Australia & New Zealand Pancreas

Transplant Registry Report 1984-2006

This report is a compilation of data provided by the five current Pancreas transplant units in Australia and New Zealand: Auckland Renal Transplant Groups, New Zealand; Monash Medical Centre, Clayton, Victoria, Royal Prince Alfred hospital Camperdown, Diabetes Transplant unit, Randwick, and National Pancreas Transplant Unit, Westmead Hospital NSW Australia. The registry is funded in part by a grant from the Commonwealth Department of Health and Ageing.

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Table of Content

Summary

- 378 Pancreas transplants have been performed in Australia and New Zealand (ANZ) in 1984-2006.
- In 2006, 41 transplants were performed: Auckland (0), Monash (8), Prince of Wales (6), Westmead (27). Transplant by category: SPK (33), PTA (1) and ITA (7) .

International

- ANZ constituted of 8% (24 out of 433) to the non-US transplant activity in 2002.
- One-year SPK Patient survival was slightly higher in ANZ (97%) than in US (95%) and non-US (96%) in 1996-2002.
- ANZ had similar proportion of SPK to non-US (90%) but less PAK and PTA.
- ANZ compared favourably with international data on the 1-year Pancreas survival, Patient survival, and Kidney survival.

SPK Patient survival (Figure i)

- The 1-year, 3-year and 5-year SPK Patient survival was 96%, 94% and 93% in 1984-2004.
- Recipients had significantly 4 fold lower in Instantaneous relative risk (hazard rate, HR) of death if the operation was performed after 1994.

1–year

- 95% for BD and 96% for ED.
- 96% for recipients aged <45 and 92% for those ≥45.
- Recipients aged less than 45 had a significantly better survival compared to those over 45 with the HR of 0.5.

SPK Kidney graft survival (Figure i)

- 1-year, 3- year and 5-year was 92%, 90% and 86%.
- The HR was 2.5 times higher for Kidney graft failure in 1984-1993 compared to 1994-2004.

1–year

- 83% in 1984-1993 and 94% 1994-2004.
- 91% for BD and 96% for ED.
- 92% for the recipients aged <45 and ≥45.

SPK Pancreas graft survival (Figure i)

- 1-year, 3-year and 5-year Pancreas survival was 86%, 82% and 78% respectively in 1984-2004.

1- year

- 82% in 1984-1993 and 87% in 1994-2004.
- HR was 2.5 times significantly higher in 1984-1994 compared to 1993-2004.
- 84% for BD and 92% for ED.
- 87% for the recipients aged <45 and 83% for those ≥45.

Islet transplant

- Eighteen Islet transplant procedures have been performed in nine patients since 2002. 7 were performed in 2006.

Others

- The most common known causes of death was Cardio/Cerebrovascular event (40.5%)
- 38% of kidney and pancreas graft failure was due to thrombosis.
- Six recipients had a second transplant: SPK (4), SPK followed by PTA (1), PAK (1).

Glossary

- SPK - Simultaneous Kidney Pancreas Transplant
- PTA - Pancreas Transplant Alone
- PAK - Pancreas after Kidney Transplant
- ITA - Islet Transplant Alone
- BD - Bladder Drained Pancreas
- ED – Enteric Drained Pancreas

Figure i. SPK Patient survival, Kidney survival and Pancreas survival in Australia and New Zealand, 1984-2006

