Chapter 5

Organ Data

2015

ANZOD Registry

Annual Report

Data to 31-Dec-2014

Kidney Donation

In Australia, there were 637 kidney transplant recipients in 2014. Of the 637 kidney transplant procedures performed, there were 17 double adult kidney recipients, five enbloc kidney recipients, 43 combined kidney/pancreas recipients, seven kidney/liver recipients, one kidney/pancreas islets recipient and one kidney/double lungs recipient.

In New Zealand, there were 66 kidney recipients including one enbloc kidney, two combined kidney/pancreas and two combined kidney/liver transplant procedures.

Figures 5.1 to 5.5 show the outcomes 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 2014, and DBD kidneys from 2010 to 2014 in Australia.

Figure 5.1

Outcomes of Request for Kidney Donation
Australia 2014

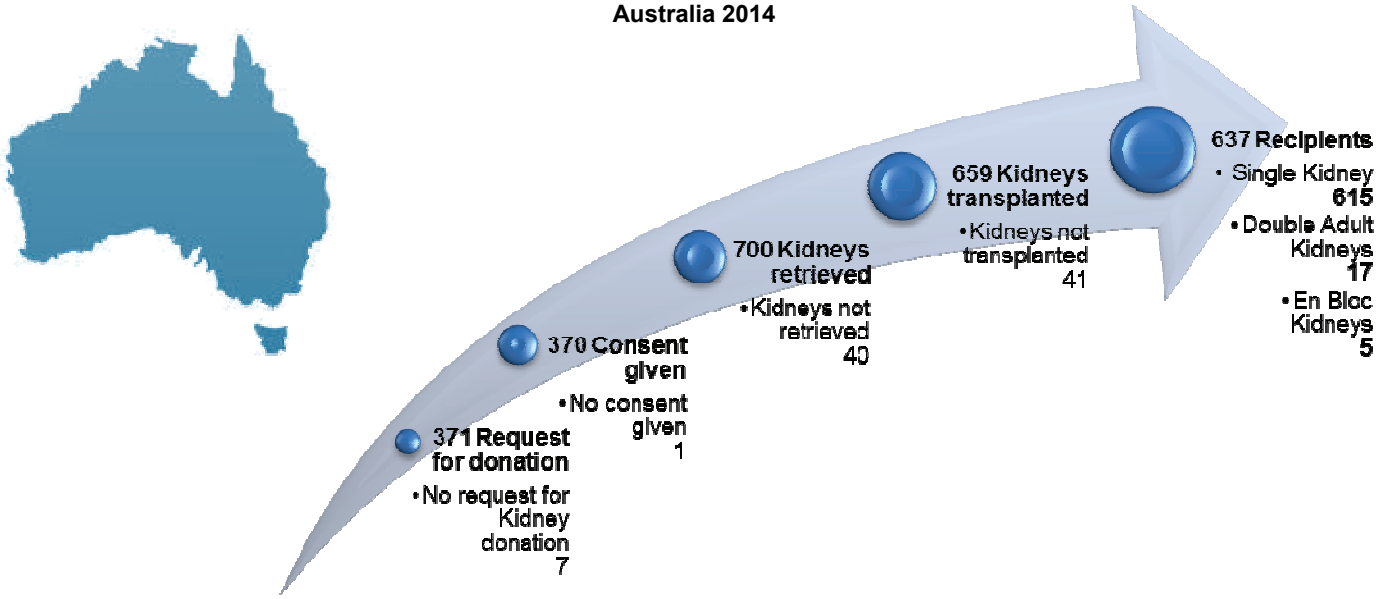


Figure 5.2

Outcomes of Request for Kidney Donation
New Zealand 2014

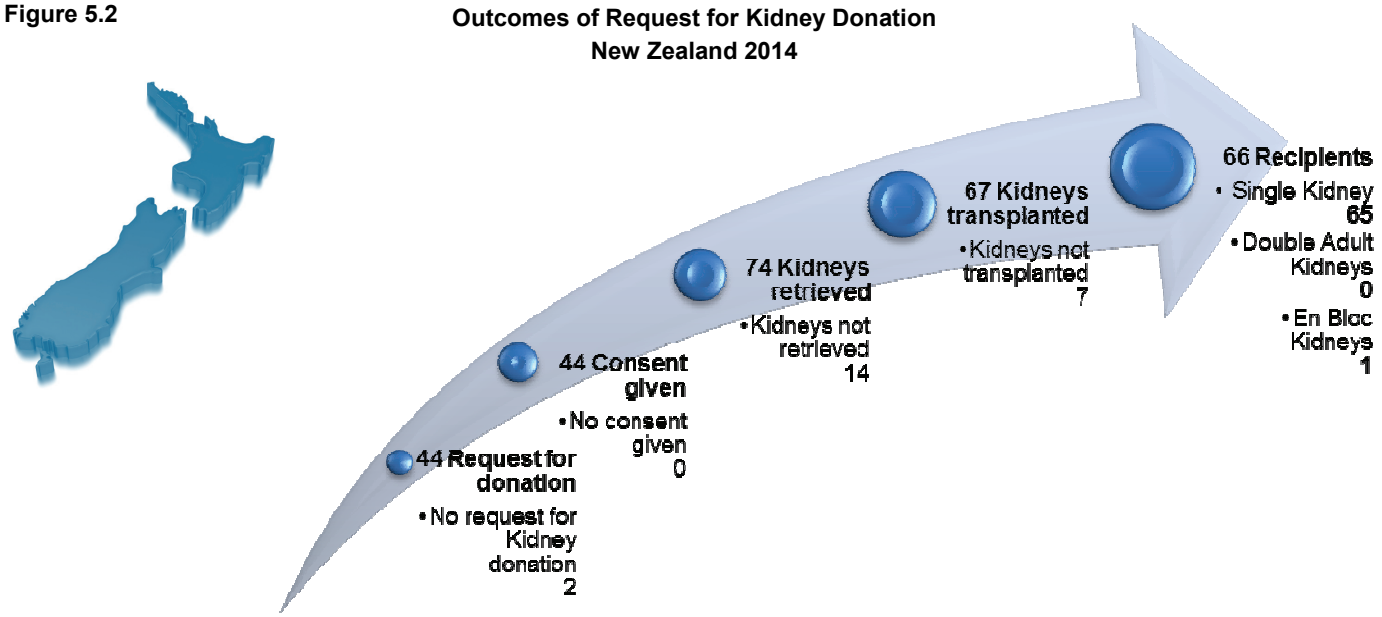


Figure 5.3

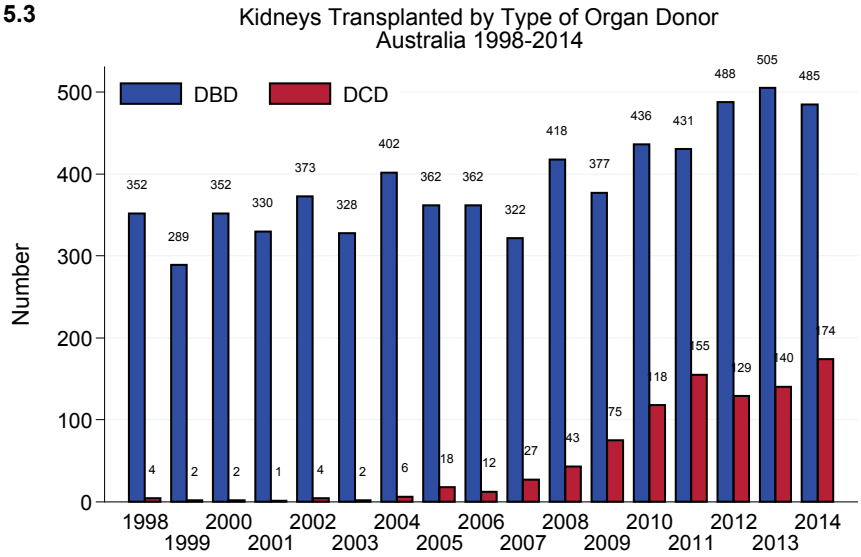


Figure 5.4

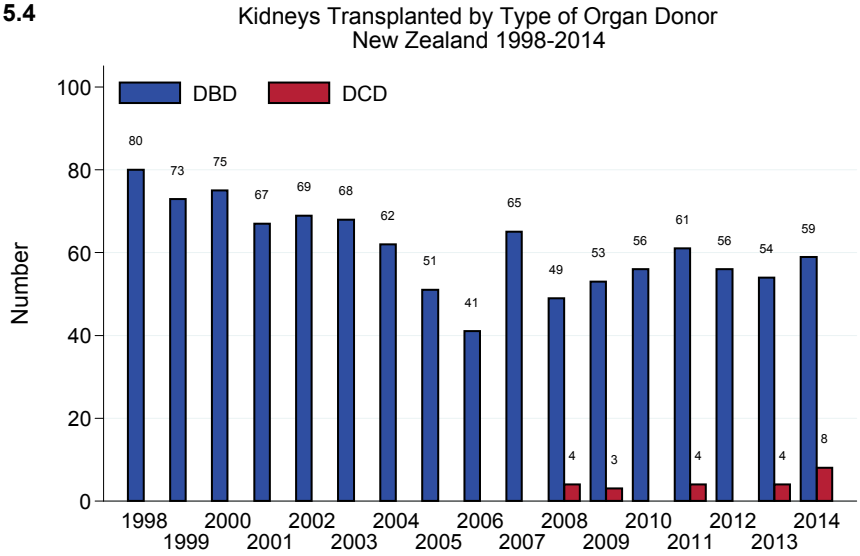
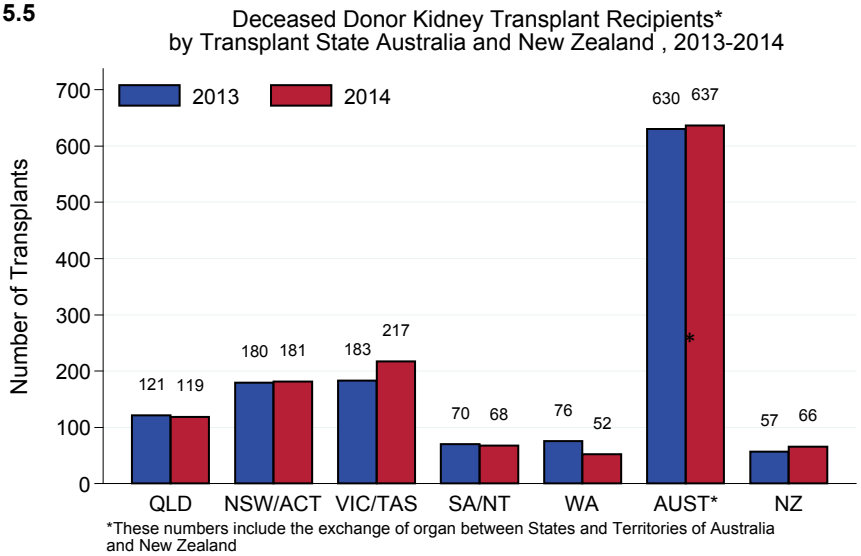


