



ANZIPTR Report 2023

Australia and New Zealand Islet and Pancreas Transplant Registry data 1984-2022

This report is a compilation of data provided by Pancreas transplant units in Australia and New Zealand. The registry is funded in part by the Organ and Tissue Authority

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Summary

Introduction

This report is produced and edited by: Professor Angela Webster, Adrian Fann, James Hedley

Chapters 1-3 are authored by: Angela Webster, Paul Robertson, Tia Mark, Helen Pilmore, Danielle Stephenson, Adrian Fann, James Hedley

We thank all contributors who have made the registry what it is and whose work has made this report possible.

Suggested Citation

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Governance structure

This report is a compilation of data provided by the four current solid-organ Pancreas transplant units in Australia and New Zealand: Auckland Renal Transplant Group, New Zealand; National Pancreas Transplant Unit Monash Medical Centre, Victoria; National Pancreas Transplant Unit, Westmead Hospital, NSW; South Australian/Northern Territory Transplant Service, Royal Adelaide Hospital, SA; The ANZIPTR registry is funded in part by the Organ and Tissue Authority.

Data release guidelines

The registry can provide de-identified data for at no cost to Transplant Physicians, Transplant Units, and Government Departments. Release of data for academic or clinical research projects is provisional on an agreed project plan and proof of ethical oversight. The registry will not provide any personally identifiable data.

The clinical data provided contains potentially sensitive information and should be used only within agreed guidelines. If data are further published elsewhere ANZIPTR permission is necessary prior to submission for publication, and ANZIPTR should be identified as the source of the data. If data provided by ANZIPTR is the primary source of data, then a copy of publication should be provided to ANZIPTR.

Data provided by ANZIPTR should be utilised by requesting parties only, further data sharing with other parties or projects is not permitted without prior approval from ANZIPTR. The data supplied will be in accordance with ANZIPTR data specifications. Please see www.anziptr.org for our data dictionary.

Participating Centres

Solid pancreas

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Analysis and Methods

The aim of this report is to record all pancreas transplant activity in Australia and New Zealand. Data included in this report was locked on 3rd August 2023, for all people transplanted up to the end of 2022. Please note new data are added to the registry regularly, and corrections are made where previous data are missing or where errors are discovered. This year the report is for solid organ pancreas transplant activity only; there is no report for islet transplant activity.

Kaplan-Meier survival curves were used to illustrate the survival distributions, and these were generated using Stata software version 17.0 (StataCorp, College Station, TX USA). Transplant survival is analysed and presented both including and excluding death with a functioning transplant. For patients receiving a second transplant, in calculating mortality, time was measured from time of first transplant.

Definitions

Pancreas transplant

A functioning pancreas transplant is defined as a recipient free of exogenous insulin dependence; thus a pancreas transplant failure is declared when either a pancreatectomy is performed, or when the recipient returns to permanent insulin therapy. Kidney transplants are defined as functioning if recipients are dialysis free. All causes of death are included in the mortality analyses.

Glossary

SPK	Simultaneous Kidney Pancreas Transplant
PTA	Pancreas Transplant Alone
PAK	Pancreas after Kidney Transplant
DBD	Donor after Brain Death
DCD	Donor after Circulatory Death
CMV	Cytomegalovirus
EBV	Epstein-Barr Virus
SD	Standard Deviation
IQR	Interquartile Range
NSW	New South Wales
VIC	Victoria
QLD	Queensland
SA	South Australia
WA	Western Australia
TAS	Tasmania
ACT	Australian Capital Territory
NT	Northern Territory
NZ	New Zealand

Synopsis

A total of 1,052 solid organ pancreas transplants have been performed in Australia and New Zealand (ANZ), in 1,026 individuals from 1984-2022 (excluding islet transplants).

In 2022, 50 pancreas transplants were performed. By centre, the number of transplants performed were: Auckland (5); Monash (12); Westmead (32); and Adelaide (1). In 2022, 46 transplants were SPK while 3 were PAK, none were PTA, and 1 was a liver-pancreas transplant (performed in Auckland).

Accessing report data

In 2015 ANZIPTR developed its own website: www.anziptr.org which describes the registry structure and function, outlines the procedure for data requests, and provides a download area for past reports. Since 2017, a slide set of key registry data tables and plots is available for download, to complement the ANZIPTR report.

The ANZIPTR welcomes suggestions for improvement or specific analyses you would like to see in the next annual report.

Chapter 1: Waiting List

Authors: Angela Webster, Adrian Fann, James Hedley. Data contributed by: Paul Robertson, Tia Mark, Helen Pilmore, Danielle Stephenson

Overview of waiting list activity

Definitions

Patients join the waiting list on the date they are referred to the transplanting centre; however, this may occur sometime before their kidneys fail. Patients are therefore classified as “under consideration” until they medically require a kidney pancreas transplant (eGFR $\leq 15\text{ml/min/1.72m}^2$ or dependant on dialysis). Once they require a kidney pancreas transplant, they are classified as “active” on the list while they remain medically fit. The “under consideration” classification also captures people recently referred to the transplant centre, who are still undergoing assessment about their medical fitness for pancreas transplant. People referred to a transplanting centre when they are already on dialysis become “active” on the list as soon as they are accepted as medically fit. People referred to a transplanting centre when their kidneys still function become active once their kidney disease progresses to such a level that dialysis is planned in the near future (eGFR $\leq 15\text{ml/min/1.72m}^2$). Once active on the waiting list, a patient may be transplanted depending on multiple factors including waiting time, blood group, duration of dialysis and other considerations.

Patient waiting list flow

The patient waiting list activity in the last three years for Australia (Westmead, Monash and Royal Adelaide Units) and New Zealand are shown in Tables 1.1 and 1.2 respectively. In Australia, the number of transplants performed annually is returning to pre-covid levels, however the number of patients active on the waiting list has continued to increase over the last three years.

Table 1.1: Waiting list activity in Australia for the last three years

Activity	Patients (n)		
	2020	2021	2022
Active on list at beginning of year	84	78	102
Added to active list during the year	47	66	56
Removed from active list during year	2	5	9
Pancreas transplants to patients on waiting list	47	34	45
Kidney only transplants to patients on waiting list	2	3	2
Transplants performed outside Australia/New Zealand	0	0	0
Died while active on list	2	0	1
On active waiting list at the end of year	78	102	101
Died within 12 months of removal from list	0	0	0
Under consideration but not active on list	176	153	134
Referred, considered, but declined for pancreas transplantation	4	2	6

Table 1.2: Waiting list activity in New Zealand for the last three years

Activity	Patients (n)		
	2020	2021	2022
Active on list at beginning of year	4	6	6
Added to active list during the year	6	6	5
Removed from active list during year	1	0	3
Transplants to patients on waiting list	3	6	5
Kidney only transplants to patients on waiting list	0	0	0
Transplants performed outside Australia/New Zealand	0	0	0
Died while active on list	0	0	0
On active waiting list at the end of year	6	6	3
Died within 12 months of removal from list	0	0	0
Under consideration but not active on list	5	8	5
Referred, considered, but declined for pancreas transplantation	3	0	0

Distribution of active patients by state

Figure 1.1 and Table 1.3 show the state and country of residence for people active on the pancreas waiting list, by year and the pancreas transplanting centre they were referred to (Australia only).

Figure 1.1: Distribution of people active on the waiting list by state or country of residence, as of December 2022

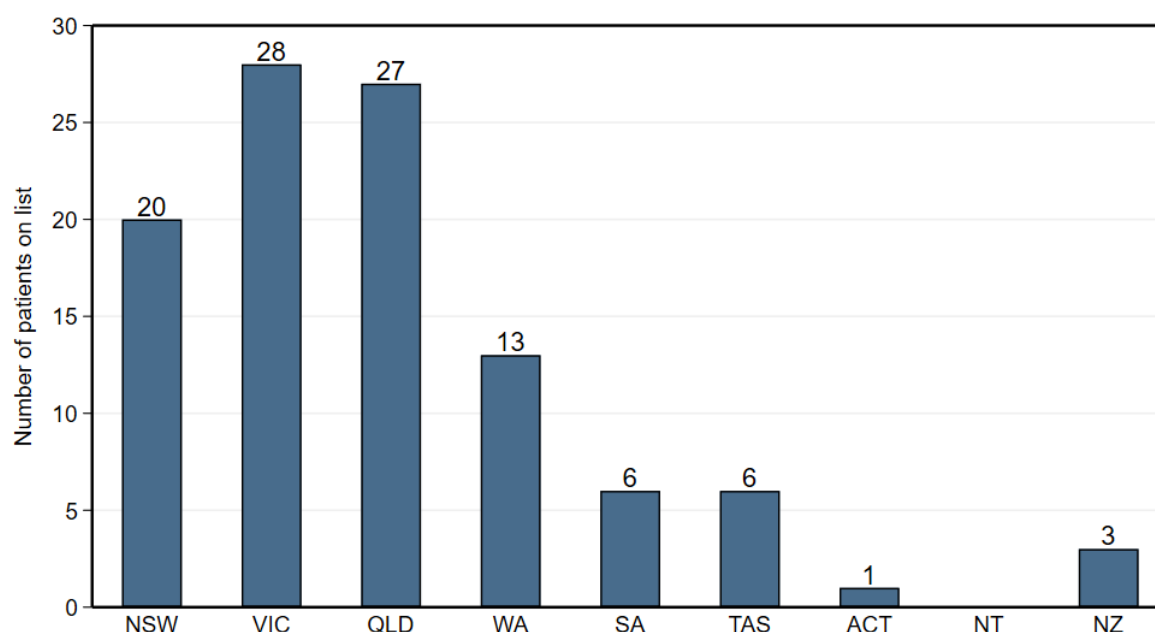


Table 1.3: Patient state of residence by Australian pancreas transplant unit for people active on the list at the end of the year for the past three years

Year	State of residence, n (row %)								Total
	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	
Westmead (NSW)									
2022	20 (33)	0 (0)	26 (43)	13 (21)	1 (2)	0 (0)	1 (2)	0 (0)	61
2021	20 (30)	0 (0)	31 (47)	14 (21)	1 (2)	0 (0)	0 (0)	0 (0)	66
2020	11 (26)	0 (0)	19 (44)	12 (28)	1 (2)	0 (0)	0 (0)	0 (0)	43
Monash (VIC)									
2022	0 (0)	28 (78)	1 (3)	0 (0)	1 (3)	6 (17)	0 (0)	0 (0)	36
2021	0 (0)	26 (79)	1 (3)	0 (0)	0 (0)	6 (18)	0 (0)	0 (0)	33
2020	2 (6)	25 (78)	0 (0)	0 (0)	1 (3)	4 (13)	0 (0)	0 (0)	32
Royal Adelaide (SA)									
2022	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)	0 (0)	0 (0)	0 (0)	4
2021	0 (0)	0 (0)	0 (0)	0 (0)	3 (100)	0 (0)	0 (0)	0 (0)	3
2020	0 (0)	0 (0)	0 (0)	0 (0)	3 (100)	0 (0)	0 (0)	0 (0)	3

Summary

Table 1.4 shows the state of residence for people who are under consideration together with people who are active on the pancreas waiting list, by the pancreas transplanting centre they were referred to, in Australia. For New Zealand data, there is no breakdown beyond that seen in Table 1.2.