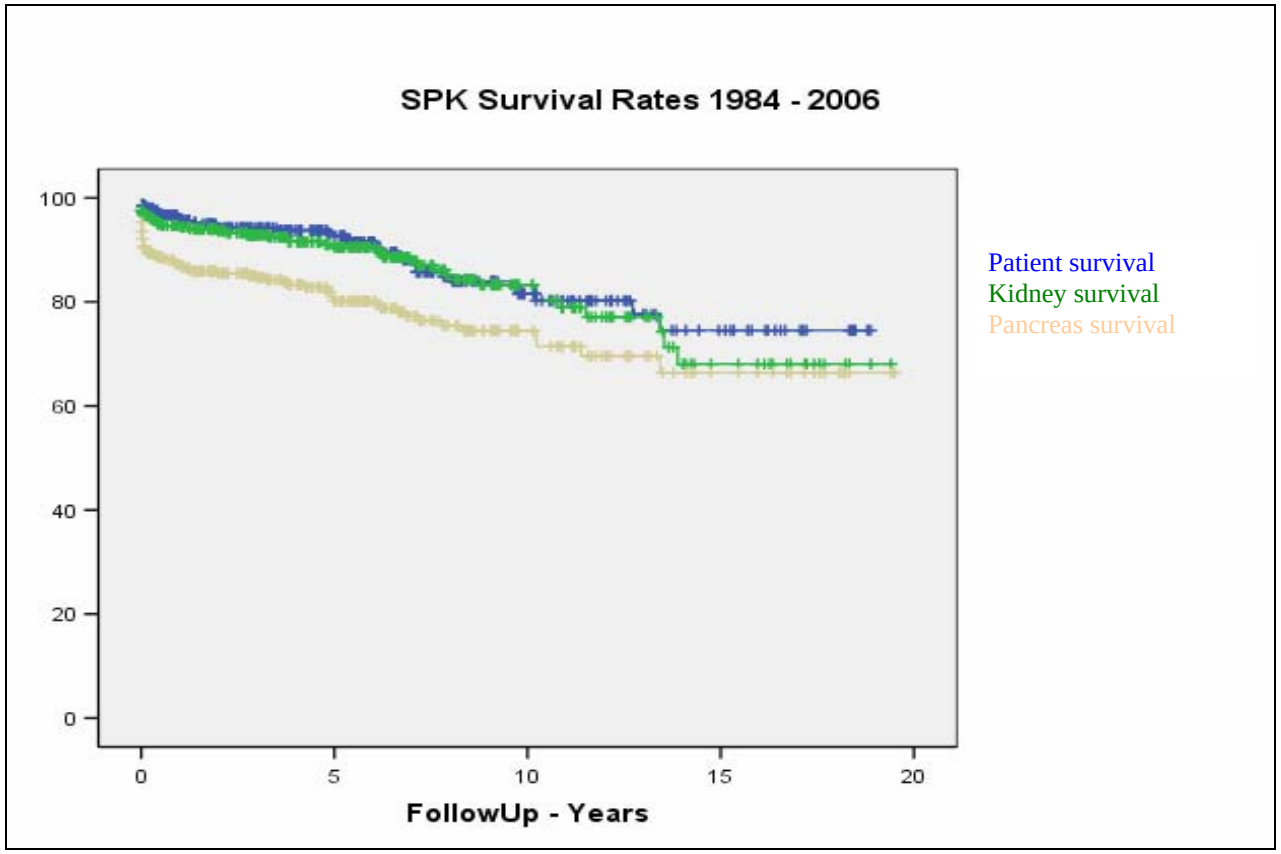

Figure ii Patient and Graft Survival from ANZDATA between 1997 - 2005

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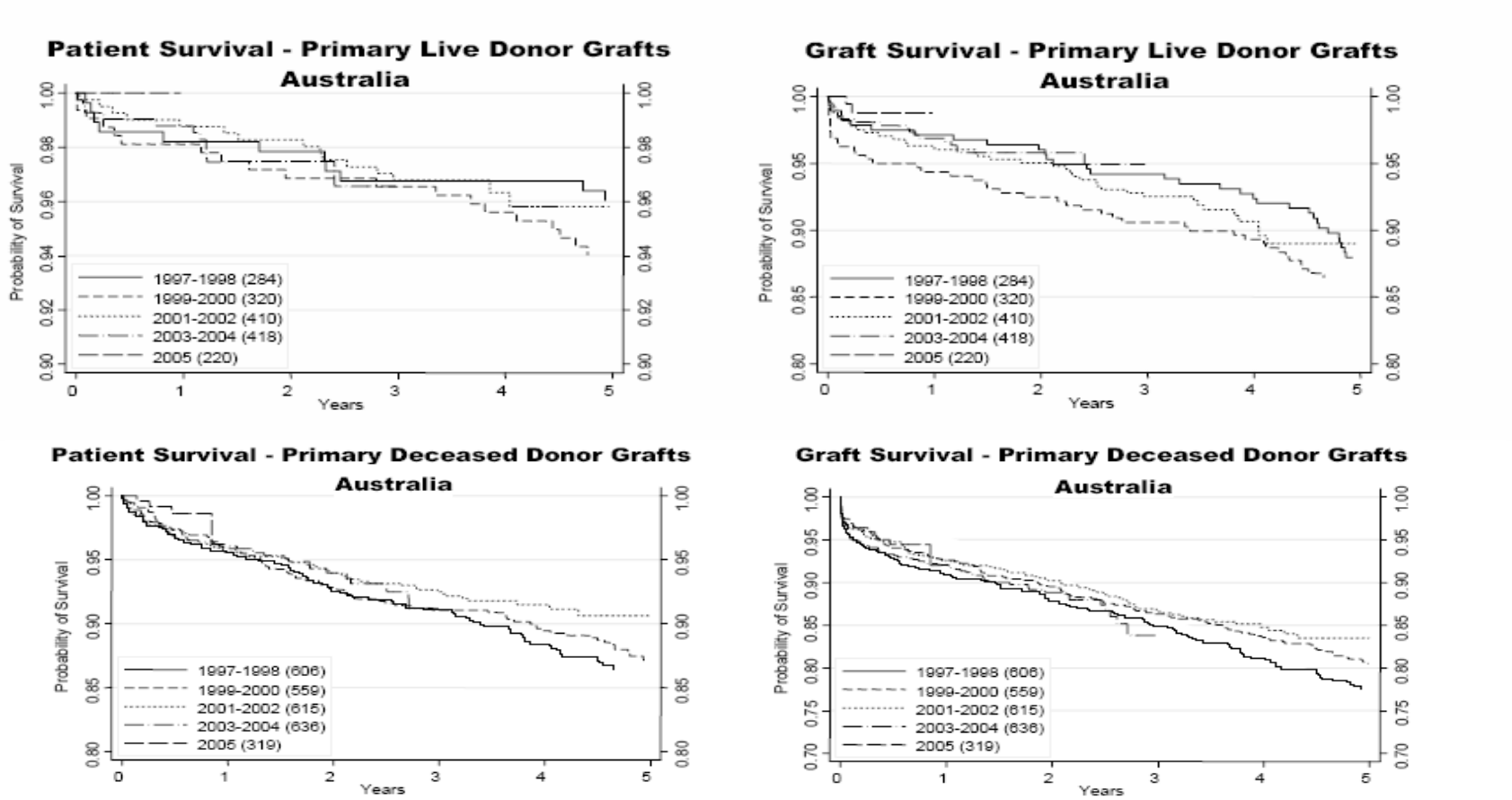

Source: ANZDATA Registry Report 2006

Introduction

The Australia and New Zealand (ANZ) Pancreas transplant data were obtained from the transplant centers in Auckland Renal Transplant Group (Auckland), Monash Medical Center (Monash), Royal Prince Alfred Hospital , (Camperdown) and National Pancreas Transplant Unit at Westmead Hospital (Westmead). Auckland commenced in 1998. Islets were first performed in Westmead in 2002, and subsequently at 6 transplants in 2006 at Prince of Wales hospital.

There have been 372 pancreas transplants in Australia and New Zealand (ANZ) between November 1984 to December 2006. No activity was recorded in 1985 and 1986. Of these, six pts have had a second transplant.

Analysis

The functioning pancreas grafts are defined as insulin independent recipients. Kidney grafts are defined as functioning if recipients are dialysis free. All causes of death are included in the survival analysis. Patients receiving a second transplant after failure of the first graft are censored for Patient survival for the first graft at the date of the second graft.

The aims of this report are to:

- outline all the transplant activity in 1984-2006
- compare the ANZ data to US and non US (noted by  in the text)

The distribution of Patient survival, Kidney graft survival and Pancreas graft survival was analysed by two periods (1984-1993 and 1994-2003), pancreas duct management (Bladder drained [BD] and Enteric drained [ED]) and two age groups (below 45 and above 45) in Simultaneous pancreas and kidney (SPK) recipients. A brief discussion was made on duct management, causes of deaths, donor age, causes of graft failure, re-transplant, waiting list and number of organ donation.

Kaplan-Meier survival curves were used to illustrate the survival distributions. Cox regression models were used to estimate the Instantaneous relative risks (hazard ratios, HR) and their 95% confidence intervals. The HR quantifies differences in survival between groups. The statistical software package, SPSS® for Windows Release 13.0 was used for all analyses.

Number of transplants

Figure 1 illustrates the number of transplants in ANZ between 1984 and 2006. Eighty-five percent of the transplants were performed after 1994 (316 out of 372). Between 1999-2006, the transplants was performed in Westmead (157 of 247), Monash (64), Auckland (19), RPA (1) and POW (6). In 2006, 41 transplants were performed: Auckland (0), Monash (8), Westmead (27) and Prince of Wales (6)

