AUSTRALIA AND NEW ZEALAND LIVER TRANSPLANT REGISTRY

From the Combined Registries of the Australian and New Zealand Liver Transplant Centres

DATA TO 30/06/99

Contents

Preface

The liver transplant centres in Australia and New Zealand report details of their liver graft recipients to a combined registry so that a National analysis can be done. Centres are situated in Adelaide, Brisbane, Melbourne, Perth and Sydney in Australia and Auckland, New Zealand.

This, the 11th Report, was prepared by the Australian National Liver Transplant Unit, Sydney. Data collected from the six units was analysed and the outcome of all liver transplant recipients from January 1985 to June 1999 is presented. The New Zealand Liver Transplant Unit began clinical practice in March 1998. Prior to this all New Zealand patients received their grafts in Australia.

The Editors thank the Liver Transplant Units for contributing their data. A full list of units is included in the Appendix. They also wish to thank the Australia and New Zealand Organ Donor Registry for kindly contributing the donor information.

All comments or requests for further copies of this report should be directed to:

Professor AGR Sheil
Australian National Liver Transplant Unit
Royal Prince Alfred Hospital
Camperdown NSW 2050
AUSTRALIA
Phone:- 61-2-9515 3500
Fax:- 61-7-9515 3512

Professor AGR Sheil
Dr D Verran
Ms P Dilworth
Ms J Fisher

Summary

Within Australasia, between January 1985 and June 1999, 1500 orthotopic liver transplants (OLTx) were performed on 1375 patients.

Of the adult recipients, 886 (83%) were Australian citizens, 110 (10.5%) New Zealand Citizens and 68 (6.5%) were from other countries. In the paediatric group, 183 (59%) were Australian citizens, 45 (14%) New Zealand citizens and 83 (27%) were from other countries.

Children received reduced liver allografts in 229/359 (64%) of cases. There were no differences in the utilisation of reduced allografts in Australian citizens 133/215 (62%) compared to New Zealand 33/50 (66%) or Other 63/94 (67%) citizens.

The most common underlying disease for which OLTx was performed on Australian citizens was chronic viral hepatitis (18%), followed by primary sclerosing cholangitis (11%), alcoholic liver disease (10%), metabolic disorders (10%), biliary atresia (10%), primary biliary cirrhosis (9%), fulminant hepatic failure (8%).

In NZ citizens the most common indications for OLTx were biliary atresia (19%), fulminant hepatic failure (14%) and primary sclerosing cholangitis (14%).

In Other citizens the most common indication for transplantation was biliary atresia (56%).

Hepatitis C is by far the most common indication for OLTx for chronic viral illness in Australians (59%), NZ (50%) and Other citizens (82%).

Current 1 year patient survival is 83%. Five year and 10 year survivals are 76% and 68% respectively. There were no major differences in survivals at 1, 5 and 10 years between Australian, NZ or Other citizens.

Australian patients who are in the 3-14 year age group at the time of OLTx have the best long term survival, (85% at 5 years), followed by those in the age group 15-54 years of age (76%). Those who are > 60 years of age survive less well (59%).

Since 1991 adult and child patient survival has remained stable at around 85% at 1 year.

Children under 8 kilograms of weight at the time of liver transplantation have a 1 year survival inferior to those over 8 kilograms of weight (66% v 87%).

There is a trend for paediatric recipients of whole liver allografts to have a superior patient survival from 1-6 years post Tx, over those who receive reduced liver allografts (92% vs 78%).

Patients who undergo liver transplantation for alcoholic liver disease have the best survival at 1 and 5 years (88% and 87% respectively), followed by adult patients with biliary atresia (86%, 86%), those with chronic autoimmune hepatitis (86% and 81%) and patients in the Other category (83% and 81%). Amongst those with chronic viral hepatitis, those with Hep C currently have long term survival (10yr) of 81%, exceeding that for most other groups. Ten year survival for those with Hep B is 50%. Survival for patients who receive grafts for fulminant hepatitis at 1 and 5 years is 73%, 69% and 61%, 61% for children. Those transplanted for malignancy have the worst long term

survival – 42% at 5 years. For children the major group with biliary atresia has 1 and 5 year survivals of 84% and 78%, similar to those with metabolic disorders of 82% and 75%.

Living related donor graft numbers remain low with 2 of 6 grafts functioning and 3 of 6 patients surviving.

Graft survival at 1 year is 79% following primary grafting, compared to 58% for a second allograft and 38% for a third graft.

In the first year following OLTx, the most common indicators for retransplantation are vascular complications, primary non function and rejection. After one year post OLTx, the most common indicator for retransplantation is rejection.

Sepsis and graft failure are the most frequent causes of patient death in the first year. After one year, malignancy emerges as the major cause of patient death.

In the first year following transplantation patient death and vascular complications are the major causes of allograft loss. After one year, recurrent disease and patient death are the major causes of allograft loss.

Grafts from donors aged < 50 years do better than those from donors aged 51-60 or > 65. However a relatively small group (n=25) from donors aged 61-65 is doing as well as those from younger donors.

An update on cancer and liver transplantation is included in Section 7.

Section 1

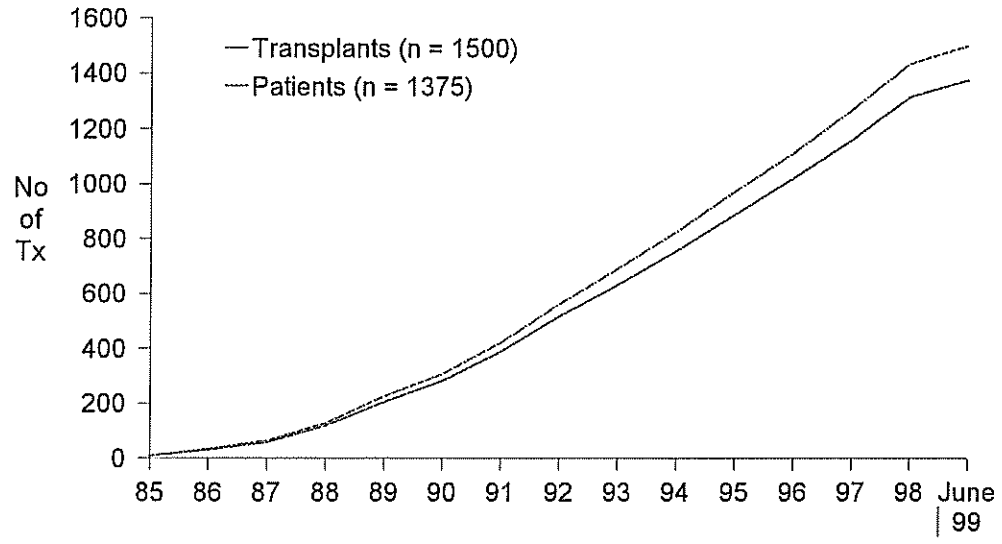
Demographic Data

Age and Gender
Summary Statistics

ALL PATIENTS (AUSTRALIAN, NEW ZEALAND, OTHER)

	Children	Adults
n = 1375	311 (23%)	1064 (77%)
Age		
Mean	4.5 ± 4.3	44.7 ± 12.5
Median	2.3y	46y
Range	1m - 14.9y	15 - 67.5y
Gender		
Female	178 (57%)	470 (44%)
Male	133 (43%)	594 (56%)

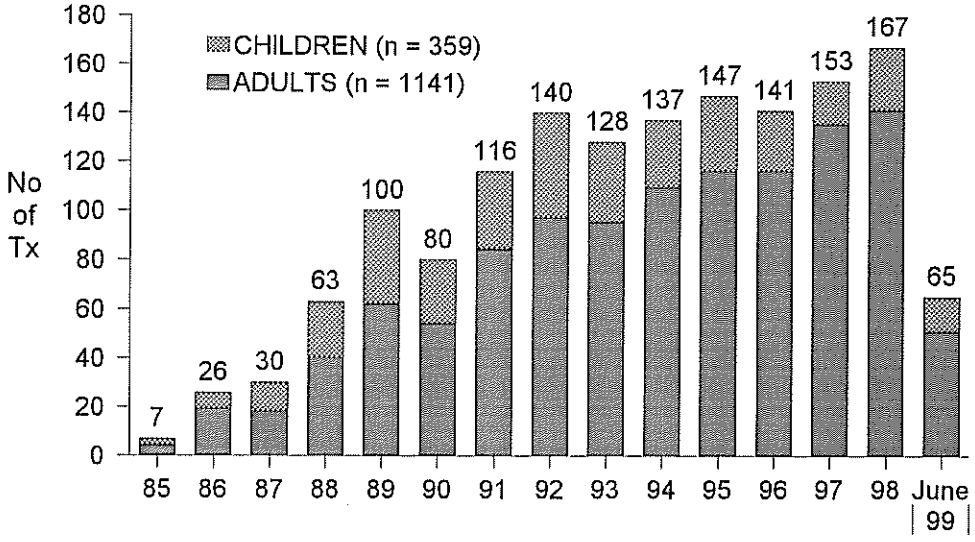
CUMULATIVE NUMBER OF PATIENTS AND TRANSPLANTS



Data to 30/06/99

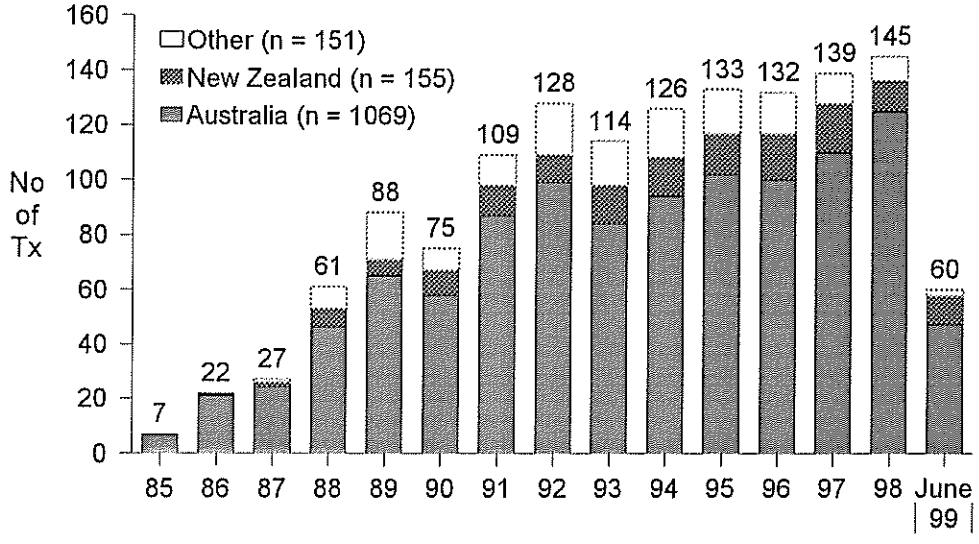
NUMBER OF TRANSPLANTS BY YEAR

n =1500



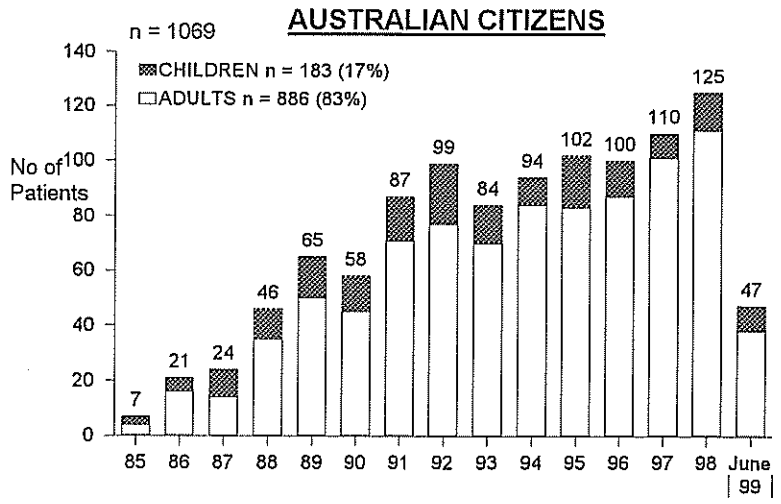
NUMBER OF NEW RECIPIENTS BY YEAR

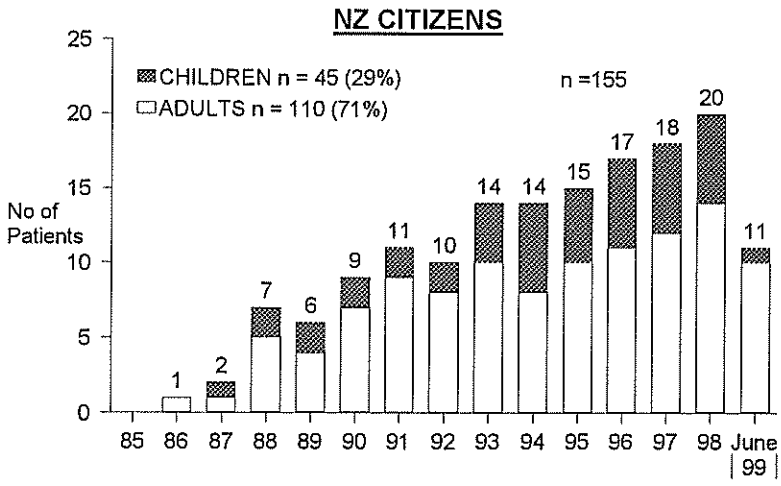
n =1375

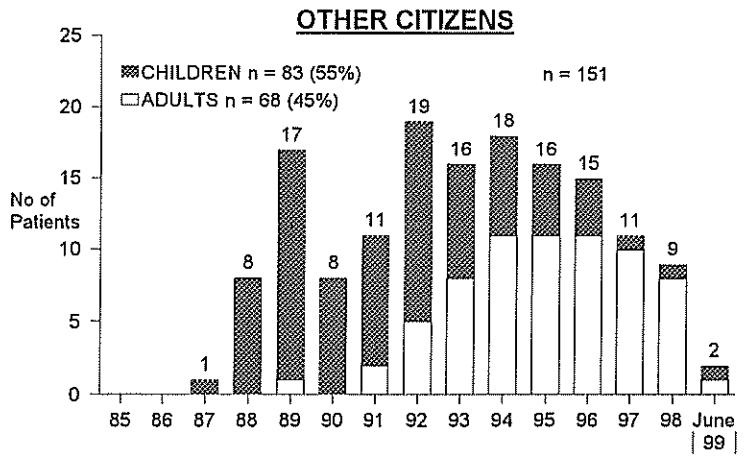


Data to 30/06/99

NUMBER OF RECIPIENTS BY YEAR (n = 1375)