Figure 5.5



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

In 2014, there were 40 kidneys not retrieved from Australian donors and 14 not retrieved from New Zealand donors. For Australia, the main reason was due to the kidney not being medically suitable (24), followed by no suitable recipient for the kidney (4). In New Zealand, all non-retrieved kidneys were due to not being medically suitable with the exception of one which was not surgically 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 transplantation is presented in Table 5.1.

Figure 5.6

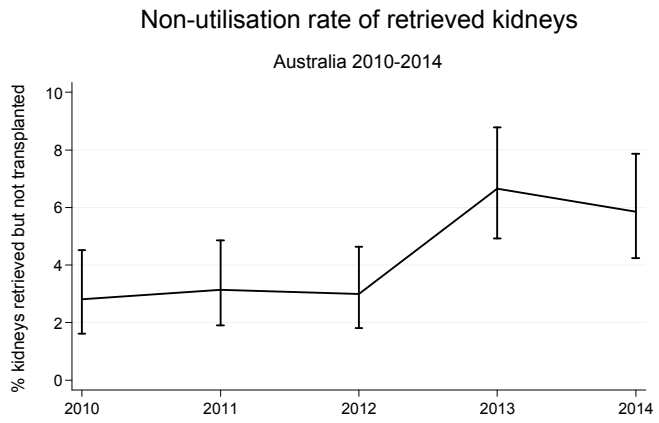


Figure 5.7

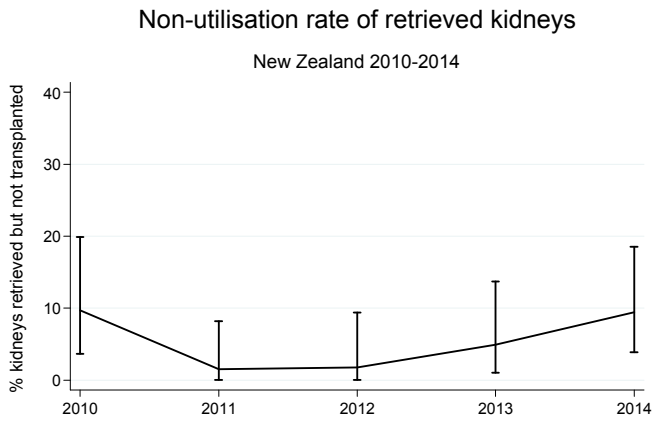


Table 5.1

Reasons Kidneys Retrieved and Not Utilised for Organ Transplantation in Australia (New Zealand) 2010 - 2014

Year	Logistics	Not Medically Suitable	Not Surgically Suitable	No Suitable Recipients	Other	Total
2010	0 (0)	8 (6)	2 (0)	1 (0)	5 (0)	16 (6)
2011	1 (0)	9 (0)	3 (0)	4 (1)	2 (0)	19 (1)
2012	0 (0)	9 (1)	7 (0)	2 (0)	1 (0)	19 (1)
2013	3 (0)	31 (3)	7 (0)	3 (0)	2 (0)	46 (3)
2014	0 (0)	31 (6)	3 (1)	6 (0)	1 (0)	41 (7)

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

Liver Donation

In 2014, there were 222 livers retrieved providing 237 recipients with transplanted livers from Australian donors, and 32 retrievals in New Zealand providing for 35 recipients, as shown in Figure 5.8 and 5.9. In Australia, this was an increase of 28.1% in the number of liver transplant recipients. There were seven recipients of combined liver/kidney transplants and one liver/intestine transplant in Australia.

Thirty partial liver transplants, from 15 donors, were performed in Australia using the "split" liver technique (transplanting one liver into two recipients) and in New Zealand there were 6 split liver transplants performed.

Figure 5.8 **Outcome of Request for Liver Donation Australia 2014**

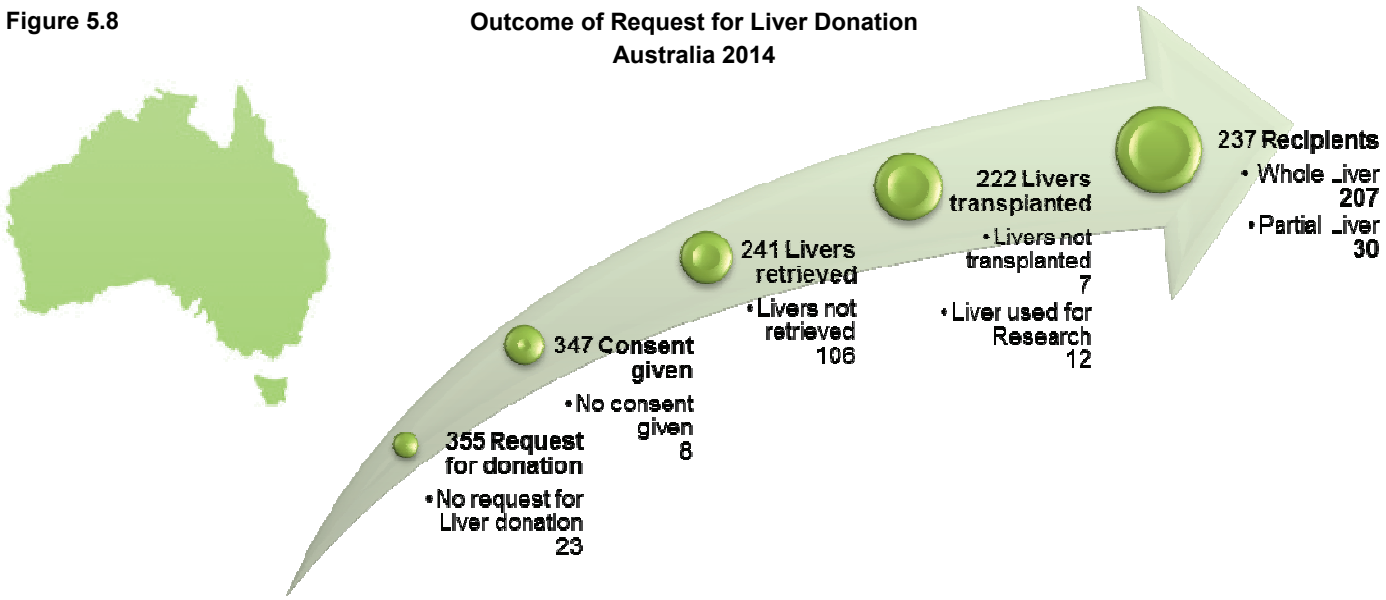
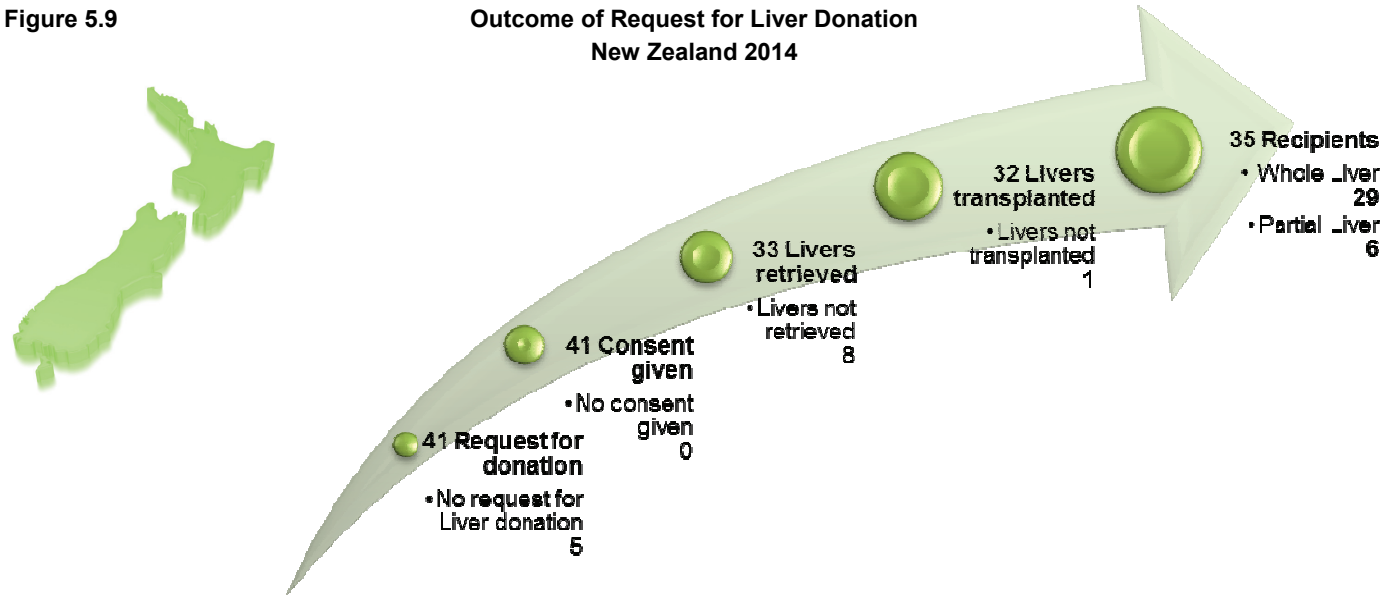


Figure 5.9 **Outcome of Request for Liver Donation New Zealand 2014**



Figures 5.10 and 5.11 show the number of recipients of liver transplants by donation pathway in Australia and New Zealand respectively from 1998 to 2014.