Table 1.4: Patient state of residence by Australian pancreas transplant unit for people under consideration and active on the list at the end of the year for the past three years¹

Year	State of residence, n (row %)								Total
	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	
Westmead (NSW)									
2022	46 (34)	0 (0)	43 (32)	38 (28)	7 (5)	1 (<1)	1 (<1)	0 (0)	136
2021	52 (32)	0 (0)	59 (36)	43 (26)	7 (4)	1 (<1)	1 (<1)	0 (0)	163
2020	54 (34)	0 (0)	56 (35)	42 (26)	7 (4)	1 (<1)	0 (0)	0 (0)	160
Monash (VIC)									
2022	1 (1)	80 (87)	1 (1)	0 (0)	2 (2)	8 (9)	0 (0)	0 (0)	92
2021	0 (0)	75 (88)	1 (1)	0 (0)	2 (2)	7 (8)	0 (0)	0 (0)	85
2020	2 (2)	70 (81)	1 (1)	0 (0)	2 (2)	11 (13)	0 (0)	0 (0)	86
Royal Adelaide (SA)									
2022	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	7
2021	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	7
2020	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	7

¹ Excludes one patient on the waiting list for a combined liver, pancreas and kidney transplant at Austin Hospital in 2020.

New referrals received over time

Table 1.5 shows the number of new referrals received by transplanting units in Australia and New Zealand over time, and by state of residence (for Australian units only).

Table 1.5: New referrals over time by pancreas transplant unit and state of residence¹

Year	State of residence, n (row %)								Total
	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	
Westmead (NSW)									
2022	7 (58)	0 (0)	4 (33)	1 (8)	0 (0)	0 (0)	0 (0)	0 (0)	12
2021	7 (26)	0 (0)	16 (59)	3 (11)	0 (0)	0 (0)	1 (4)	0 (0)	27
2020	12 (46)	0 (0)	14 (54)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	26
Monash (VIC)									
2022	1 (3)	27 (79)	0 (0)	0 (0)	0 (0)	6 (18)	0 (0)	0 (0)	34
2021	0 (0)	19 (90)	0 (0)	0 (0)	1 (5)	1 (5)	0 (0)	0 (0)	21
2020	0 (0)	24 (83)	0 (0)	0 (0)	0 (0)	5 (17)	0 (0)	0 (0)	29
Royal Adelaide (SA)									
2022	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	2
2021	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)	0 (0)	0 (0)	0 (0)	5
2020	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	1
Auckland (NZ)									
2022	-	-	-	-	-	-	-	-	3
2021	-	-	-	-	-	-	-	-	9
2020	-	-	-	-	-	-	-	-	9

¹ Excludes 1 patient referred for a liver-pancreas-kidney transplant at Austin Hospital in 2020 and 1 patient referred for a liver-pancreas transplant at Royal Children's Hospital Melbourne in 2021.

Patient characteristics for those active on the list in 2022

The following figures illustrate the distribution of other characteristics of those active on the waiting list in 2022, including the distribution of blood groups and patient ages.

Figure 1.2: Distribution of people active on the list by their blood group, as at December 2022

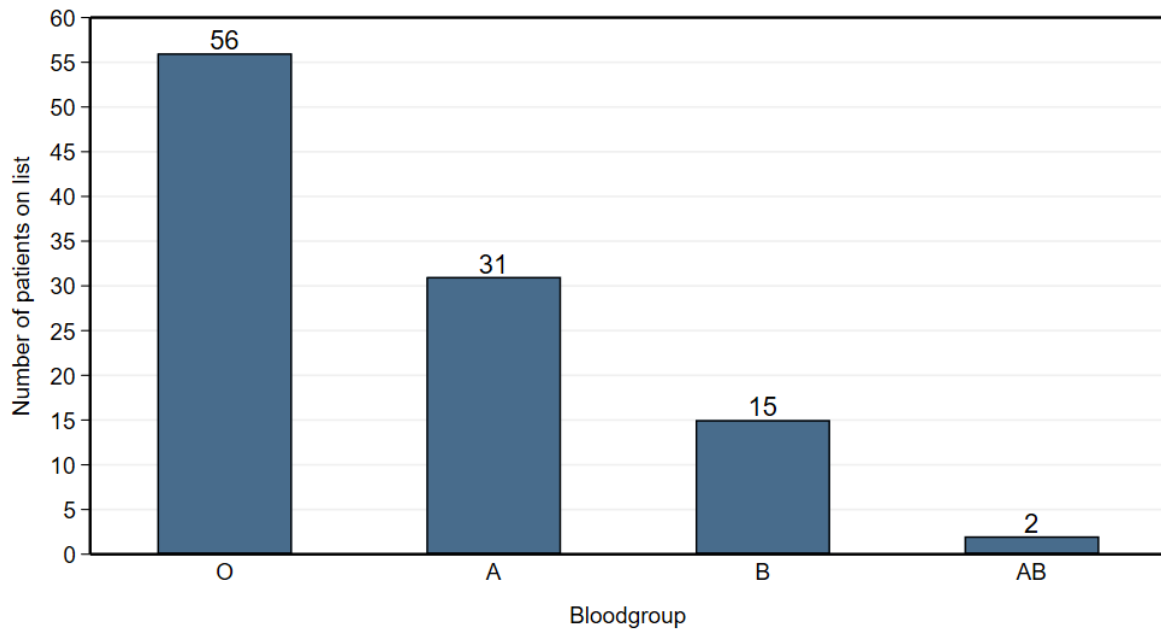
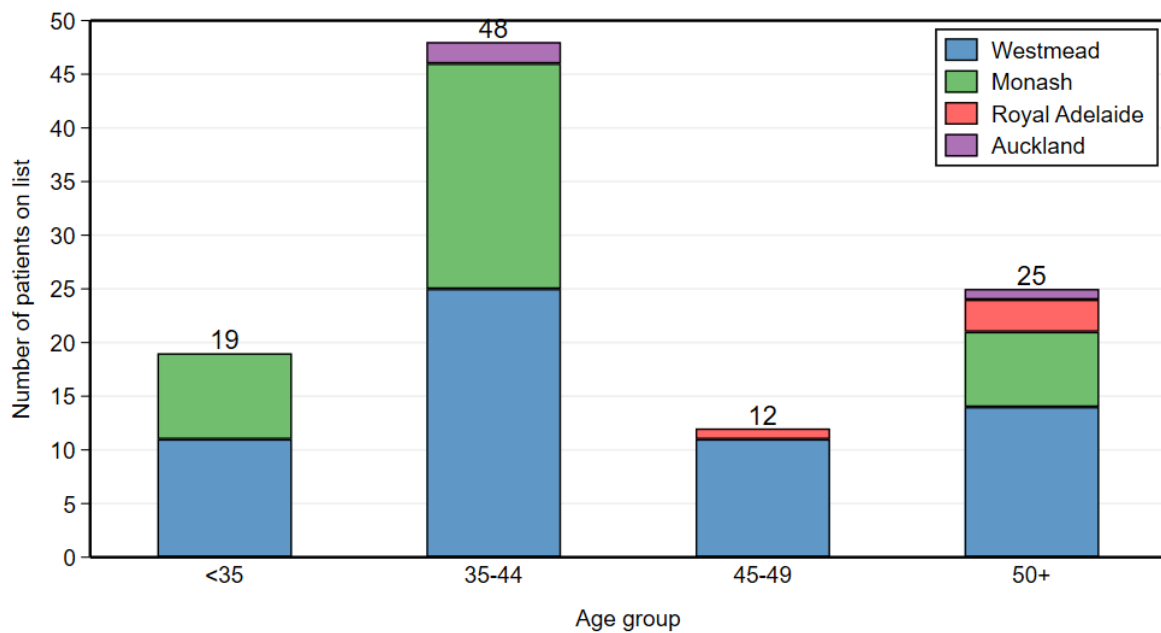


Figure 1.3: Distribution of people active on the list by their age, as at December 2022

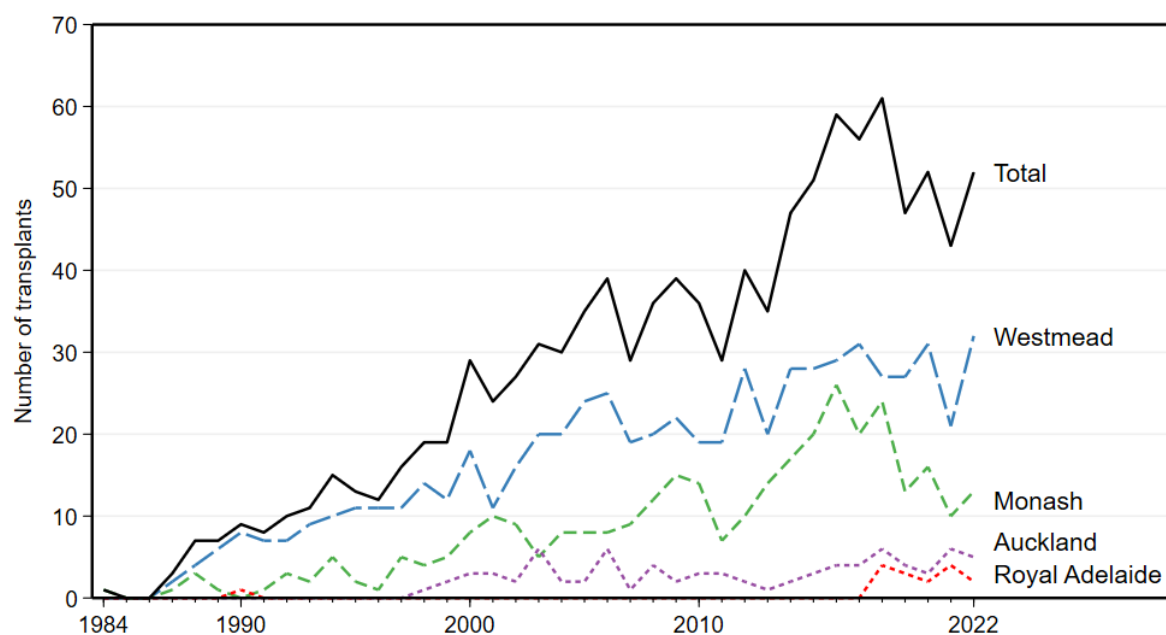


Chapter 2: Pancreas transplant recipients

Authors: Angela Webster, Adrian Fann, Paul Robertson, Tia Mark, Helen Pilmore, Danielle Stephenson, James Hedley, Patrick Kelly

Pancreas transplant incidence

A total of 1,052 solid organ pancreas transplants have been performed in Australia and New Zealand (ANZ) from 1984-2022. Transplants have been performed in Westmead (644), Monash (307), Auckland (80), and Royal Adelaide (15). In 2019 the Royal Adelaide Hospital started pancreas transplantation in South Australia. There have also been multi-organ transplants including pancreas in several locations over time. Since 1984 there have been a total of 3 SPK transplants conducted outside the main transplanting centres (1 at Royal Prince Alfred, 1 at Royal Melbourne Hospital, 1 at Queen Elizabeth Hospital), as well as 3 multi-organ transplants conducted at Austin Hospital (1 liver-pancreas, 1 liver-kidney-pancreas, 1 liver-kidney-pancreas-intestine). Figure 2.1 shows pancreas transplants over time. The number of transplants has substantially increased in last decade compared to previous years. There was a decrease in activity recently which may be related to the impact of the COVID-19 pandemic but it appears that activity is slowly returning to pre-pandemic levels.

Figure 2.1: Incidence of pancreas transplants over time, 1984-2022

Note: There have been six pancreas transplants performed in Australia, which were not conducted by either Westmead, Monash, or Royal Adelaide. These occurred in 1988, 1990, 2005, and 2017, and two occurred in 2021.

In 2022, 50 people received a pancreas transplant, by centre this was; Monash (12), Westmead (32), Royal Adelaide (1), Auckland (5). The number of transplants in 2022 increased by 25% compared to 2021.