Figure 1. Number of transplants by centers between 1984-2006

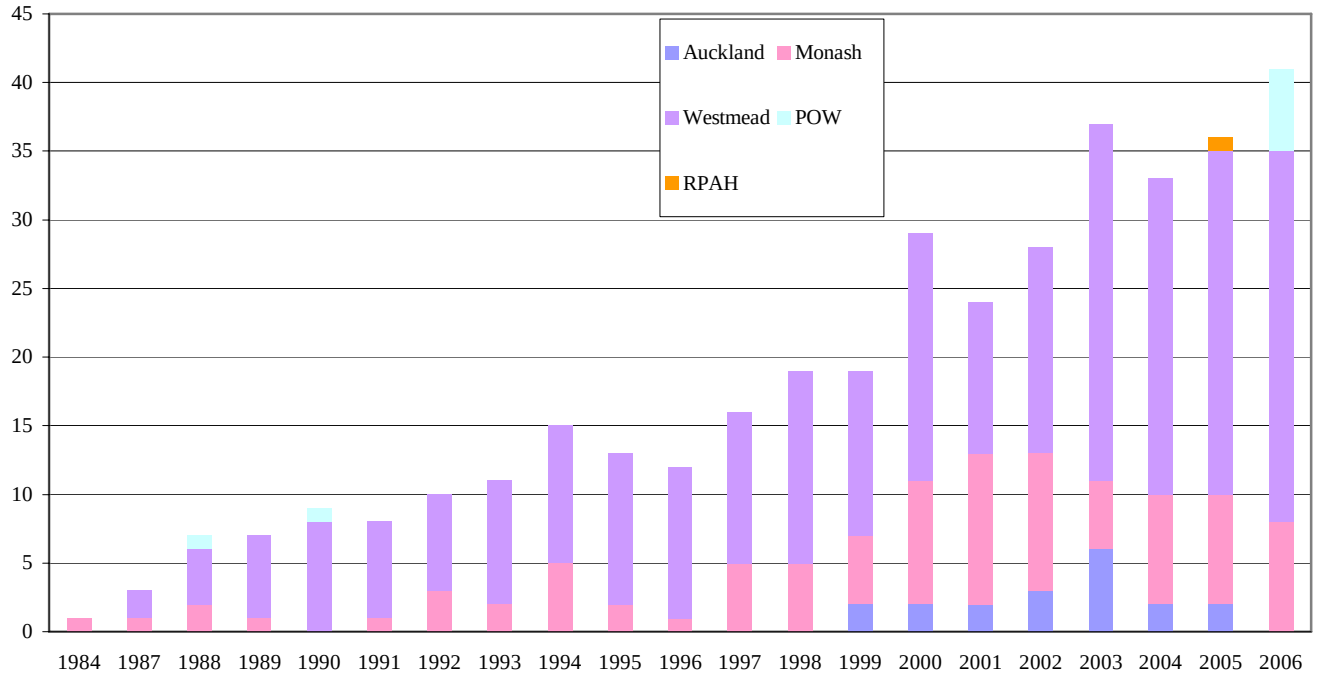

Figure 2. Number of Pancreas transplants by centre in Australia and New Zealand, 1984-2006

Pancreas Transplant by Category

Figure 2 shows the pancreas transplants by category: Simultaneous pancreas-kidney transplant (SPK), Pancreas after kidney (PAK), Pancreas transplant alone (PTA) and Islets transplant (ITA). SPK is the major pancreas transplants by category in ANZ at 91% (345 out of 372) in 1984-2006 followed by eighteen ITA, eight PAK, six PTA and one Pancreas/Liver and Kidney was performed in 2006.

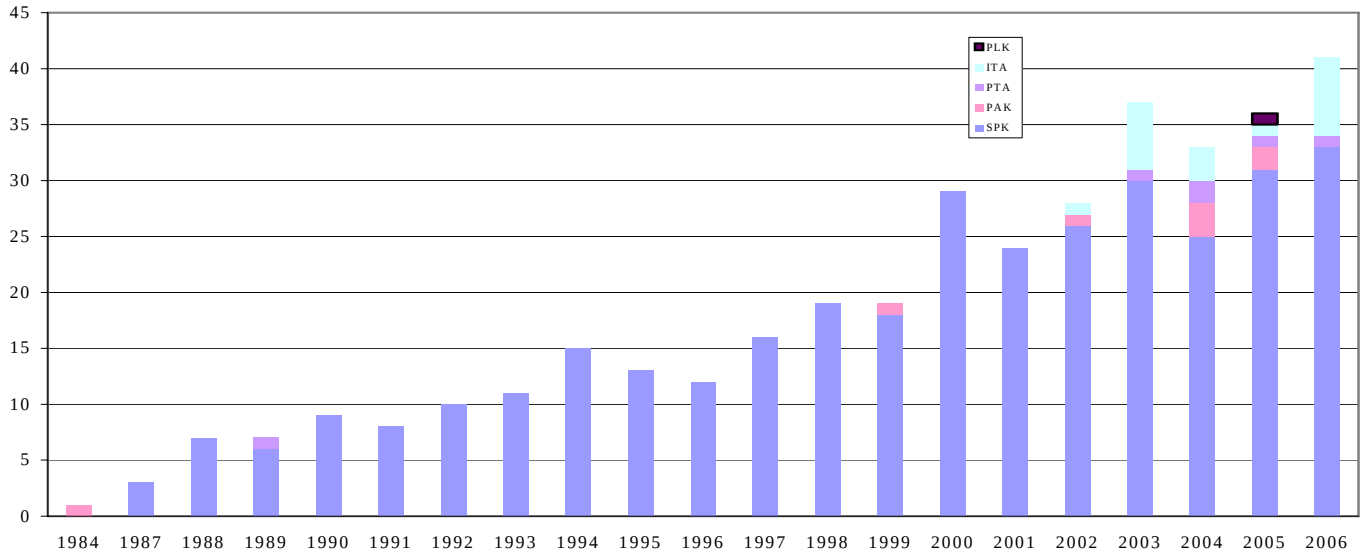

Figure 2. Pancreas transplant by category in Australia and New Zealand, 1984-2006

The proportion of all transplants which were SPK was over 90% in both ANZ (345 out of 372, excluding eighteen ITA) and non-US (4,336 out of 4,756) but less in US (79%, 11,505 out of 14,605) in 1984-2004 (Figure 3). In 2002, ANZ (4%, 0%) had less PAK and PTA compared to non-US (11%, 6%) and US (26%, 9%).

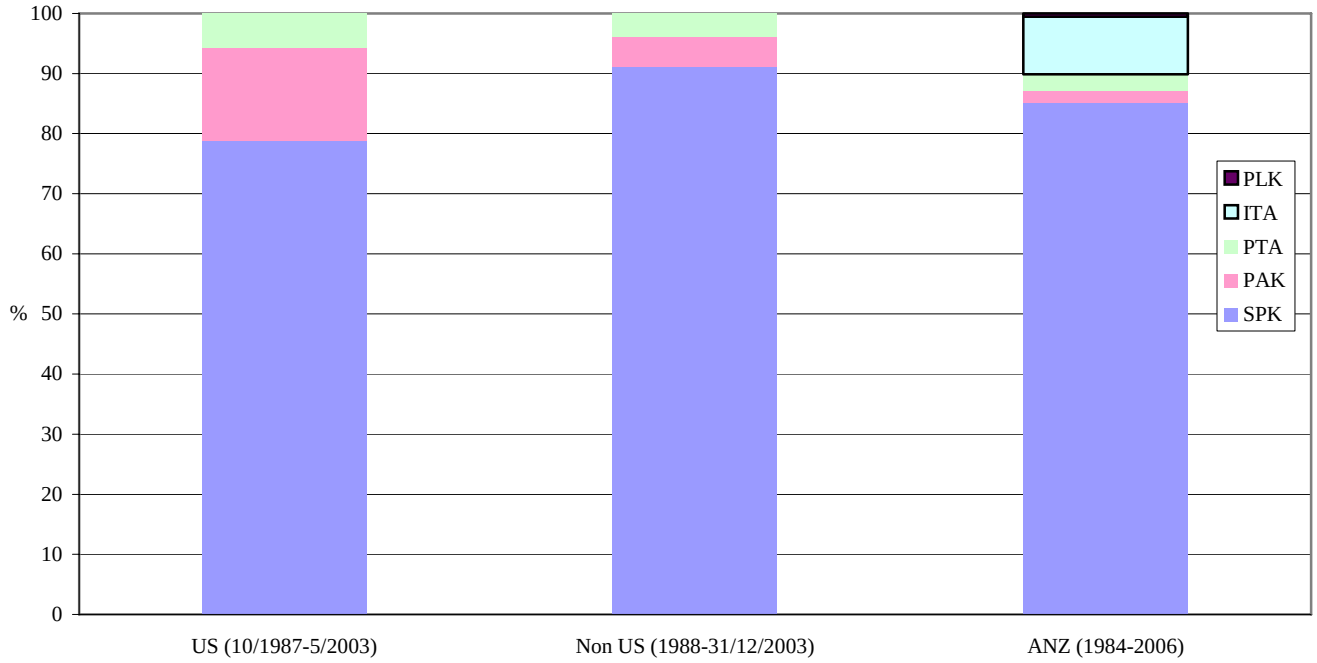

Figure 3. Pancreas transplant by category (%)

By Pancreas duct management

ED was introduced in ANZ during 2001. Figure 5 illustrates the number of transplant by duct management. In 2006, all transplants activities were performed with ED but two.