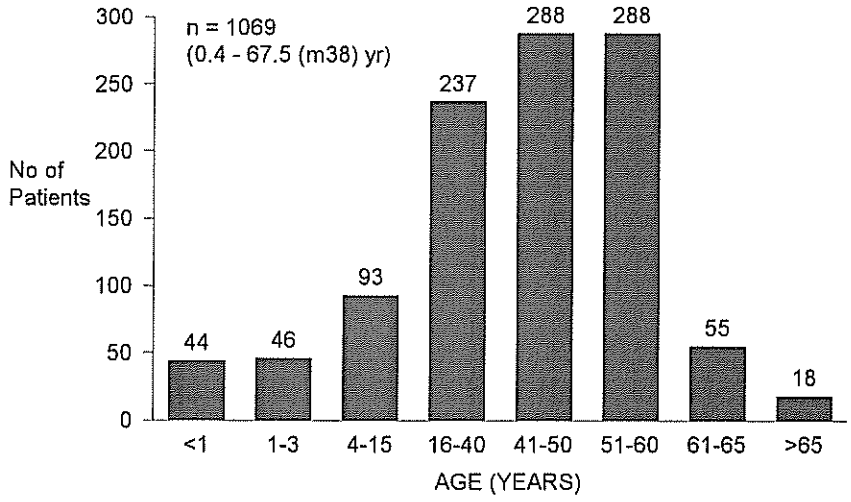




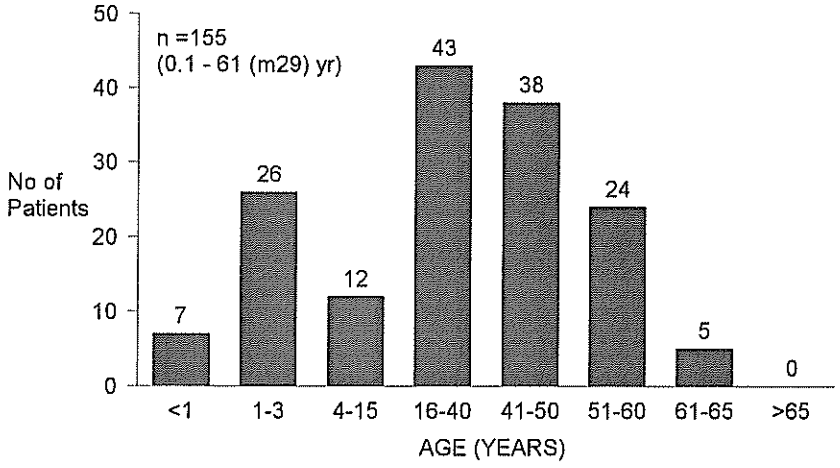
Data to 30/06/99

NUMBER OF RECIPIENTS BY AGE

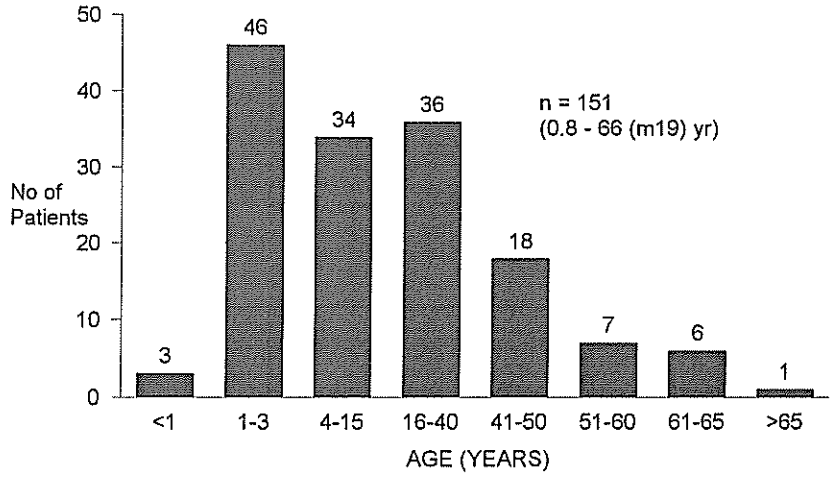
AUSTRALIAN CITIZENS



NZ CITIZENS

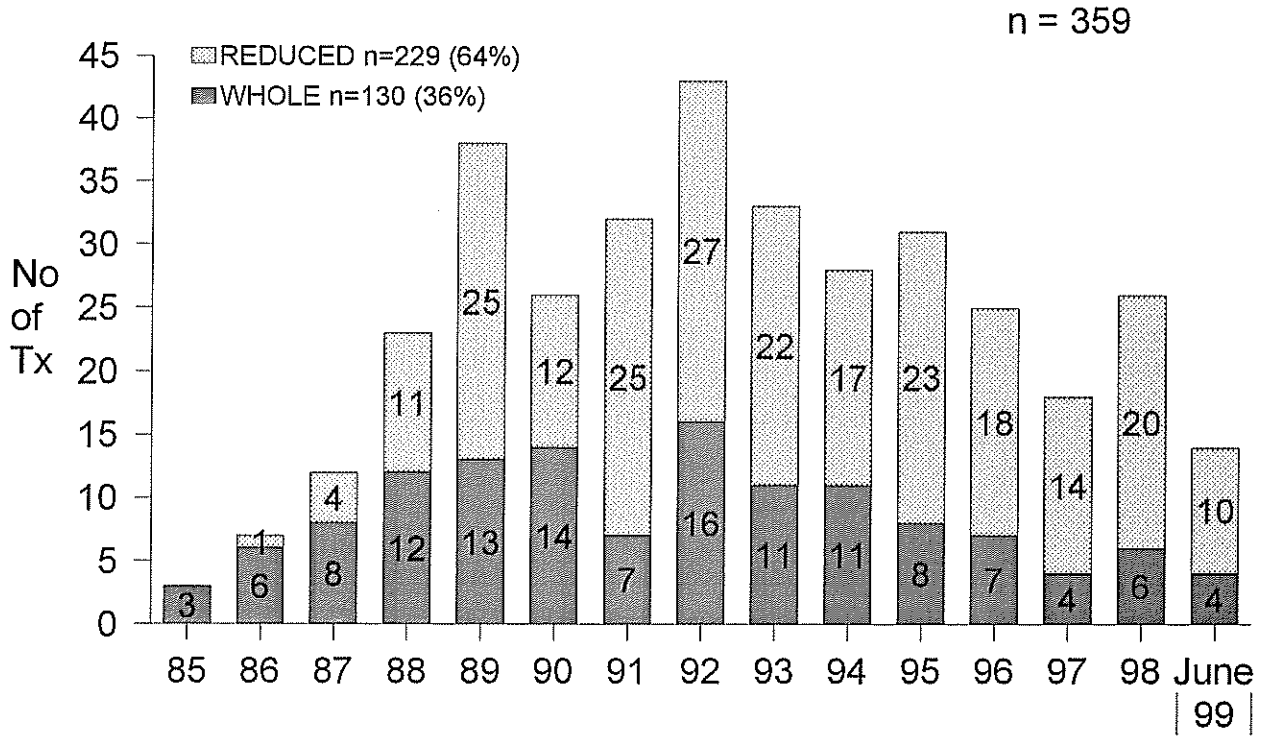


OTHER CITIZENS



Data to 30/06/99

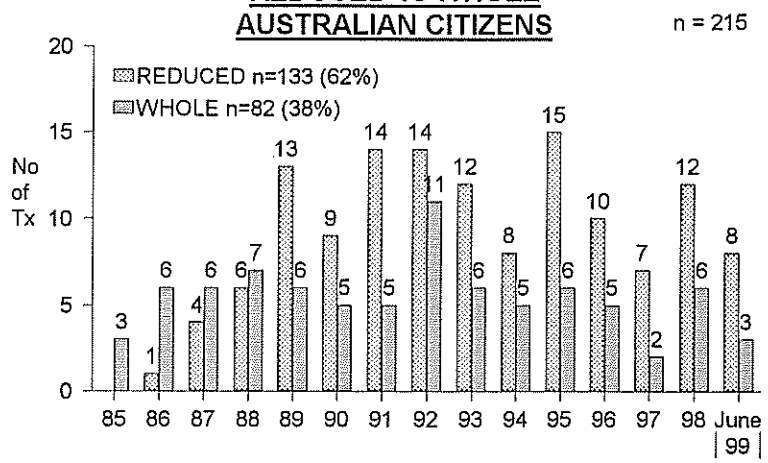
NUMBER OF GRAFTS BY YEAR
CHILDREN - REDUCED vs WHOLE



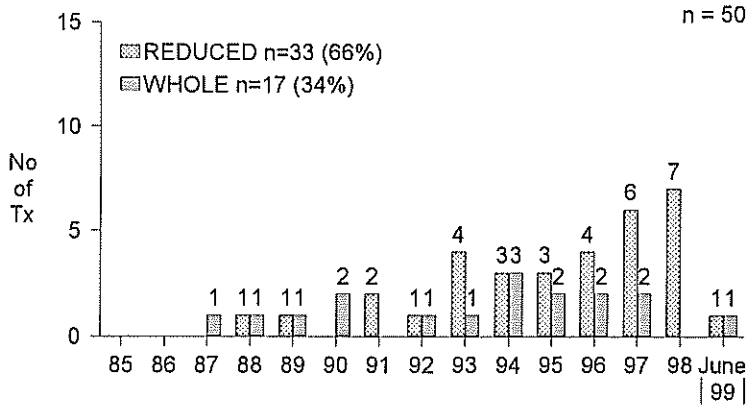
Data to 30/06/99

CHILDREN
NUMBERS OF GRAFTS BY YEAR

REDUCED vs WHOLE
AUSTRALIAN CITIZENS



NZ CITIZENS



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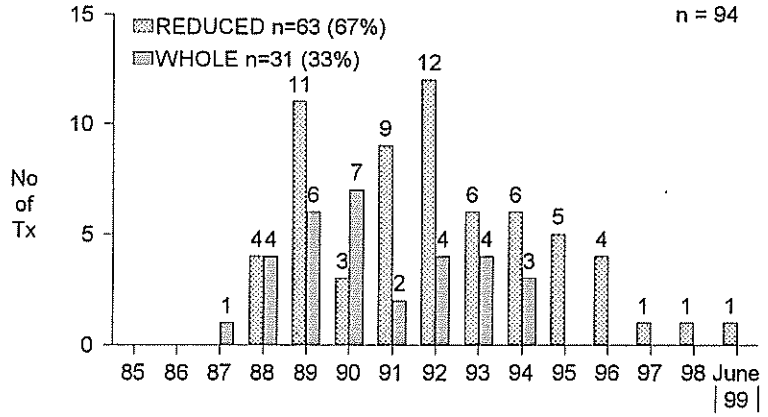


Data to 30/06/99

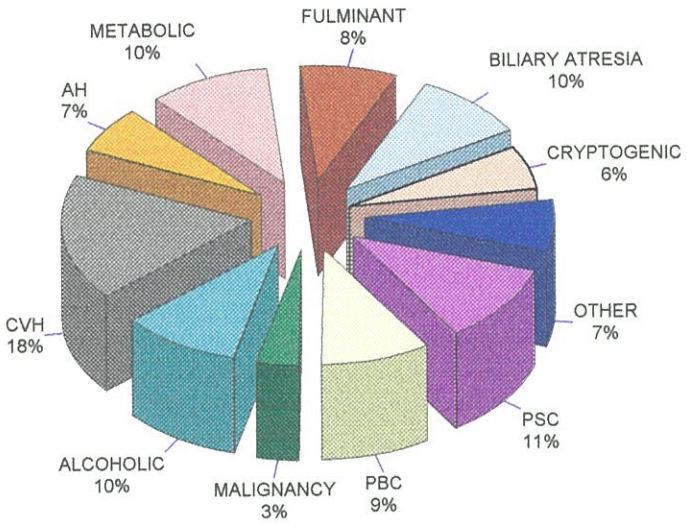
Section 2

Primary Diagnosis

PRIMARY DISEASES OF RECIPIENTS

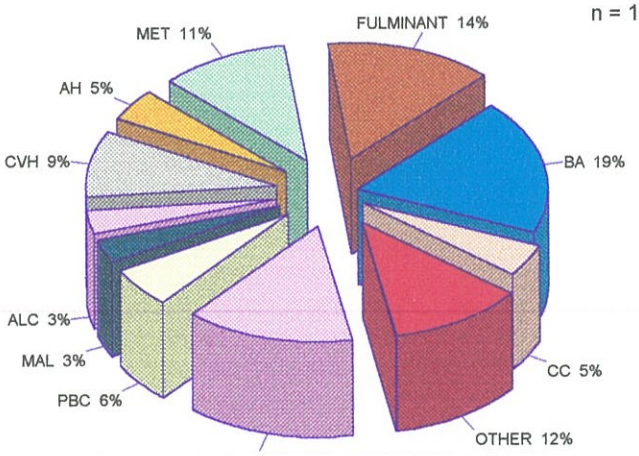
AUSTRALIAN CITIZENS

n = 1069



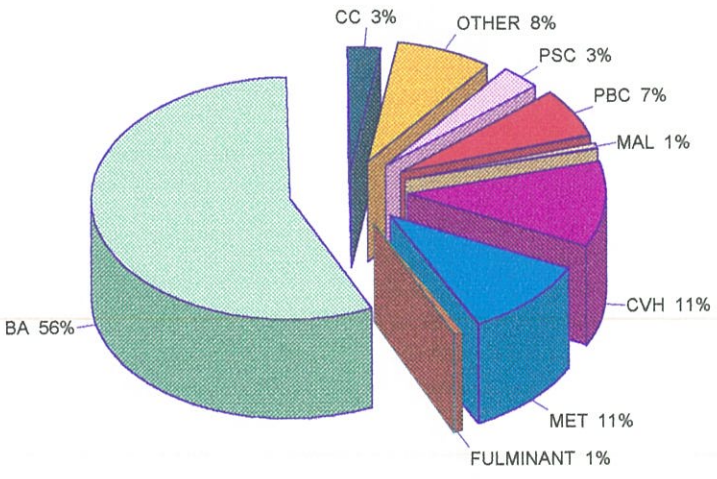
NZ CITIZENS

n = 155



OTHER CITIZENS

n = 151

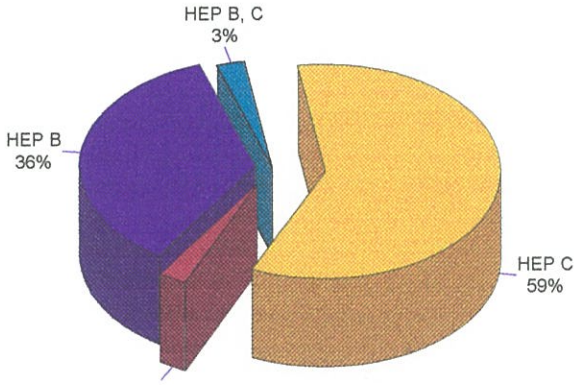


Data to 30/06/99

CHRONIC VIRAL HEPATITIS

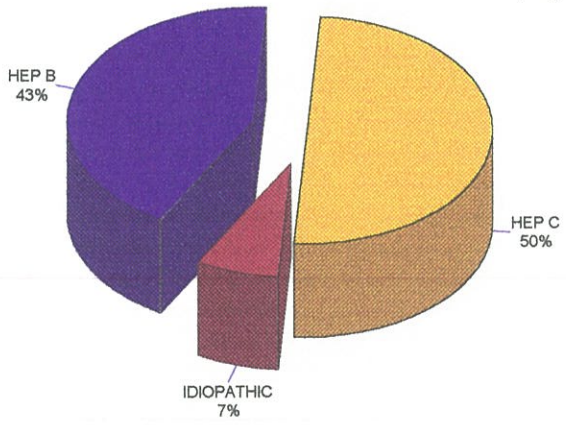
AUSTRALIAN CITIZENS

n = 188 (18%)