Figure 5.10

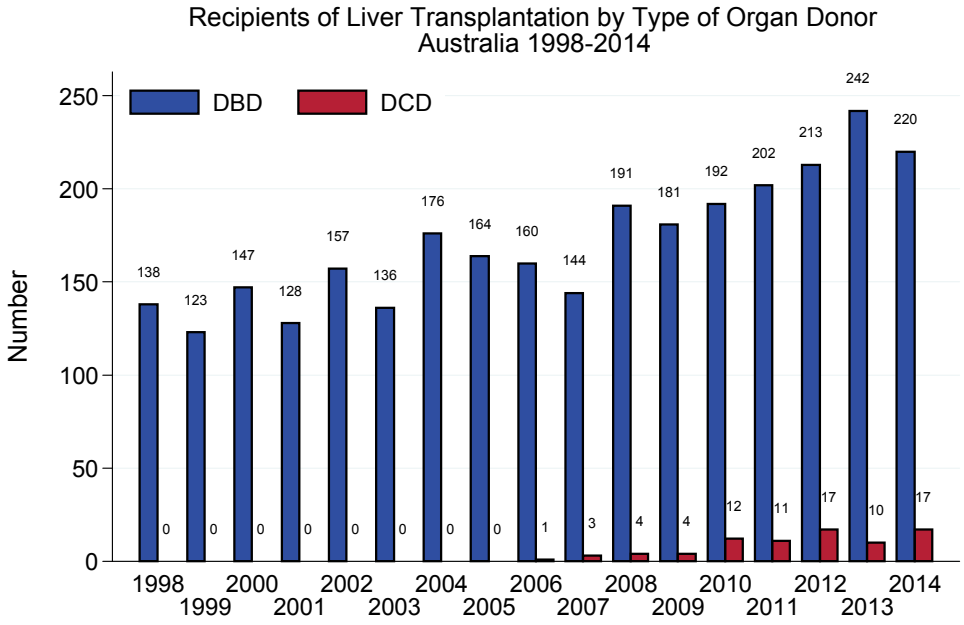


Figure 5.11

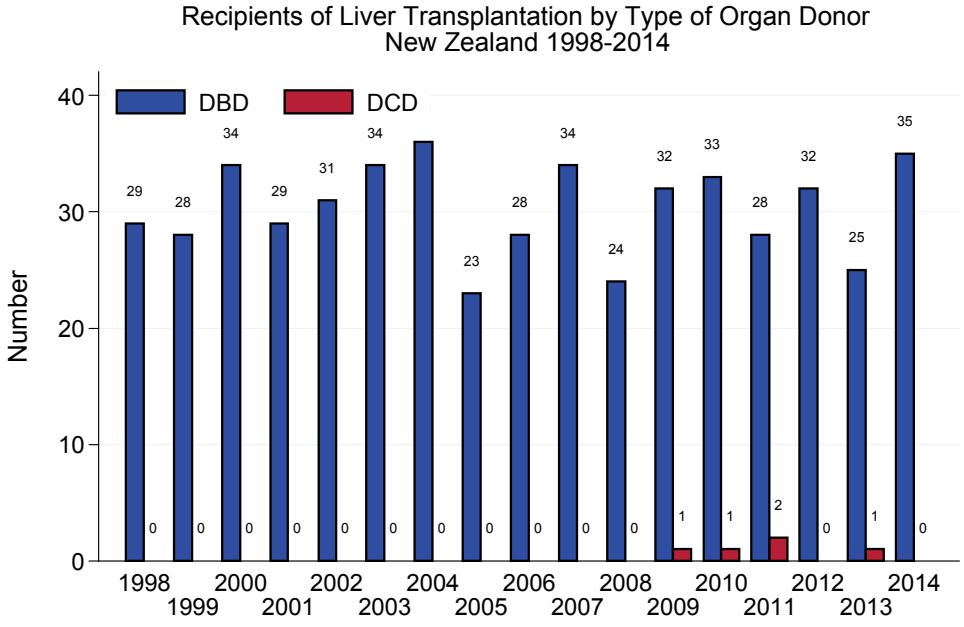
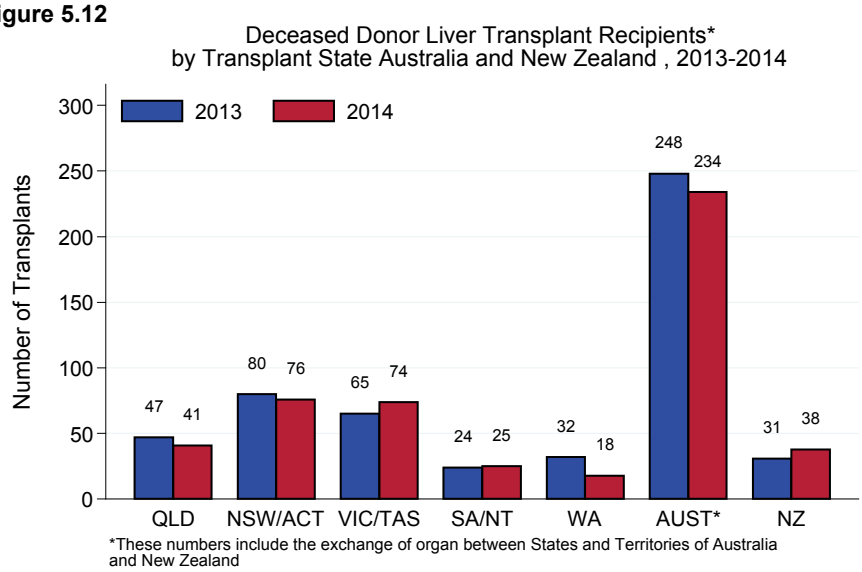


Figure 5.12 compares the number of deceased donor liver recipients by state and country for 2013 and 2014.

Figure 5.12



There were 105 livers not retrieved from Australian donors in 2014 and no livers from New Zealand donors.

For Australia, the main reasons were the liver not being medically suitable (77), followed by age of donor (16). In New Zealand, mostly non-retrieved livers were due to being not medically suitable (7).

Figure 5.2 tabulates the reasons livers were not used after retrieval for the purpose of transplantation since 2010.

Table 5.2

Reasons Livers Retrieved and Not Utilised for Organ Transplantation in Australia (New Zealand) 2010 - 2014

Year	Logistics	Not Medically Suitable	Not Surgically Suitable	No Suitable Recipients	Other	Total
2010	0 (0)	2 (0)	0 (0)	0 (0)	1 (0)	3 (0)
2011	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)
2012	0 (0)	5 (1)	0 (0)	0 (0)	1 (0)	6 (1)
2013	0 (0)	6 (1)	0 (0)	0 (0)	0 (0)	6 (1)
2014	0 (0)	6 (1)	0 (0)	0 (0)	1 (0)	7 (1)

Age of Liver Donors

The age distribution of donors providing transplanted livers for Australia and New Zealand is shown in Figures 5.13 and 5.14 respectively.

Figure 5.13

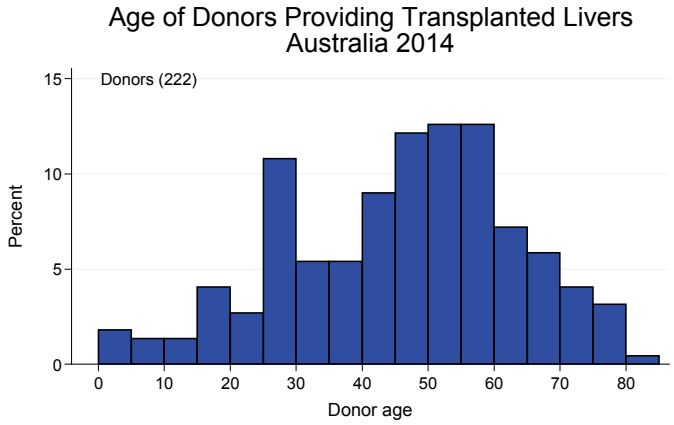
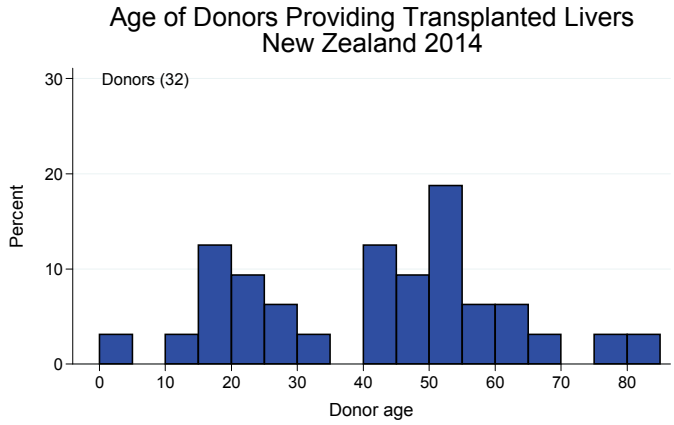


Figure 5.14



Donor Liver Function

The results of the serum tests for liver function for 243 Australian and 22 New Zealand donors in 2014 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. Table 5.3 shows the number of donors whose liver function was above the normal range.

