing transplanted pancreas for Australia are shown in Figures 5.53 .

Figure 5.53



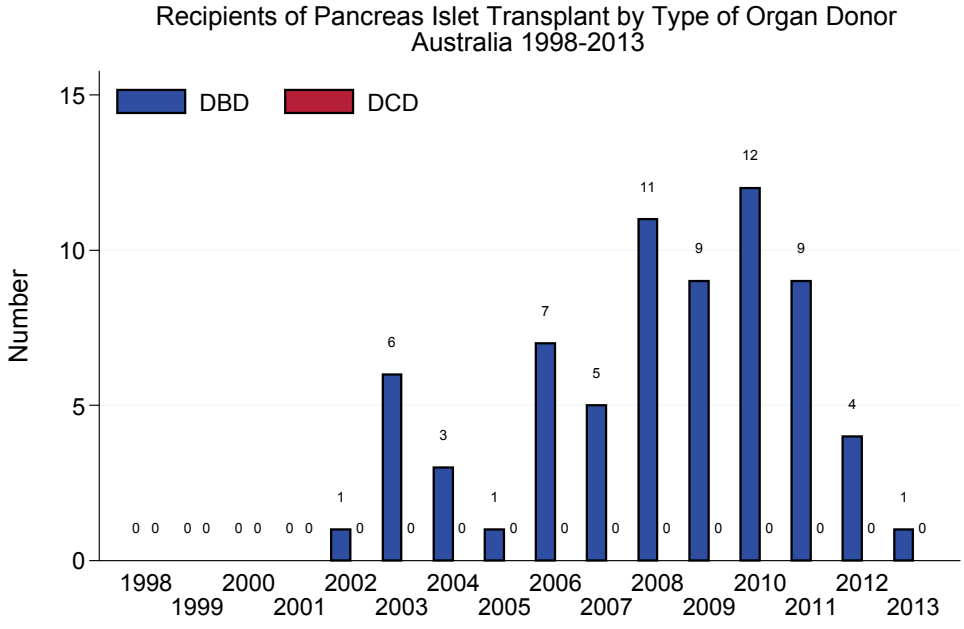
Pancreas Islets Donation

Pancreas islet transplantation is a procedure in which islets from the pancreas of the deceased organ donor are purified, processed and transplanted into a recipient. This procedure is performed only in people with Type 1 Diabetics where blood glucose levels are difficult to control.

In Australia and New Zealand, the total number of pancreas islet transplants performed, since this experimental procedure began in 2002 is 69. In 2013, one person received a pancreas islet transplant.

Of all pancreas retrieved in 2013, five pancreas islets were not used for transplantation due to insufficient islets and a further 13 pancreas retrieved were used for pancreas islets research.

Figure 5.54

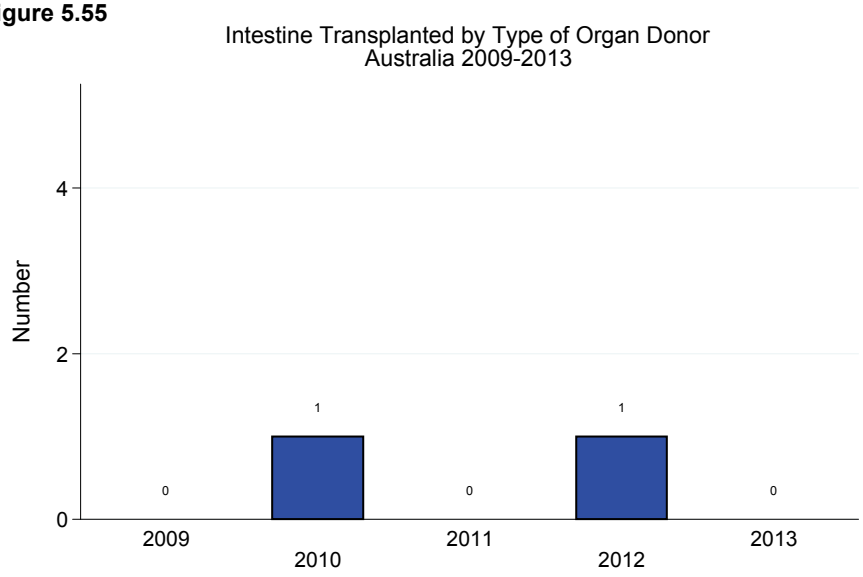


Intestine Donation

Adult and paediatric patients with irreversible intestinal failure and developing severe complications from parenteral nutrition can benefit from intestinal transplantation. Only two intestinal transplants have been performed in Australia; this is not yet a widespread treatment for irreversible intestinal failure.

The first successful intestinal transplant was performed at the Austin Hospital in Victoria, Australia in 2010.

Figure 5.55



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