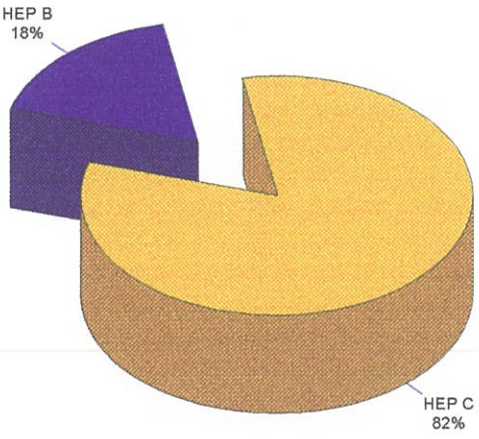
NZ CITIZENS

n = 14 (9%)



OTHER CITIZENS

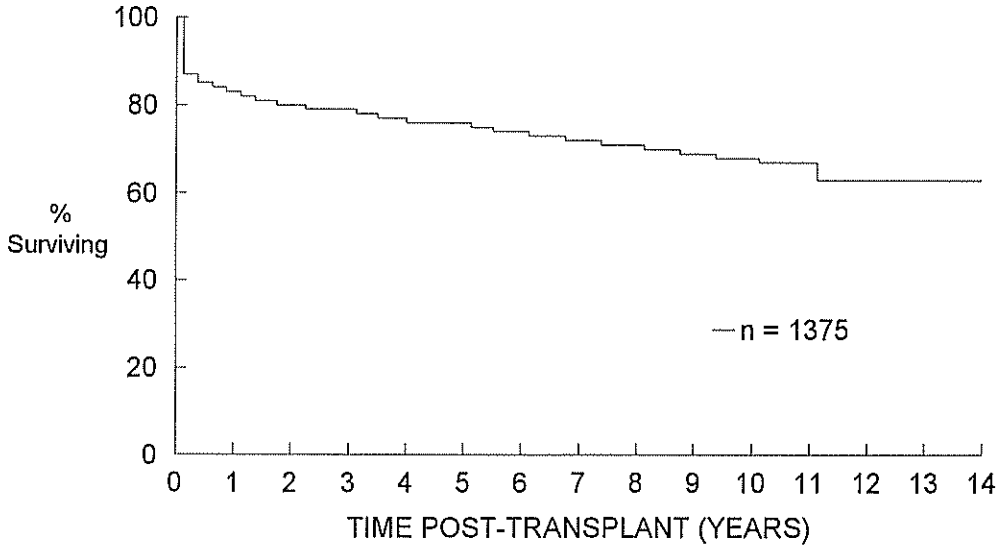
n =17 (11%)



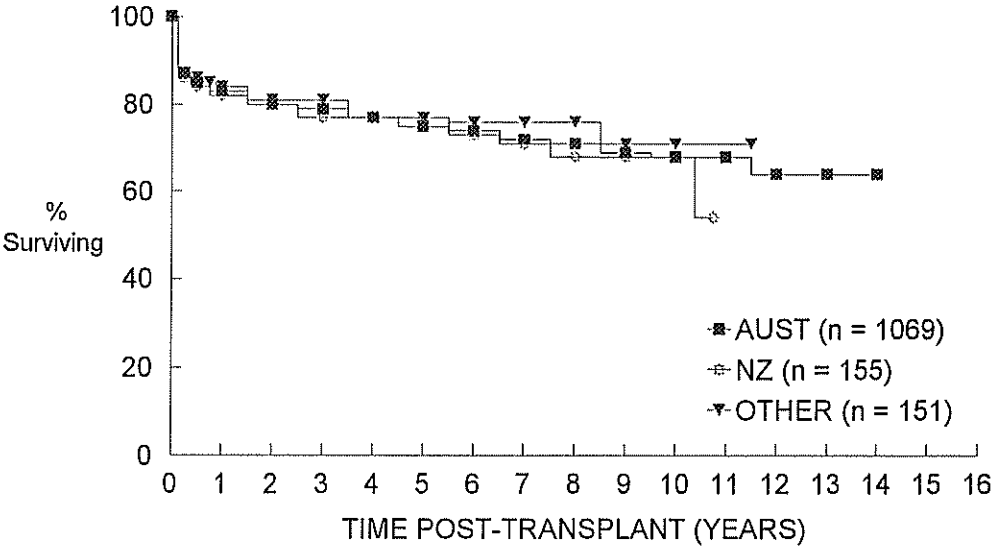
Section 3

Patient and Graft Survival

PATIENT SURVIVAL POST Tx



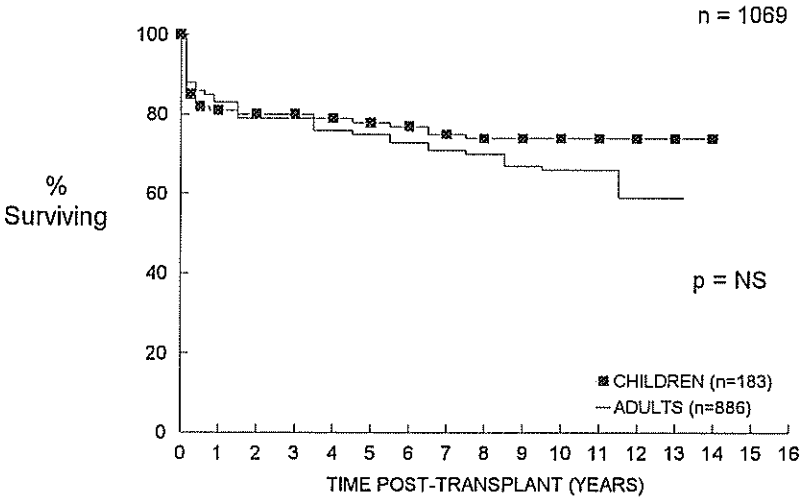
PATIENT SURVIVAL POST Tx



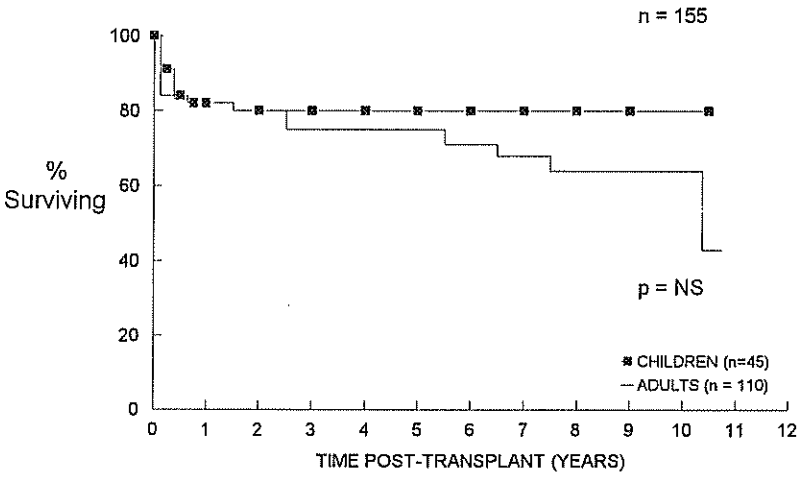
Data to 30/06/99

PATIENT SURVIVAL - ADULTS AND CHILDREN

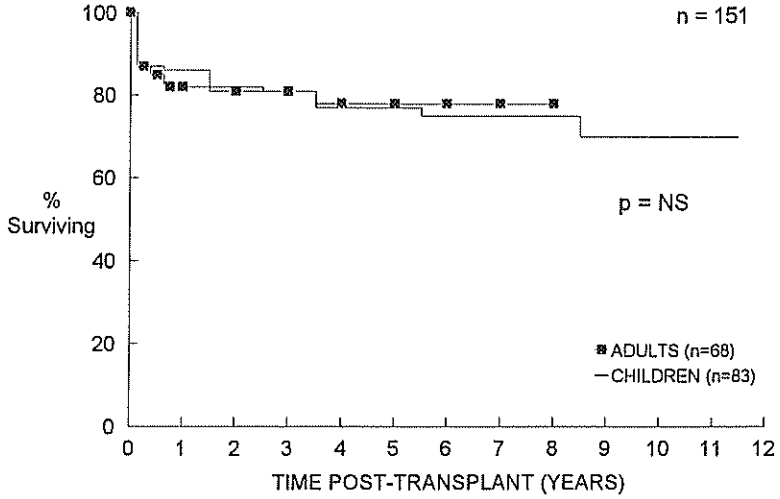
AUSTRALIAN CITIZENS



NZ CITIZENS



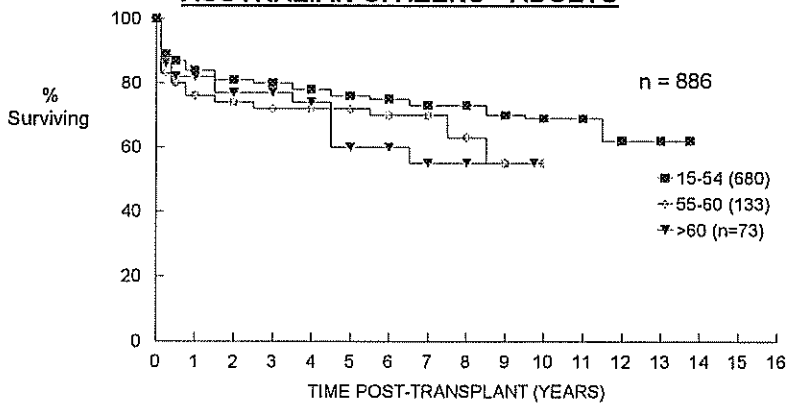
OTHER CITIZENS



Data to 30/06/99

PATIENT SURVIVAL BY AGE AT TRANSPLANT

AUSTRALIAN CITIZENS - ADULTS



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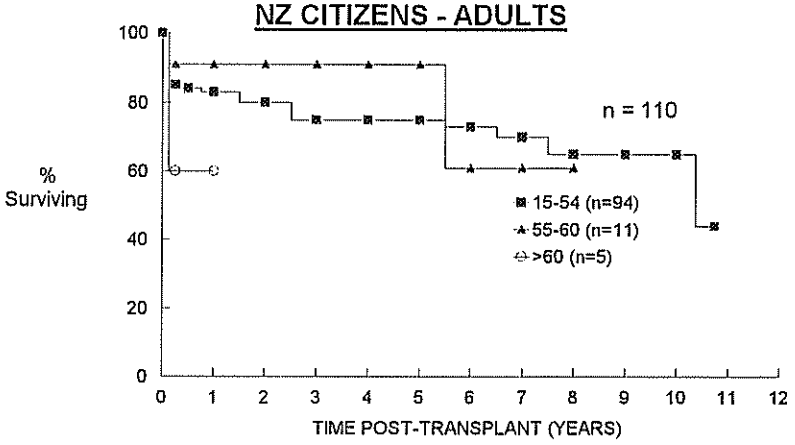
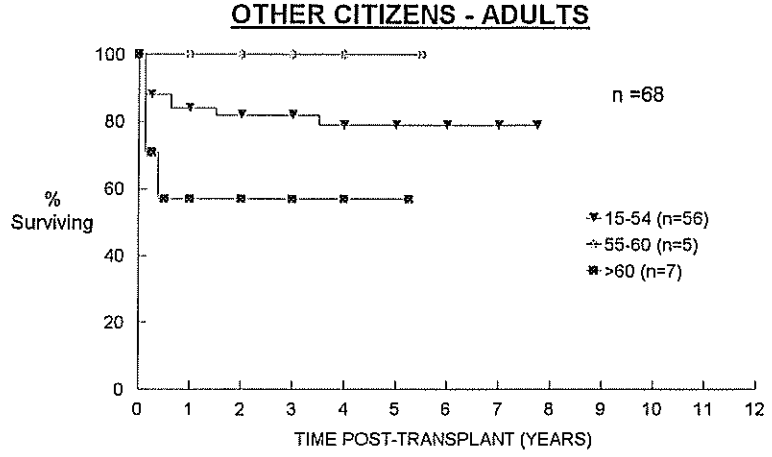