Not all pancreas transplant operations are undertaken together with a kidney. In 2022, simultaneous pancreas-kidney transplant (SPK) was the most common operation, representing 92% of all pancreas transplants in Australia and New Zealand over the year. From the 50 transplants performed in 2022, 46 were SPK, 3 were pancreas after kidney (PAK), and 1 was a liver-pancreas transplant. PAK operations are done for type 1 diabetic people who either had a first kidney transplant without a pancreas (most commonly from a living donor relative) and subsequently opt for a pancreas, or for people who underwent an SPK and have good kidney transplant function, but had a pancreas transplant failure, so need a further pancreas transplant. Pancreas transplant alone (PTA) is a less common operation and occurs very rarely. Indications for PTA include management of patients with hypoglycaemic unawareness or brittle diabetes that have failed best medical therapy. On rarer occasions, a multi-organ transplant is undertaken which includes a pancreas transplant. In 2022, there was 1 liver-pancreas transplant, and previously there were 2 liver-pancreas transplants and 1 liver-kidney-pancreas transplant in 2021, 1 liver-pancreas

transplant in 2020, 1 liver-kidney-pancreas transplant in 2017, 1 liver-pancreas in 2016, 1 liver-pancreas-intestine transplant in 2012, and 1 liver-kidney-pancreas transplant in 2005. The distribution of operation types is shown in Figure 2.2 and the number of transplants by operation type is shown in Table 2.1.

Figure 2.2: Pancreas transplants over time by type, Australia and New Zealand

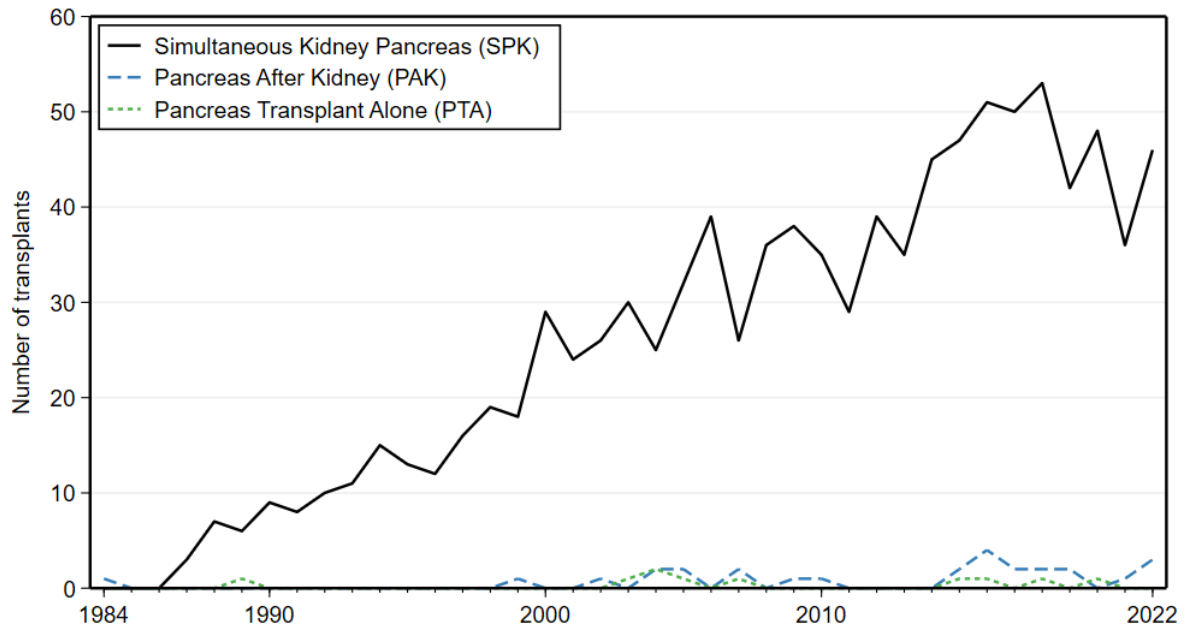


Table 2.1: Pancreas transplant operations over time, by transplant centre

Year	Hospital and transplant type, n (row %)								
	<i>Westmead</i>			<i>Monash</i>			<i>Royal Adelaide</i>	<i>New Zealand</i>	<i>Total</i>
	<i>SPK</i>	<i>PAK</i>	<i>PTA</i>	<i>SPK</i>	<i>PAK</i>	<i>PTA</i>	<i>All</i>	<i>All</i>	<i>All</i>
2022	31 (62)	1 (2)	0 (0)	10 (20)	2 (4)	0 (0)	1 (2)	5 (10)	50
2021	21 (55)	0 (0)	0 (0)	6 (16)	1 (3)	0 (0)	4 (11)	6 (16)	38
2020	30 (60)	0 (0)	1 (2)	13 (26)	0 (0)	0 (0)	3 (6)	3 (6)	50
2019	26 (59)	1 (2)	0 (0)	10 (23)	0 (0)	0 (0)	3 (7)	4 (9)	44
2018	24 (43)	2 (4)	0 (0)	20 (36)	0 (0)	0 (0)	4 (7)	6 (11)	56
2017	30 (58)	0 (0)	0 (0)	16 (31)	2 (4)	0 (0)	0 (0)	4 (8)	52
2016	26 (46)	3 (5)	0 (0)	21 (38)	1 (2)	1 (2)	0 (0)	4 (7)	56
2015	27 (54)	1 (2)	0 (0)	18 (36)	1 (2)	0 (0)	0 (0)	3 (6)	50
2014	28 (62)	0 (0)	0 (0)	15 (33)	0 (0)	0 (0)	0 (0)	2 (4)	45
2013	20 (57)	0 (0)	0 (0)	14 (40)	0 (0)	0 (0)	0 (0)	1 (3)	35
2012	28 (72)	0 (0)	0 (0)	9 (23)	0 (0)	0 (0)	0 (0)	2 (5)	39
2011	19 (66)	0 (0)	0 (0)	7 (24)	0 (0)	0 (0)	0 (0)	3 (10)	29
2010	19 (53)	0 (0)	0 (0)	14 (39)	0 (0)	0 (0)	0 (0)	3 (8)	36
2009	22 (56)	0 (0)	0 (0)	14 (36)	1 (3)	0 (0)	0 (0)	2 (5)	39
2008	20 (56)	0 (0)	0 (0)	12 (33)	0 (0)	0 (0)	0 (0)	4 (11)	36
2007	16 (55)	2 (7)	1 (3)	9 (31)	0 (0)	0 (0)	0 (0)	1 (3)	29
2006	25 (64)	0 (0)	0 (0)	8 (21)	0 (0)	0 (0)	0 (0)	6 (15)	39
2005	21 (62)	2 (6)	1 (3)	8 (24)	0 (0)	0 (0)	0 (0)	2 (6)	34
2004	15 (52)	2 (7)	2 (7)	8 (28)	0 (0)	0 (0)	0 (0)	2 (7)	29
2003	19 (61)	0 (0)	1 (3)	5 (16)	0 (0)	0 (0)	0 (0)	6 (19)	31
2002	15 (56)	1 (4)	0 (0)	9 (33)	0 (0)	0 (0)	0 (0)	2 (7)	27
2001	11 (46)	0 (0)	0 (0)	10 (42)	0 (0)	0 (0)	0 (0)	3 (13)	24
1984 – 2000 ¹	128 (72)	1 (<1)	1 (<1)	40 (23)	1 (<1)	0 (0)	0 (0)	6 (3)	177
Total	621 (59)	16 (2)	7 (<1)	296 (28)	9 (<1)	1 (<1)	15 (1)	80 (8)	1045

SPK, simultaneous pancreas-kidney; PAK, pancreas after kidney; PTA, pancreas alone. The above table excludes the six transplants performed in Australia outside of Westmead, Monash, or Royal Adelaide in 1988, 1990, 2005, and 2017, two performed in 2021, and one in 2022. The above table also excludes one combined liver-pancreas transplant performed at Monash in 2016.

¹Earlier versions of the report showed disaggregated data for 1984 to 2000

Patients transplanted by state

The state of origin of the people receiving pancreas transplants at each transplant unit in Australia over time are shown in Table 2.2.

Table 2.2: State of residence of people receiving pancreas transplants over time¹

Year	State of residence, n (row %)								Total
	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	
Westmead (NSW)									
2022	11 (34)	0 (0)	17 (53)	4 (13)	0 (0)	0 (0)	0 (0)	0 (0)	32
2021	9 (43)	0 (0)	11 (52)	1 (5)	0 (0)	0 (0)	0 (0)	0 (0)	21
2020	16 (52)	1 (3)	11 (35)	3 (10)	0 (0)	0 (0)	0 (0)	0 (0)	31
Monash (VIC)									
2022	0 (0)	8 (67)	0 (0)	0 (0)	0 (0)	4 (33)	0 (0)	0 (0)	12
2021	2 (29)	5 (71)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7
2020	0 (0)	12 (86)	0 (0)	0 (0)	1 (7)	1 (7)	0 (0)	0 (0)	14
Royal Adelaide (SA)									
2022	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	1
2021	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)	0 (0)	0 (0)	0 (0)	4
2020	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	2
Auckland (NZ)									
2022	-	-	-	-	-	-	-	-	5
2021	-	-	-	-	-	-	-	-	6
2020	-	-	-	-	-	-	-	-	3

¹Excludes 1 patient who received a liver-kidney-pancreas transplant, and 1 patient who received a liver-pancreas transplant, both at Austin Hospital in 2021.

Demographics of new pancreas transplant recipients

The characteristics of pancreas transplant recipients in 2022 and in previous years are shown in Table 2.3. The primary diagnosis causing end stage kidney disease of recipients during 2022 and historically was type I diabetes. The number of diabetic recipients with other cause of end stage kidney failure was small. Type 2 diabetes is not regarded as an indication for SPK in Australia and New Zealand, though there may be rare exceptions. Consequently, the number of people with type II diabetes accepted for pancreas transplantation was also small, and none received a transplant in 2022.

Table 2.3: Demographics and characteristics of pancreas transplant recipients

Patients, n (column %)	2022	1984-2021	Total
Age category			
Median (IQR)	40.5 (37, 48)	39 (33, 44)	39 (33, 44)
0-34	8 (16)	306 (30)	314 (29)
35-44	24 (48)	457 (45)	481 (45)
45-50	8 (16)	165 (16)	173 (16)
50+	10 (20)	73 (7)	83 (7)
Not reported	0 (0)	1 (<1)	1 (<1)
Sex			
Female	25 (50)	463 (46)	488 (46)
Male	25 (50)	539 (53)	564 (53)
Cause of end stage kidney disease			
Diabetes type 1	49 (98)	527 (52)	576 (54)
Diabetes type 2	0 (0)	2 (<1)	2 (<1)
Haemolytic uraemic syndrome	0 (0)	1 (<1)	1 (<1)
Interstitial nephritis	0 (0)	1 (<1)	1 (<1)
Wegener's granulomatosis	0 (0)	1 (<1)	1 (<1)
Focal segmental glomerulosclerosis	0 (0)	1 (<1)	1 (<1)
No kidney disease	1 (2)	21 (2)	22 (2)
Not reported	0 (0)	448 (44)	448 (42)
Ethnicity¹			
Indigenous Australian	1 (2)	2 (<1)	3 (<1)
Māori	2 (4)	8 (<1)	10 (<1)
Pacific islander	1 (2)	11 (1)	12 (1)
White	43 (86)	941 (93)	984 (93)
North Asian	1 (2)	4 (<1)	5 (<1)
South-East Asian	0 (0)	1 (<1)	1 (<1)
Southern and Central Asian	2 (4)	19 (1)	21 (1)
North African and Middle Eastern	0 (0)	14 (1)	14 (1)
Other	0 (0)	1 (<1)	1 (<1)
Not reported	0 (0)	1 (<1)	1 (<1)
Blood group			
O	20 (40)	452 (45)	472 (44)
A	25 (50)	408 (40)	433 (41)
B	3 (6)	95 (9)	98 (9)
AB	2 (4)	46 (4)	48 (4)
Not reported	0 (0)	1 (<1)	1 (<1)
Total	50	1002	1052

¹ Ethnicity classified according to the Australian Bureau of Statistics standard classification, 2nd Edition;

<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/1249.02011>

The type of pancreas transplants and the types of donors for transplants performed in 2022 is presented in Table 2.4, stratified by country and sex.