Table 5.3

Number of Donors with Liver Function Tests above Normal Range 2014				
Liver Function Tests	**Australia**		**New Zealand**	
	Donors with value recorded *	**Above Normal**	**Donors with value recorded ***	**Above Normal**
Alanine Transaminase ALT > 40 u/L	238	100	27	12
Aspartate Transaminase AST > 40 u/L	207	113	27	11
Gamma Glutamol Transferase GGT > 60 u/L	237	61	29	4
Alkaline Phosphatase > 116 u/L	237	20	33	2
Total Bilirubin > 20 umol/L	239	34	33	6
* Not all donors have all tests				

Heart Donation

In 2014, there were 83 heart transplant recipients, including four heart/double lung transplant recipients. This was an increase of almost 36% for heart transplants since 2009.

New Zealand performed 17 heart transplants in 2014. This number has increased by 88.8% after being relatively stable over the past 8 years at between 9 and 12 heart transplants per year.

Figures 5.15 and 5.16 show the outcomes of requests for heart donation in Australia and New Zealand for 2014 respectively.

Figure 5.15

Outcome of Request for Heart Donation
Australia 2014

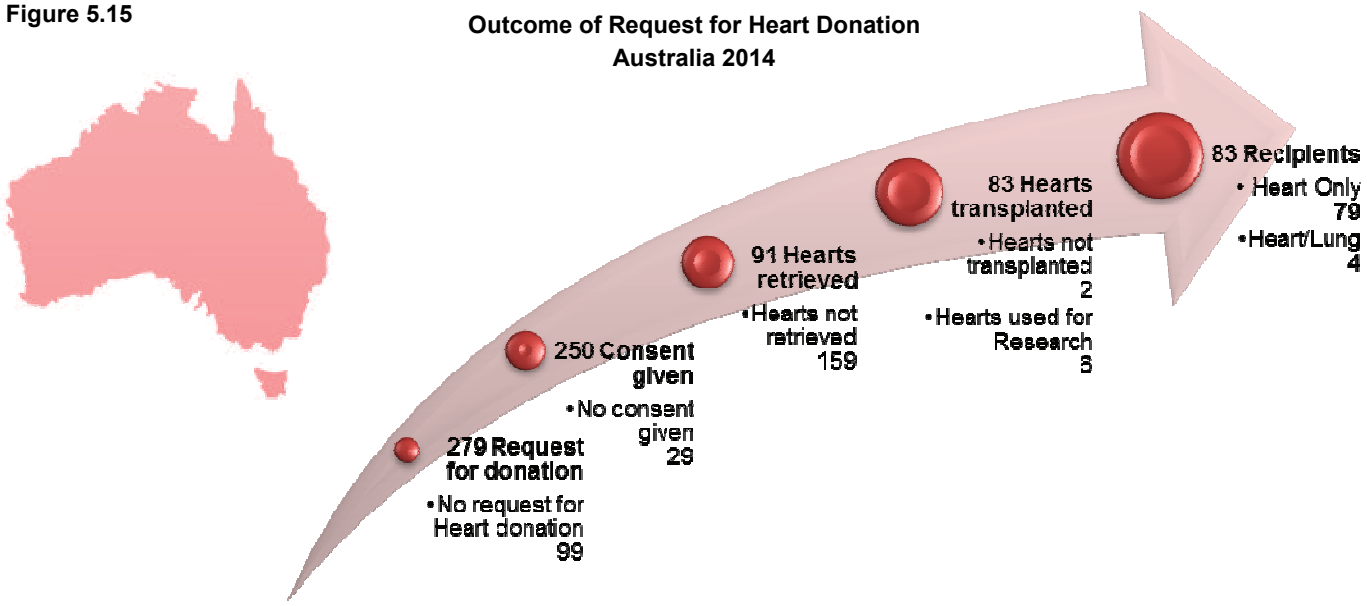
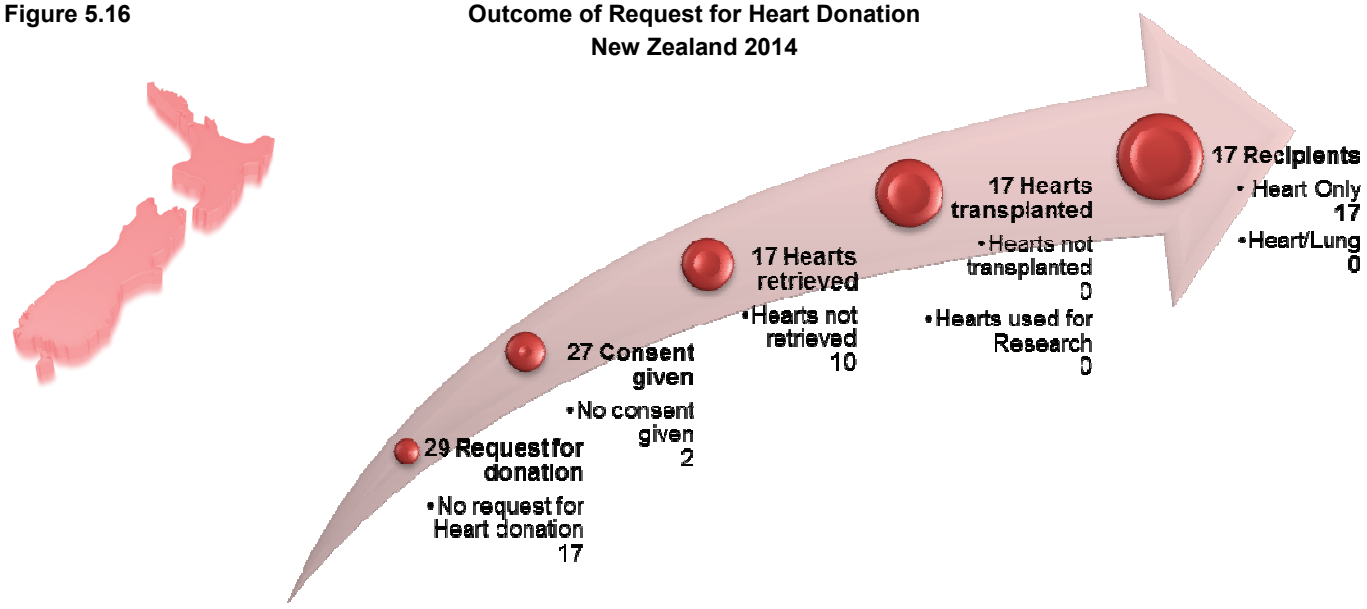


Figure 5.16

Outcome of Request for Heart Donation
New Zealand 2014



Figures 5.17 and 5.18 show the number of recipients of heart transplants in Australia and New Zealand respectively from 1998 to 2014. In Australia in 2014, the first heart transplant following donation after donor circulatory death was successfully performed .

Figure 5.17

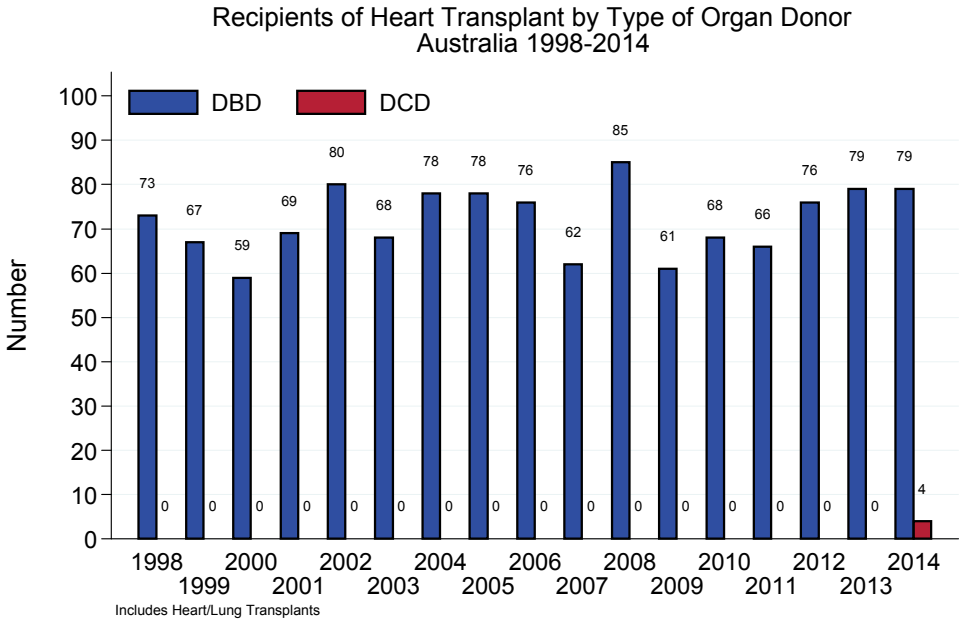
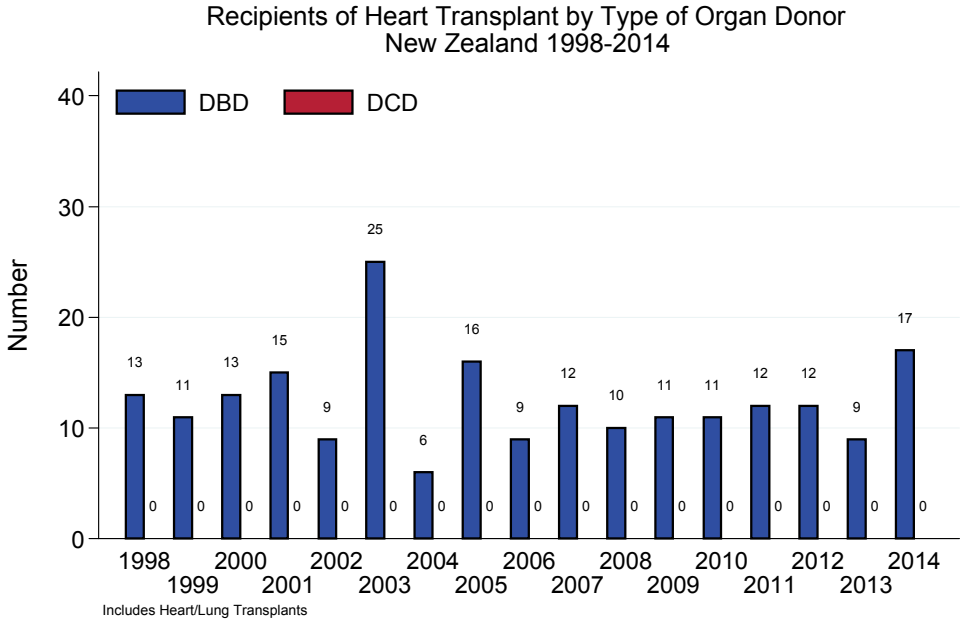


Figure 5.18



Figures 5.19 and 5.20 show the number of heart transplant and heart-lung transplant recipients from Australia and New Zealand decreased donaors from 2013 to 2014.