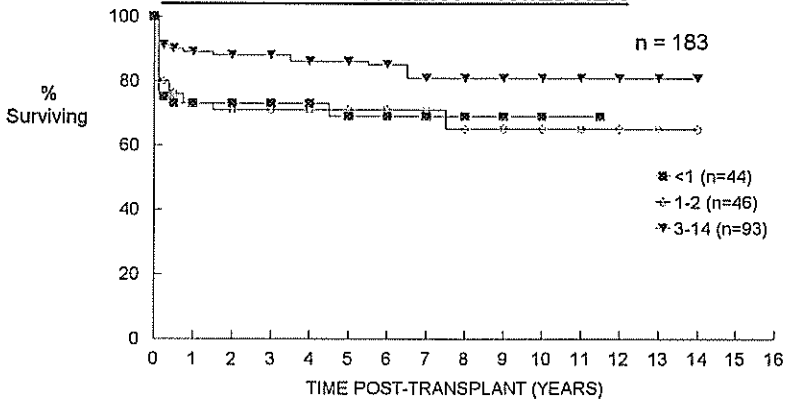
OTHER CITIZENS - ADULTS



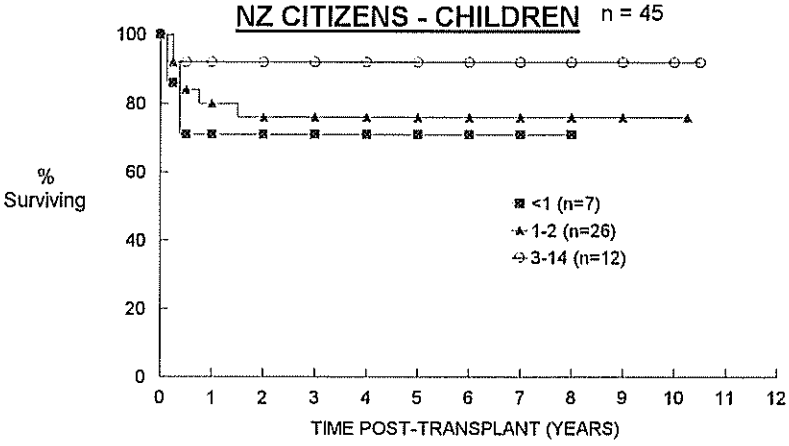
Data to 30/06/99

PATIENT SURVIVAL BY AGE AT TRANSPLANT

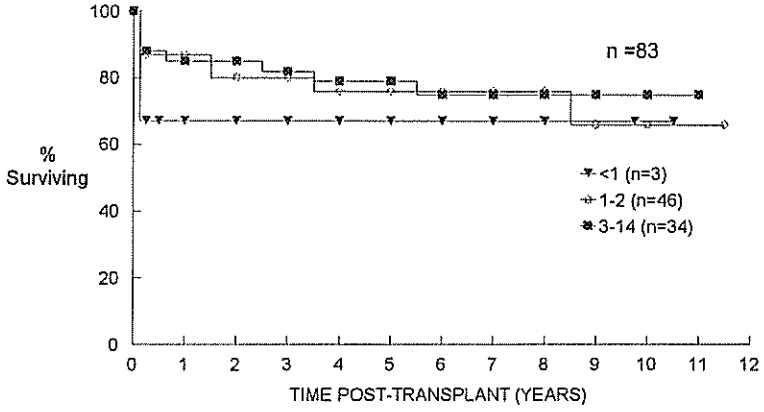
AUSTRALIAN CITIZENS - CHILDREN



NZ CITIZENS - CHILDREN n = 45

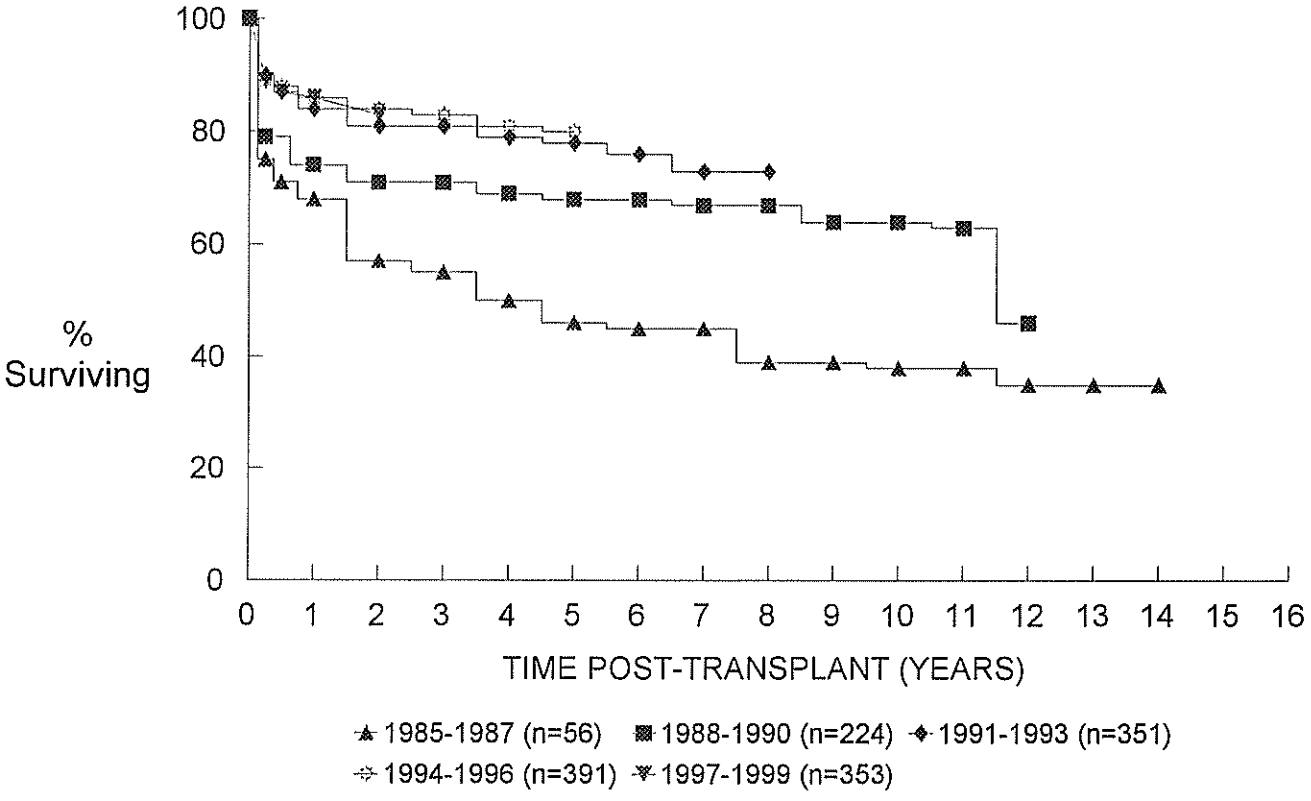


OTHER CITIZENS - CHILDREN



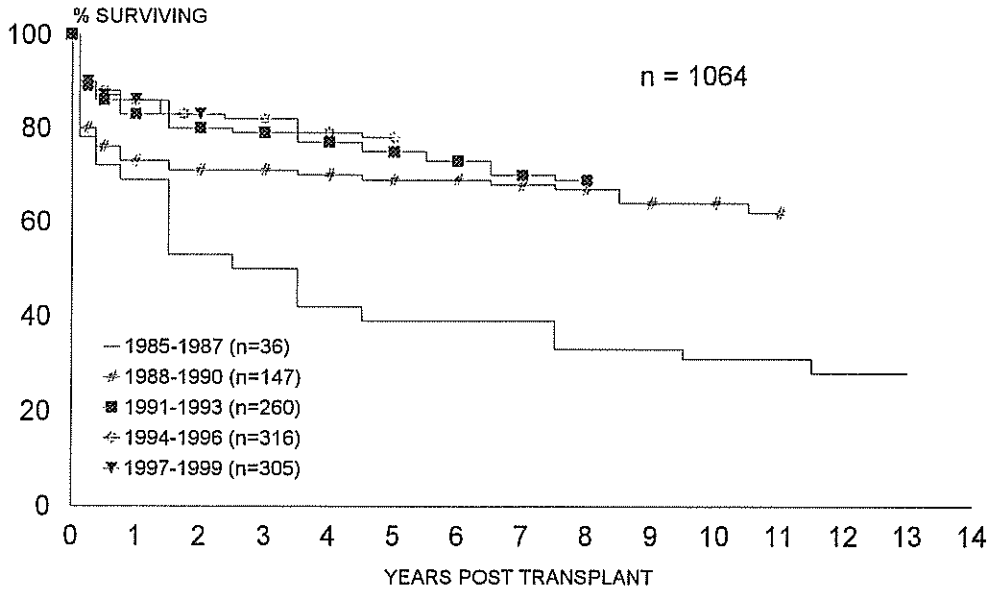
Data to 30/06/99

PATIENT SURVIVAL - BY YEAR OF Tx

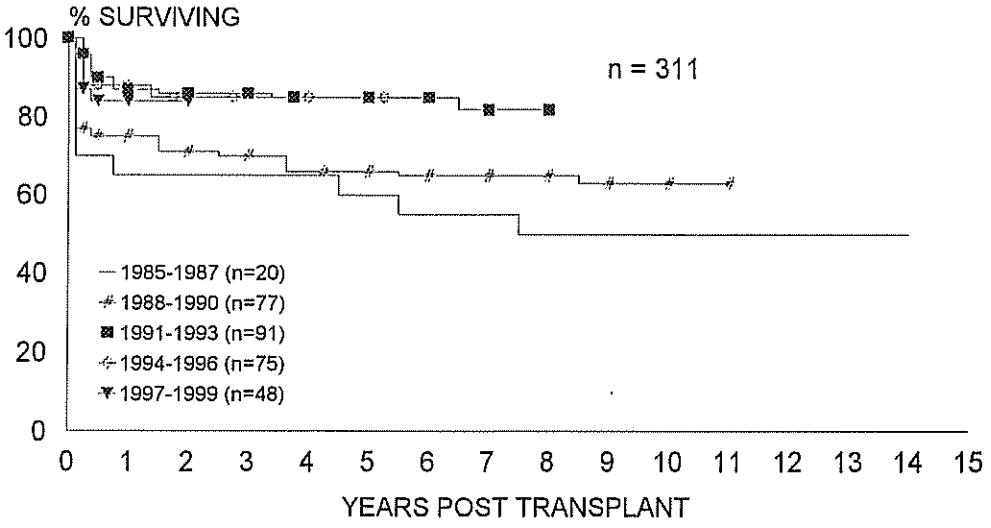


Data to 30/06/99

ADULTS



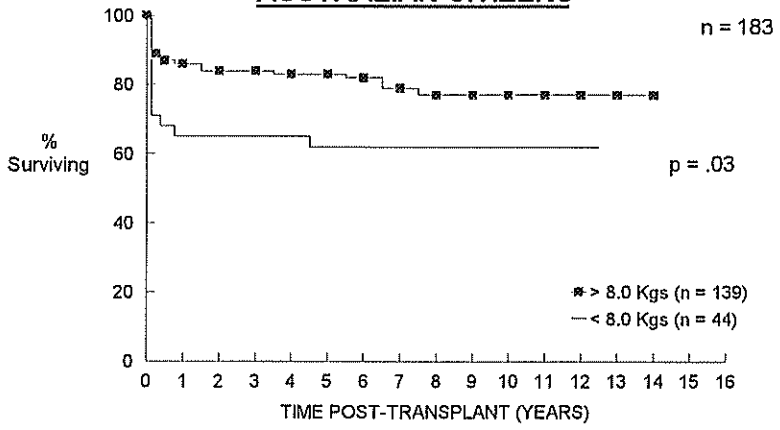
CHILDREN



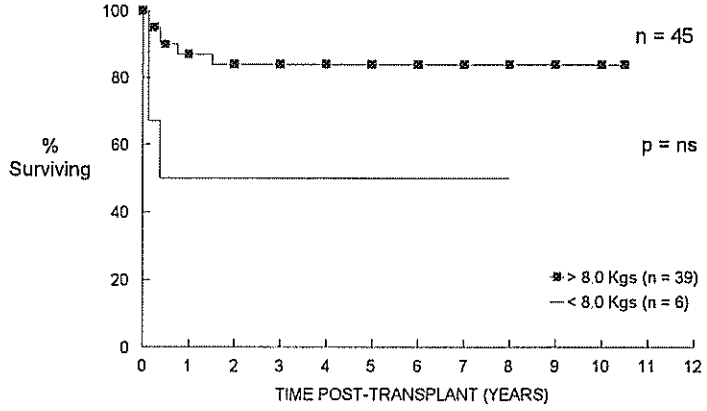
Data to 30/06/99

PATIENT SURVIVAL

CHILDREN > 8.0 KG AND < 8.0 KG
AUSTRALIAN CITIZENS



NZ CITIZENS



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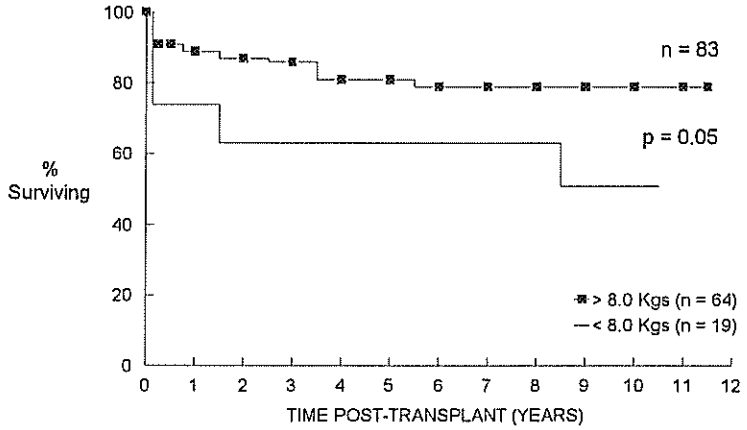
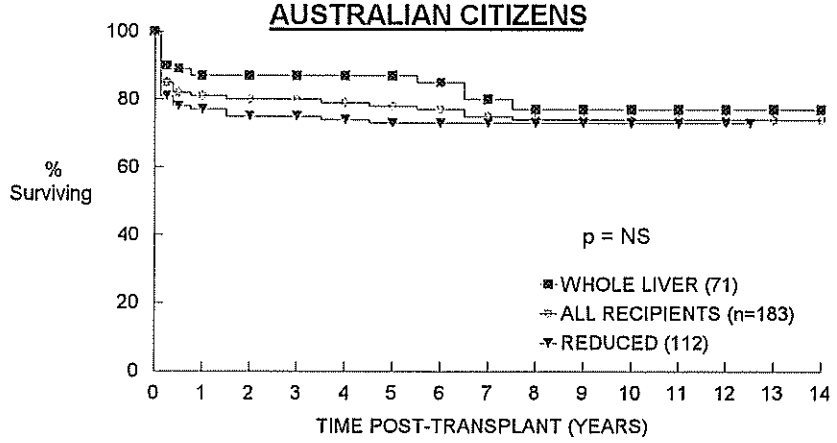


