AUSTRALIA AND NEW ZEALAND LIVER TRANSPLANT REGISTRY

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

DATA TO 30/06/98

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 10th 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 1998 is presented. Until March 1998 all New Zealand patients received their grafts in Australia. The New Zealand group began clinical activity at this time and their first 4 cases are included.

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:

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Professor AGR Sheil
Dr D Verran
Dr AKK Chui
Ms P Dilworth

Summary

Within Australasia, between January 1985 and June 1998, 1336 orthotopic liver transplants (OLTx) were performed on 1224 patients.

Of the adult recipients, 785 (84%) were Australian citizens, 91 (10%) New Zealand Citizens and 62 (6%) were from other countries. In the paediatric group, 164 (58%) were Australian citizens, 41 (14%) New Zealand citizens and 81 (28%) were from other countries.

Children received reduced liver allografts in 206/327 (63%) of cases. There were no differences in the utilisation of reduced allografts in Australian citizens 117/191 (61%) compared to New Zealand 28/44 (64%) or Other 61/92 (66%) citizens.

The most common underlying disease for which OLTx was performed on Australian citizens was chronic viral hepatitis (17%), followed by primary sclerosing cholangitis (11%), primary biliary cirrhosis (10%), biliary atresia (10%), fulminant hepatic failure (10%).

In NZ citizens the most common indications for OLTx were biliary atresia (21%), fulminant hepatic failure (17%) and primary sclerosing cholangitis (15%).

In Other citizens the most common indication for transplantation was biliary atresia (58%).

Chronic hepatitis C is by far the most common indication for OLTx for chronic viral illness in Australians (58%), NZ (57%) and Other citizens (80%).

Current 1 year patient survival is 82%. Five year and 10 year survivals are 75% and 66% respectively. There were no major differences in survivals at 1, 5 and 10 years between Australian, NZ or Other citizens.

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. However, after the first year, the difference in survival is not marked.

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%).

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

Patients who undergo liver transplantation for alcoholic liver disease have the best survival at 1 and 5 years (88% and 87% respectively), followed by patients with chronic autoimmune hepatitis (86% and 81%) and patients in the Other category (83% and 81%). Those transplanted for malignancy have the worst long term survival – 42% at 5 years.

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 1990 adult patient survival has remained stable between 80 – 86% at 1 year.

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 factors for allograft loss.

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

Section 1

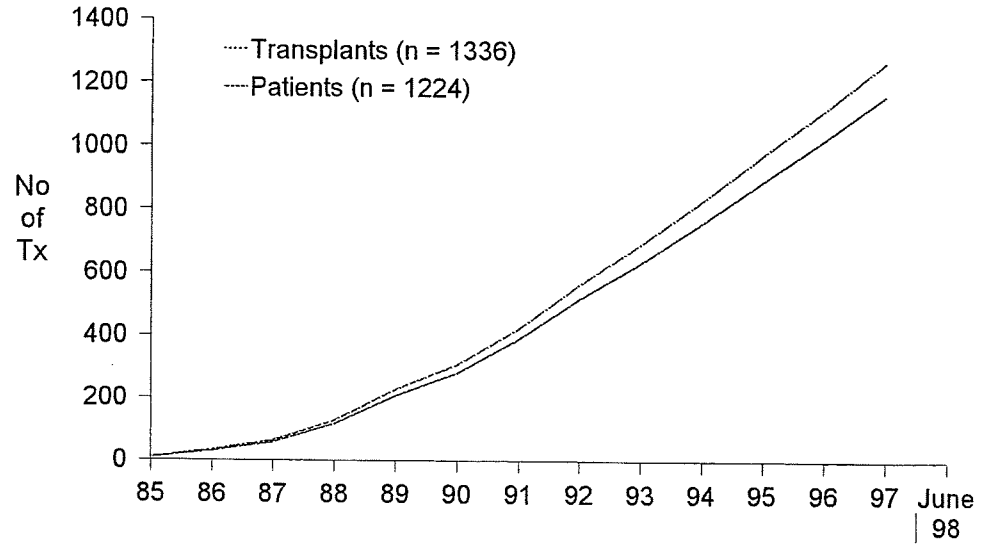
Demographic Data

Age and Gender
Summary Statistics

ALL PATIENTS (AUSTRALIAN, NEW ZEALAND, OTHER)

	Children	Adults
n = 1224	286 (23%)	938 (77%)
Age		
Mean	4.4 ± 4.3	44.3 ± 12.5
Median	2.3y	46y
Range	1m - 14.9y	15 - 67.5y
Gender		
Female	164 (57%)	431 (46%)
Male	122 (43%)	507 (54%)