Figure 5.19

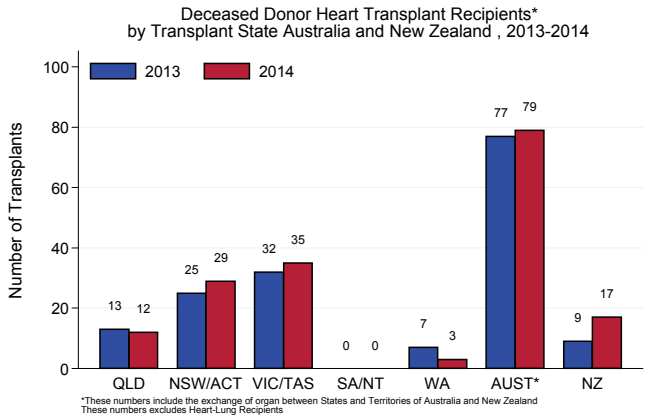
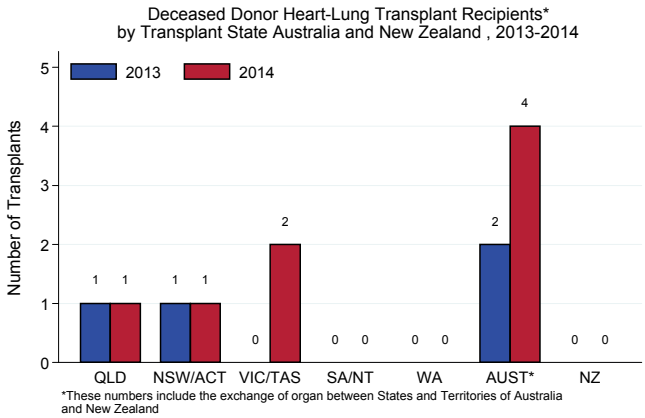


Figure 5.20



In 2014, there were 158 hearts not retrieved from Australian donors and 10 hearts not retrieved from New Zealand donors. For Australia, the main reason was due to the heart not being medically suitable (74) followed by age of donor (25), circulatory death preventing donation (24) and no suitable recipient for the heart (22).

In New Zealand, six hearts were not retrieved as there were no suitable recipients, three of the hearts were medically unsuitable and one heart was not retrieved due to logistics.

Table 5.4

Reasons Hearts Retrieved and Not Utilised for Organ Transplantation in Australia (New Zealand) 2010 - 2014

Year	Logistics	Not Medically Suitable	Not Surgically Suitable	No Suitable Recipients	Other	Total
2010	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
2011	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
2012	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
2013	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	1 (0)
2014	0 (0)	2 (0)	0 (0)	0 (0)	0 (0)	2 (0)

Age of Heart Donors

The age of donors providing transplanted hearts for Australia and New Zealand are shown in Figures 5.20 and 5.21 respectively.

Figure 5.20

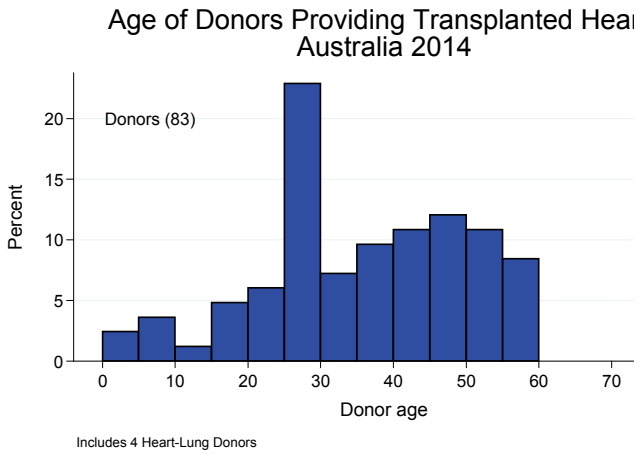
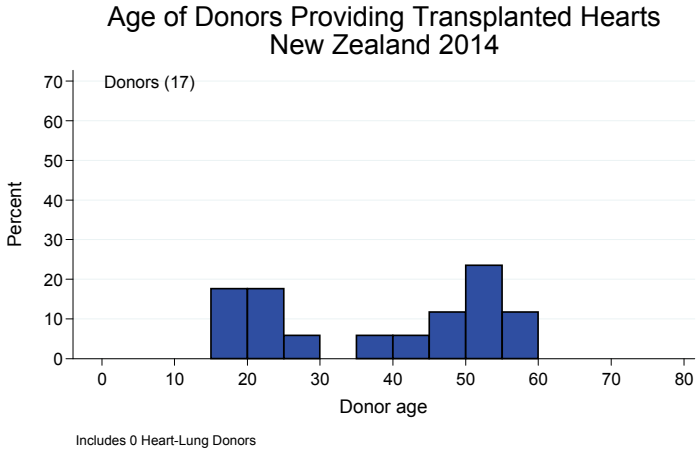


Figure 5.21



ECG and Echocardiogram

In Australia, 62 donors (74%) had a normal ECG and 71 of the 84 heart donors (84.5%) had a normal echocardiogram. In New Zealand, all 17 heart donors had a normal ECG and 15 had a normal echocardiogram.

Lung Donation

In 2014, there were 163 lung transplant recipients, including four heart/double lung transplant recipients. This was an increase of almost 24.5% for the number of lung transplants recipients since 2009.

New Zealand performed 20 lung transplants in 2014. This included 19 double lungs transplanted and one single lung transplant.

Figures 5.22 and 5.23 show the outcome of request for heart donation in Australia and New Zealand for 2014 respectively.

Figure 5.22

Outcome of Request for Lung Donation
Australia 2014

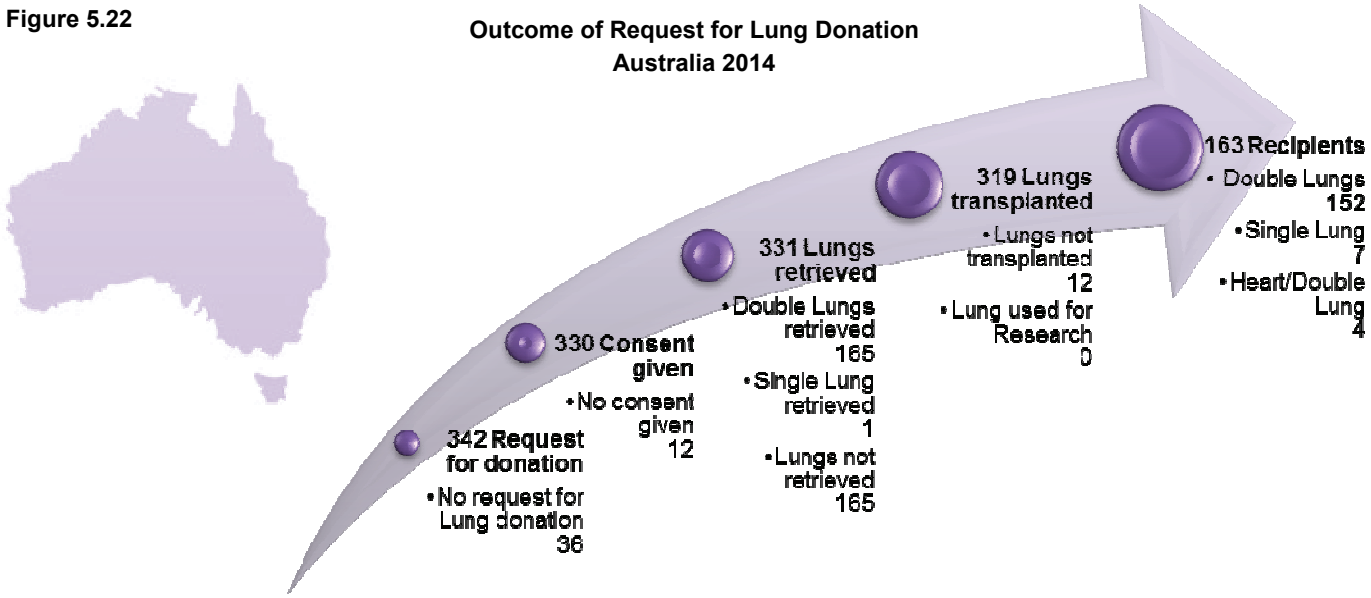
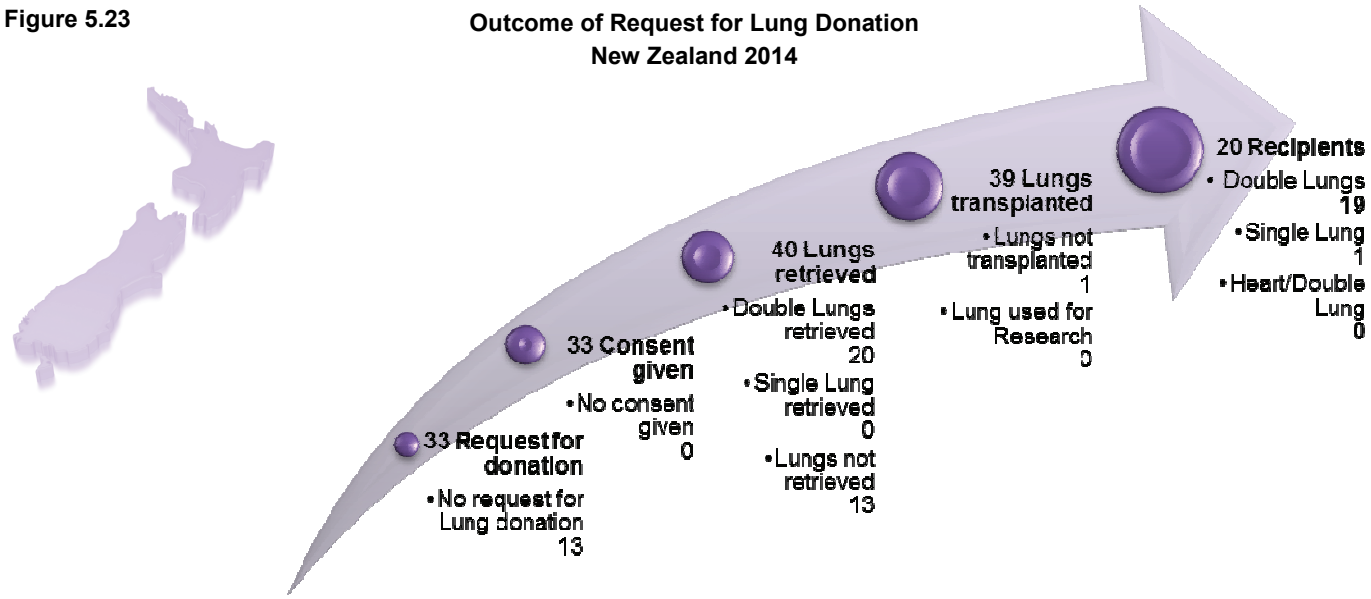