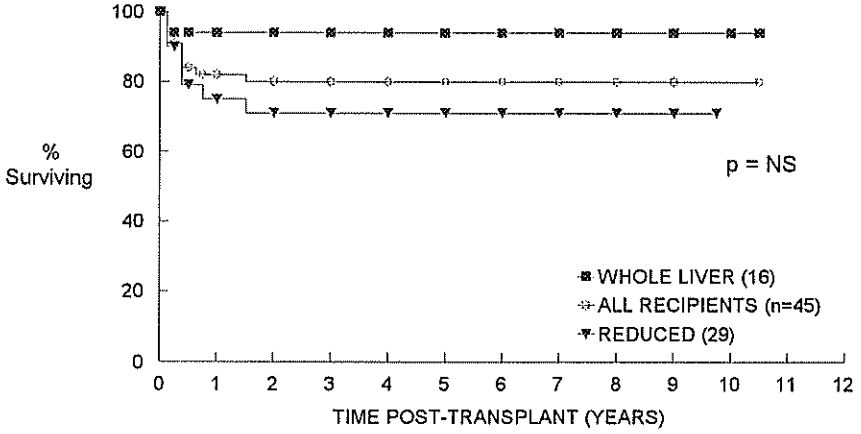
Data to 30/06/99

PAEDIATRIC PATIENT SURVIVAL

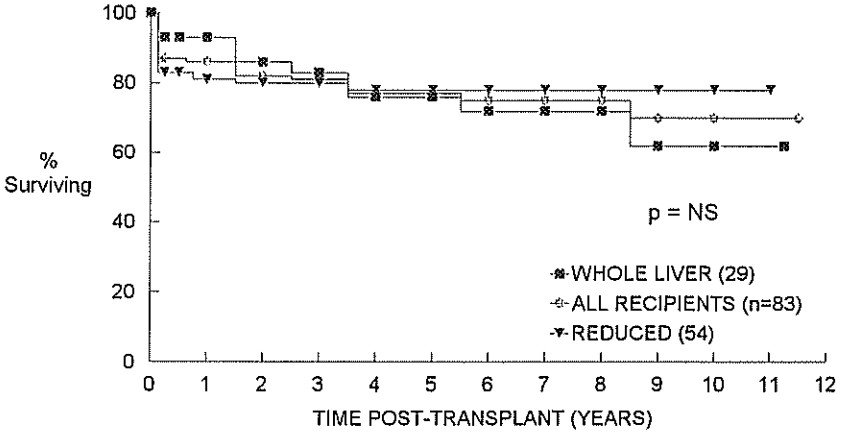
WHOLE LIVER V REDUCED LIVER AUSTRALIAN CITIZENS



NZ CITIZENS



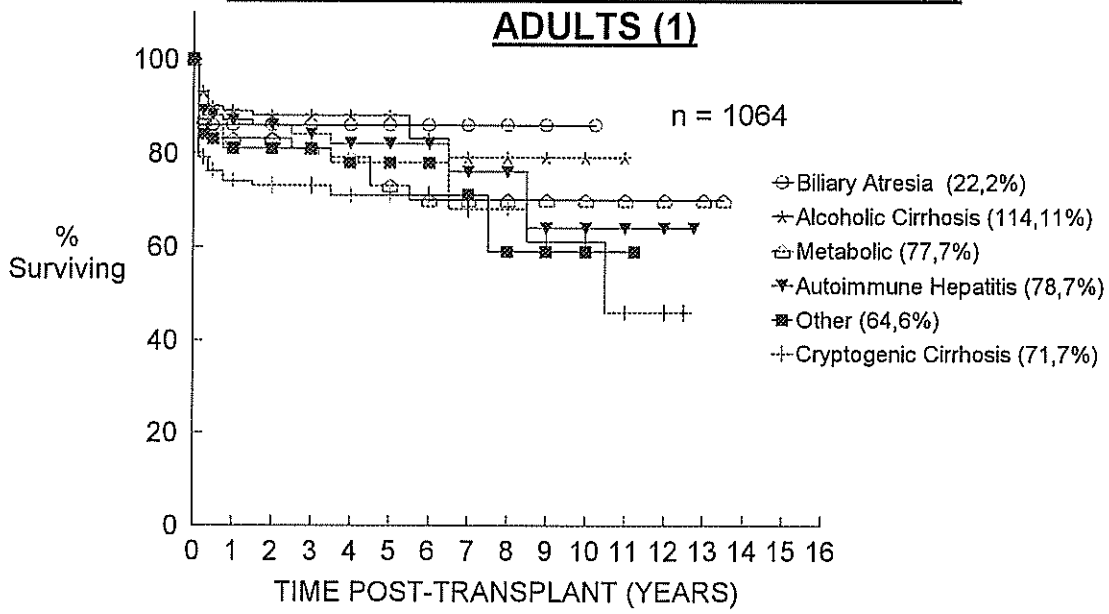
OTHER CITIZENS



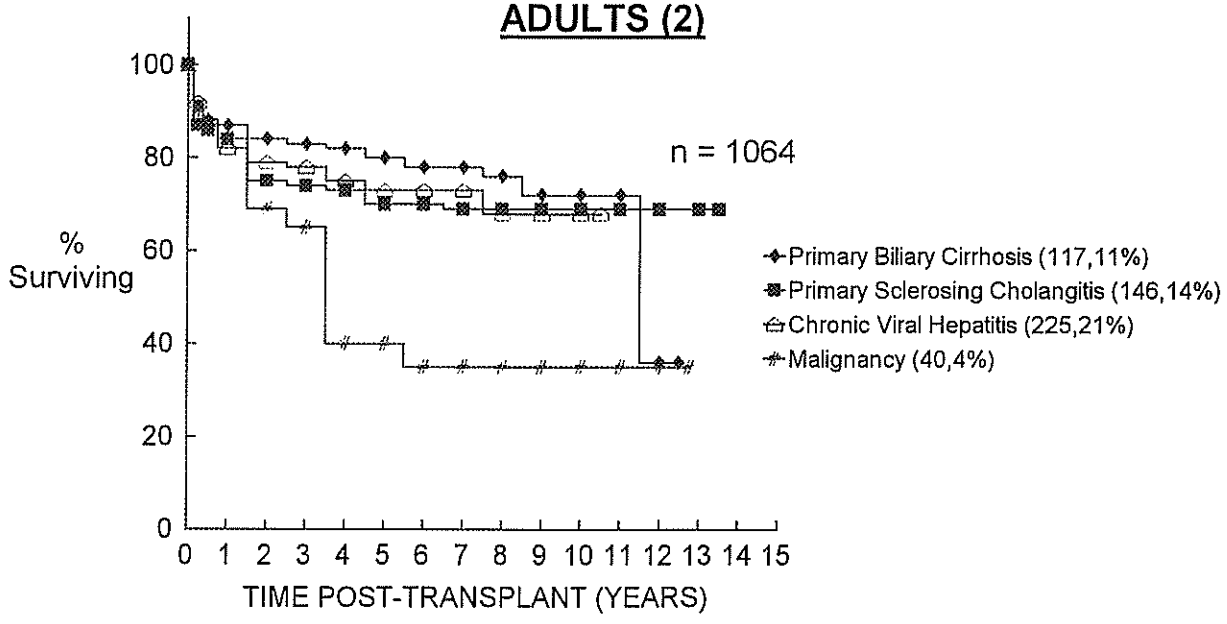
Data to 30/06/99

ALL PATIENTS

PRIMARY CONDITION AND OUTCOME (1)
ADULTS (1)

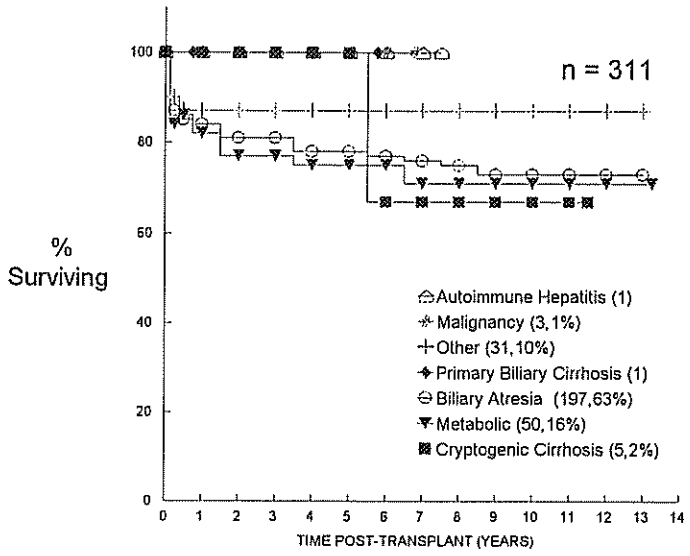


PRIMARY CONDITION AND OUTCOME (2)
ADULTS (2)

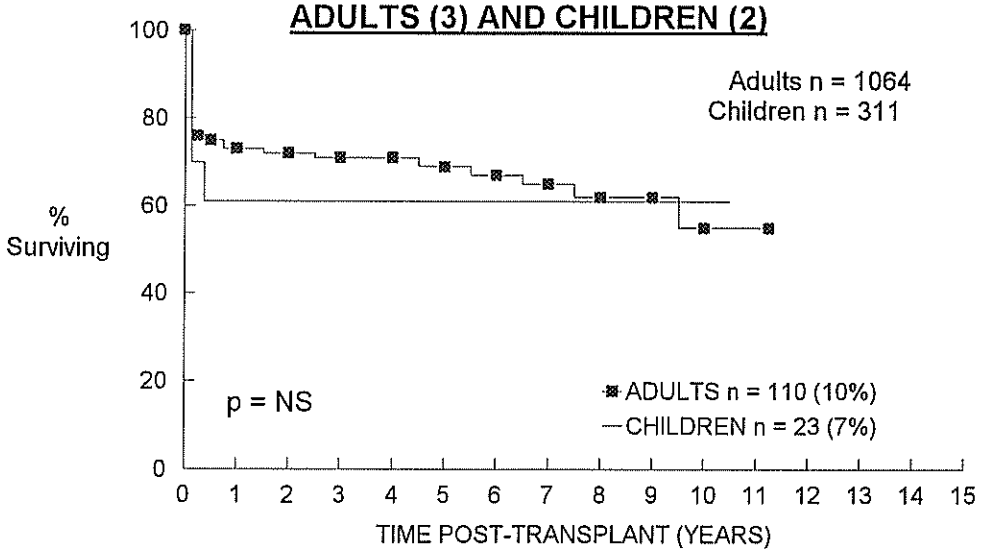


Data to 30/06/99

PRIMARY CONDITION AND OUTCOME (3)
CHILDREN (1)



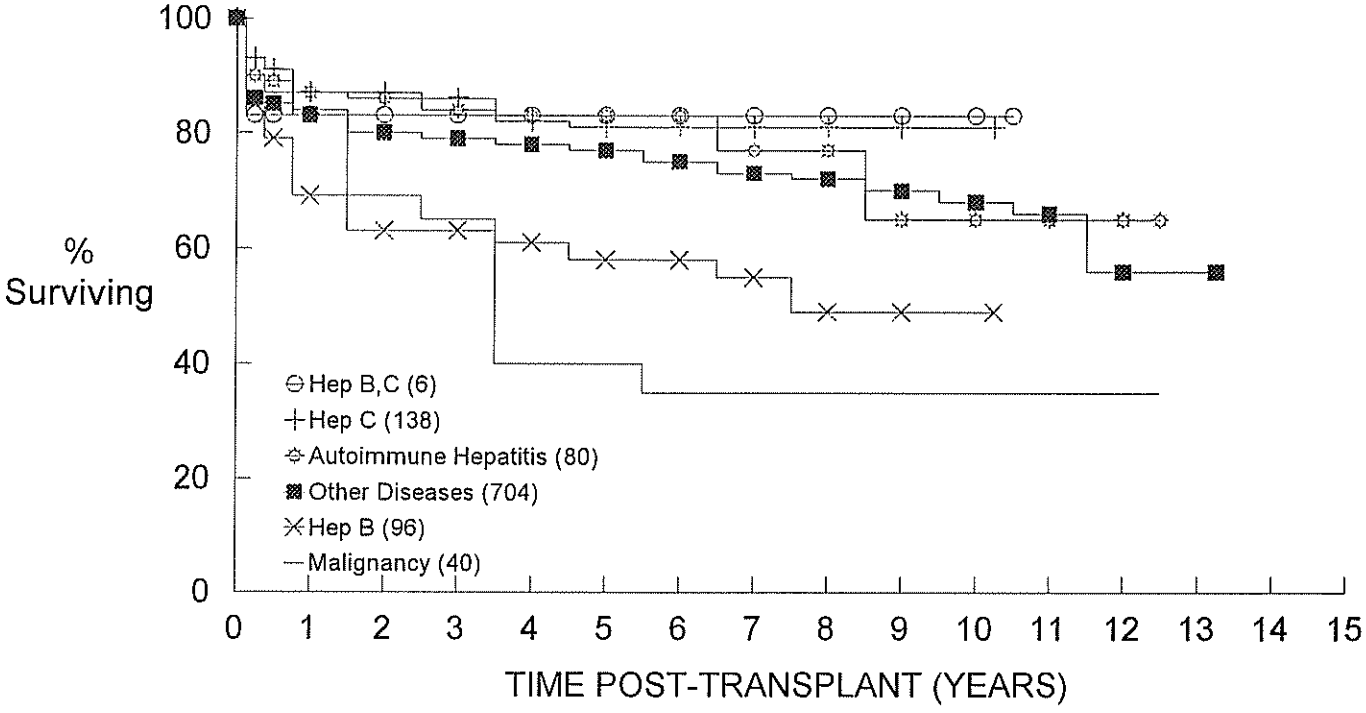
PRIMARY CONDITION AND OUTCOME (4)
FULMINANT DISEASE
ADULTS (3) AND CHILDREN (2)



Data to 30/06/99

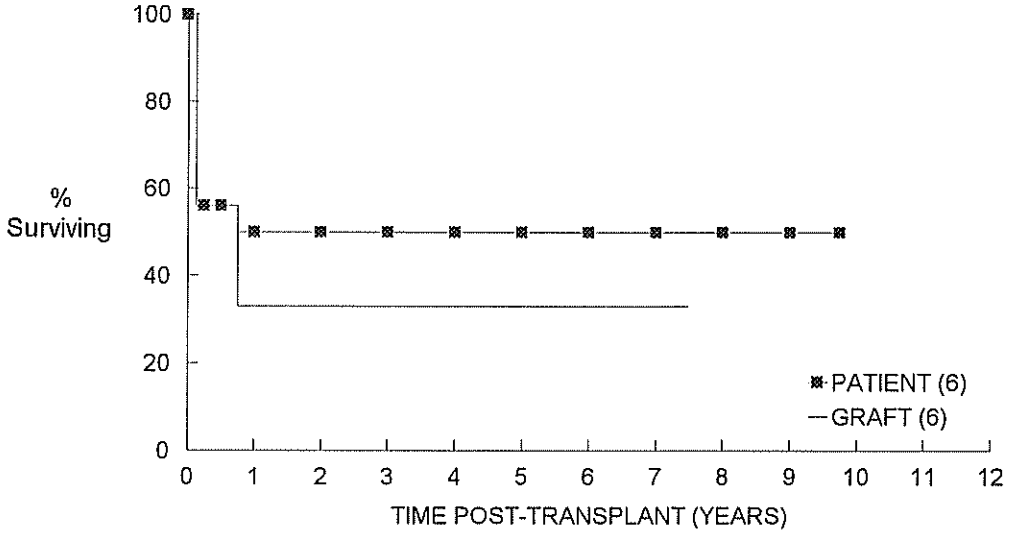
MALIGNANCY vs HEP B vs HEP C vs AUTO-IMMUNE vs OTHER DISEASES