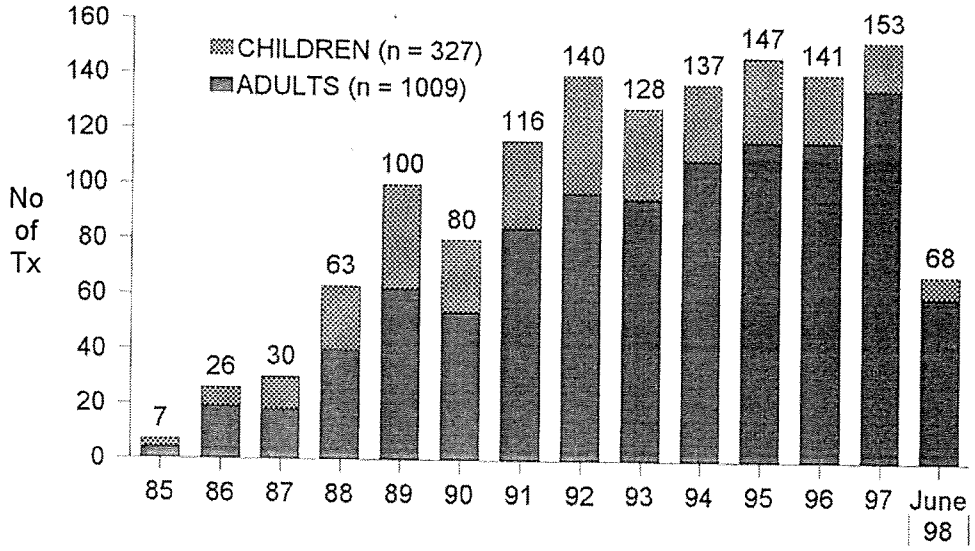
CUMULATIVE NUMBER OF PATIENTS AND TRANSPLANTS



Data to 30/06/98

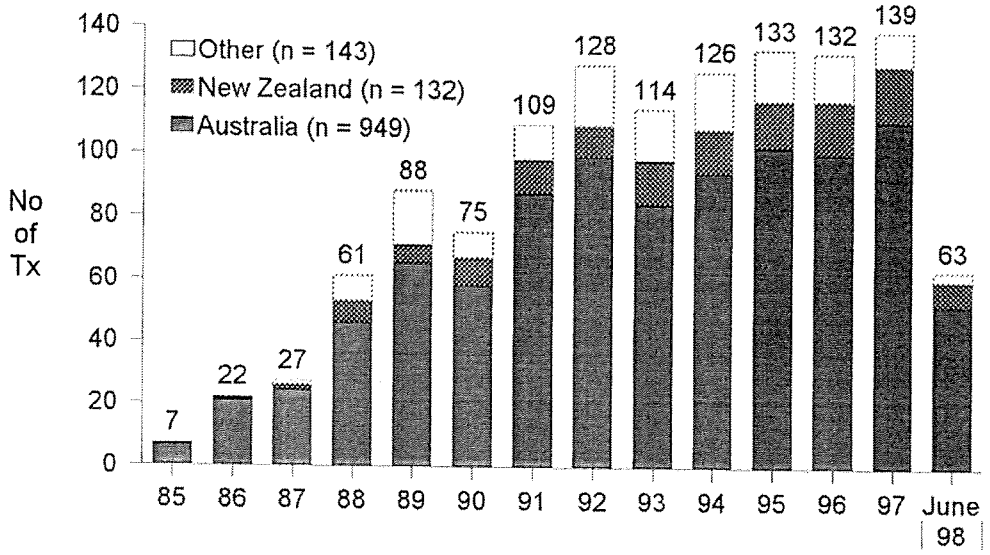
NUMBER OF TRANSPLANTS BY YEAR

n =1336



NUMBER OF NEW RECIPIENTS BY YEAR

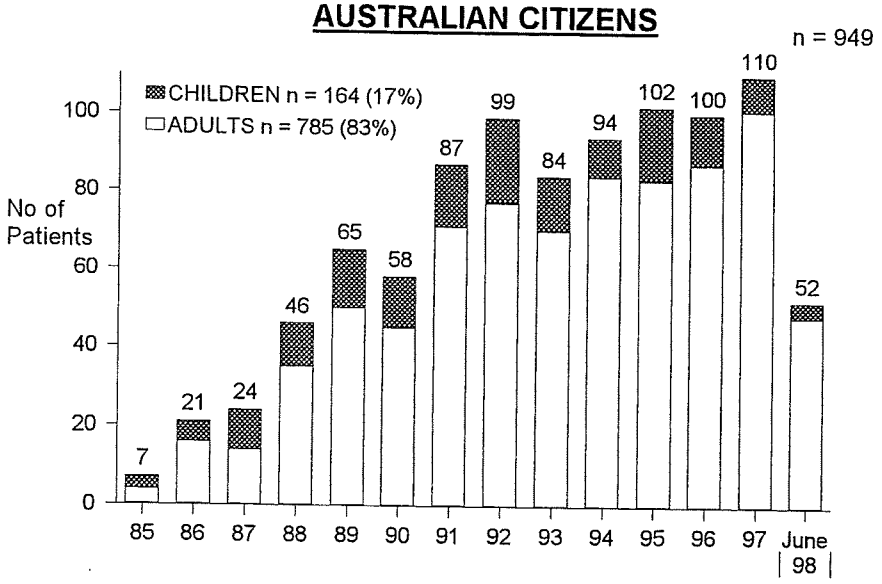
n =1224



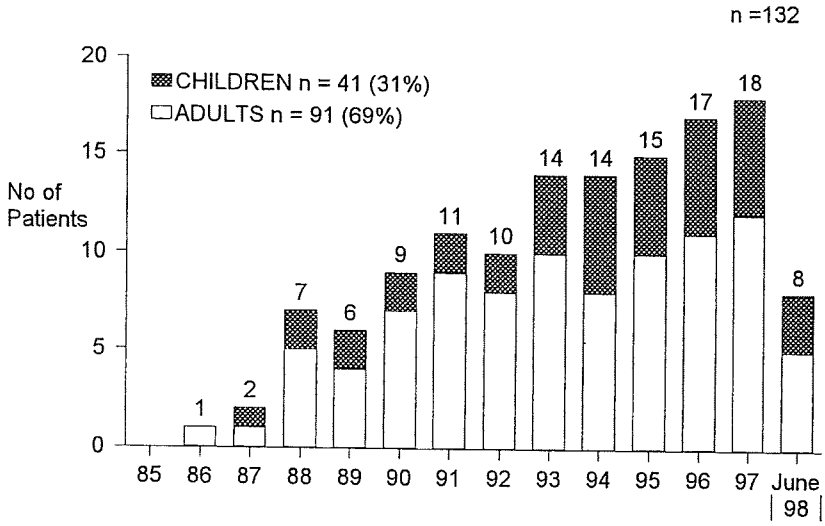
Data to 30/06/98

NUMBER OF RECIPIENTS BY YEAR (n = 1224)