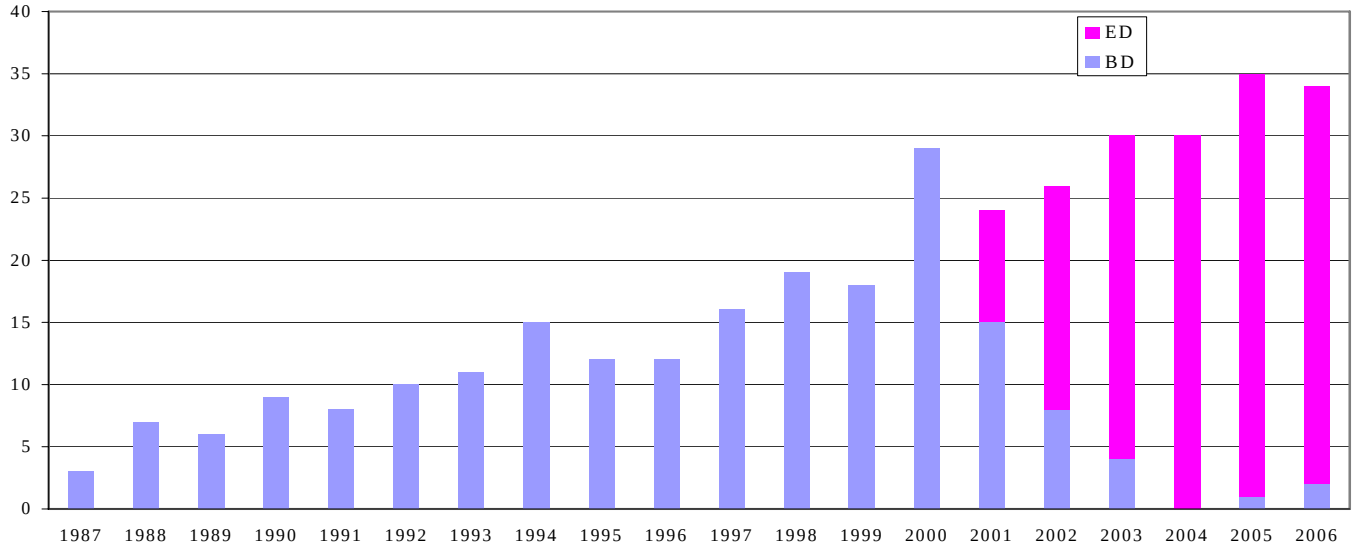

Figure 4. Pancreas duct management in ANZ, 1984-2006

Preservation time

The mean ischaemic time was 10-11 hours (standard deviation: 4 hours) for both kidney and pancreas.

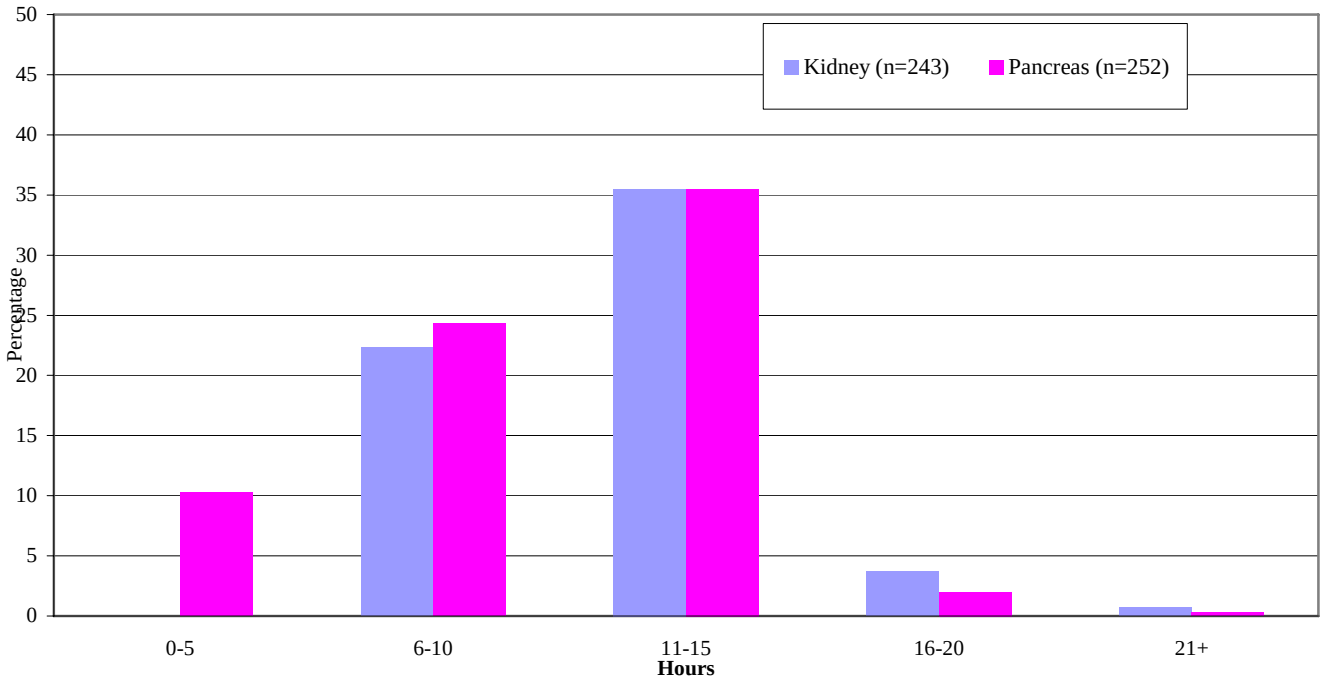

Figure 5. Ischaemic time for Kidney and Pancreas graft, 1984-2006

Demographics

Gender

Sixty one percent of donors were male compared to 52% in the recipients (Figure 6).