ADULTS



Data to 30/06/99

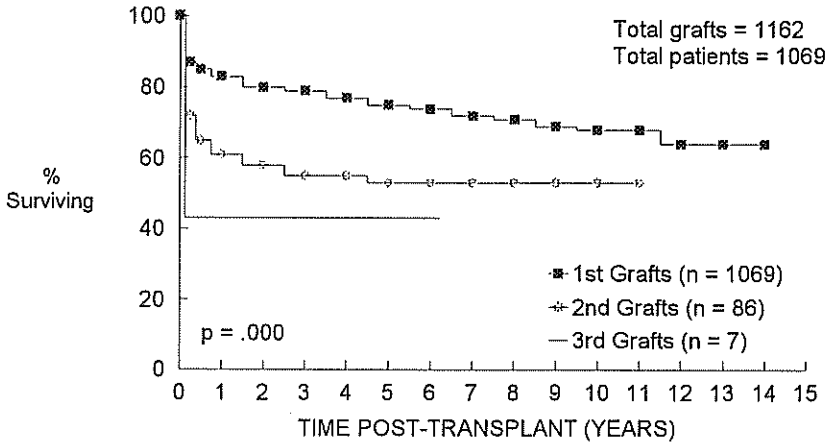
PATIENT AND GRAFT SURVIVAL
LRD



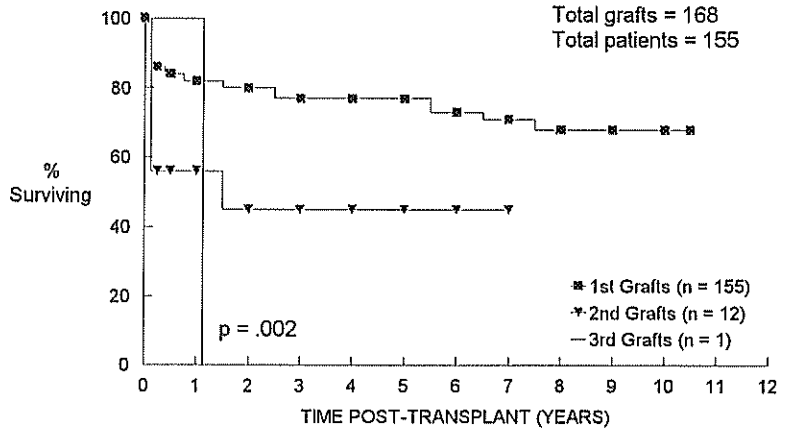
Data to 30/06/99

GRAFT SURVIVAL - PRIMARY AND SECONDARY

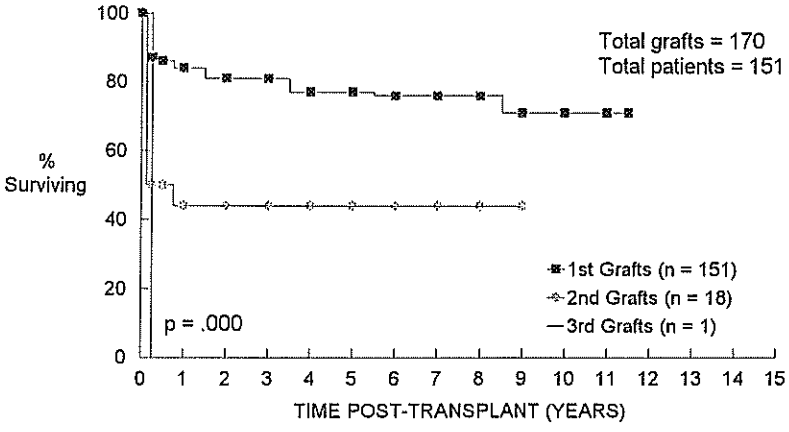
AUSTRALIAN CITIZENS



NZ CITIZENS

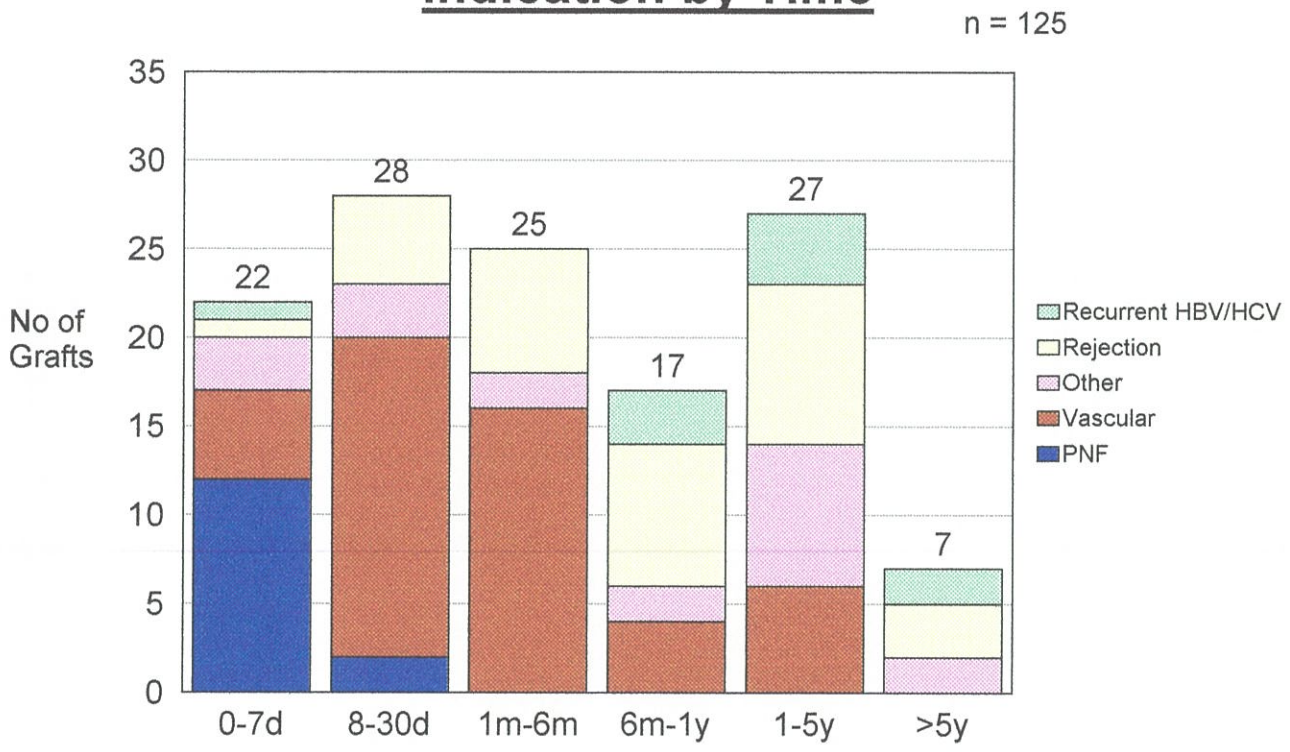


OTHER CITIZENS



Data to 30/06/99

SECONDARY TRANSPLANTATION
Indication by Time



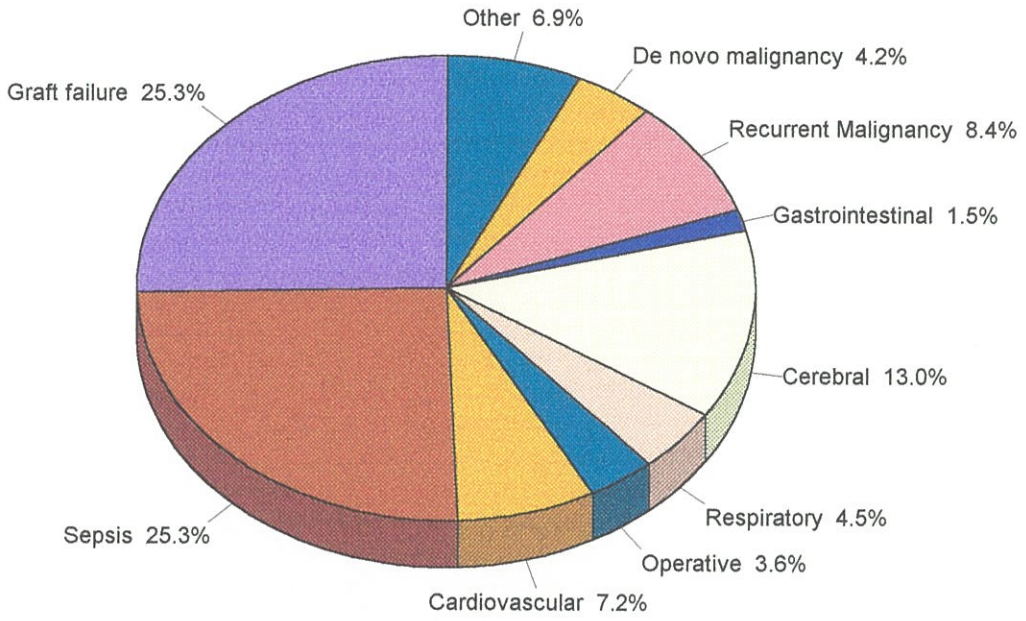
Data to 30/06/99

Section 4

Cause of Death

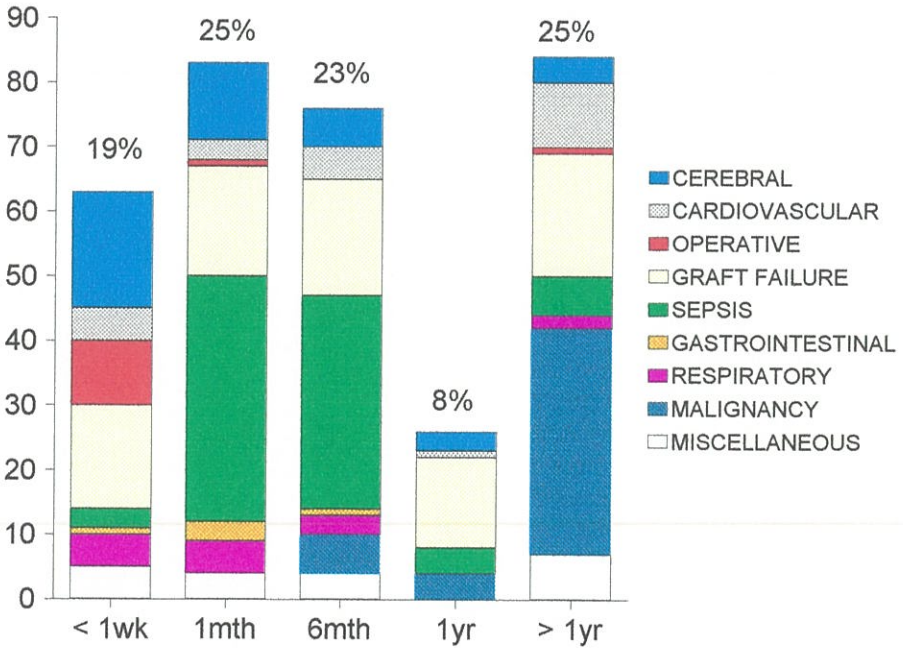
CAUSE OF DEATH
ALL PATIENTS

n = 332 (24%)



CAUSE OF DEATH
ALL PATIENTS

n = 332 (24%)

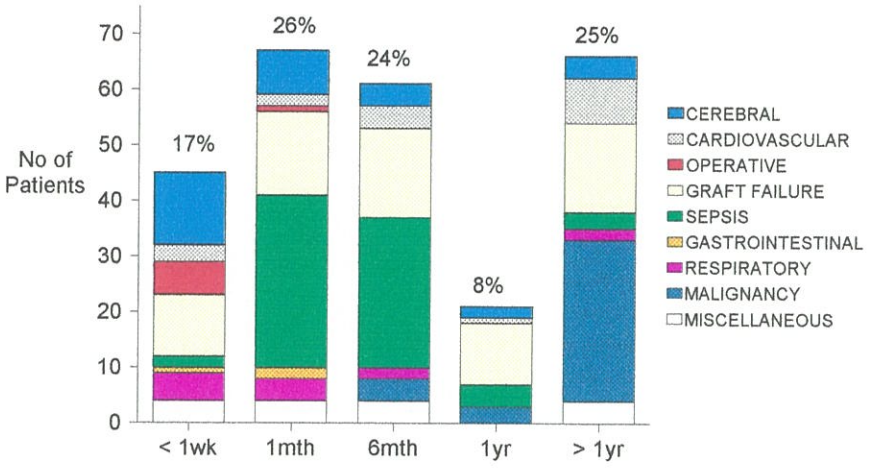


Data to 30/06/99

CAUSE OF DEATH

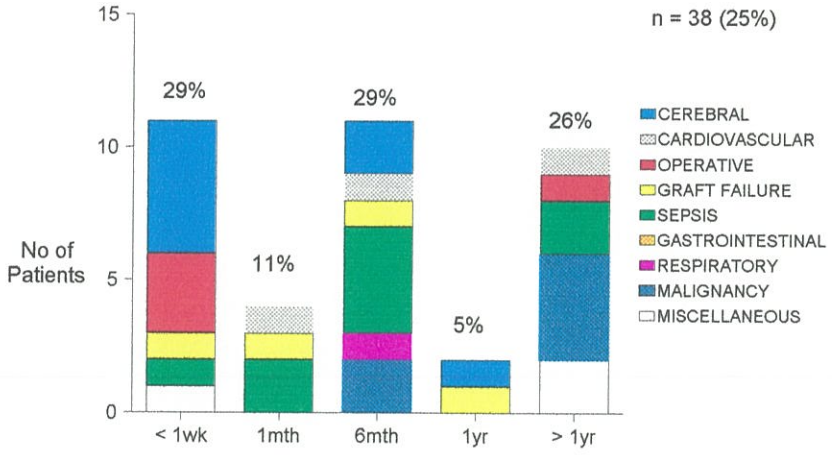
AUSTRALIAN CITIZENS

n = 260 (24%)



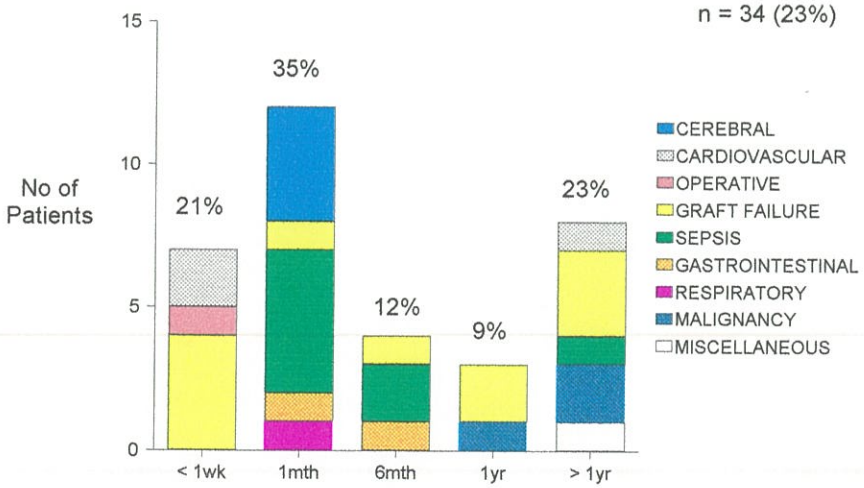
NZ CITIZENS

n = 38 (25%)