Table 2.4: Transplant and donor pathway in 2022 by country and donor sex

	Australia		New Zealand		Overall		Total
	Female	Male	Female	Male	Female	Male	
Pancreas alone							
<i>DBD</i>	0	3	0	1	0	4	4
<i>DCD</i>	0	0	0	0	0	0	0
SPK							
<i>DBD</i>	20	18	1	3	21	21	42
<i>DCD</i>	1	3	0	0	1	3	4

DBD, donor after brain death; DCD, donor after circulatory death; SPK, simultaneous pancreas-kidney

Balance of donor and recipient characteristics in 2022

Cross tabulations of donor and recipient blood group and gender for people transplanted in 2022 are displayed in Table 2.5 and Table 2.6. These distributions remain similar to previous years.

Table 2.5: Cross tabulation of recipient and donor blood groups for 2022

Recipient blood group	Donor blood group, n (row %)				Total
	O	A	B	AB	
O	19 (95)	1 (5)	0 (0)	0 (0)	20
A	0 (0)	25 (100)	0 (0)	0 (0)	25
B	1 (33)	0 (0)	2 (66)	0 (0)	3
AB	0 (0)	1 (50)	0 (0)	1 (50)	2
Total	20 (40)	27 (54)	2 (4)	1 (2)	50

Table 2.6: Cross tabulation of recipient and donor sex for 2022

Recipient sex	Donor sex, n (row %)		Total
	Female	Male	
Female	12 (48)	13 (52)	25
Male	10 (40)	15 (60)	25
Total	22 (44)	28 (56)	50

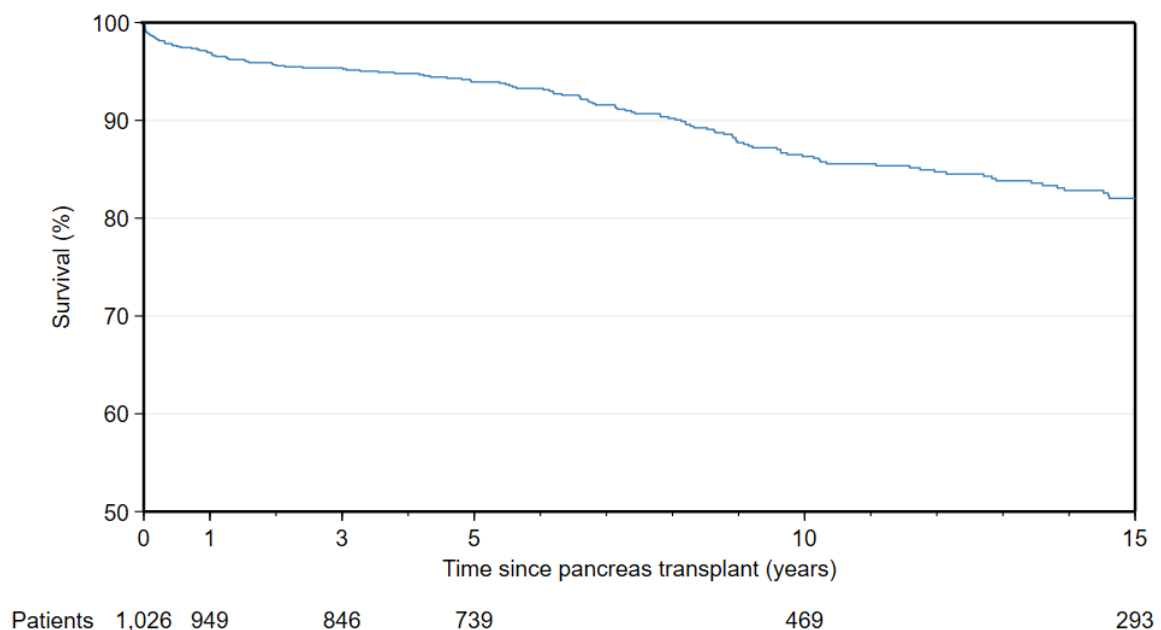
McNemar's test for difference $p=0.53$

Patient survival

Patient survival is calculated from the date of transplantation until death. Patients still alive at the end of the follow-up period are censored. For people who had more than one transplant, their survival is calculated from the date of their first transplant. For these analyses we had survival data for 1,026 patients, 25 of whom have received a second pancreas transplant and 1 of whom has received a third pancreas transplant, for a total of 1,052 pancreas transplant procedures. Note that for the following survival plots survival proportion on the y-axis does not always start at zero; this is to better demonstrate some observed differences.

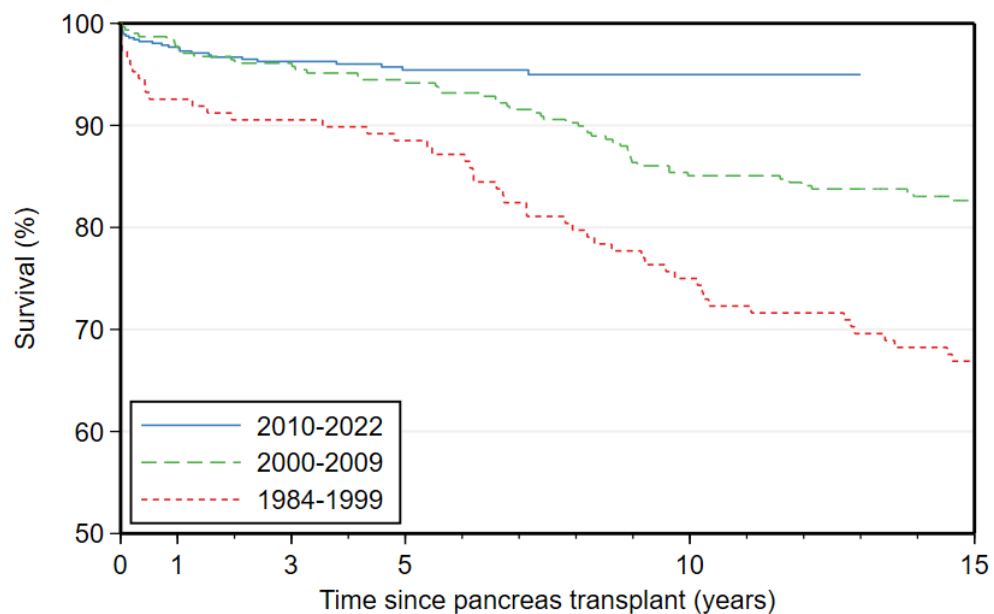
Figure 2.3 shows overall survival following pancreas transplant. There were 10,988 years of follow-up, and 155 people died in that time. Survival at 1 year was 96.9%, at 5 years 93.9%, at 10 years 86.3% and at 15 years 82.0%.

Figure 2.3: Patient survival after pancreas transplantation in Australia and New Zealand



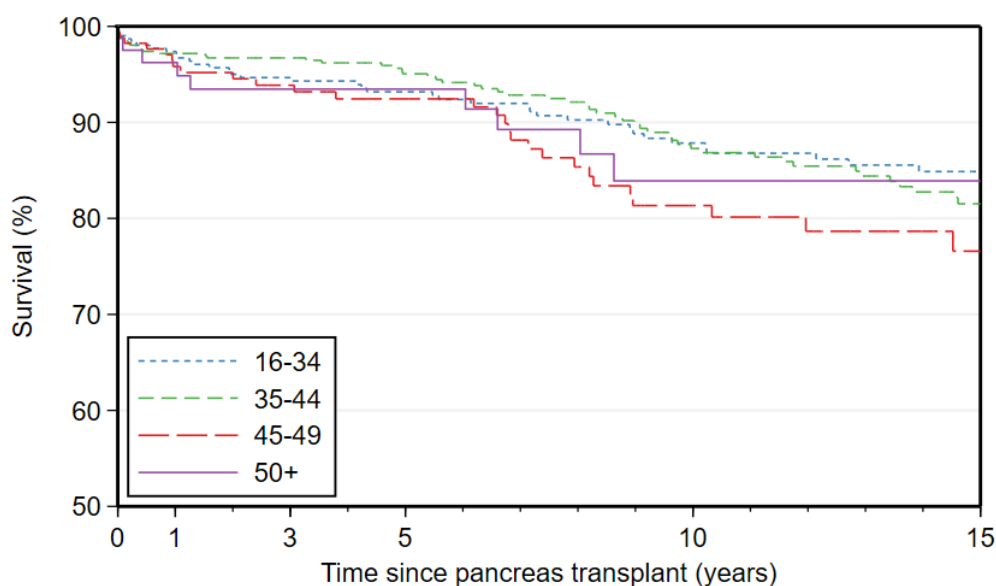
Patient survival by era of transplantation is shown in Figure 2.4. Survival has improved over time ($p < 0.001$). Survival at 1 year for people transplanted before 2000 was 92.6%; in recent years this has risen to 97.7%. Survival at 5 years was 88.5% for those transplanted before 2000, where for those transplanted in 2010 or later, 5-year survival was 95.4%.

Figure 2.4: Patient survival by era of transplantation



Year of transplant	0	1	3	5	10	15
2010-2022	570	511	416	318	96	0
2000-2009	308	301	296	290	262	194
1984-1999	148	137	134	131	111	99

Patient survival by age at transplantation is shown in Figure 2.5. People that were older at the time of pancreas transplantation had poorer survival than those who were younger ($p=0.12$). Survival at 1 year for recipients aged <35 years was 97.4%, and for those aged 35-44 was 97.2%, whereas for those aged 45-49 was 95.8% and for those 50 or older was 96.2%. Survival at 5 years for those aged <35 years was 93.2%, and for those aged 35-44 was 95.1%, whereas for those aged 45-49 was 92.5% and for those 50 or older was 93.5%. The greater survival for the 50 years and older group may be because these recipients are a more highly selected population.

Figure 2.5: Patient survival by age at transplantation

Age at transplant						
16-34	309	293	265	240	169	117
35-44	464	429	388	327	202	125
45-49	171	156	137	120	71	37
50+	81	70	55	51	27	14

Pancreas survival

Pancreas transplant survival was calculated from the time of transplant until the time of permanent return to insulin therapy or pancreatectomy. We calculated both pancreas failure including death with a functioning pancreas and pancreas failure censored at death with a functioning transplant. For pancreas transplant survival we included all pancreas transplants undertaken, including those who had received a pancreas transplant more than once (25 patients received a second pancreas transplant and 1 patient received a third pancreas transplant). At the time of this report, we had survival records for 1,047 pancreas transplants.

Figure 2.6 shows pancreas transplant survival censored at death. Over 9,473 years of follow-up, there were 155 pancreas transplant failures (excluding people who died with a functioning transplant). Overall, 1-year pancreas transplant survival was 91.8%, 5-year survival 87.6%, and 10-year survival 84.8%.