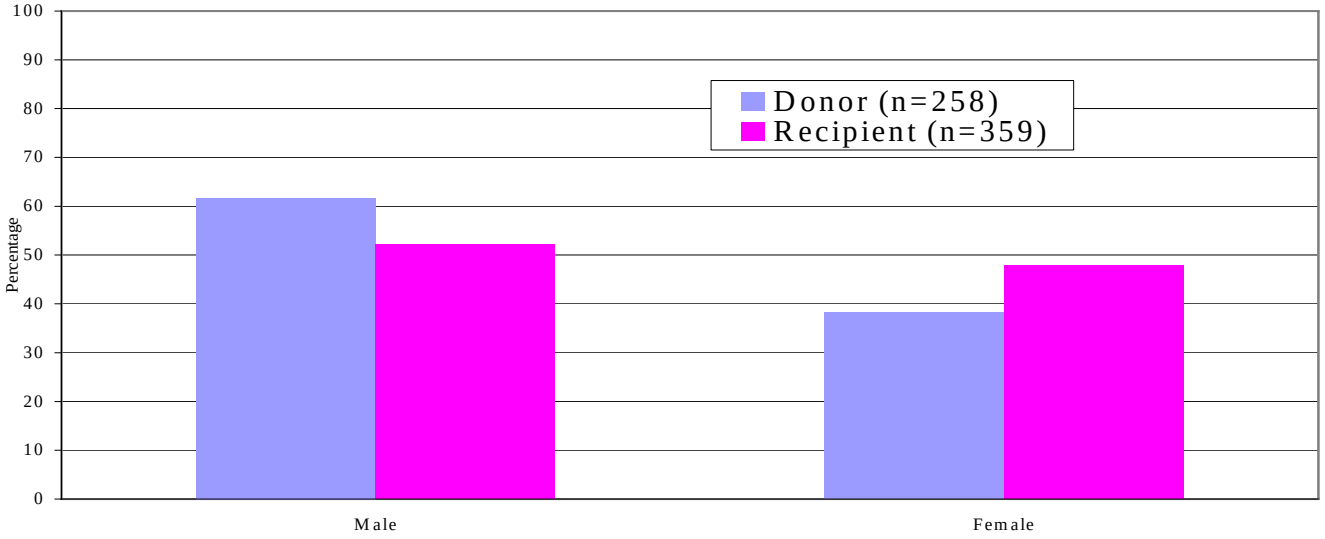

Figure 6. Gender in Donor and recipients, 1984-2006

Age groups

Figure illustrates the distribution of six age groups in both donor and recipients. The age range for the donors was between 6 to 61 years. It was between 20 to 60 in the recipients. The median age was 23 years (standard deviation: 10.5) and 37 years (standard deviation: 7.17) for the donors and recipients respectively. Majority of the donors and recipients were aged less than 40.

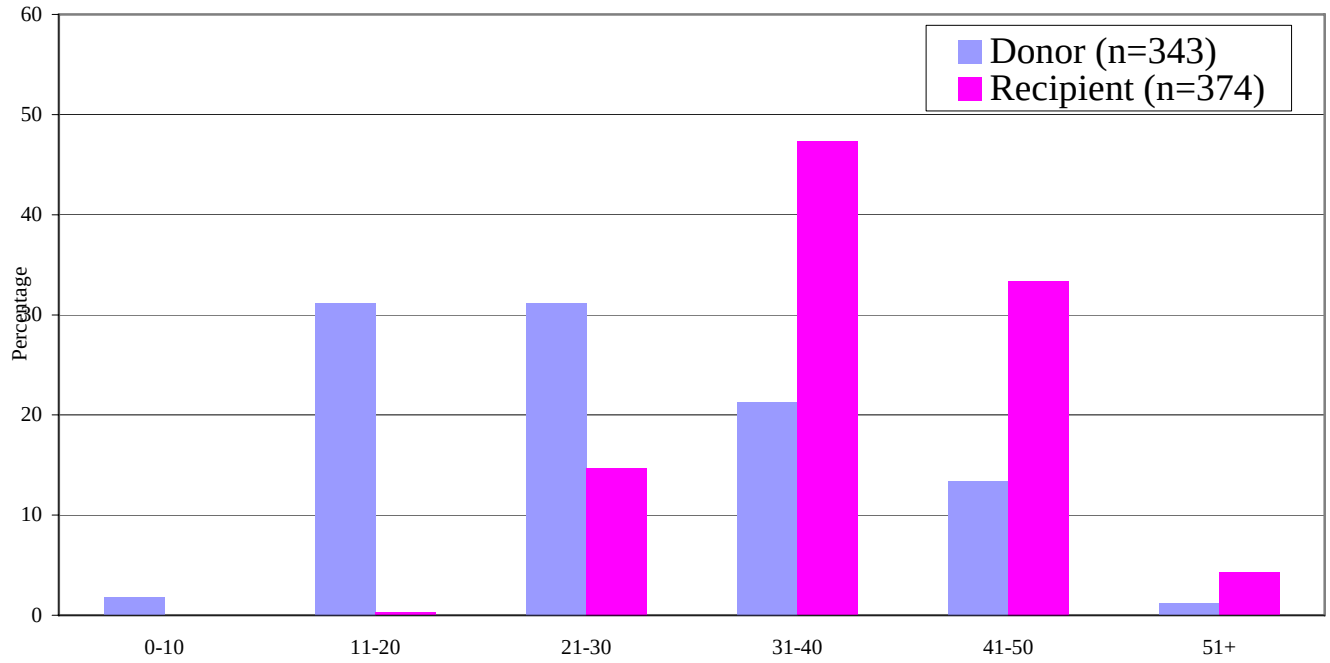

Figure 7. Age groups in Donor and recipients, 1984-2006

Smoking

Majority of the recipients had never smoked (65%, 100 out of 253) compared to 48% in the recipients (Figure). Over forty percent of the recipients were current smokers.

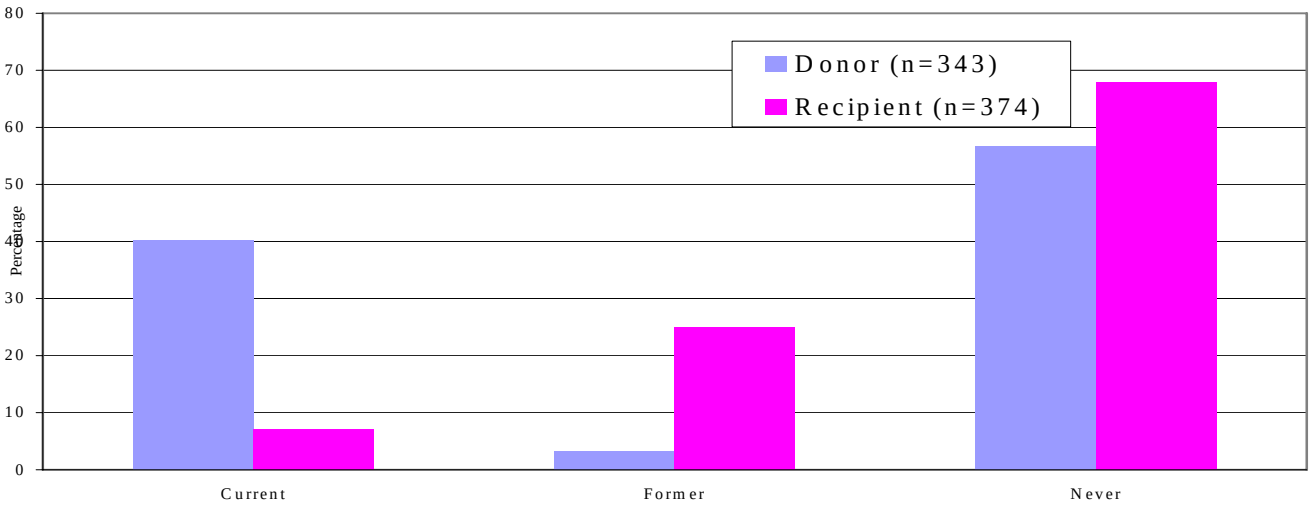

Figure 8. Smoking status in Donor and recipients, 1984-2006

Alcohol status in donor

Over eighty percent of the donors had never consumed alcohol (> than 40g/day) (Figure9).