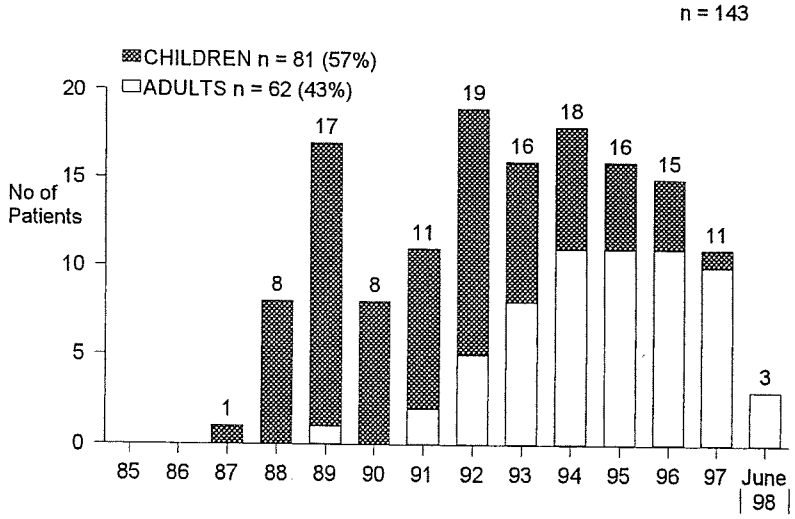
AUSTRALIAN CITIZENS



NZ CITIZENS



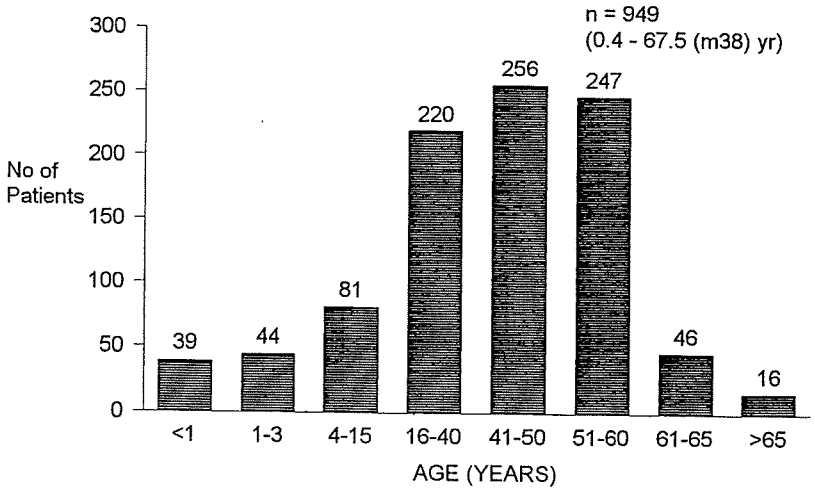
OTHER CITIZENS



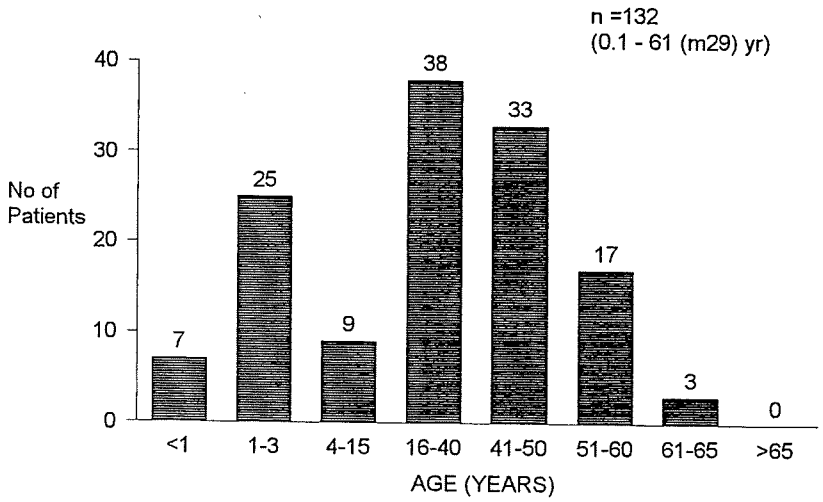
Data to 30/06/98

NUMBER OF RECIPIENTS BY AGE

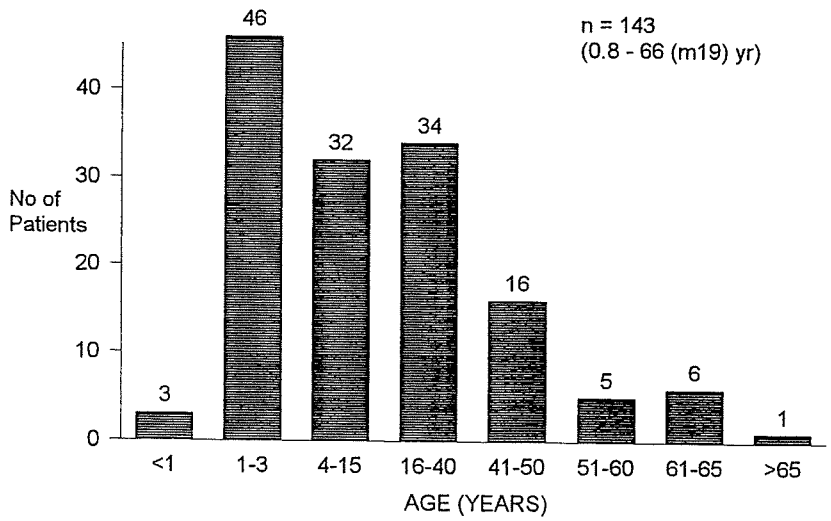
AUSTRALIAN CITIZENS



NZ CITIZENS



OTHER CITIZENS

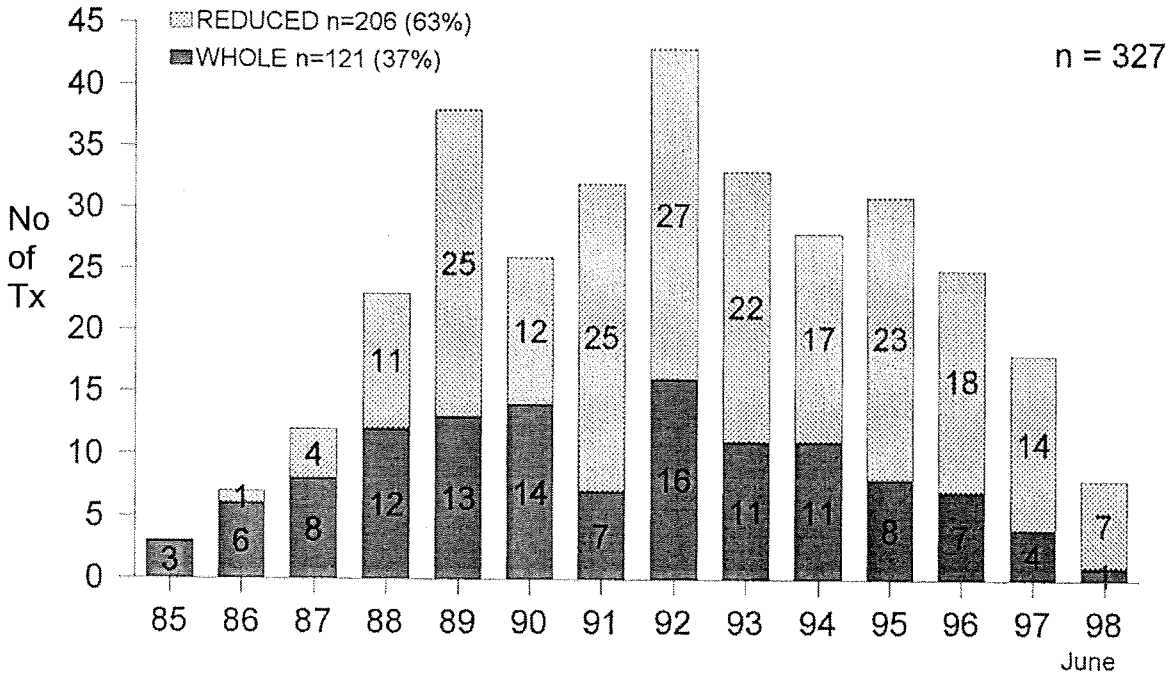


Data to 30/06/98

NUMBER OF GRAFTS BY YEAR

AUSTRALIA

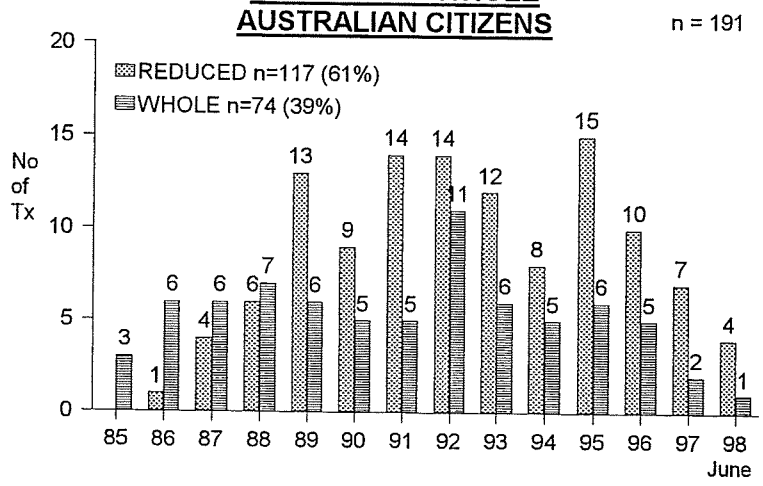
CHILDREN - REDUCED vs WHOLE



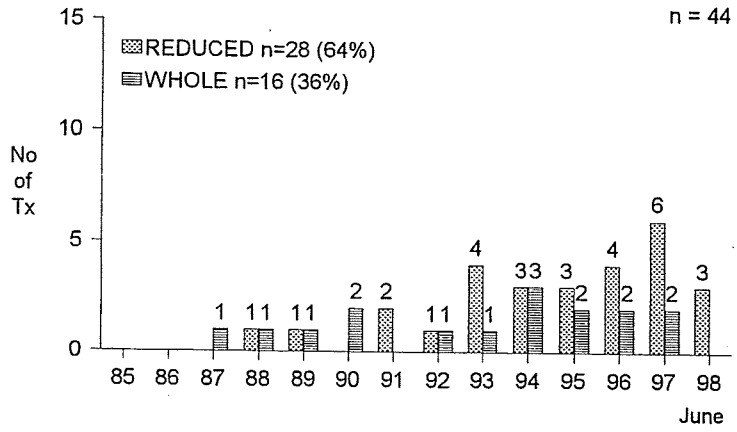
Data to 30/06/98

CHILDREN
NUMBERS OF GRAFTS BY YEAR

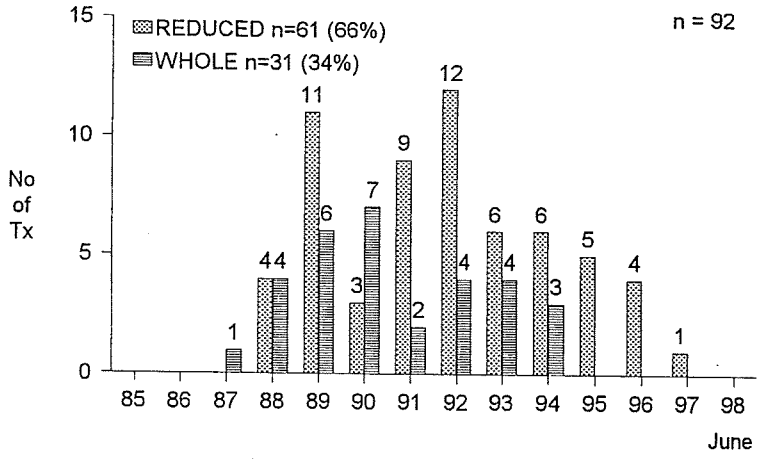
REDUCED vs WHOLE
AUSTRALIAN CITIZENS



NZ CITIZENS



OTHER CITIZENS



Data to 30/06/98

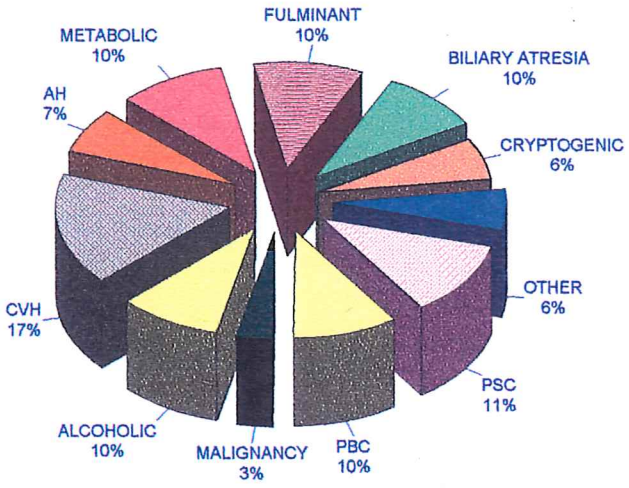
Section 2

Primary Diagnosis

PRIMARY DISEASES OF RECIPIENTS

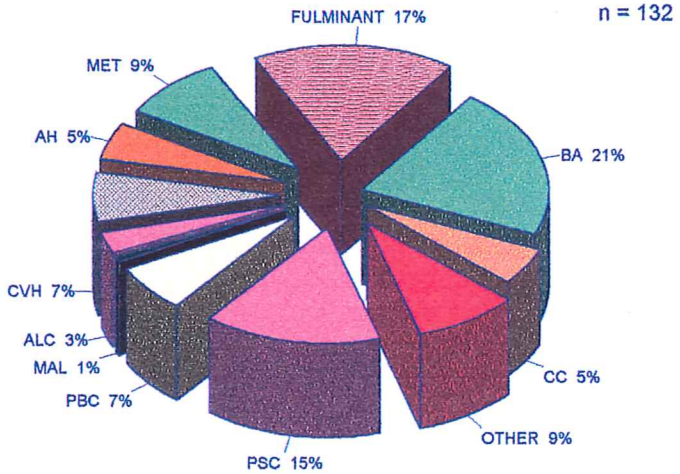
AUSTRALIAN CITIZENS

n = 949



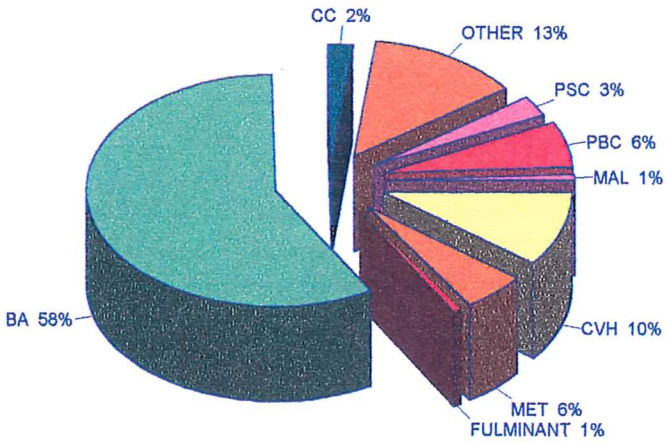
NZ CITIZENS

n = 132



OTHER CITIZENS

n = 143

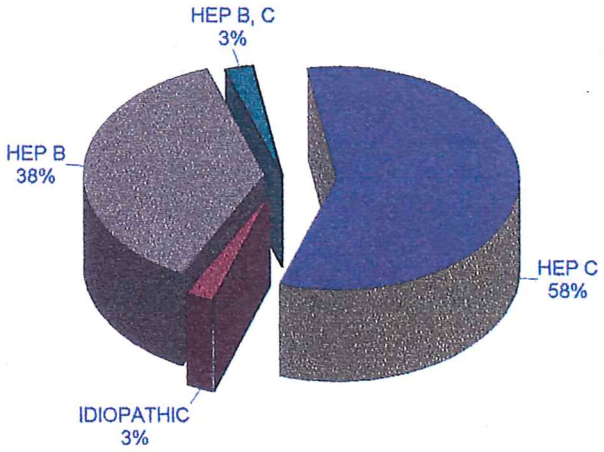


Data to 30/06/98

CHRONIC VIRAL HEPATITIS

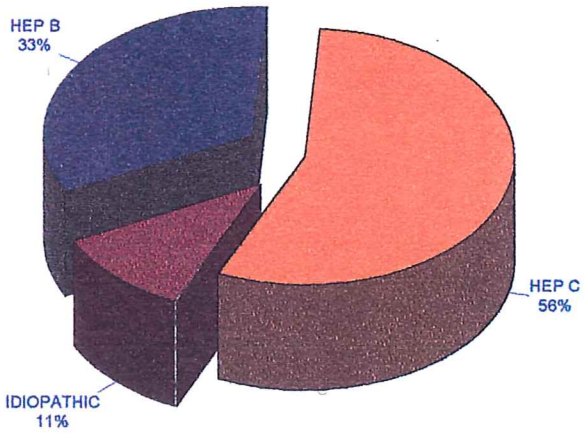
AUSTRALIAN CITIZENS

n = 160 (17%)



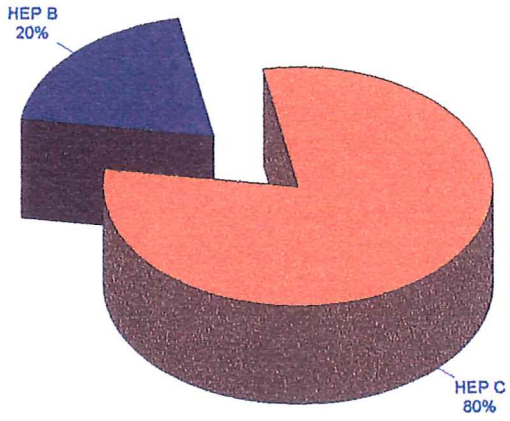
NZ CITIZENS

n = 9 (7%)