Figure 2.6: Pancreas transplant survival (censored at death)

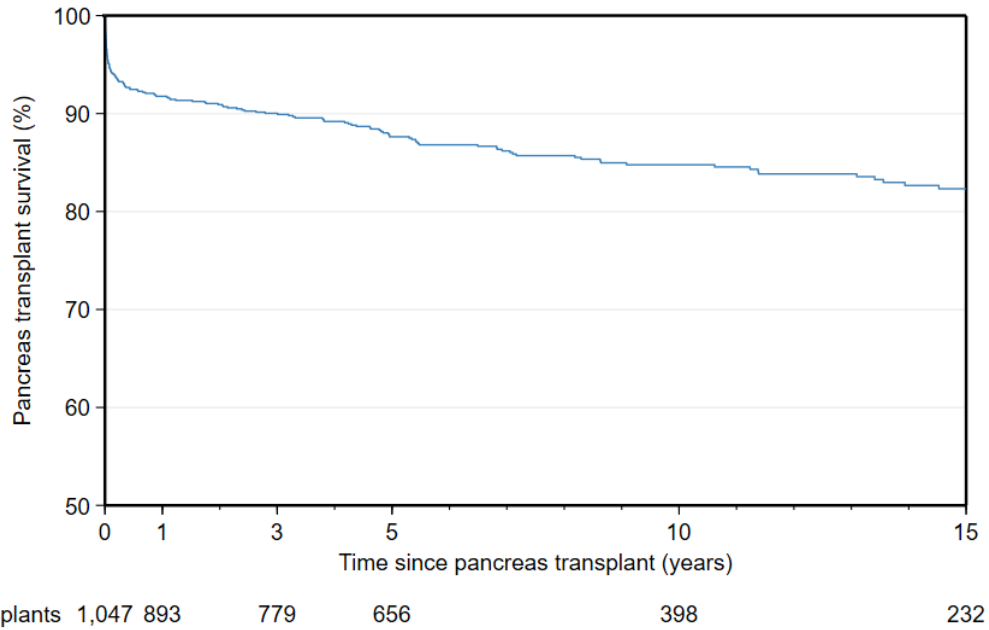
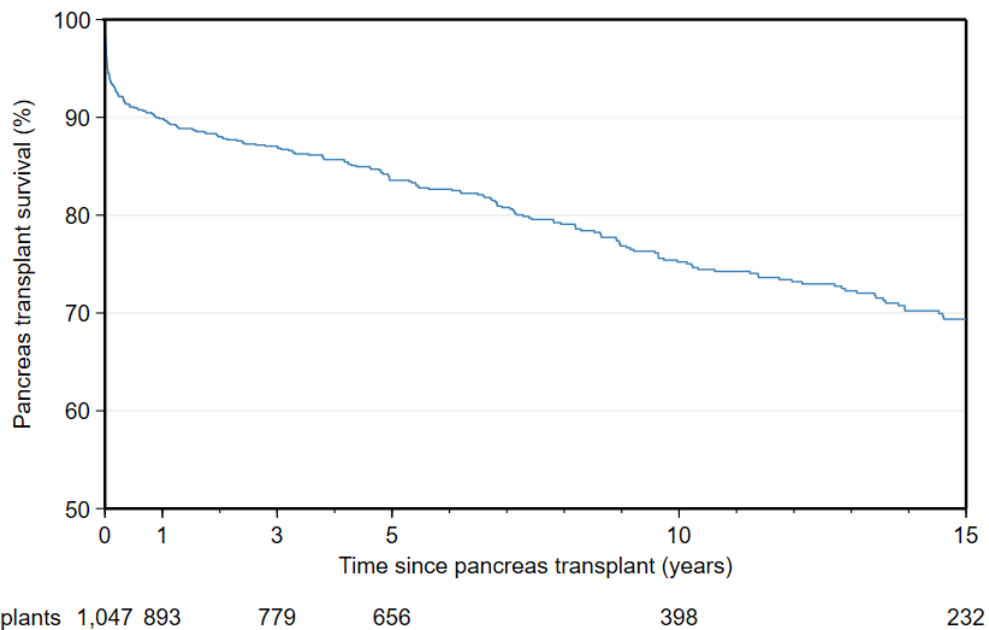


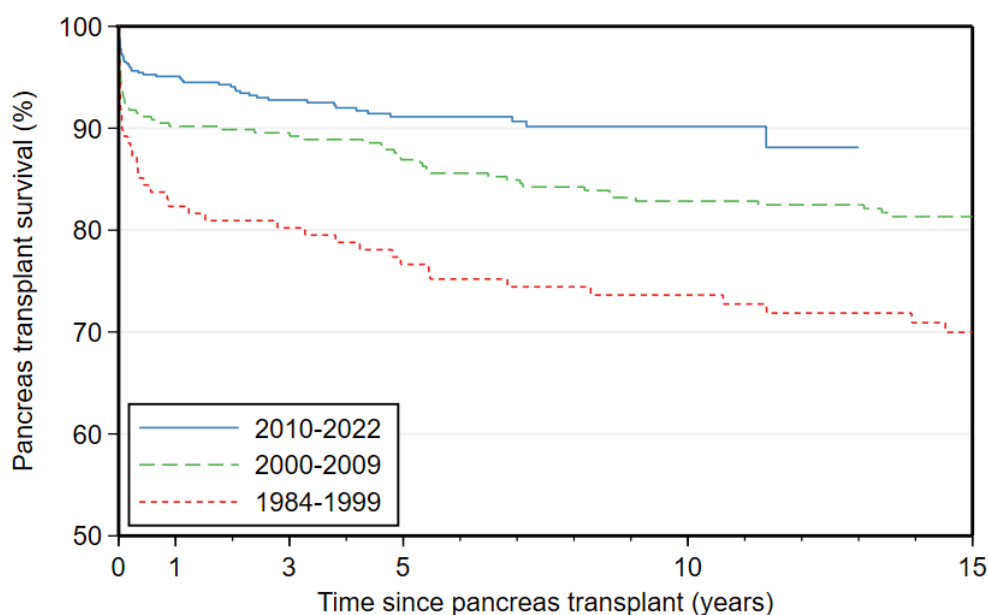
Figure 2.7 shows pancreas transplant survival including death with a functioning pancreas. Over the same observation time there were 270 recipients who either died or experienced pancreas transplant failure. Survival at 1, 5 and 10 years was 89.9%, 83.6% and 75.2% respectively.

Figure 2.7: Pancreas transplant survival (including death as transplant failure)



Survival of pancreas transplants has changed over time, as shown in Figure 2.8. Survival improved markedly over time ($p < 0.001$). For those transplanted prior to 2000, 1-year pancreas transplant survival was 82.3%, and 5-year survival 76.6%. For those transplanted in 2010 or later, 1-year survival was 95.1% and 5-year survival 91.1%.

Figure 2.8: Pancreas transplant survival over time (censored at death)

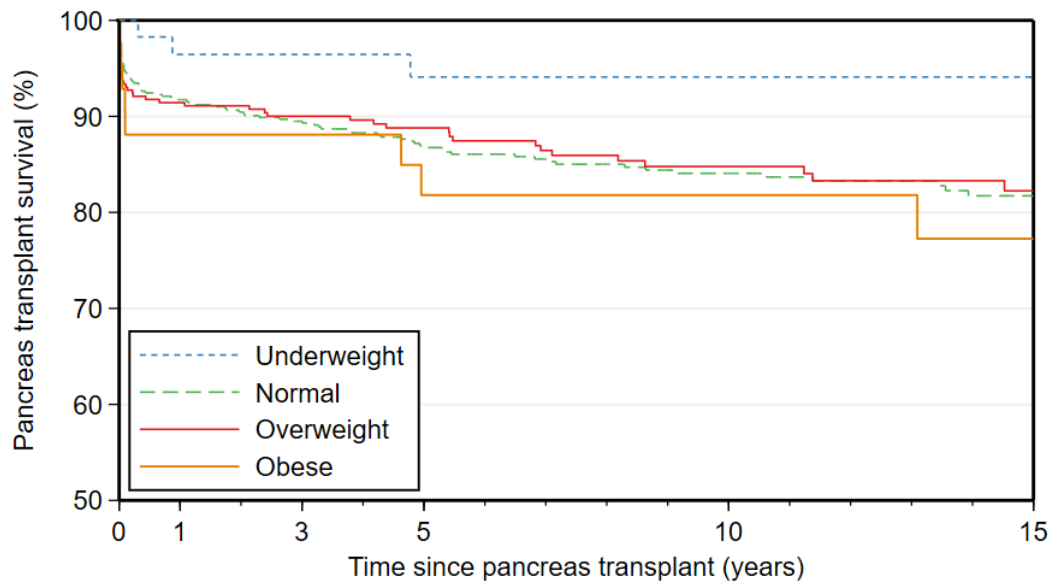


Year of transplant	0	1	3	5	10	15
2010-2022	580	493	390	288	81	0
2000-2009	317	282	276	262	230	159
1984-1999	150	118	113	106	87	73

Pancreas transplant survival by donor BMI is presented in Figure 2.9 (a. Censored at death and b. Not censored at death i.e. including death as pancreas failure). Most donors (59%) were normal weight (BMI 18.5-25). However, 6% were underweight (BMI <18.5), 31% were overweight (BMI 25-29) and 4% were obese (BMI 30+). While Figure 2.9a and 2.9b suggest separation of survival curves, there were no statistical associations between donor BMI and pancreas survival ($p=0.3$). Furthermore, there was no significant statistical difference in pancreas transplant survival by donor BMI either when censoring for death, or when including death with a functioning pancreas transplant. Pancreas transplant survival at 1 year (censored at death) was 91.3% for transplants where the donor was normal weight normal BMI, 96.1% for transplants where the donor was underweight, 91.1% for transplants where the donor was overweight, and 87.0% where the donor was obese. This may reflect selection bias of the overweight donors that were accepted.

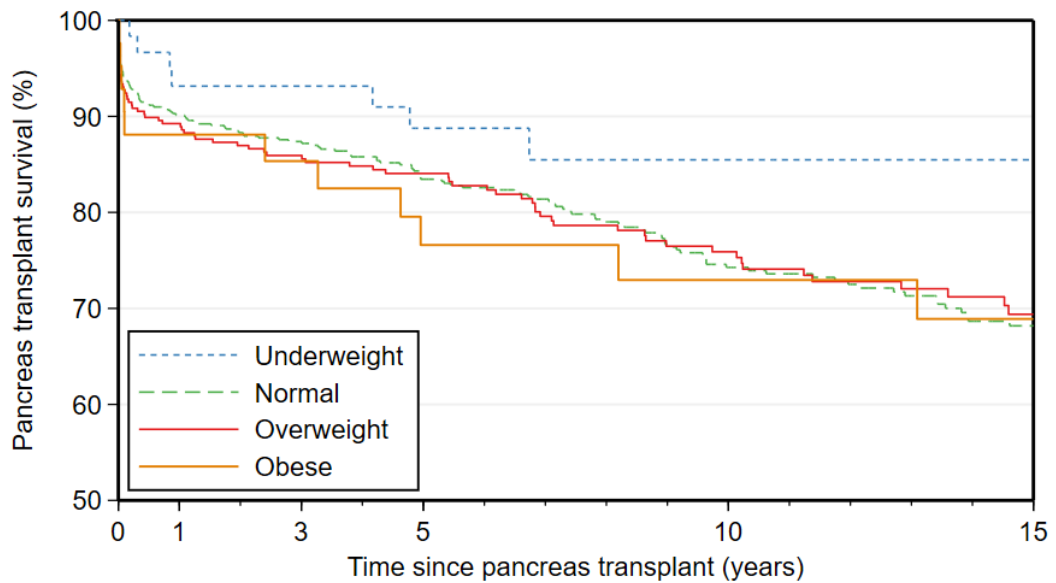
Figure 2.9: Pancreas transplant survival by donor BMI

a. Censored at death



Donor BMI	63	52	45	35	20	16
Underweight	63	52	45	35	20	16
Normal	603	513	449	389	232	138
Overweight	319	276	239	204	127	69
Obese	42	34	30	26	19	9