Figure 5.23

Outcome of Request for Lung Donation
New Zealand 2014



Figures 5.24 and 5.25 show the number of recipients of lung transplants in Australia and New Zealand respectively from 1998 to 2014.

Figure 5.24

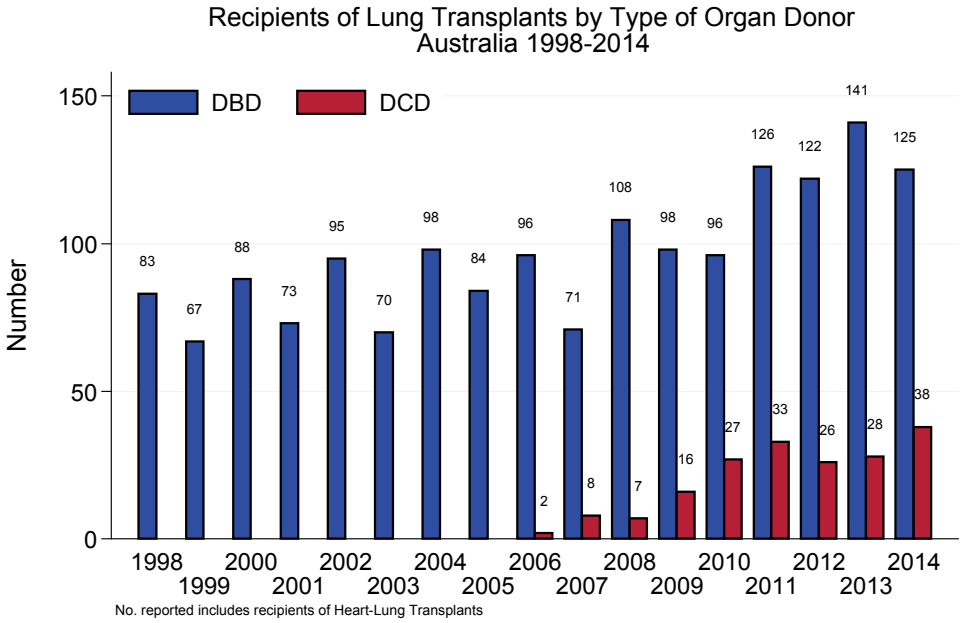
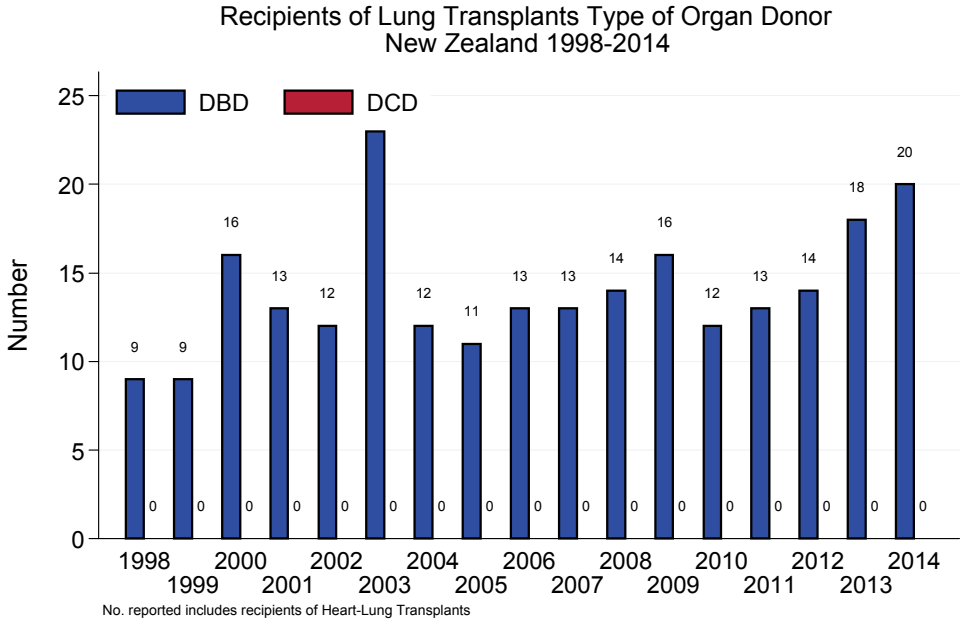
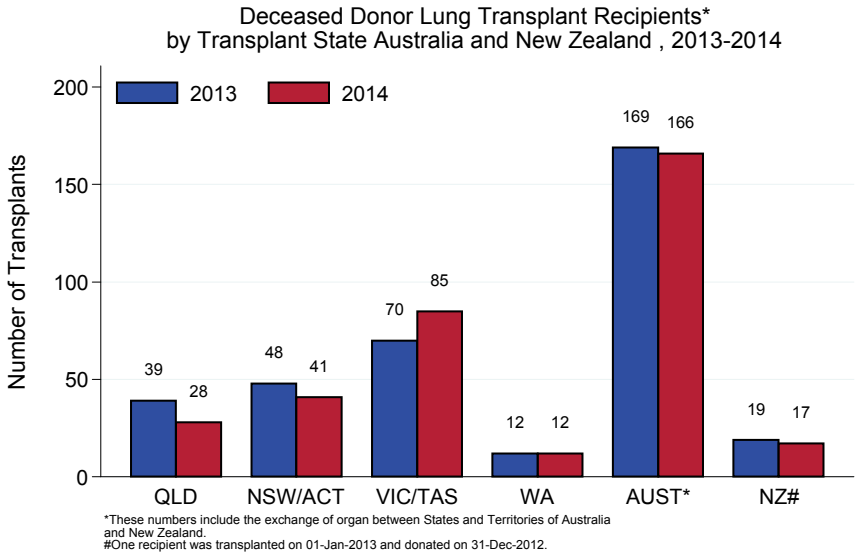


Figure 5.25



Figures 5.26 shows the number of recipients for lung transplants by state Australia and New Zealand deceased donaors from 2013 to 2014.

Figure 5.26



In 2014, there were 165 lungs not retrieved from Australian donors and 13 lungs not retrieved from New Zealand donors. For Australia, 112 lungs (68%) were not medically suitable, and in New Zealand, seven lungs (53%) were not medically suitable for transplantation.

Figure 5.5 shows the reasons lungs were not used from Australian deceased donors since 2010. In New Zealand, only one lung in 2009 was not transplanted, due to no suitable recipient being available.

Table 5.5

Reasons Lungs Retrieved and Not Utilised for Organ Transplantation in Australia (New Zealand) 2010 - 2014

Year	Logistics	Not Medically Suitable	Not Surgically Suitable	No Suitable Recipients	Other	Total
2010	0 (0)	1 (0)	2 (0)	0 (0)	2 (0)	5 (0)
2011	0 (0)	1 (0)	0 (0)	0 (0)	1 (0)	2 (0)
2012	0 (0)	0 (0)	0 (0)	0 (0)	3 (0)	3 (0)
2013	0 (0)	4 (0)	0 (0)	0 (0)	0 (0)	4 (0)
2014	0 (0)	10 (1)	0 (0)	2 (0)	0 (0)	12 (1)

Age of Lung Donors

The age distribution of donors providing transplanted lungs for Australia and New Zealand is shown in Figures 5.27 and 5.28 respectively.