OTHER CITIZENS

n =15 (10%)

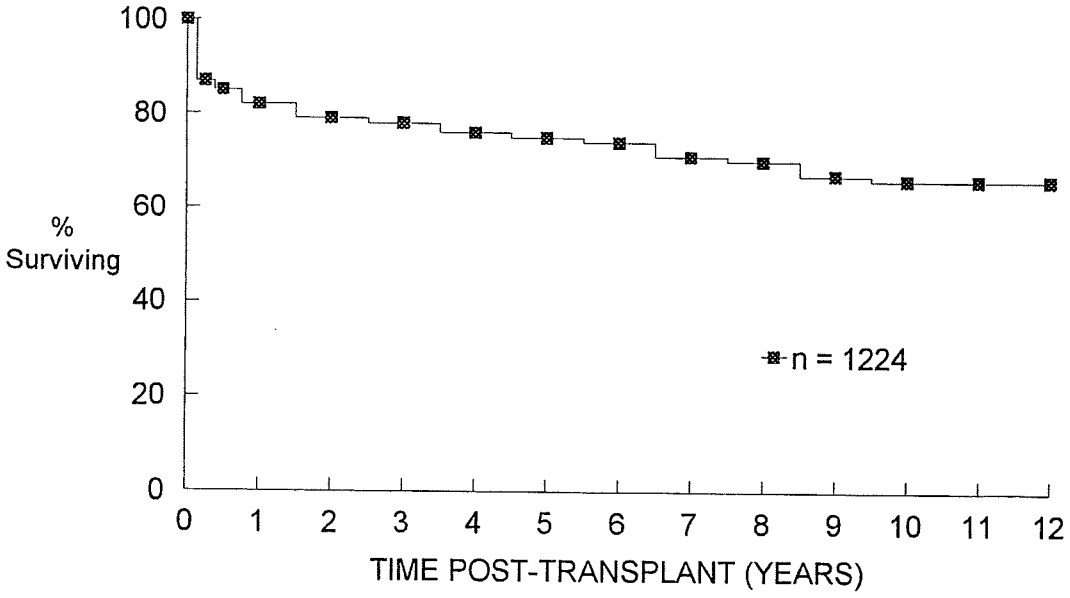


Data to 30/06/98

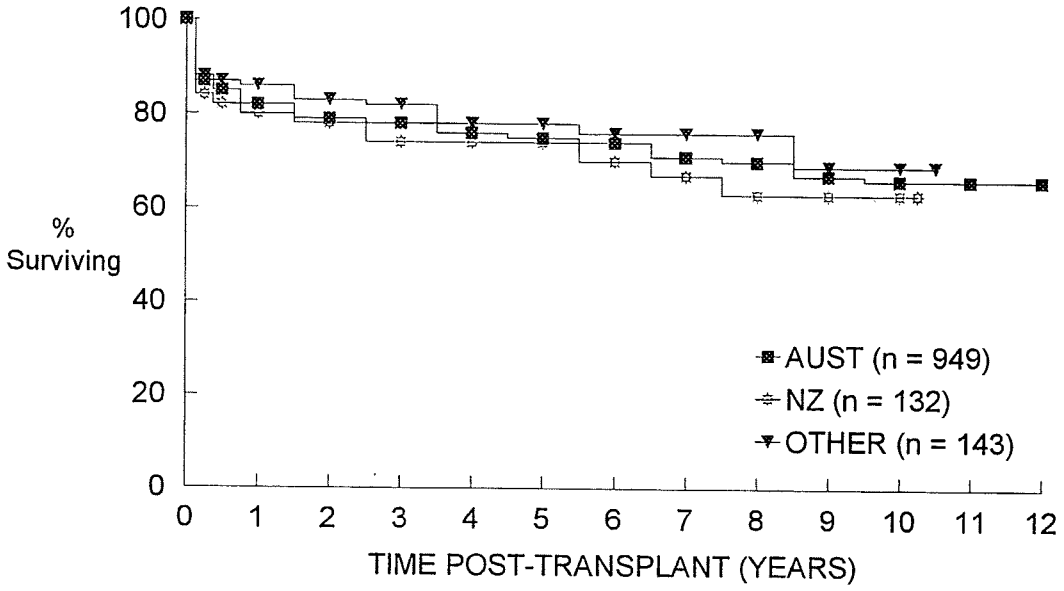
Section 3

Patient and Graft Survival

PATIENT SURVIVAL POST Tx



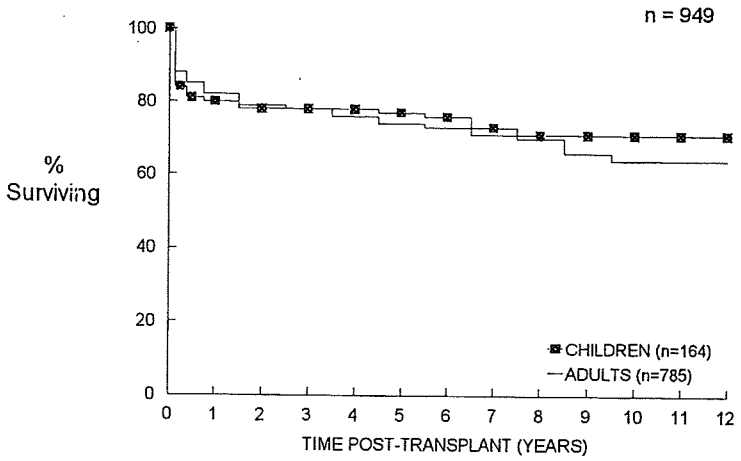
PATIENT SURVIVAL POST Tx



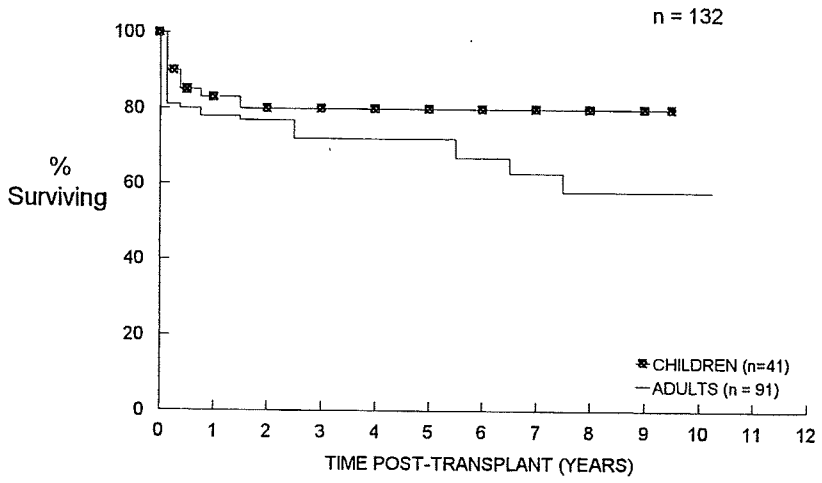
Data to 30/06/98

PATIENT SURVIVAL - ADULTS AND CHILDREN

AUSTRALIAN CITIZENS



NZ CITIZENS



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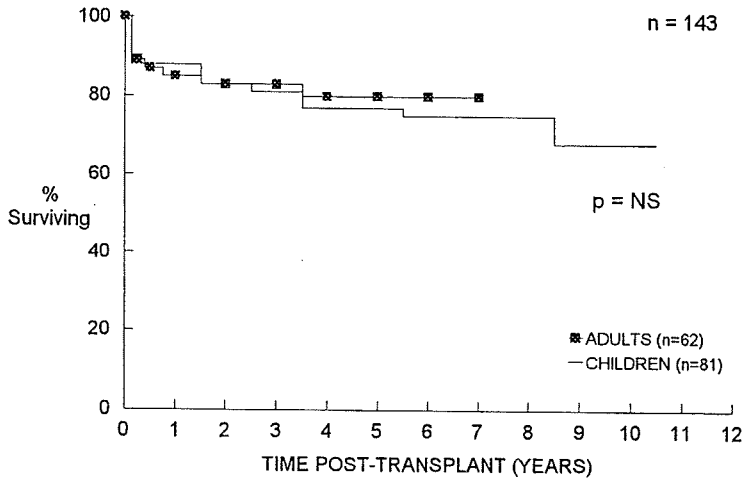
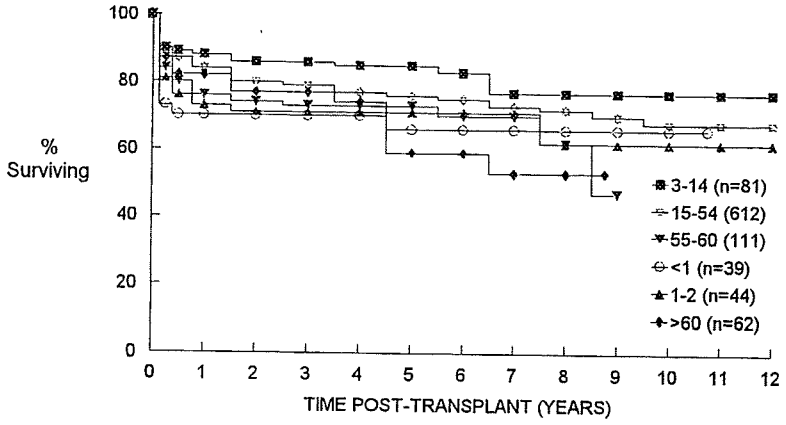