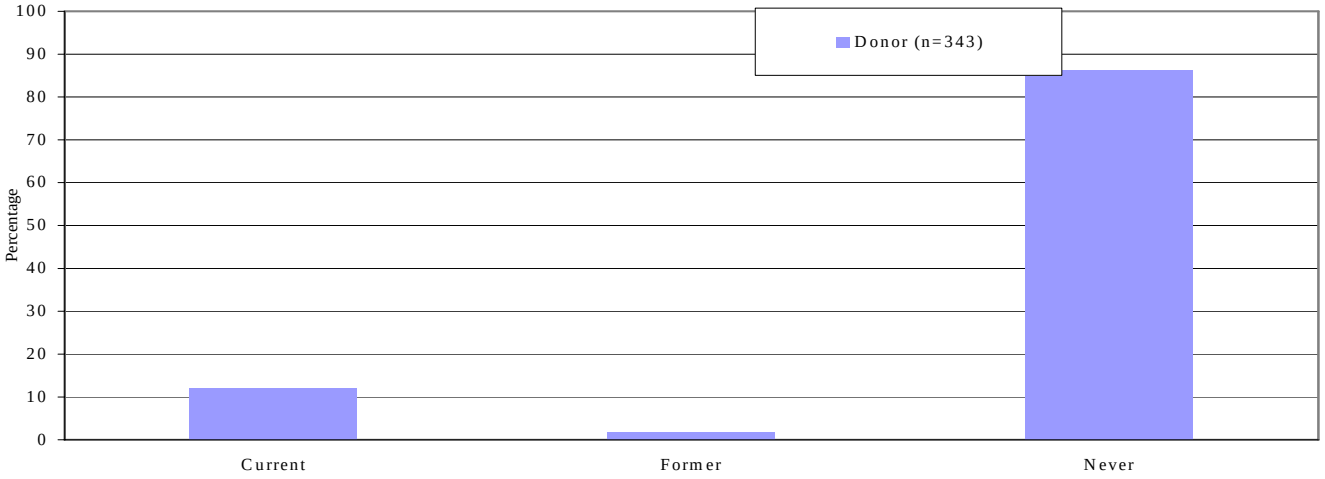

Figure 9 Alcohol consumption in Donor , 1984-2006

Islet transplant

Since 2002, eighteen Islet transplant procedures have been performed in 9 patients with 100% patient survival. Figure 18 shows the Islet recipient by age group. The mean age of Islet recipients at transplant was 43 (standard deviation: 7.0). There were an equal proportion of recipients in both sexes. The average length of Type I Diabetes to transplant was 22 years, (standard deviation: 5.6 years).

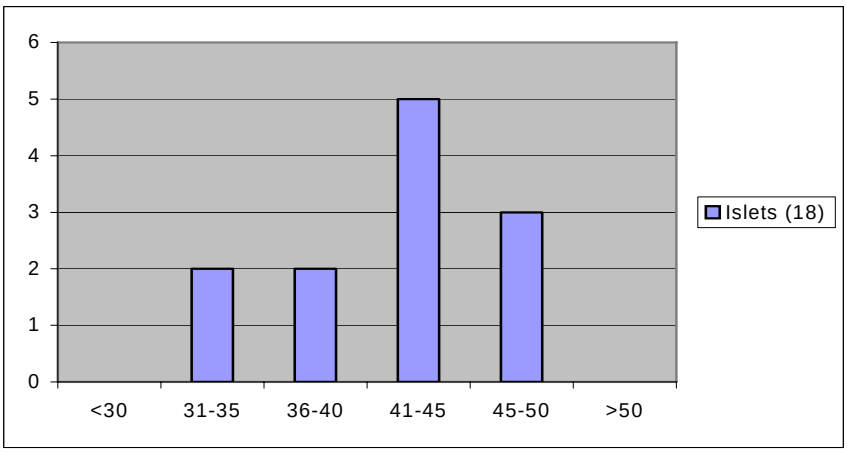

Figure 10. Islet recipient by age groups at transplant, 2002-2006

- The number of Islet transplant worldwide in 2000 was 280

Death

Figure 11 shows the causes of death after transplant for recipients in 1984-2006. The common known causes of death were Cardio/Cerebrovascular event 39% and other 28%.

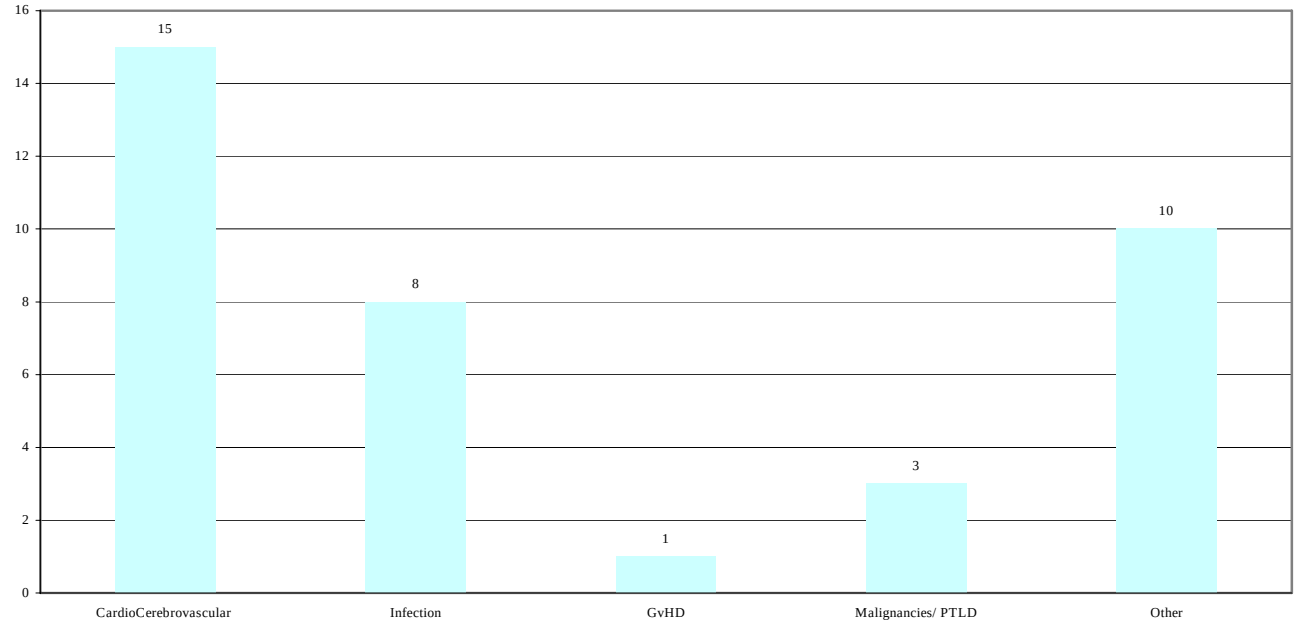

Figure 11. Number of known causes of death after transplant, 1984-2006

Reasons for graft failure

Forty Nine percent (38 out of 77) of pancreas graft failure were due to thrombosis in 1984-2006 (Figure 12). This was followed by other (235%). The major cause of kidney graft failure was thrombosis (41%, 21 out of 51) and rejection (35%).