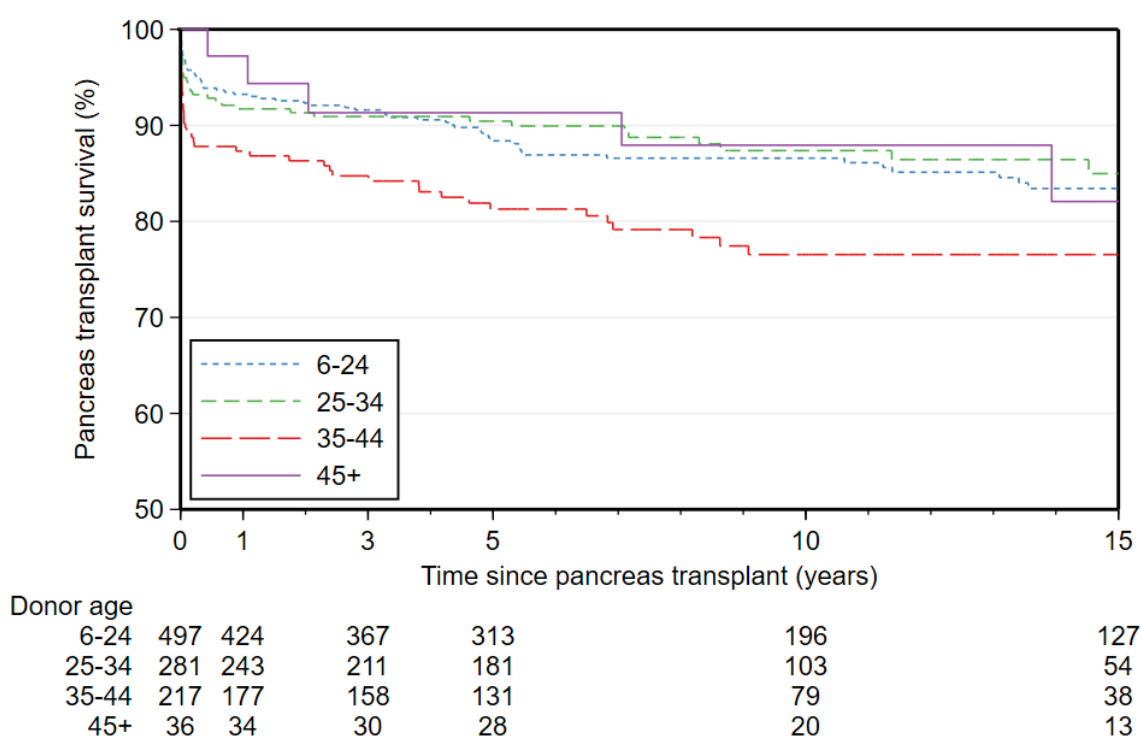
b. Including death as pancreas failure



Donor BMI	63	52	45	35	20	16
Underweight	63	52	45	35	20	16
Normal	603	513	449	389	232	138
Overweight	319	276	239	204	127	69
Obese	42	34	30	26	19	9

Pancreas transplant survival by donor age is presented in Figure 2.10. The survival curves are poorer for donors aged 35-44 compared with those 45 and older, or younger donors ($p=0.02$). We can only hypothesise that any difference may be due to donors over 45 being a more highly selected group, compared to the donors aged 35-44. Pancreas transplant survival at 1 year was 93.2% for transplants from donors aged 6-24 years, 91.7% for donors aged 25-34 years, 87.3% for donors aged 35-44 years, and 97.2% for donors aged 45+ years.

Figure 2.10: Pancreas transplant survival by donor age (censored at death)



Pancreas transplant survival at 1 year and 5 years post-transplant, censored at death and stratified by country and era of transplantation is presented in Table 2.7.

Table 2.7: Pancreas transplant survival censored at death, by country and era

Year of transplant	N	Australia				New Zealand				
		1-year		5-year		1-year		5-year		
		n	%	n	%	N	n	%	n	%
2013-2018	252	236	94.1%	185	90.7%	20	19	95.0%	12	90.0%
2014-2019	260	246	95.0%	162	92.7%	23	22	95.7%	11	91.3%
2015-2020	270	260	96.5%	131	94.9%	0	0	100.0%	10	95.8%
2016-2021	259	251	97.0%	88	95.6%	27	26	96.3%	9	96.3%
2017-2022	209	203	97.7%	41	96.6%	23	22	96.3%	5	96.3%

Prevalence of functioning pancreas transplants

We calculated the point prevalence of people living in Australia and New Zealand who were alive with a functioning transplant on 31st December each year for the last five years (Table 2.8). The below numbers exclude people still alive, but whose pancreas transplant has failed. The number of functioning transplants is increasing over time, possibly because of increased survival of pancreas transplants while the number of new transplants performed remains relatively steady over time.

Table 2.8: People alive with a functioning pancreas transplant in Australia and New Zealand by year and residence, at year end

State/country of residence	2018	2019	2020	2021	2022
New South Wales	153	167	183	193	204
Victoria	184	191	205	215	223
Queensland	116	126	136	147	164
Western Australia	30	32	35	36	40
South Australia	47	50	53	57	59
Tasmania	27	29	29	29	32
Australian Capital Territory	15	15	15	15	15
Northern Territory	4	4	4	4	4
New Zealand	44	48	49	54	59
Total	620	662	709	750	800

Kidney transplant survival

Kidney transplant survival was calculated for those who received SPK transplants, from the time of transplantation until the time of return to dialysis. We calculated both kidney failure including death with a functioning kidney and kidney failure censored at death with a functioning graft. For kidney transplant survival we included only SPK transplants and excluded PAK transplant recipients. We had survival records for 1,008 SPK transplants.

Figure 2.11 shows kidney survival censored at death. Over 9,953 years of observation, there were 89 kidney transplant failures (excluding people who died with a functioning kidney transplant). Overall, 1-year kidney transplant survival was 97.5%, 5-year survival 96.1%, and 10-year survival 91.2%.

Figure 2.11: Kidney transplant survival for people receiving SPK transplants (censored at death)

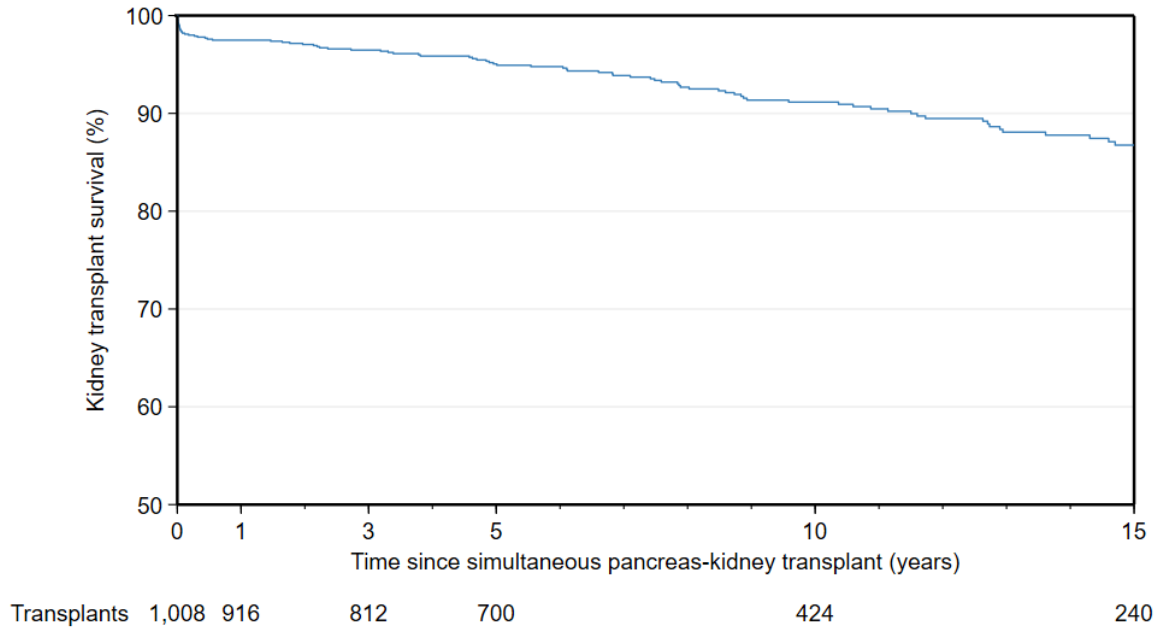
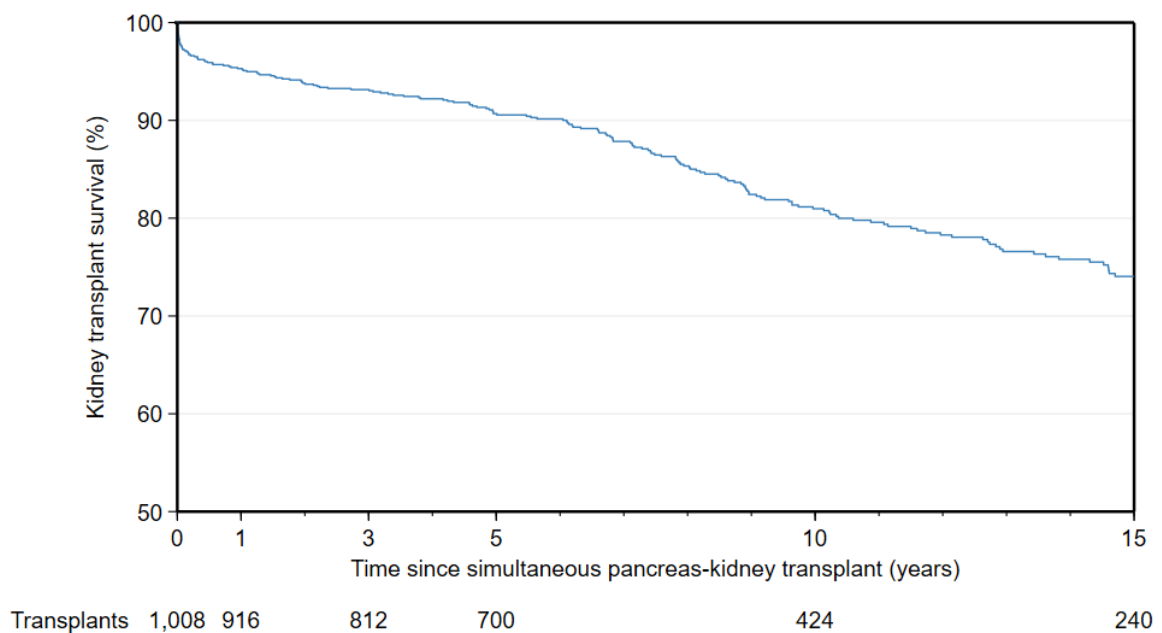


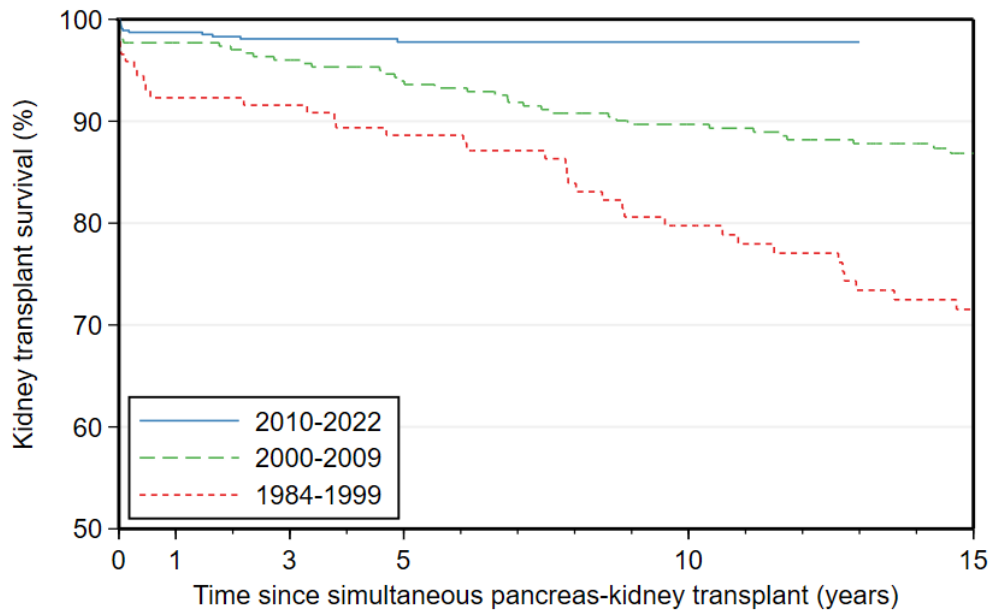
Figure 2.12 shows kidney survival including death with a functioning kidney. Over the same observation time there were 203 recipients who either died with kidney transplant function or experienced kidney transplant failure. Kidney transplant survival at 1, 5 and 10 years was 95.3%, 90.7% and 81.0% respectively.