Data to 30/06/98

PATIENT SURVIVAL BY AGE AT TRANSPLANT

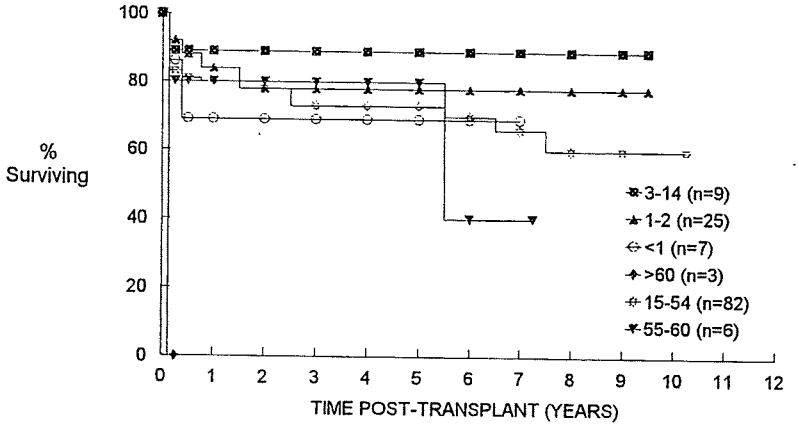
AUSTRALIAN CITIZENS

n = 949



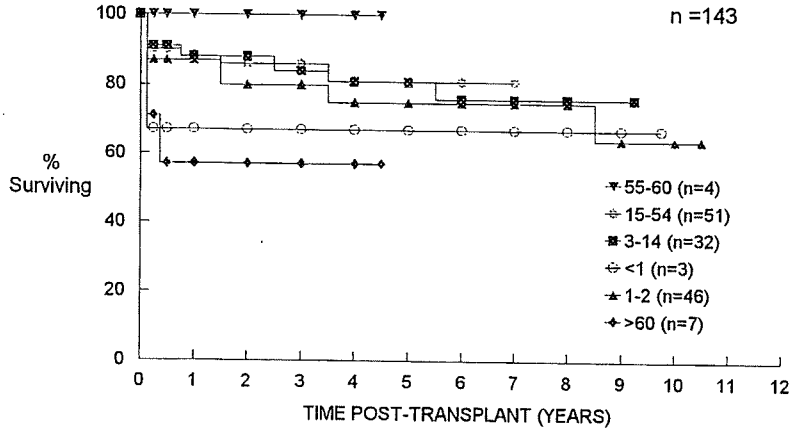
NZ CITIZENS

n = 132



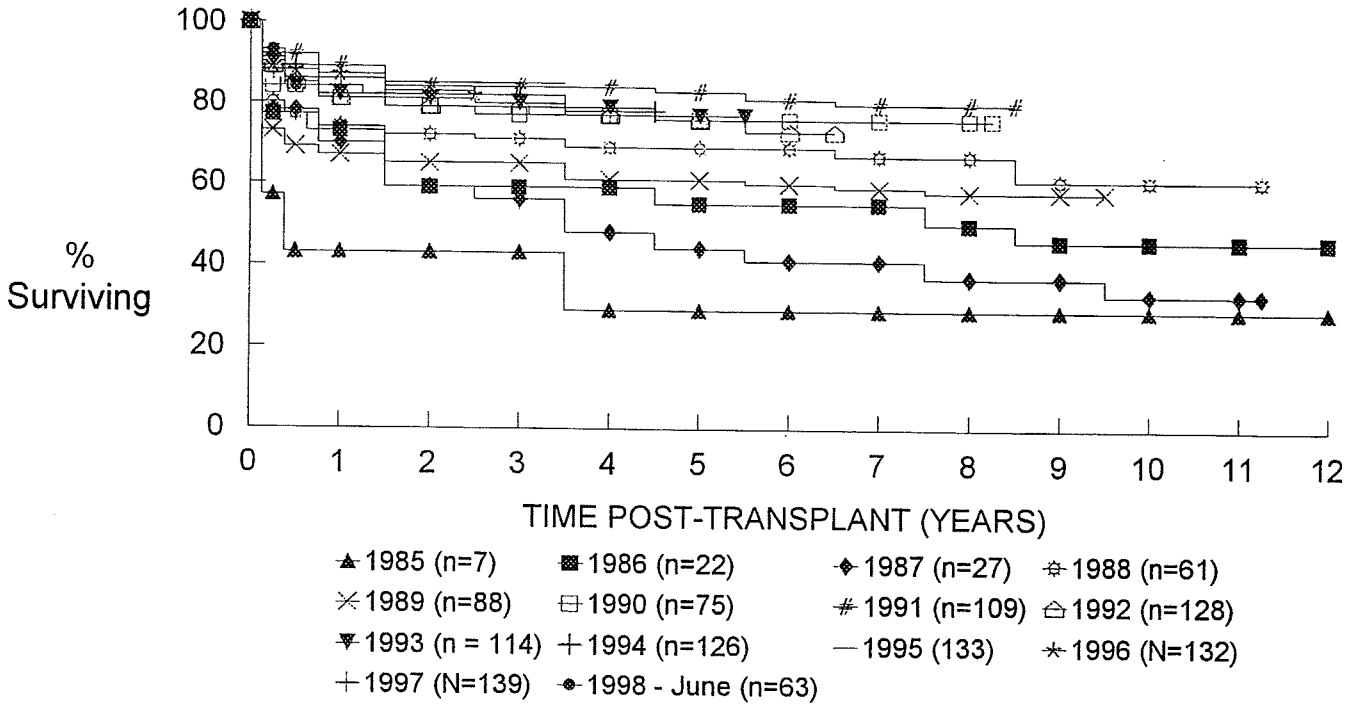
OTHER CITIZENS

n =143



Data to 30/06/98

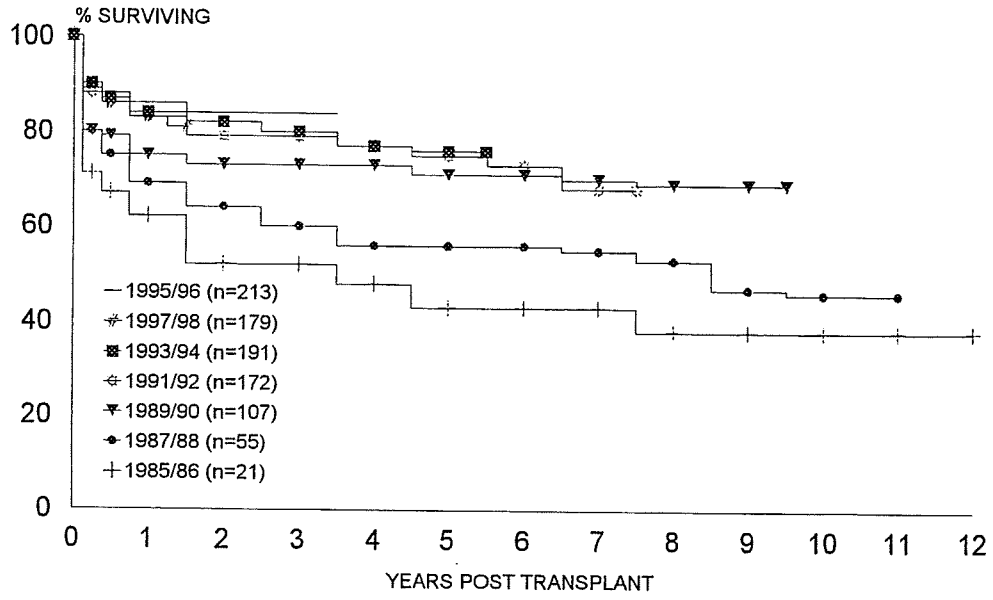
PATIENT SURVIVAL - BY YEAR OF Tx



Data to 30/06/98

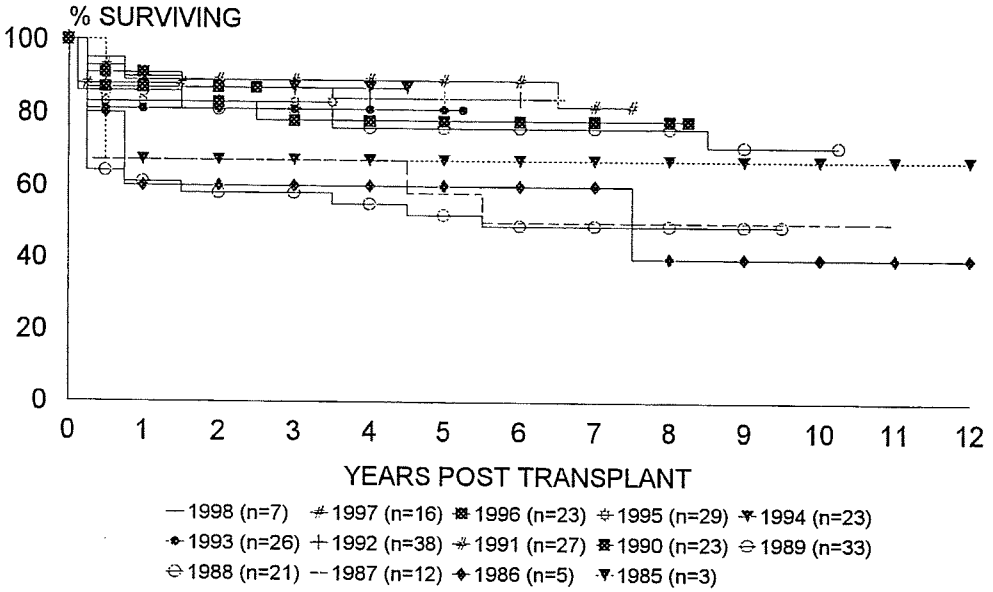
ADULTS

n = 938



CHILDREN

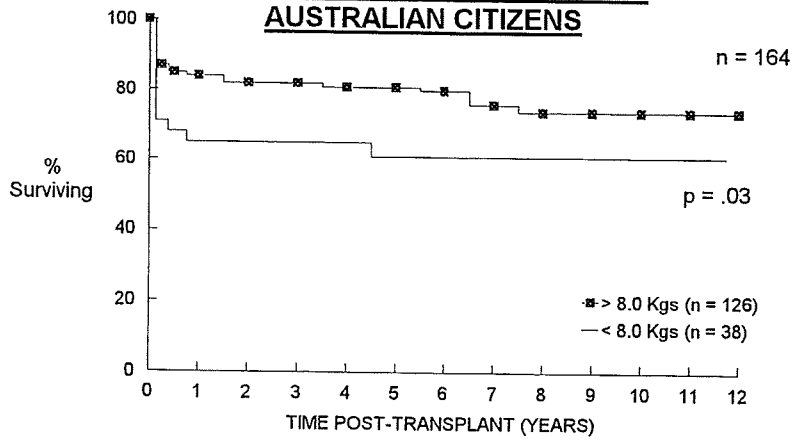
n = 286



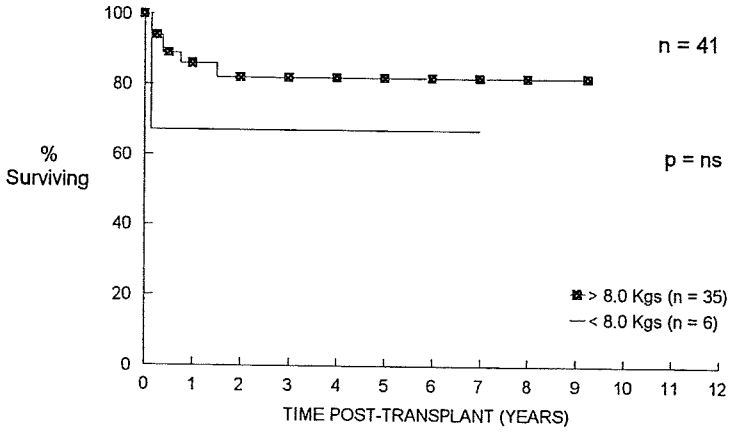
Data to 30/06/98

PATIENT SURVIVAL

CHILDREN > 8.0 KG AND < 8.0 KG