Figure 5.27

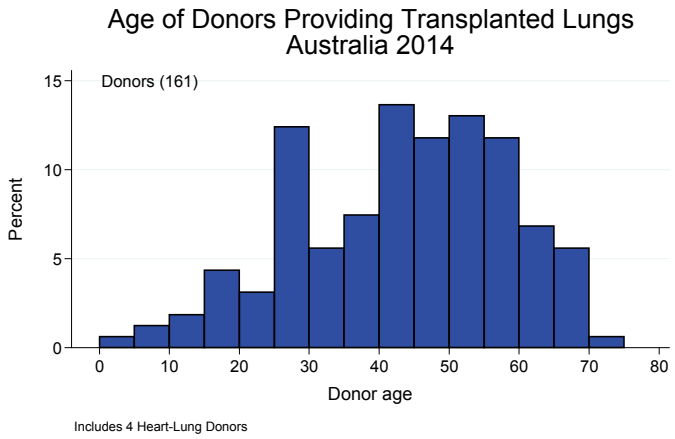
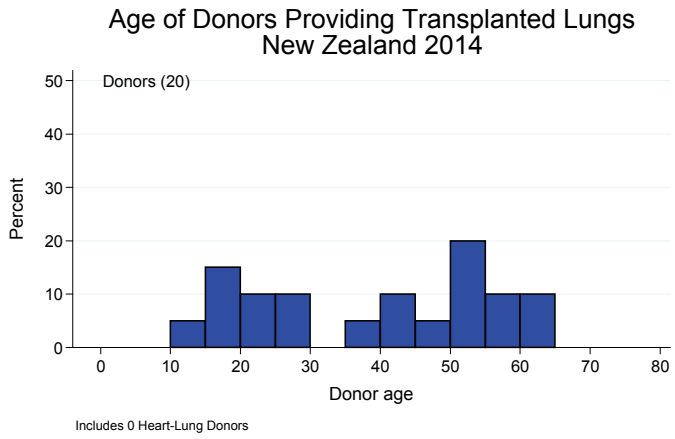


Figure 5.28



Donor Lung Function

In Australia, there were 140 lung donors (84.8%) who had a bronchoscopy in 2014. Sixteen donors had chest trauma; these included eight with a chest drain, five pneumothorax, with an contusions and one with fractured ribs. The arterial blood gases were taken on 100% FiO2 and PEEP of 5 cm. Seventy donors had a PEEP > 5 cm (42.4%). The results from 166 lung donors in 2014 show 14.6% (24) to be acidotic (pH < 7.35) and 22.4% (37) 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.

In New Zealand, there were four (22%) 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

In 2014, there were 44 pancreas transplant recipients and 43 were recipients of combined kidney/pancreas transplants and one of a combined pancreas, liver and intestine transplant. The 44 pancreas transplants was an increase of 15.9% since 2009.

New Zealand performed 2 pancreas transplants in 2014 compared to no pancreas transplants in 2013.

Figures 5.29 and 5.30 show the outcomes of request for pancreas donation in Australia and New Zealand for 2014 respectively.

Figure 5.29

Outcome of Request for Pancreas Donation
Australia 2014

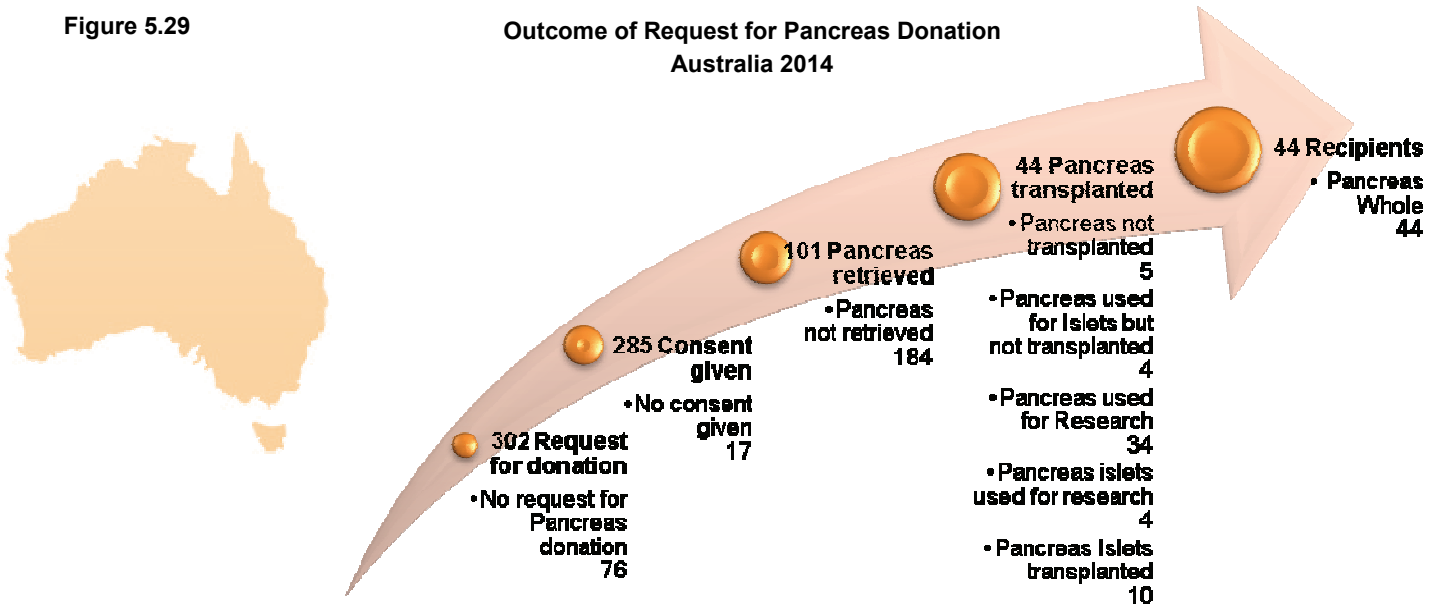
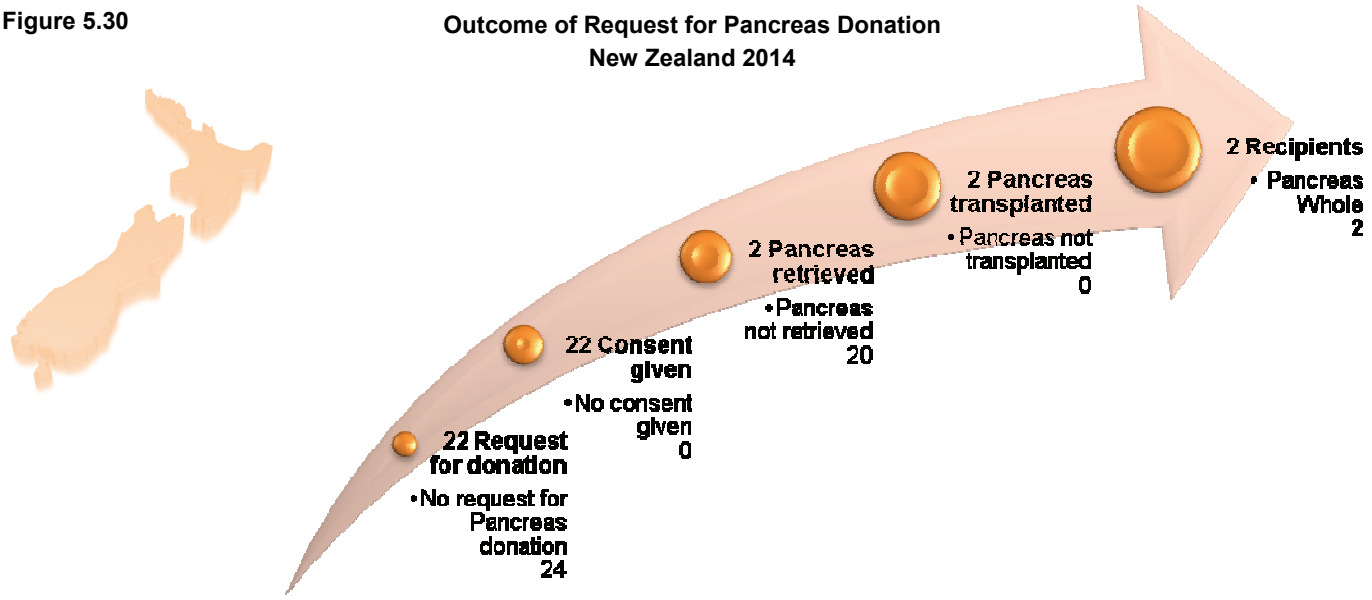


Figure 5.30

Outcome of Request for Pancreas Donation
New Zealand 2014



Figures 5.31 and 5.32 show the number of recipients of pancreas transplants by donation pathway in Australia and New Zealand respectively from 1998 to 2014.