Figure 2.12: Kidney transplant survival for people receiving SPK transplants (including death as a kidney transplant failure)



Kidney transplant survival improved over time, with longer survival for those transplanted in more recent years ($p < 0.001$). For those transplanted before 2000, kidney transplant survival was 92.3% at 1 year and 88.6% at 5 years but was 98.7% at 1 year and 97.7% at 5 years for those transplanted in 2010 or later (Figure 2.13).

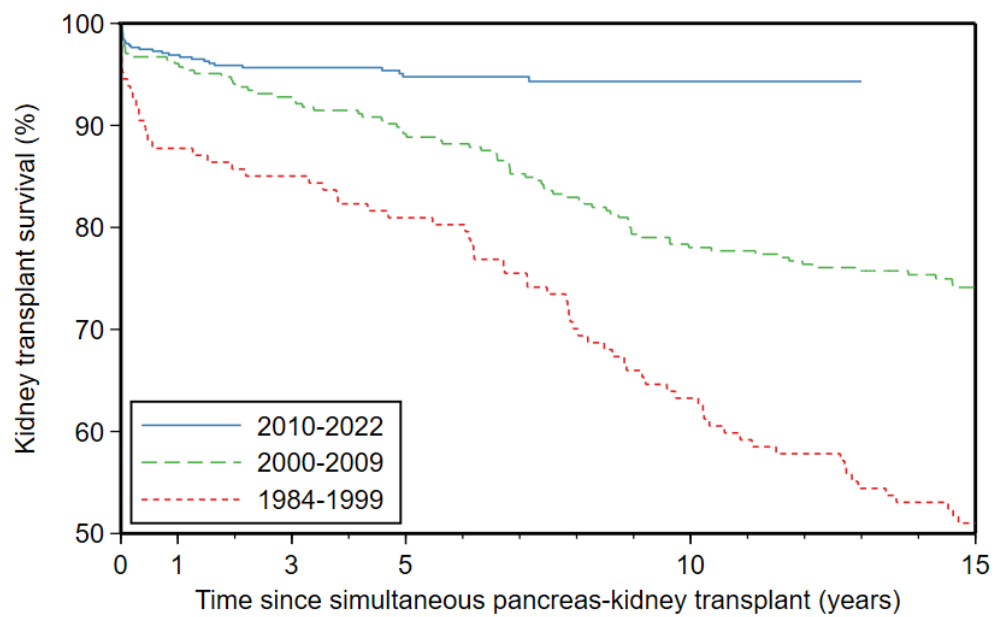
Figure 2.13: Kidney transplant survival for SPK recipients over time (censored at death)



Year of transplant	0	1	3	5	10	15
2010-2022	556	494	404	309	93	0
2000-2009	305	293	283	272	238	165
1984-1999	147	129	125	119	93	75

The era effect was even stronger when considering kidney failure including death with kidney function ($p < 0.001$). For those transplanted before 2000, survival was 87.8% at 1 year and 81.0% at 5 years but was 96.9% at 1 year and 94.8% at 5 years for those transplanted in 2010 or later (Figure 2.14).

Figure 2.14: Kidney transplant survival for SPK recipients over time (including death as a kidney transplant failure)



Year of transplant	0	1	3	5	10	15
2010-2022	556	494	404	309	93	0
2000-2009	305	293	283	272	238	165
1984-1999	147	129	125	119	93	75

Pancreas transplant operative data

Characteristics of the pancreas transplant operations for 2022, previous years, and overall are shown in Table 2.9 below.

Table 2.9: Descriptive characteristics of pancreas transplant operations

	2022	1984-2021	Total
Pancreas transplant			
Total pancreas transplants	50	1002	1052
Cold ischaemic time (hours)			
Patients (%)	49 (98)	811 (81)	860 (82)
Mean (SD)	8.7 (2.9)	10.9 (18.3)	10.8 (17.8)
Median (IQR)	8 (7, 10.5)	12.6 (7.9, 12.6)	10.3 (7.7, 12.5)
Anastomosis time (minutes)			
Patients (%)	34 (68)	761 (76)	795 (76)
Mean (SD)	20.4 (5.2)	28.9 (8.5)	28.5 (8.6)
Median (IQR)	20 (18, 22)	29 (24, 34)	29 (23, 34)
Exocrine drainage			
Enteric, n (%)	50 (100)	762 (76)	812 (77)
Bladder, n (%)	0 (0)	164 (16)	164 (16)
Not reported, n (%)	0 (0)	76 (8)	76 (7)
Kidney transplant			
Total SPK transplants	42	835	877
Cold ischaemic time (hours)			
Patients (%)	46 (92)	782 (78)	828 (79)
Mean (SD)	8.9 (2.7)	11.0 (18.6)	10.8 (18.1)
Median (IQR)	8.5 (7, 11)	10.4 (7.9, 12.6)	10.3 (7.8, 12.5)
Anastomosis time (minutes)			
Patients (%)	33 (66)	731 (73)	764 (73)
Mean (SD)	20.5 (5.3)	29.0 (8.4)	28.6 (8.4)
Median (IQR)	20 (18, 22)	29 (24, 34)	29 (23, 34)
Kidney donor arteries			
None, n (%)	0 (0)	2 (<1)	2 (<1)
One, n (%)	38 (76)	701 (70)	739 (70)
Two, n (%)	7 (14)	76 (8)	83 (8)
Three, n (%)	1 (2)	4 (<1)	5 (<1)
Not reported, n (%)	0 (0)	179 (18)	179 (17)

SPK, simultaneous pancreas-kidney

To investigate how much the total cold ischaemic time varied dependant on the donor state, and distance travelled to the transplanting centre, Table 2.10 displays a cross tabulation of donor state of origin with transplanting centre.

Table 2.10: Comparison of cold ischaemic time of pancreas transplants by donor state, for Australian pancreas transplants 2022

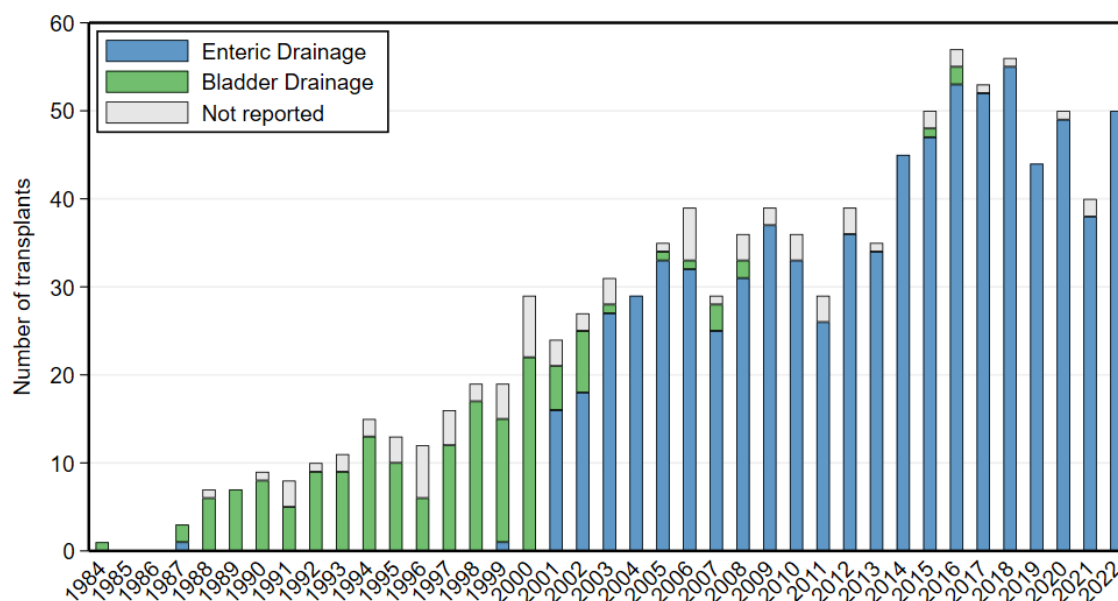
Donor state	Cold ischaemic time in hours					
	Westmead (NSW)		Monash (VIC)		Royal Adelaide (SA)	
	<i>N</i>	<i>Mean (SD)</i>	<i>N</i>	<i>Mean (SD)</i>	<i>N</i>	<i>Mean (SD)</i>
New South Wales	12	7.25 (2.3)	0	-	0	-
Victoria	2	9.5 (0.7)	10	6.5 (1.3)	0	-
Queensland	7	10.4 (2.1)	0	-	0	-
Western Australia	7	12.4 (1.5)	0	-	0	-
South Australia	2	10 (-)	0	- (-)	1	6 (-)
Tasmania	0	-	2	(6.7)	0	-
Australian Capital Territory	2	7.5 (0.7)	0	-	0	-
Northern Territory	0	-	0	-	0	-
Total	32	9.4 (2.7)	12	6.2 (2.4)	1	6 (-)

Note: Data as incomplete for cold ischaemic times, hence data in this table may not be representative of all pancreas transplants. We are seeking to address data completeness.

Surgical technique

Exocrine drainage of the pancreas transplant has changed over time. Enteric drainage of the pancreas was first used in Australia and New Zealand during 2001. Figure 2.15 illustrates the number of transplants by pancreas duct management. Since 2001, most pancreas transplants have used enteric drainage of the pancreas duct.

Figure 2.15: Change in management of exocrine drainage of the pancreas over time



The site of donor vessel anastomoses onto the recipient vessels is dependent on many things, including but not limited to surgeon’s preference, surgical ease of access, length and relative calibre of donor vessels. The sites of anastomosis for donor arteries and veins are displayed in Figure 2.16 and Figure 2.17 below.