AUSTRALIAN CITIZENS



NZ CITIZENS



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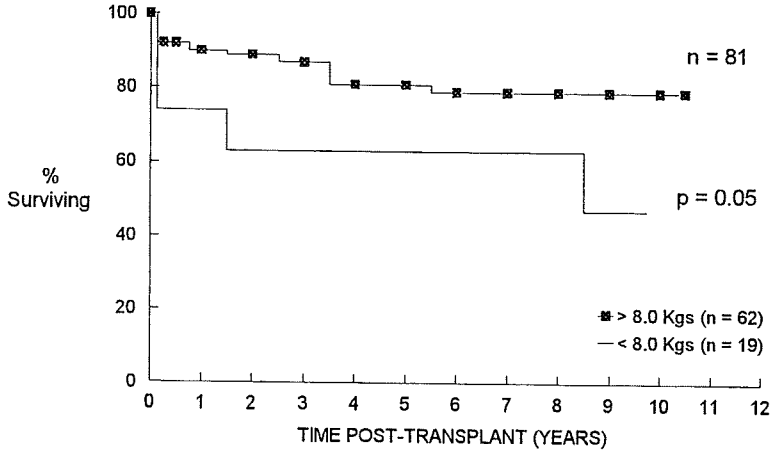
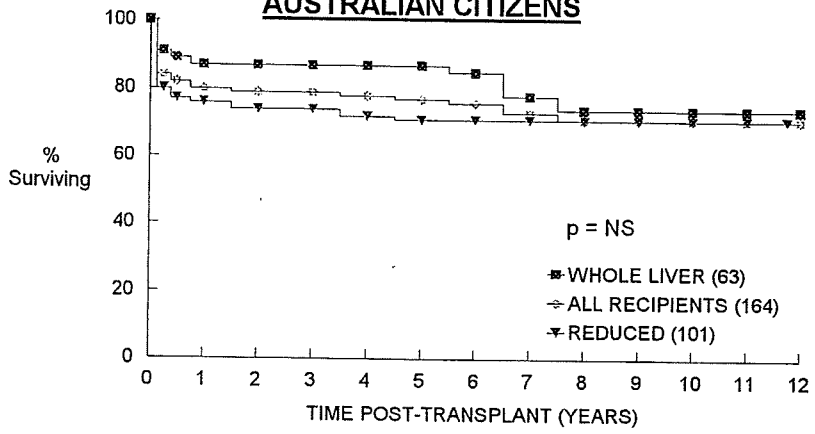


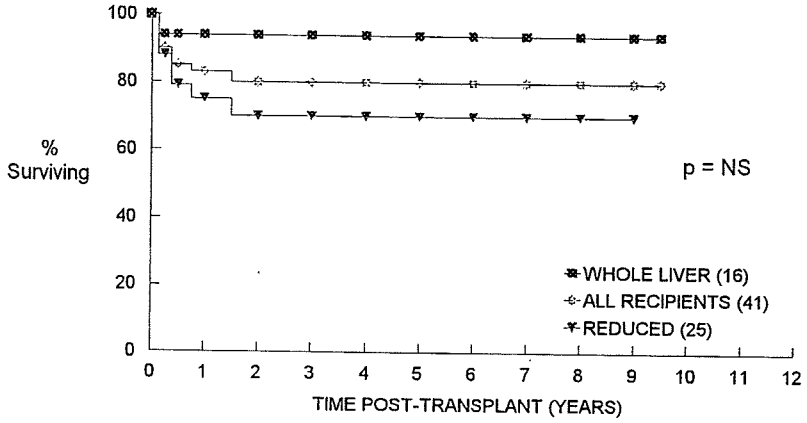
Data to 30/06/98

PAEDIATRIC PATIENT SURVIVAL

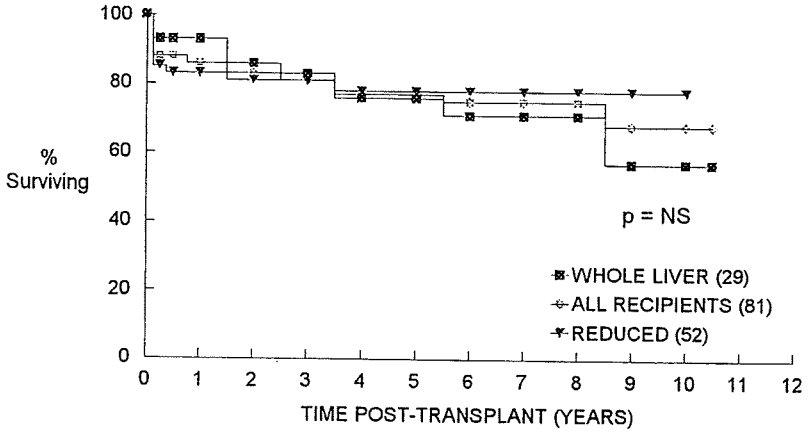
WHOLE LIVER V REDUCED LIVER AUSTRALIAN CITIZENS



NZ CITIZENS



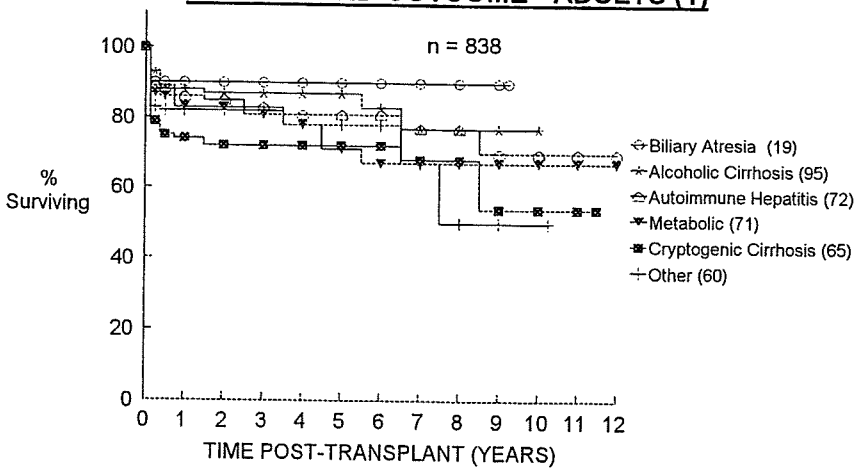
OTHER CITIZENS



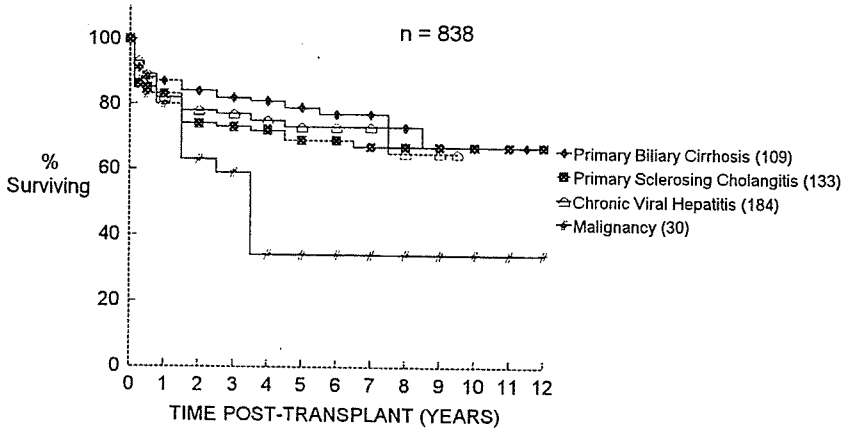
Data to 30/06/98

ALL PATIENTS

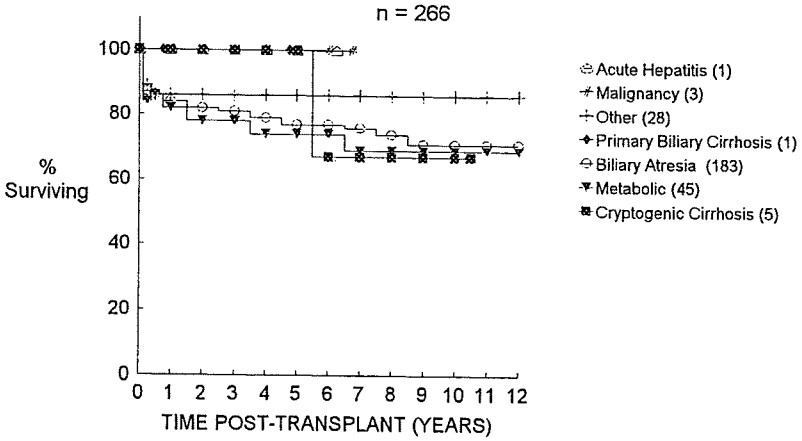
DISEASE AND OUTCOME - ADULTS (1)