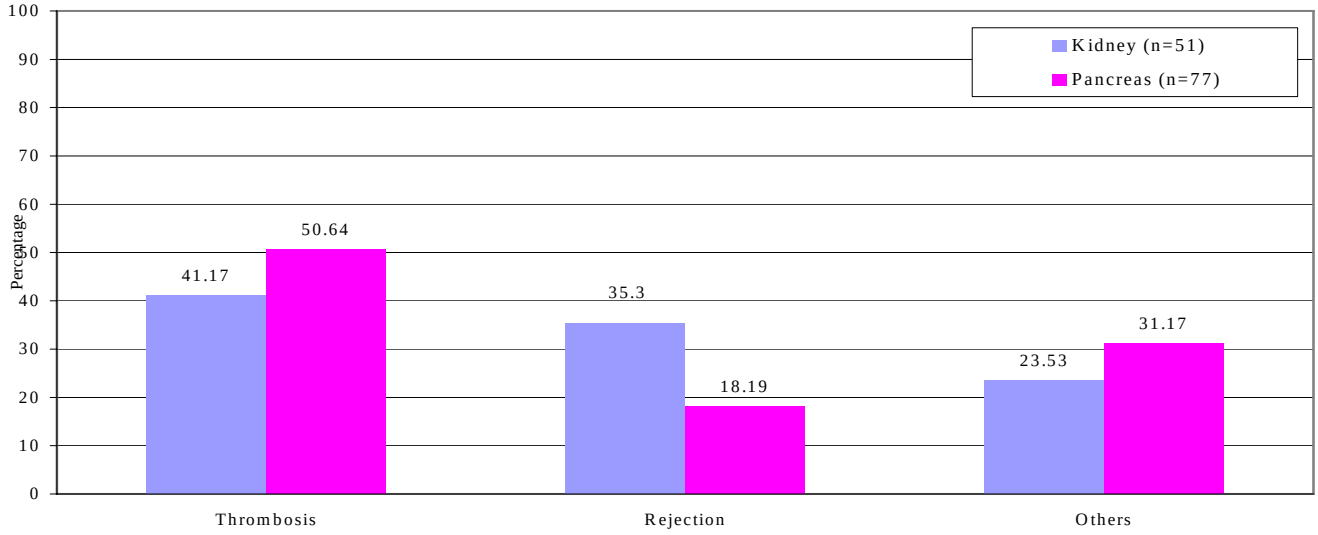

Figure 12. Reasons for graft failure

Thrombosis was also the most common reason for graft failure in US, 1999-2003 (60%).

Re-transplant

Six recipients had a second transplant. Four pancreas recipients had a second SPK and one had a PTA and one had a PAK.

Waiting time

In December 2006, the number of recipients on the active Kidney Pancreas Transplant waiting list was 37. The number of patients on Islet Transplant Waiting list was 6 (The average waiting time for patients transplanted with cadaver pancreas was 1.9 years (33 patients) and 1.4 years (4 patients) for islets.

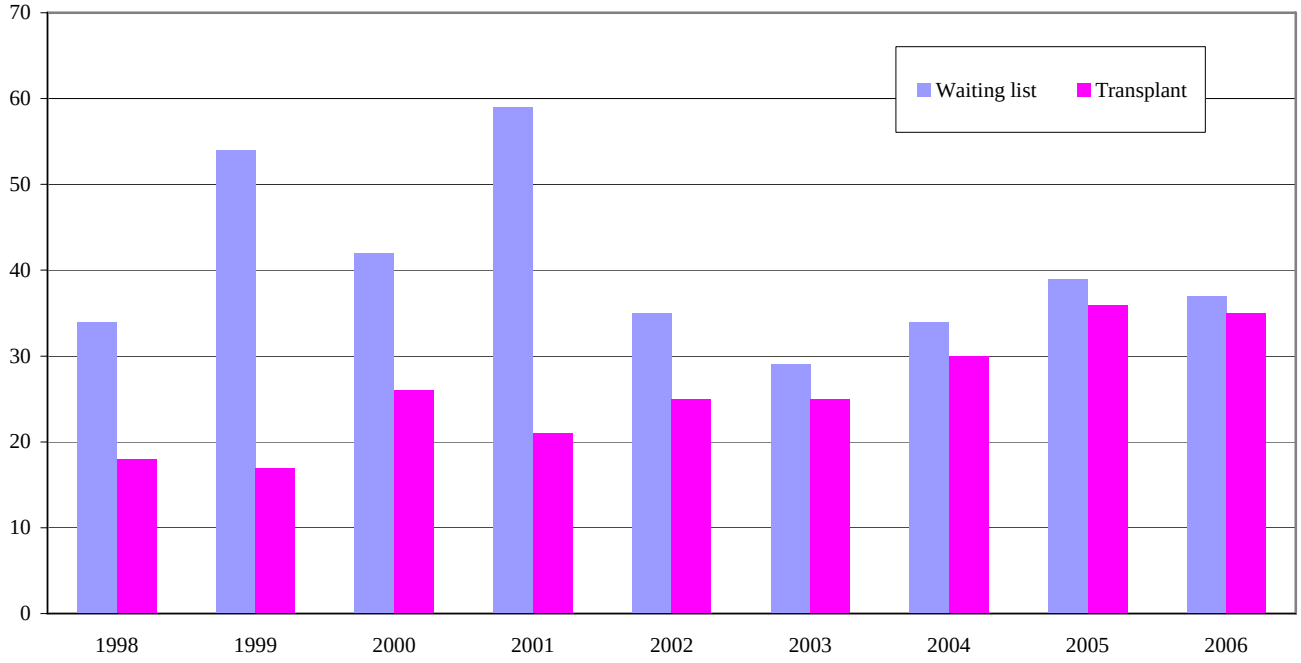

Figure 13. Waiting list for Pancreas transplant in Australia

Source: ANZOD registry Report 2006

Organ donation and exchange

During 1994 to 2004, the average number of donated cadaver pancreases and kidneys was 20 and 343 respectively (Figure 14).