Figure 2.16: Site of donor artery anastomosis onto recipient vessel

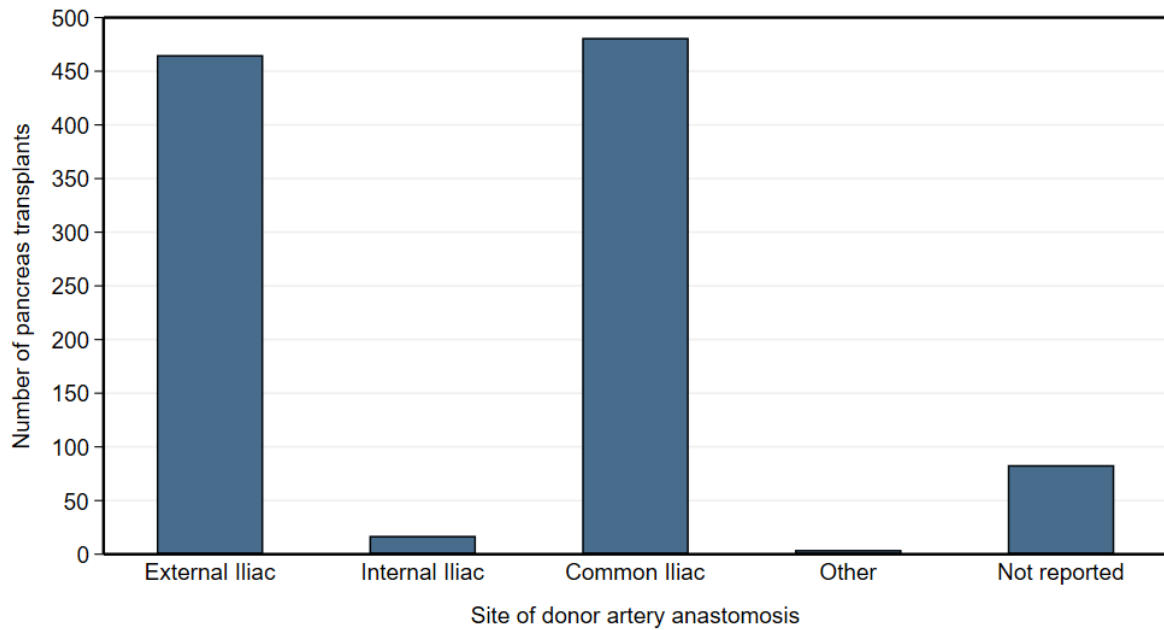
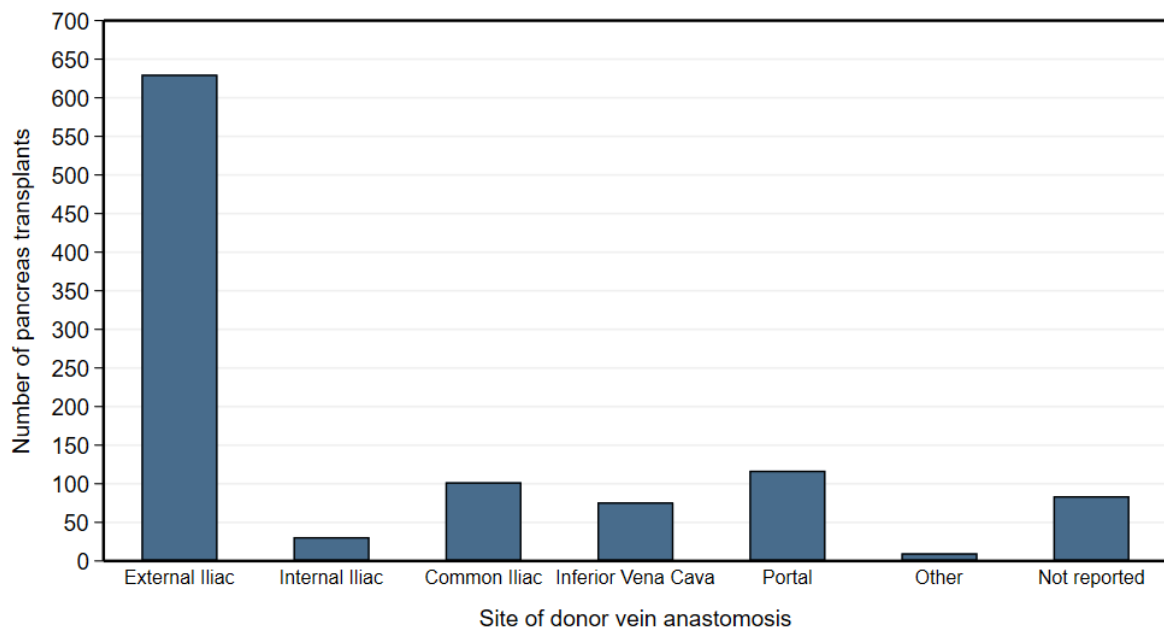


Figure 2.17: Site of donor vein anastomosis onto recipient vessel



The immunological matching of donor-recipient pairs is shown in Table 2.11, and the cytomegalovirus (CMV) and Epstein-Barr virus (EBV) matching is illustrated in Table 2.12.

Table 2.11: Immunological cross-matching of donor recipient pairs

	Donor-recipient pairs, n (column %)	
	<i>Current</i>	<i>Peak</i>
Crossmatch		
T and B cell Negative	848 (81)	815 (77)
T-cell Positive	0 (0)	3 (<1)
B-cell Positive	4 (<1)	4 (<1)
DTT Negative	3 (<1)	4 (<1)
Not reported	197 (18)	226 (21)
Recipient Panel Reactive Antibodies (%)		
0-49	148 (14)	144 (14)
50+	2 (<1)	10 (<1)
Not reported	902 (86)	898 (85)

Table 2.12: Infectious disease serology cross-tabulation of donor-recipient pairs

Recipient serology	Donor serology, n (column %)		
	<i>Positive</i>	<i>Negative</i>	<i>Not reported</i>
Cytomegalovirus (CMV)			
Positive	186 (29)	66 (19)	6 (11)
Negative	33 (5)	18 (5)	2 (4)
Not reported	426 (66)	270 (76)	45 (85)
Epstein-Barr virus (EBV)			
Positive	226 (35)	30 (32)	40 (13)
Negative	11 (2)	0 (0)	4 (1)
Not reported	408 (63)	65 (68)	268 (86)

Chapter 3: Pancreas donors

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This chapter gives an overview of donors in 2022 and over time. Donor eligibility criteria guidelines are available in the TSANZ consensus statement <https://tsanz.com.au/guidelinesethics-documents/tsanz-clinical-guidelines.htm>, but briefly require donors to be over 25kg, and up to the age of 45, without known diabetes mellitus, or history of alcoholism, or pancreatic trauma. Donation after circulatory death may be considered up to the age of 35. As these are guidelines, there may be occasions when there is minor deviation from these criteria.

Donor BMI is perceived as impacting recipient outcomes. Obese donors are more likely to have fatty pancreas, which results in more difficult surgery and increased postoperative complications, and suboptimal insulin secretion. Alcohol consumption is defined by a history of consumption of more than 40g/day. Table 3.1 describes pancreas donor characteristics in Australia and New Zealand to date.

Pancreas donor characteristics

Table 3.1: Demographics and characteristics of pancreas transplant donors

	Donors, n (column %)		
	2022	1984-2021	Total
Total (row %)	50 (100)	1002 (100)	1052 (100)
Age category			
0-24	28 (56)	471 (47)	499 (47)
25-34	14 (28)	270 (27)	284 (27)
35-44	7 (14)	210 (21)	217 (21)
45+	1 (2)	35 (3)	36 (3)
Not reported	0 (0)	16 (2)	16 (2)
Sex			
Female	22 (44)	553 (55)	575 (55)
Male	28 (56)	436 (44)	464 (44)
Not reported	0 (0)	13 (1)	13 (1)
BMI (kg/m2)			
Underweight/Normal (<24.9)	38 (76)	633 (63)	671 (64)
Overweight (25-29.9)	9 (18)	310 (31)	319 (30)
Obese (30+)	3 (6)	39 (4)	42 (4)
Not reported	0 (0)	20 (2)	20 (2)
Donor type			
Brain death (DBD)	46 (92)	976 (97)	1022 (97)
Circulatory death (DCD)	4 (8)	21 (2)	25 (2)
Not reported	0 (0)	5 (<1)	5 (<1)
Donor mode of death			
Cerebral hypoxia/ischaemia	20 (40)	159 (16)	179 (17)
Cerebral infarction	3 (6)	18 (2)	21 (2)
Intracranial haemorrhage	8 (16)	261 (26)	269 (26)
Non-neurological condition	0 (0)	195 (19)	195 (19)
Other neurological condition	1 (2)	21 (2)	22 (2)
Traumatic brain injury	18 (36)	332 (33)	350 (33)
Not reported	0 (0)	16 (2)	16 (2)
Alcohol consumption			
Never	36 (72)	730 (73)	766 (73)
Former	1 (2)	9 (<1)	10 (<1)
Current	13 (26)	81 (8)	94 (9)
Not reported	0 (0)	182 (18)	182 (17)
Smoking history			
Never	32 (64)	589 (59)	621 (59)
Former	3 (6)	42 (4)	45 (4)
Current	15 (30)	249 (25)	264 (25)
Donor's blood group			
O	20 (40)	492 (49)	512 (49)
A	27 (54)	382 (38)	409 (39)
B	2 (4)	96 (10)	98 (9)
AB	1 (2)	25 (2)	26 (2)
Not reported	0 (0)	7 (<1)	7 (<1)
Kidney biopsy			
Performed	18 (36)	741 (74)	759 (72)
Not performed	27 (54)	222 (22)	249 (24)
Not reported	5 (10)	39 (4)	44 (4)
Cytomegalovirus (CMV)			

Positive	39 (78)	607 (61)	646 (61)
Negative	11 (22)	343 (34)	354 (34)
Not reported	0 (0)	52 (5)	52 (5)
Epstein-Barr virus (EBV)			
Positive	46 (92)	600 (60)	646 (61)
Negative	4 (8)	91 (9)	95 (9)
Not reported	0 (0)	311 (31)	311 (30)

DBD, donor after brain death; DCD, donor after circulatory death

The distribution of donor states of origin by transplanting unit for Australian pancreas donors is shown in Table 3.2.

Table 3.2: Distribution of state of residence of pancreas donors in Australia over time, by national pancreas transplant unit

State	Donors, n (column %)					
	2022	2021	2020	2019	2018	2017
Westmead (NSW)						
NSW	12 (38)	7 (33)	15 (48)	14 (52)	13 (50)	14 (47)
VIC	2 (6)	1 (5)	1 (3)	3 (11)	1 (4)	0 (0)
QLD	7 (22)	8 (38)	8 (26)	4 (15)	7 (27)	4 (13)
WA	7 (22)	2 (10)	5 (16)	4 (15)	2 (8)	7 (23)
SA	2 (6)	2 (10)	0 (0)	1 (4)	0 (0)	1 (3)
TAS	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)
ACT	2 (6)	1 (5)	1 (3)	1 (4)	3 (12)	3 (10)
NT	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)
Monash (VIC)						
NSW	0 (0)	1 (14)	0 (0)	0 (0)	1 (5)	0 (0)
VIC	10 (83)	5 (71)	7 (50)	9 (90)	17 (85)	16 (89)
QLD	0 (0)	0 (0)	1 (7)	0 (0)	0 (0)	1 (6)
WA	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	1 (6)
SA	0 (0)	1 (14)	1 (7)	1 (10)	1 (5)	0 (0)
TAS	2 (17)	0 (0)	4 (29)	0 (0)	0 (0)	0 (0)
ACT	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
NT	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Not reported	0 (0)	0 (0)	1 (7)	0 (0)	0 (0)	0 (0)
Royal Adelaide (SA)						
NSW	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 -
VIC	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 -
QLD	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 -
WA	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 -
SA	1 (100)	4 (100)	2 (100)	2 (67)	3 (75)	0 -
TAS	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 -
ACT	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 -
NT	0 (0)	0 (0)	0 (0)	1 (33)	1 (25)	0 -

Donor and recipient state/territory

Table 3.3 shows the distribution of donor organs according to state of origin, cross-tabulated with the state of origin of the recipients who received those organs, for 2022, and from inception of the pancreas program. Note, these tables include Australian donors and recipients only.

Table 3.3: Number of pancreas transplants by donor and recipient state of residence in Australia for 2022 only and all years

Recipient state	Donor state									Total
	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	Not reported	
2022 only										
NSW	6	0	2	1	1	0	1	0	0	11
VIC	0	7	0	0	0	1	0	0	0	8
QLD	5	2	5	3	1	0	1	0	0	17
WA	1	0	0	3	0	0	0	0	0	4
SA	0	0	0	0	1	0	0	0	0	1
TAS	0	3	0	0	0	1	0	0	0	4
ACT	0	0	0	0	0	0	0	0	0	0
NT	0	0	0	0	0	0	0	0	0	0
Total	12	12	7	7	3	2	2	0	0	45
All years (1984-2022)										
NSW	171	14	36	23	23	5	19	0	0	291
VIC	23	211	3	7	8	20	3	0	1	276
QLD	87	12	42	21	26	0	13	1	0	202
WA	22	5	13	15	5	1	3	0	0	64
SA	17	20	3	5	21	1	5	2	0	74
TAS	16	15	1	0	1	3	0	0	0	36
ACT	16	1	3	1	2	0	0	0	0	23
NT	1	0	0	2	1	0	0	0	0	4
Total	353	278	101	74	87	30	43	3	1	970

Appendices

Previous ANZIPTR Reports, other abstracts, and publications

We have not been notified of any publications or abstracts using ANZIPTR data within the past year (2021-2022).