DISEASE AND OUTCOME - ADULTS (2)



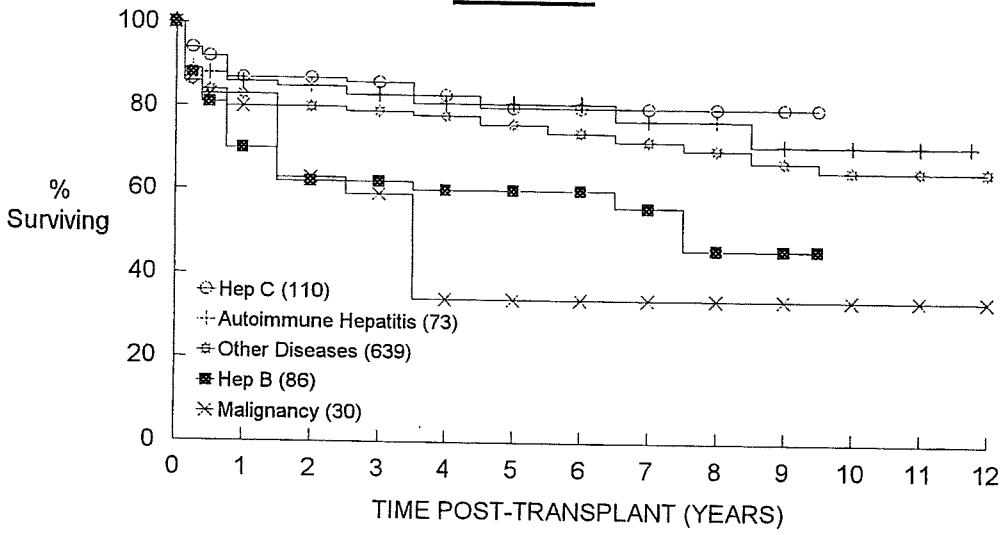
DISEASE AND OUTCOME - CHILDREN



Data to 30/06/98

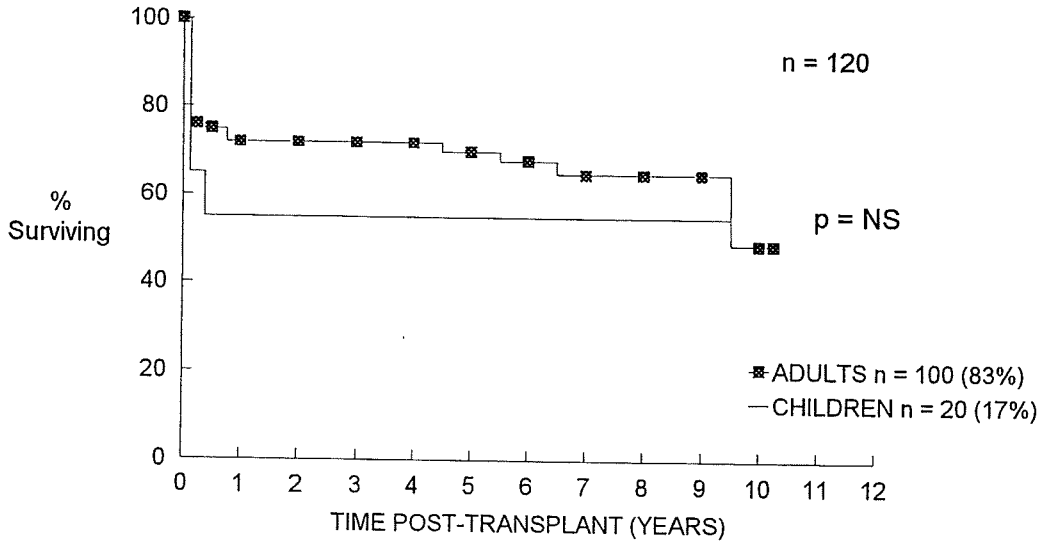
MALIGNANCY vs HEP B vs HEP C vs AUTO-IMMUNE vs OTHER DISEASES