OTHER CITIZENS

n = 34 (23%)



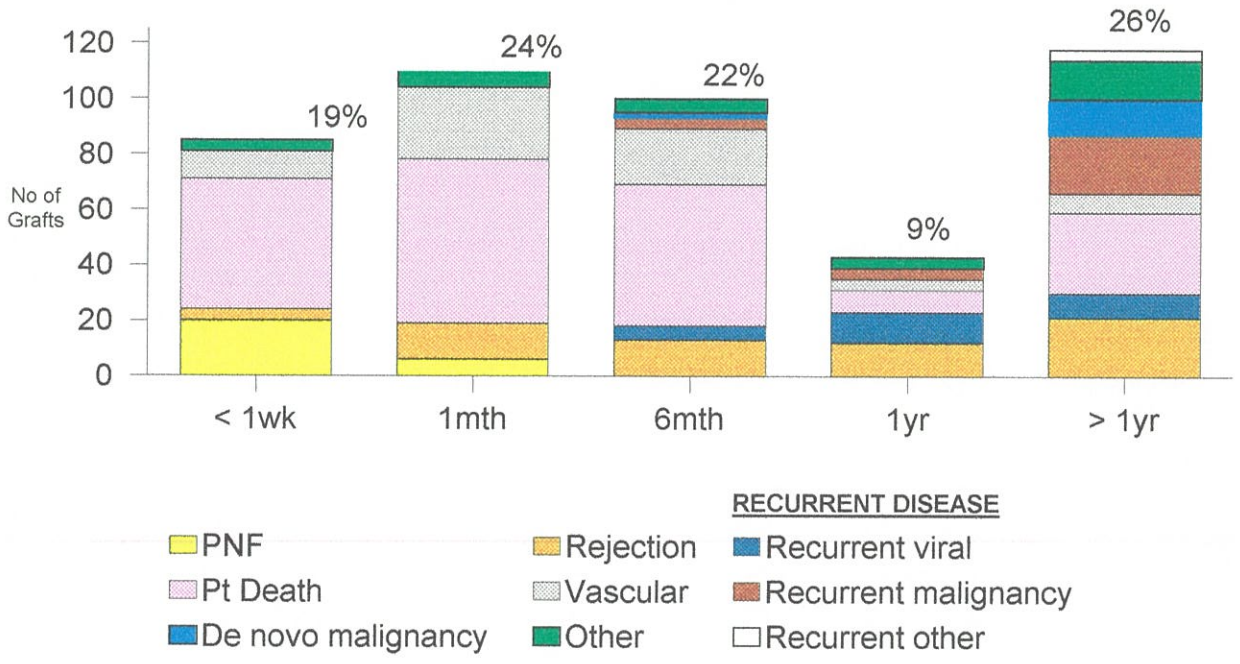
Data to 30/06/99

Section 5

Cause of graft failure

CAUSE OF GRAFT FAILURE

ALL GRAFTS n = 457 (30%)

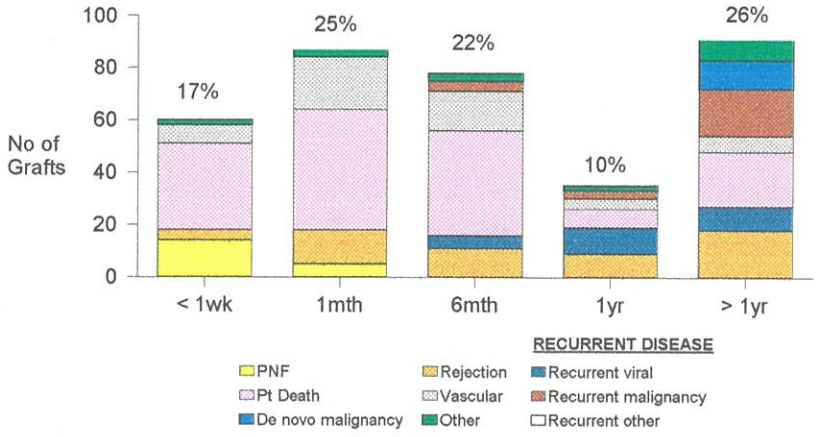


Data to 30/06/99

CAUSE OF GRAFT FAILURE

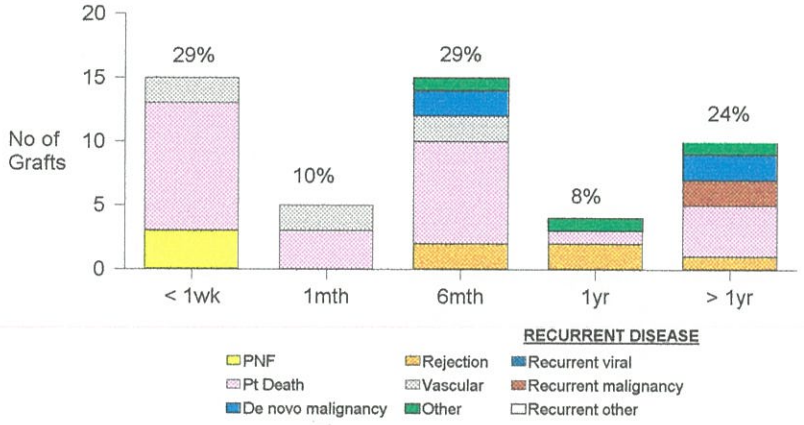
AUSTRALIAN CITIZENS

n = 354 (33%)



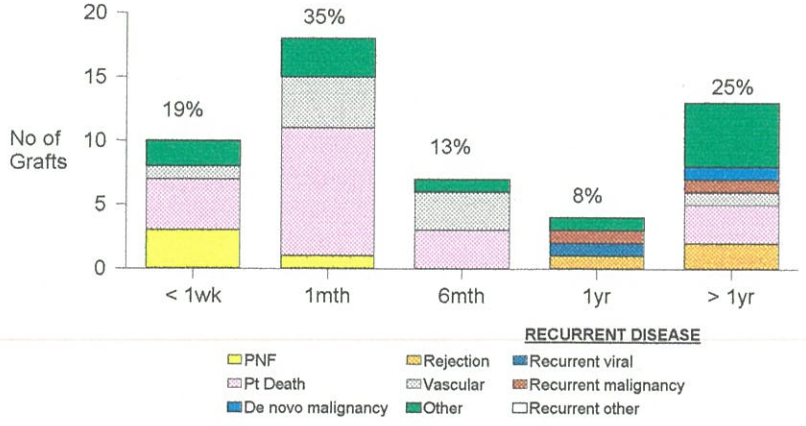
NZ CITIZENS

n = 51 (33%)



OTHER CITIZENS

n = 52 (34%)



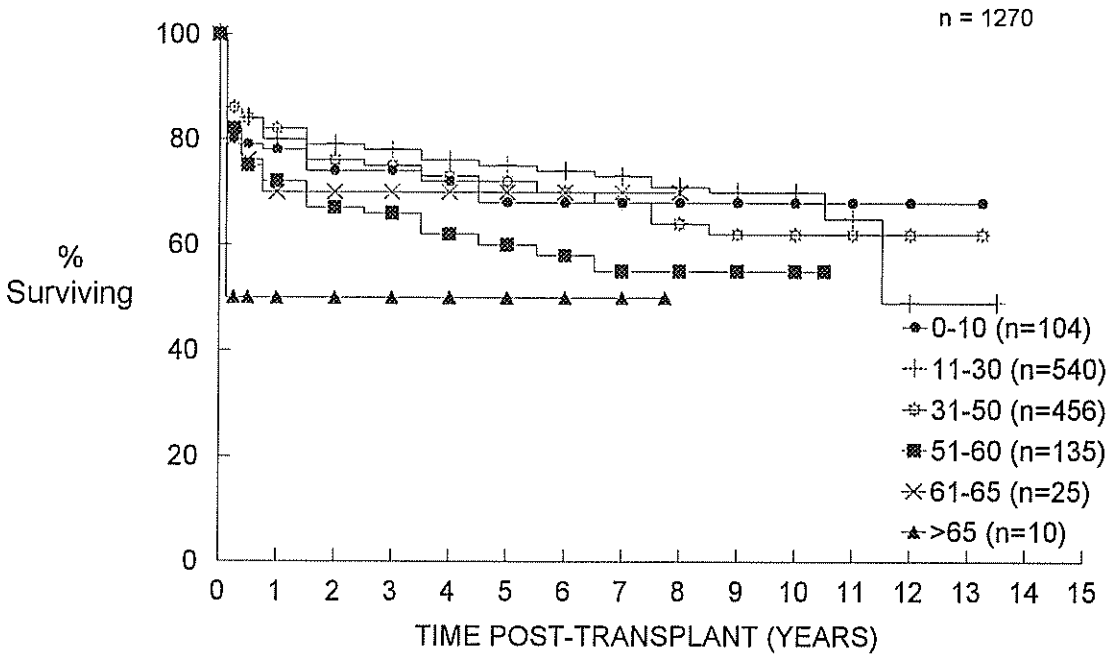
Data to 30/06/99

Section 6

Donor information

PRIMARY GRAFT SURVIVAL

DONOR AGE vs SURVIVAL



DONATION BY YEAR

	QLD	NSW	VIC/ TAS	SA/ NT	WA	NZ	TOTAL
1990	22	27	16	5	-	7	77
1991	28	35	20	6	8	11	108
1992	43	31	18	9	8	24	133
1993	27	39	25	13	6	16	126
1994	31	39	23	12	10	21	136
1995	32	42	24	17	8	21	144
1996	33	38	19	17	10	24	141
1997	36	49	19	19	8	25	153
1998	39	41	27	23	12	32	174
1999 (June)	11	13	16	10	1	12	63

Data to 30/06/99

Section 7

Liver Transplantation and Cancer

TYPES OF CA IN LIVER Tx RECIPIENTS

PRIMARY LIVER CA	43 (3%)	
INCIDENTAL CA	66 (5%)	
TOTAL	119 (9%)	

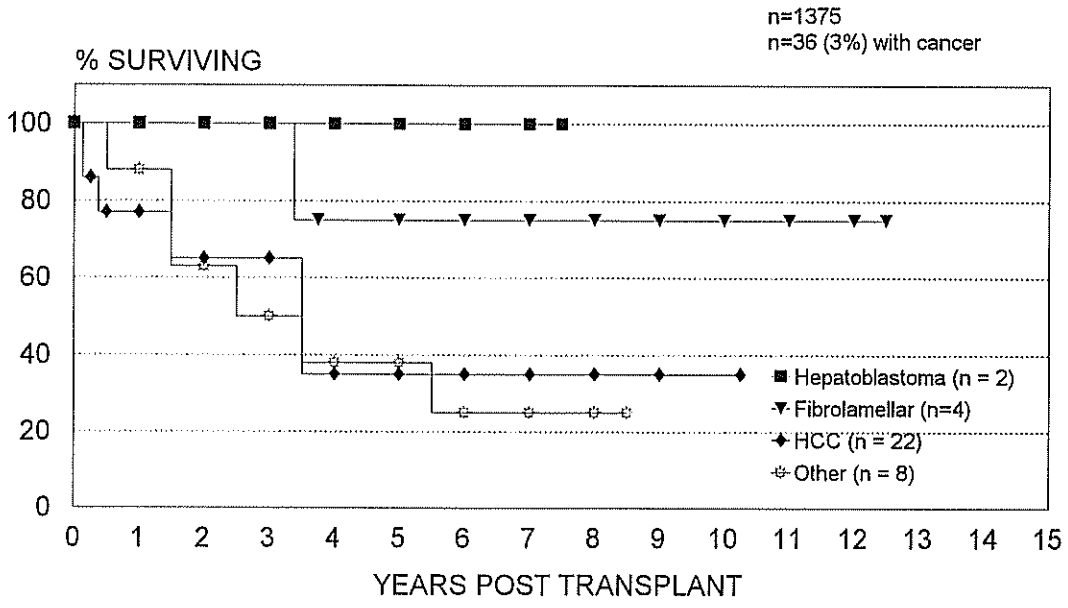
RECURRENT CA	31	(3% of all pts, 26% of pts with Ca at Tx)
DE NOVO CA	43 (3%)	45 (Ca)
SKIN CA	114 (9%)	604 (Ca)
TOTAL	188 (14%)	

PRIMARY LIVER MALIGNANCY

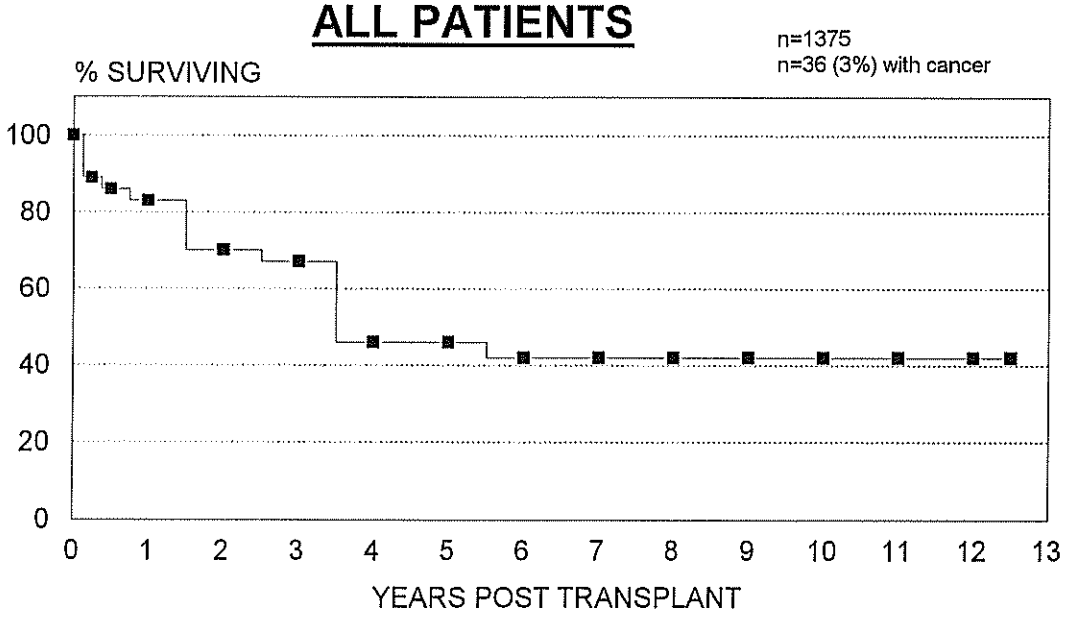
n =1375
n =36 (3%) with cancer

TYPE OF CA	No	DIED	DIED OF CA
HEPATOCELLULAR CA	22	10	7 (32%)
LAMELLAR VARIANT	4	1	1 (25%)
CARCINOID	4	3	2 (50%)
ENDOCRINE	2	2	2 (100%)
HEPATOBLASTOMA	2	0	0
ANGIOSARCOMA	1	1	1 (100%)
EPITHELOID HAEMANGIOMA	1	0	0
TOTALS	36 (3% of pts)	17 (47% of those with Ca)	13 (36% of those with Ca)