Figure 5.31

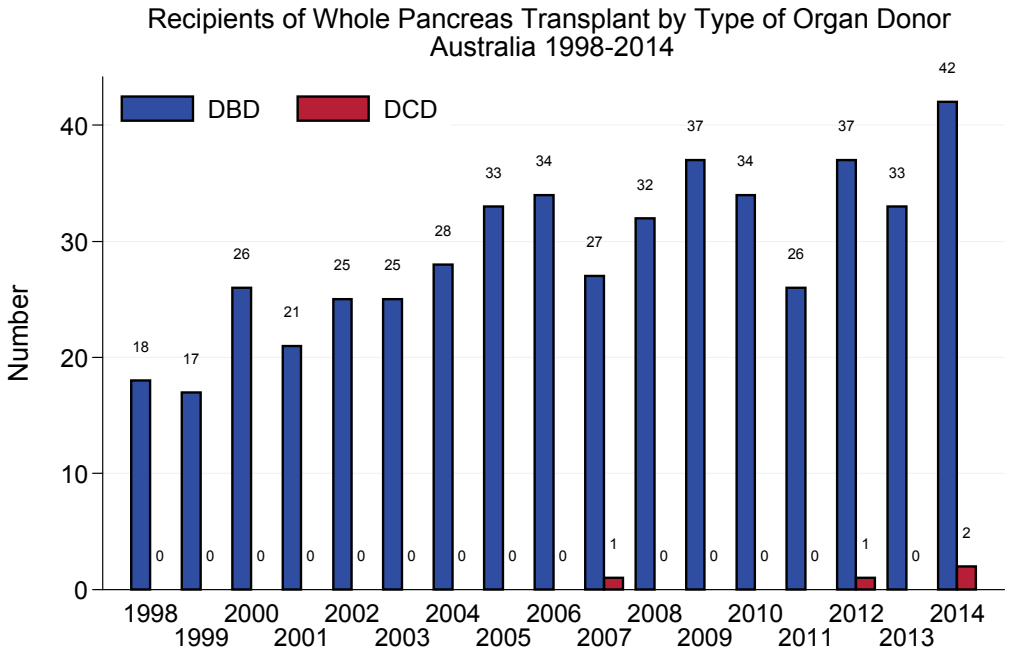
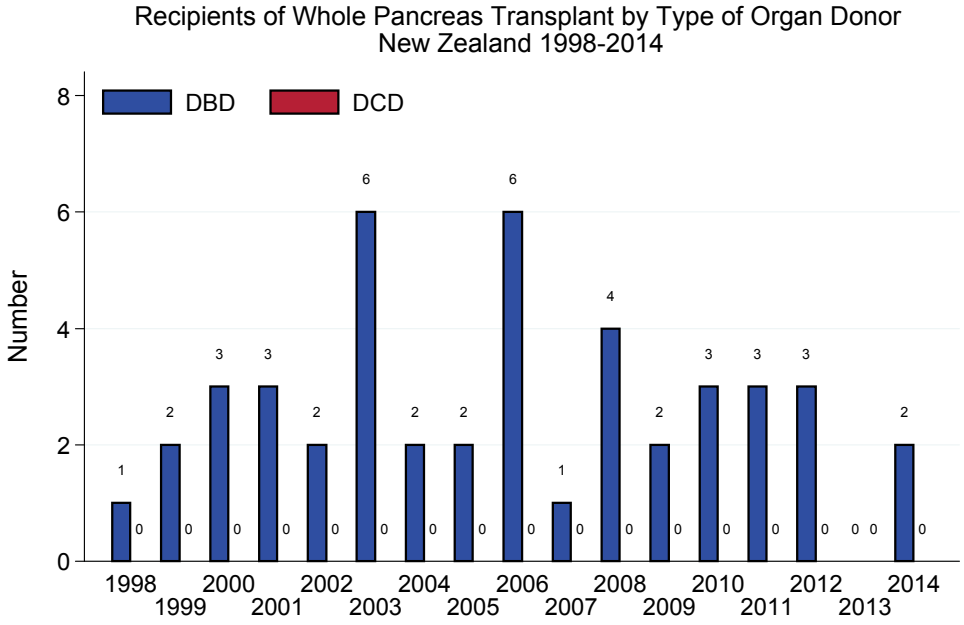
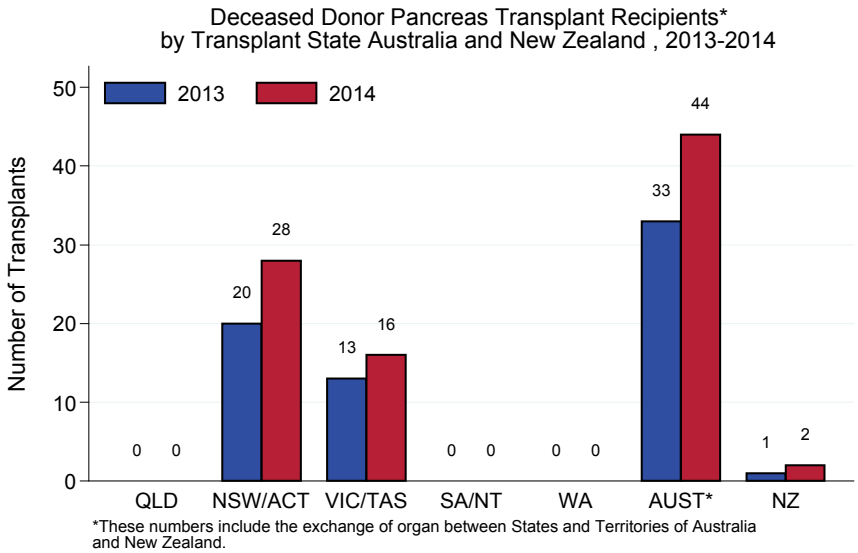


Figure 5.32



Figures 5.33 shows the number of recipients of pancreas transplant recipients by Australia and New Zealand in 2013 to 2014.

Figure 5.33



In 2014, there were 184 pancreas not retrieved from Australian donors and 20 from New Zealand donors. For those pancreas not retrieved in Australia, 81 were not medically suitable, 53 due to age of donor, 19 due to no suitable recipient being available, 15 due to logistical issues, 11 a result of DCD donation, two surgically unsuitable, one not retrieved for other reasons and one consent withdrawn. In New Zealand, pancreas were not retrieved due to the age of donor (7), no suitable recipient being available (6), not medically suitable (5) and two a result of trauma to the organ.

One hundred and one donors in 2014 had pancreas retrieved in Australia, however 38 of those were not for the purpose of organ transplantation but rather retrieved for research purposes. In New Zealand, no pancreas retrieved from donors were used for research purposes.

Table 5.6 shows the reasons pancreas were not used from Australian and New Zealand deceased donors since 2010.

Table 5.6

Reasons Pancreas Retrieved and Not Utilised for Organ Transplantation in Australia (New Zealand) 2010 - 2014

Year	Logistics	Not Medically Suitable	Not Surgically Suitable	No Suitable Recipients	Other	Total
2010	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)
2011	0 (0)	0 (0)	0 (0)	1 (0)	0 (1)	1 (1)
2012	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0)
2013	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)
2014	0 (0)	2 (0)	1 (0)	0 (0)	0 (0)	3 (0)

Age of Pancreas Donors

The age distribution of donors providing transplanted pancreas for Australia and New Zealand is shown in Figures 5.32 and 5.35 respectively.

Figure 5.32

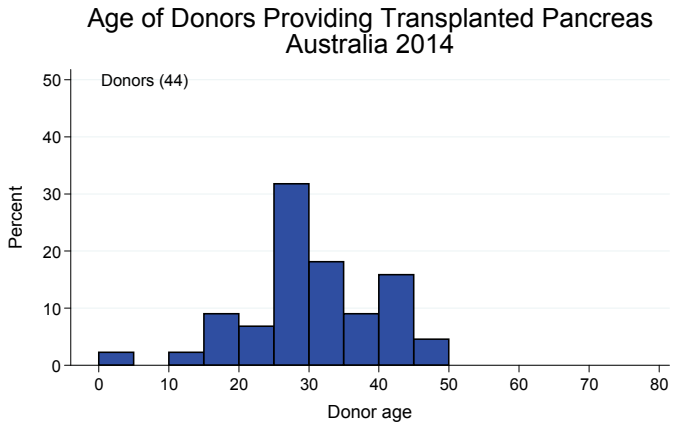
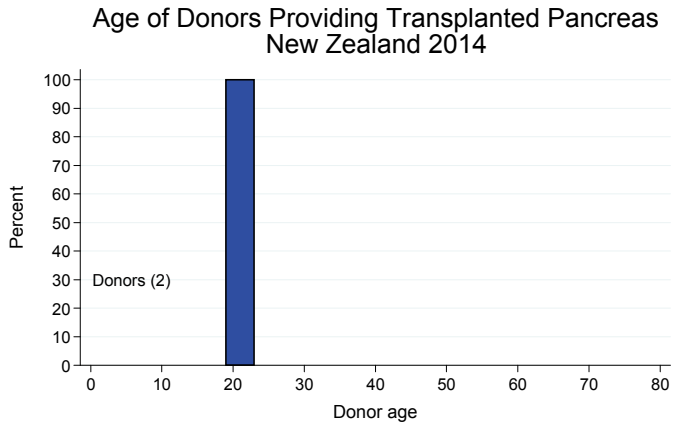


Figure 5.34

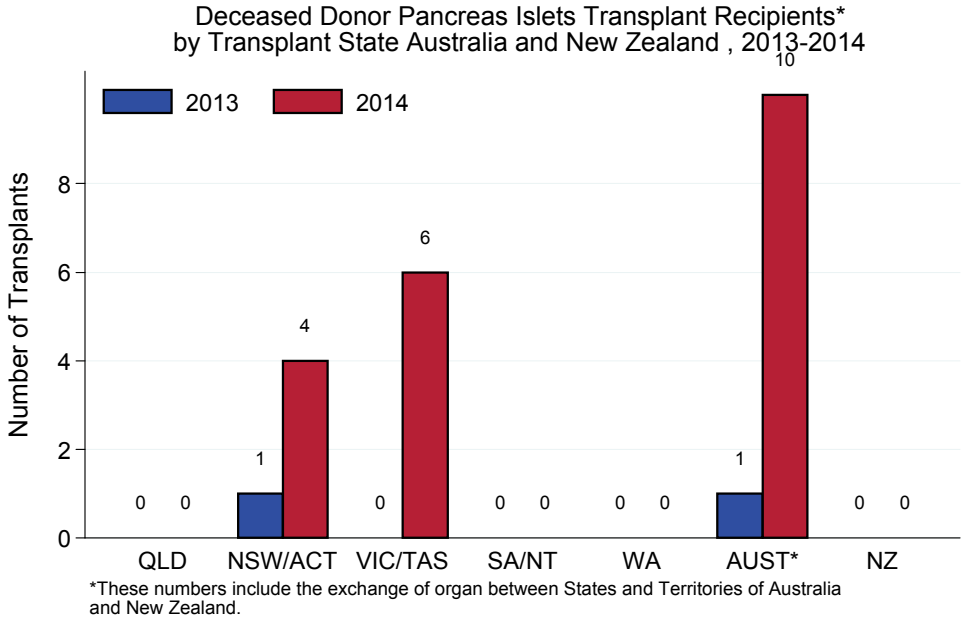


Pancreas Islets Donation

In Australia and New Zealand, the total number of pancreas islet transplants performed, since this experimental procedure began in 2002, is 79. In 2014, one person received a pancreas islet transplant combined with a kidney transplant procedure. Pancreas islets were not used for transplantation in six cases due to insufficient islets and a further four pancreas retrieved were used for pancreas islets research.

Figure 5.36 shows the pancreas islets transplant recipients from Australian and New Zealand deceased donors from 2013-2014.

Figure 5.36



Intestine Donation

Adult and paediatric patients with irreversible intestinal failure and developing severe complications from parenteral nutrition can benefit from intestinal transplantation. Only three 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. Subsequently there was one intestinal transplant in 2012 and another in 2014.

Figure 5.26