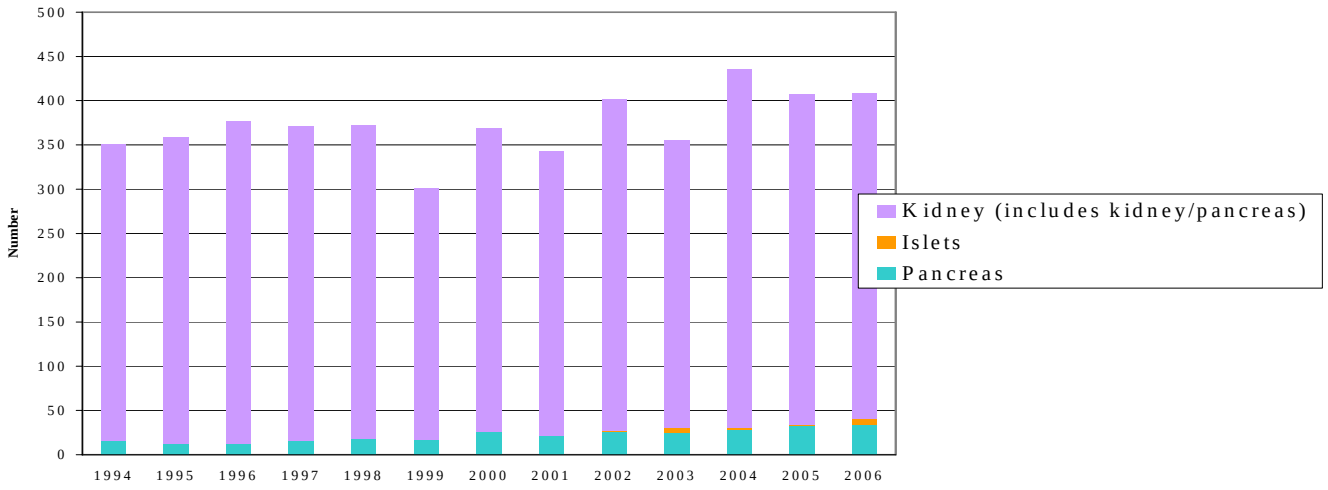

Figure 14. Annual number of donated kidney, pancreas and islets in Australia, 1994-2006

Source: ANZOD Registry Report 2007

Figure 15 shows the number of pancreas transplant retrieved and transplant by Australia States and New Zealand in 1989-2006.

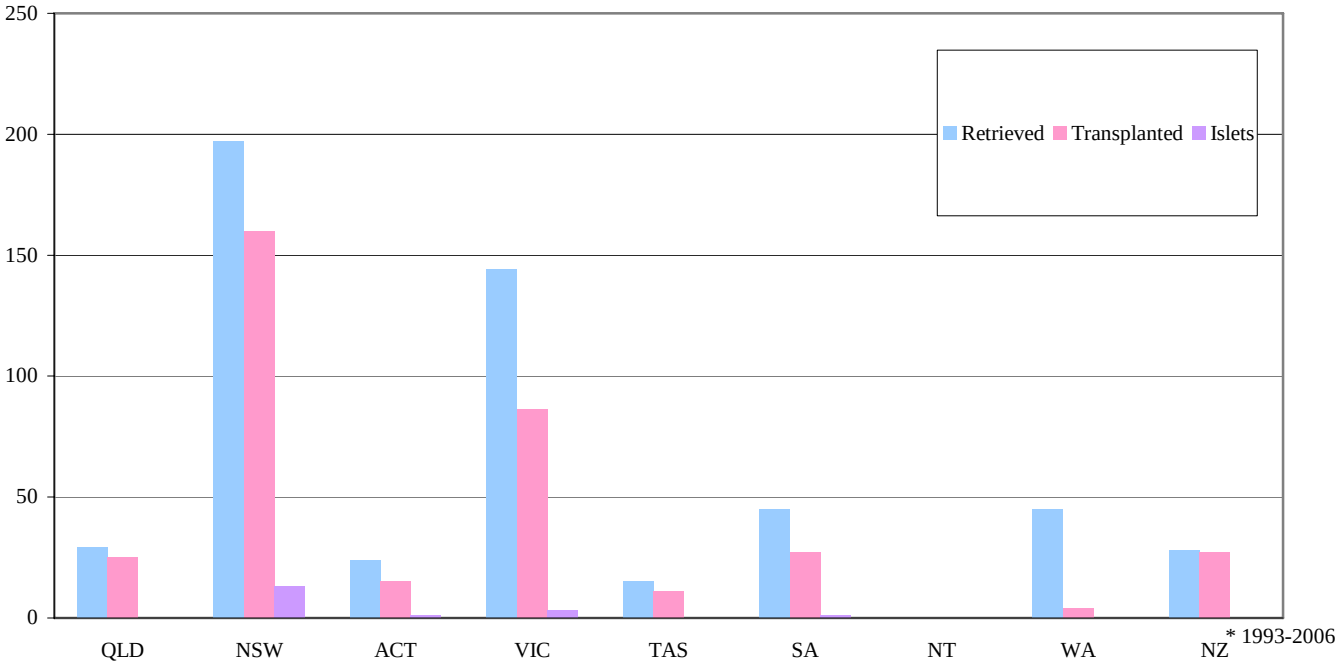

Figure 15. Number of pancreas transplanted and retrieved by Australian States and New Zealand, 1989-2006

Source: ANZOD Registry Report 2007

The donation of pancreas from States and New Zealand in 2004-2005 is illustrated in Figure 16.

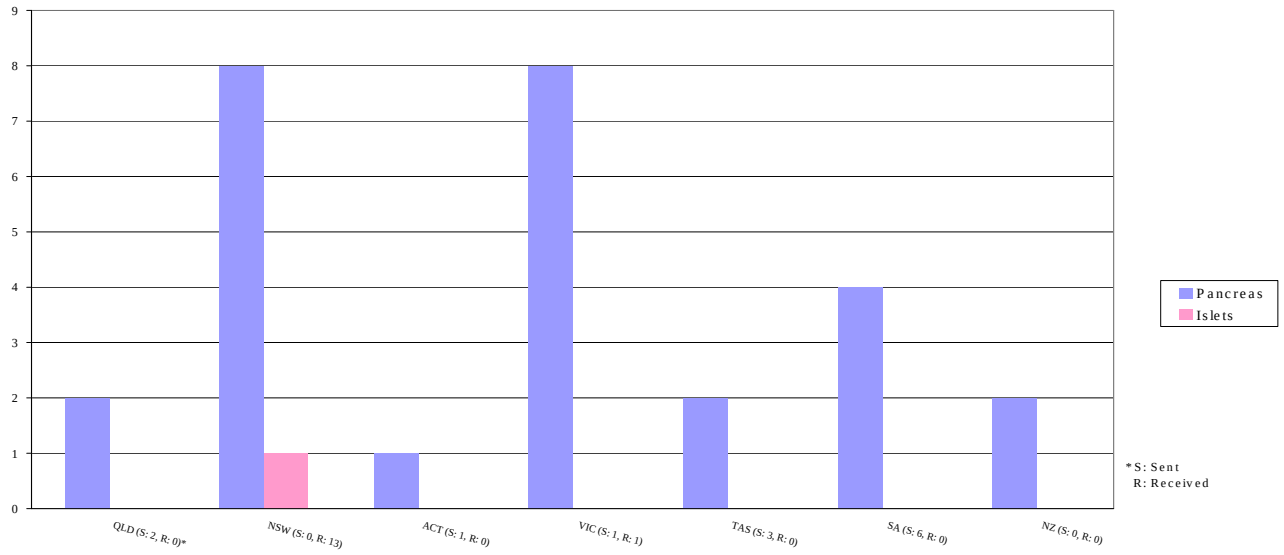

Figure 16. The exchange of pancreas between States and New Zealand in 2004-2006

Source: ANZOD Registry Report 2007

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