PRIMARY LIVER CA



PRIMARY LIVER CA ALL PATIENTS



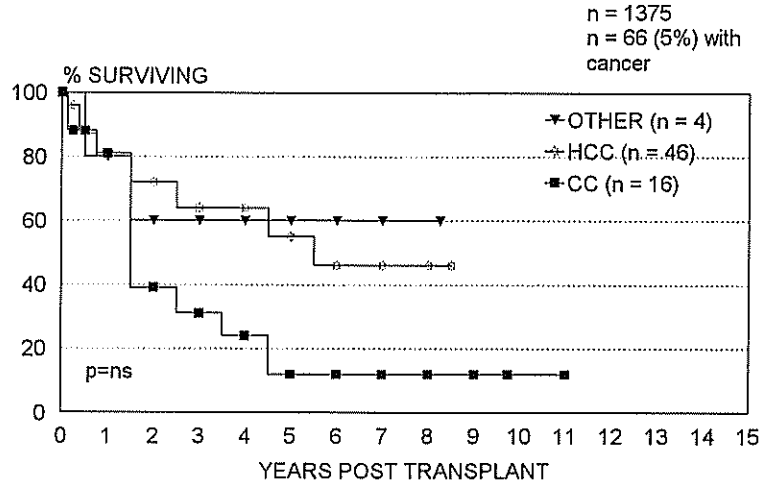
INCIDENTAL CA

n = 1375

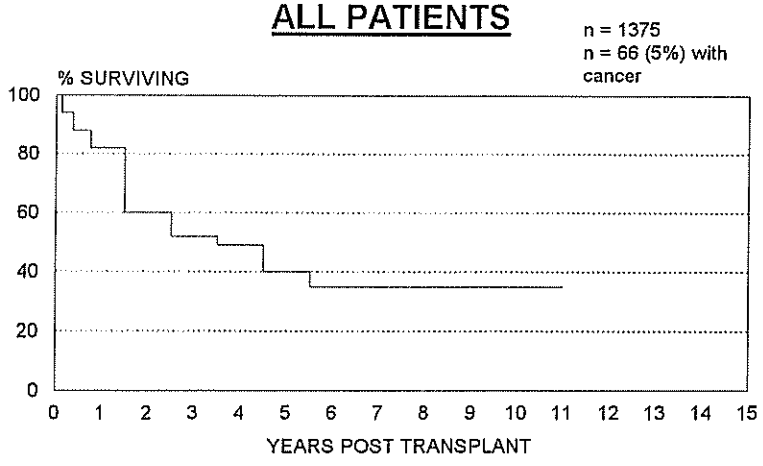
	NO	DIED	DIED OF CA
HEPATOCELLULAR CA	46	12	5 (13%)
CHOLANGIO CA	16	12	10 (73%)
ANGIOSARCOMA	1	1	1 (100%)
ADENOCARCINOMA	1	0	0
HEPATOBLASTOMA	2	0	0
FIBROLAMELLAR	1	0	0
TOTALS	67* in 66 (5% of pts)	25 (38% of those with Ca)	16 (24% of those with Ca)

* 1 patient had 2 different incidental Ca

INCIDENTAL CA



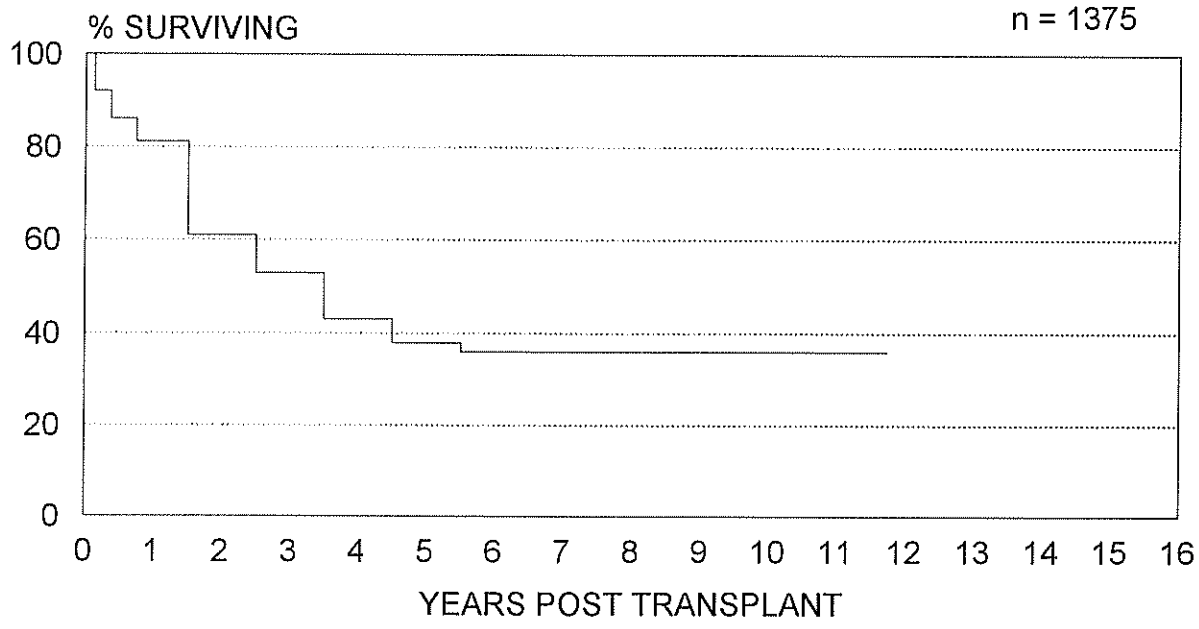
INCIDENTAL CA ALL PATIENTS



Data to 30/06/99

PRE-TX LIVER CA

(PRIMARY AND INCIDENTAL)



Data to 30/06/99

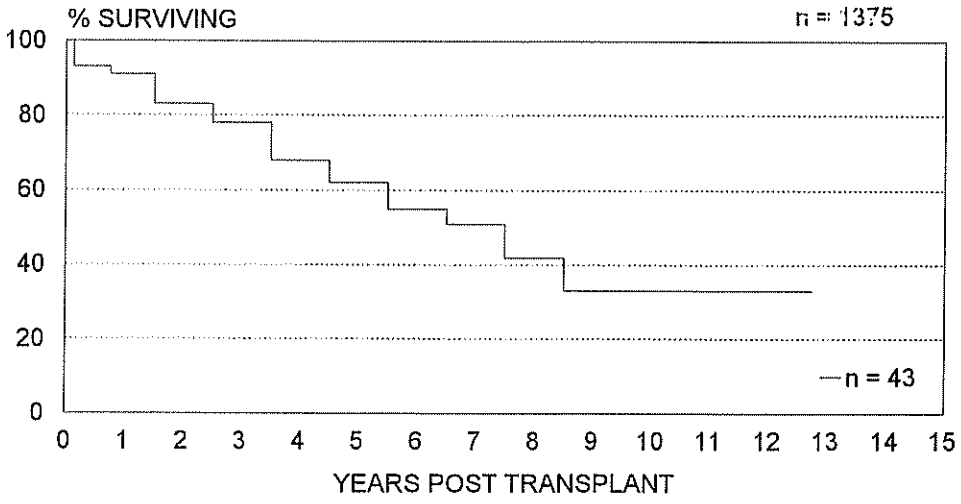
DE NOVO NON SKIN CA POST Tx

n = 1375

	NO	DIED	DIED OF CA
NON HODGKINS LYMPHOMA	16 (37%)	11	8
KAPOSI SARCOMA	3	1	0
DIGESTIVE ORGANS	10	3	1
GLOTTIS	1	0	0
STOMACH	1	1	0
COLON	7	2	1
APPENDIX	1	0	0
GENITO-URINARY	6	2	1
BLADDER	1	1	1
TESTIS	1	0	0
KIDNEY	2	1	0
PROSTATE	1	0	0
RESPIRATORY	1	1	1
LEUKAEMIA	1	1	1
BREAST	1	0	0
ENDOCRINE	4	1	1
CERVIX	2	0	0
CEREBRAL	1	1	1
TOTALS	45 in 43 (3%) pts	21 (49% of pts with Ca)	14 (33% of pts with Ca)

Two patients also had incidental malignancy; Two patients had two de novo malignancies

DE NOVO NON SKIN CA POST TX



Data to 30/06/99

SKIN CA POST LTx

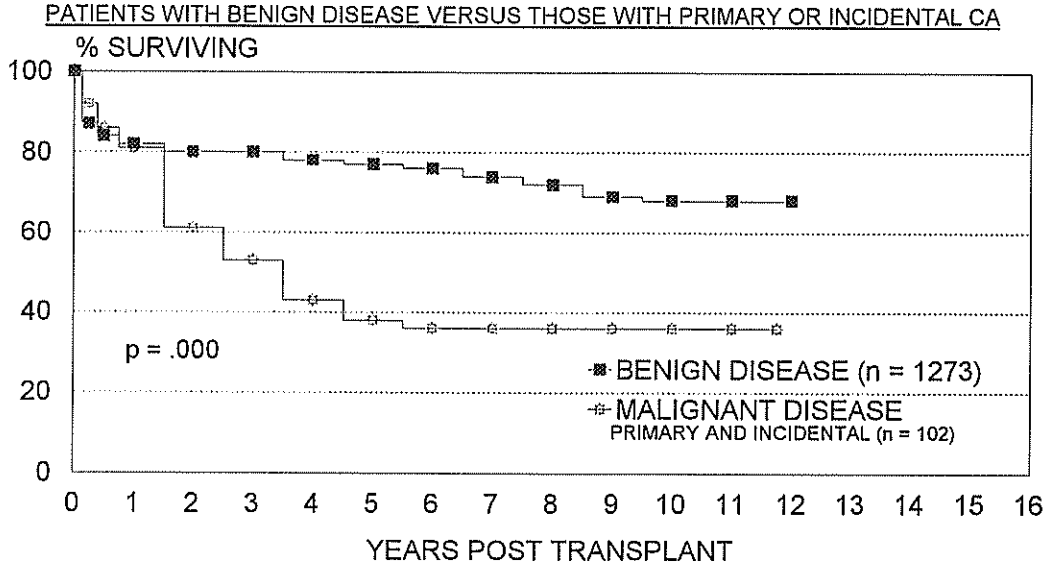
n = 1375

TYPE	CANCERS	PATIENTS
BCC	163	60
SCC	226	63
MELANOMA	3	3
TOTALS	393	114 ** (8%)

** 64 pts had multiple skin cancer types

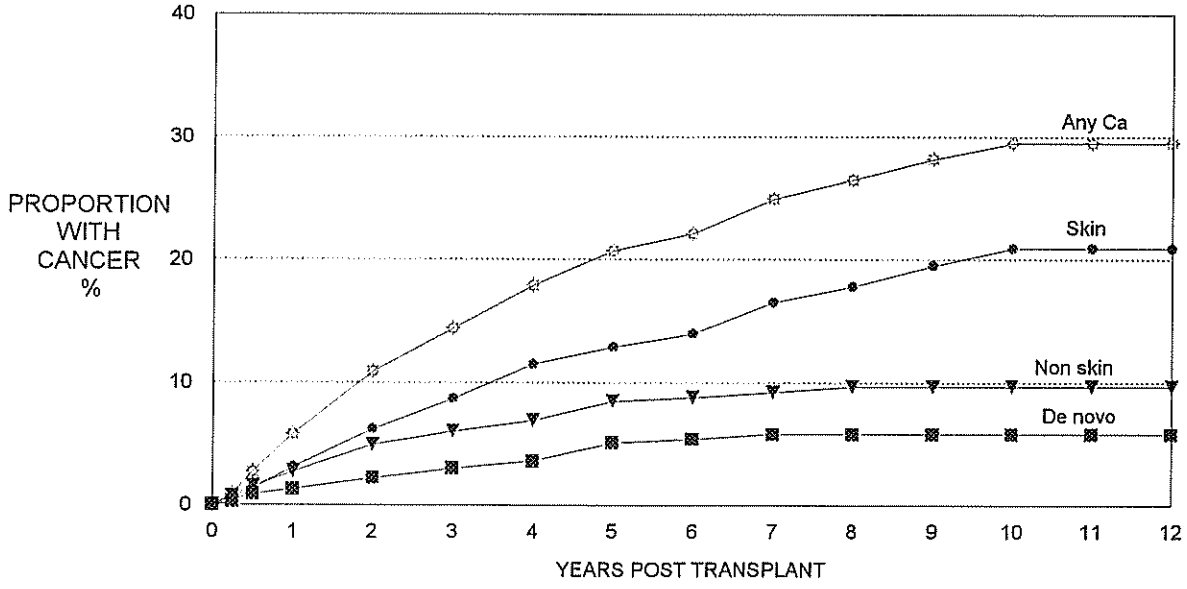
PATIENT SURVIVAL

n = 1375



CANCER DEVELOPMENT FOLLOWING LIVER Tx. AUSTRALIA.

n = 1375



Data to 30/06/99

Appendix

Appendix

Liver Transplant Units of Australia and New Zealand

Australian National Liver Transplant Unit
Royal Prince Alfred Hospital
Missenden Road
CAMPERDOWN NSW 2050

and

The New Children's Hospital
Hawkesbury Road
WESTMEAD NSW 2145

Liver Transplant Unit - Victoria
The Austin Hospital
Sudley Road
HEIDELBERG VIC 3084

and

Royal Children's Hospital
Flemington Road
PARKVILLE VIC 3052

Queensland Liver Transplant Service
Princess Alexandra Hospital
Ipswich Road
WOOLLOONGABBA QLD 4102

and

Royal Children's Hospital
Bowens Bridge Road
HERSTON QLD 4029

South Australian Liver Transplant Unit
Flinders Medical Centre
Flinders Drive
BEDFORD PARK SA 5042

WA Liver Transplantation Service
Sir Charles Gairdner Hospital
Verdun Street
NEDLANDS WA 6009

New Zealand Liver Transplant Unit
Auckland Public Hospital
Park Road
Auckland 1
New Zealand