ADULTS



PATIENT SURVIVAL

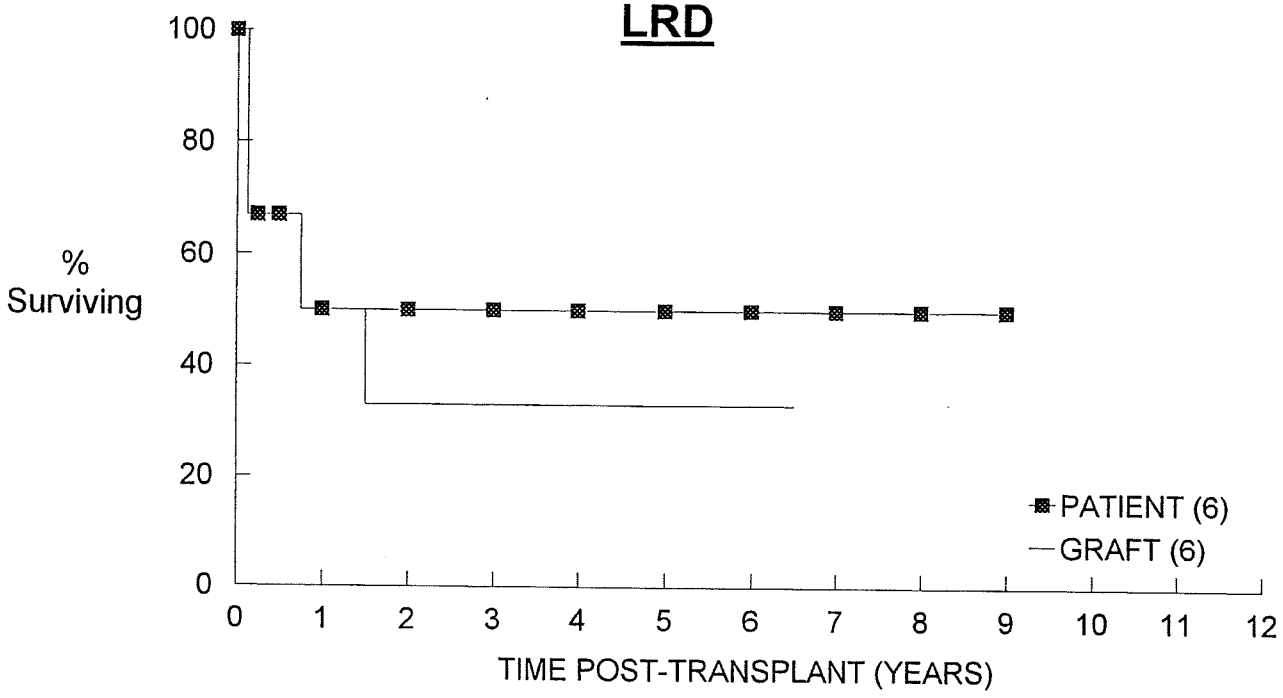
FULMINANT DISEASE



Data to 30/06/98

AUSTRALIA

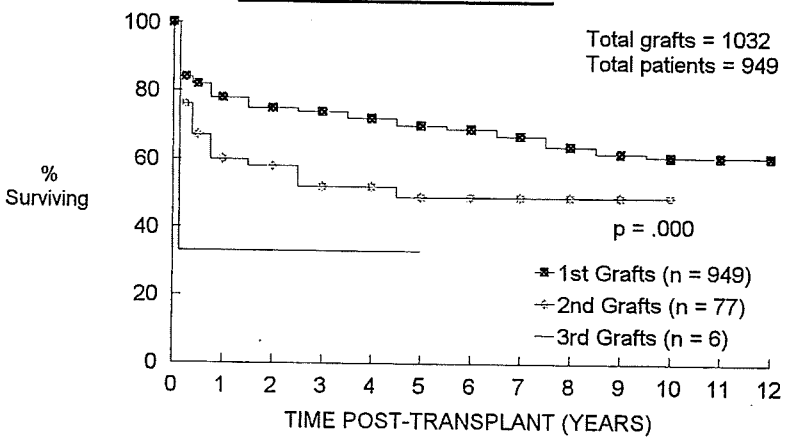
PATIENT AND GRAFT SURVIVAL
LRD



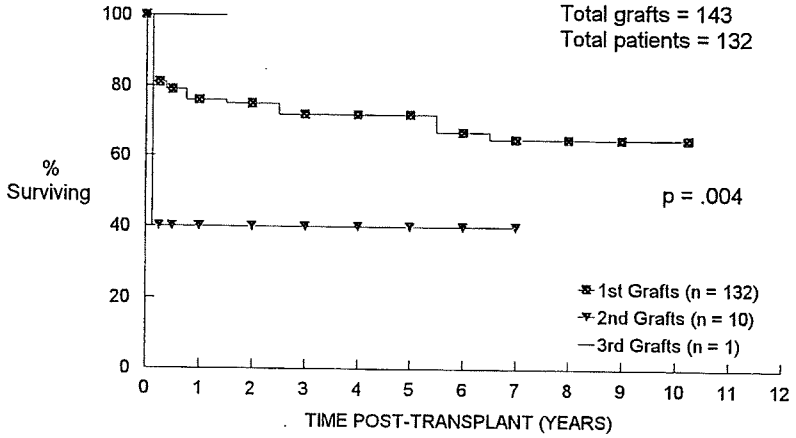
Data to 30/06/98

GRAFT SURVIVAL - PRIMARY AND SECONDARY

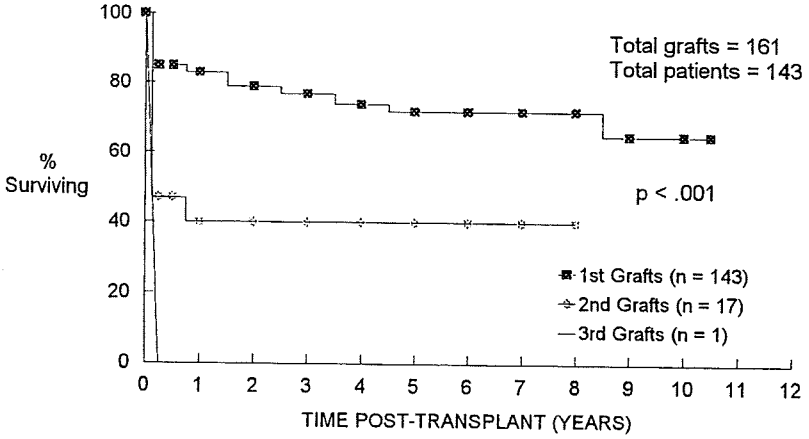
AUSTRALIAN CITIZENS



NZ CITIZENS



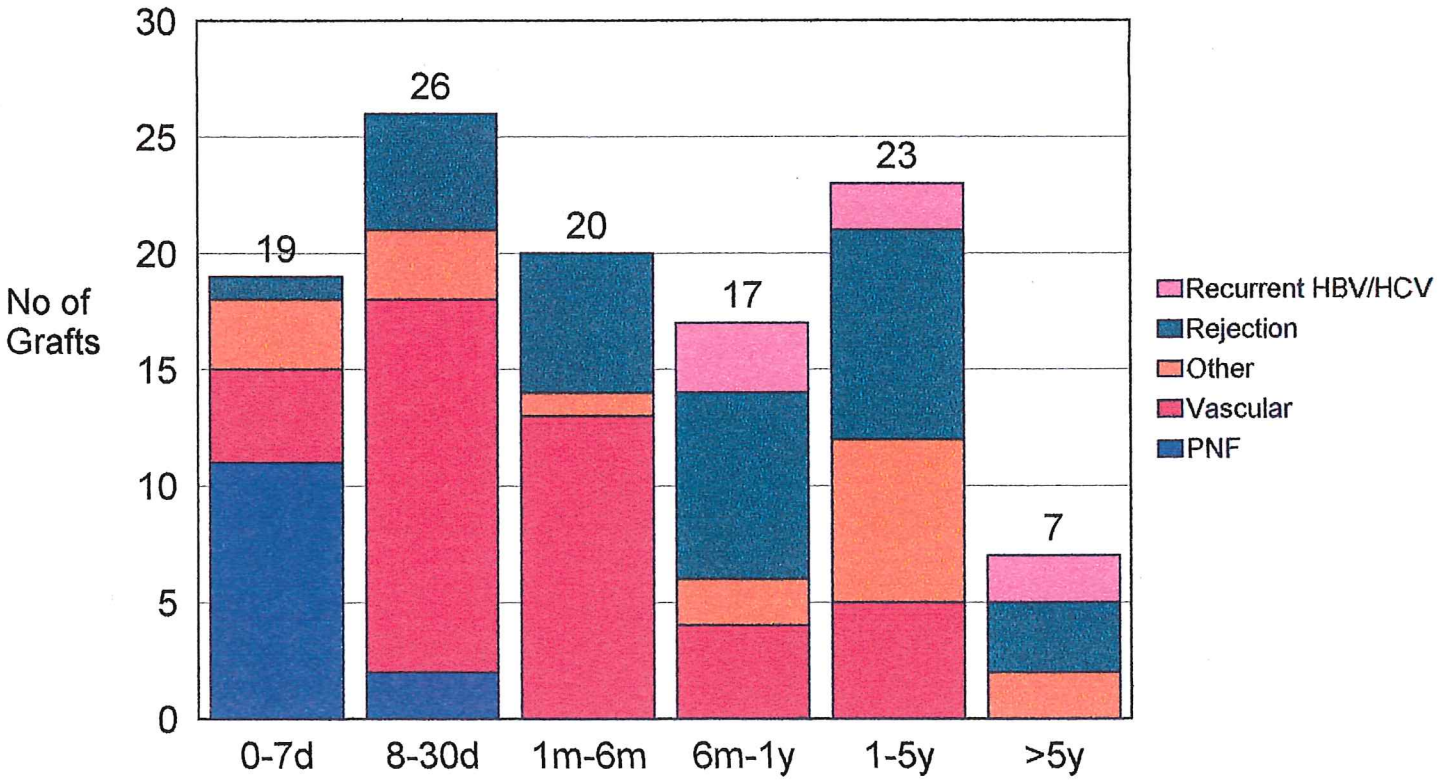
OTHER CITIZENS



Data to 30/06/98

SECONDARY TRANSPLANTATION
Indication by Time

n = 112



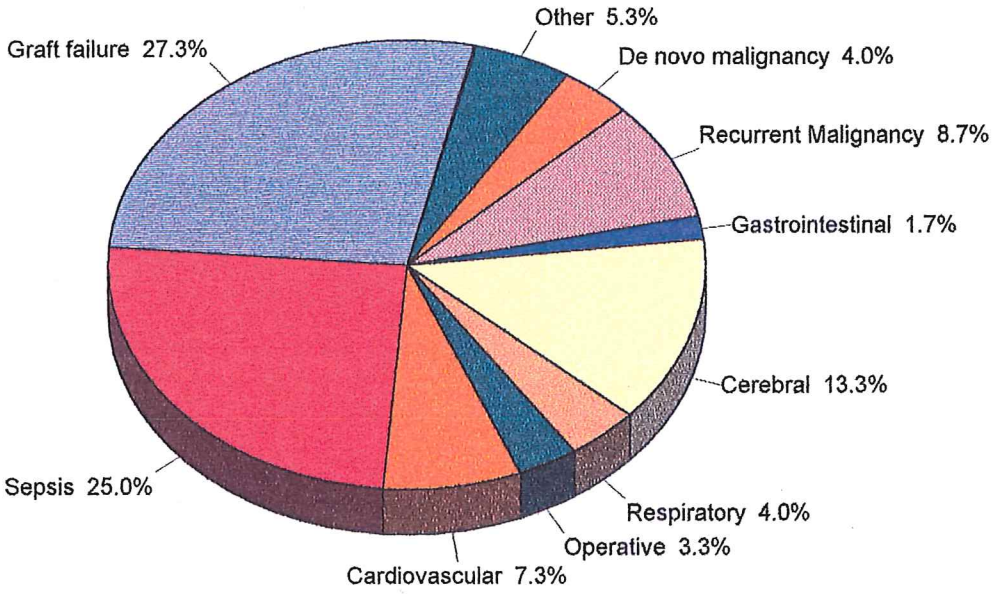
Data to 30/06/98

Section 4

Cause of Death

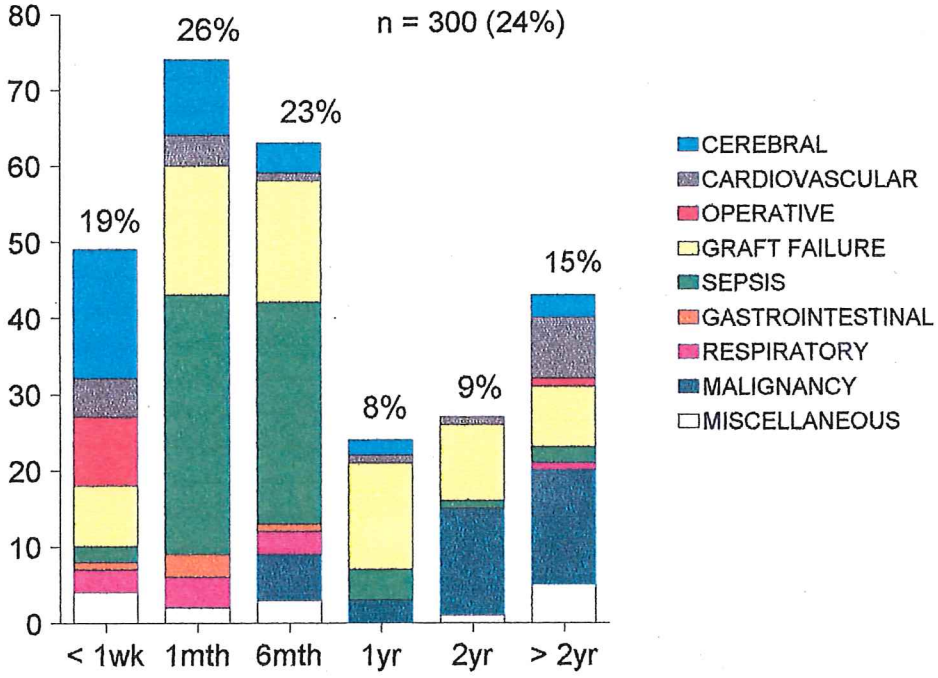
CAUSE OF DEATH

ALL PATIENTS n = 300 (24%)



CAUSE OF DEATH

ALL PATIENTS

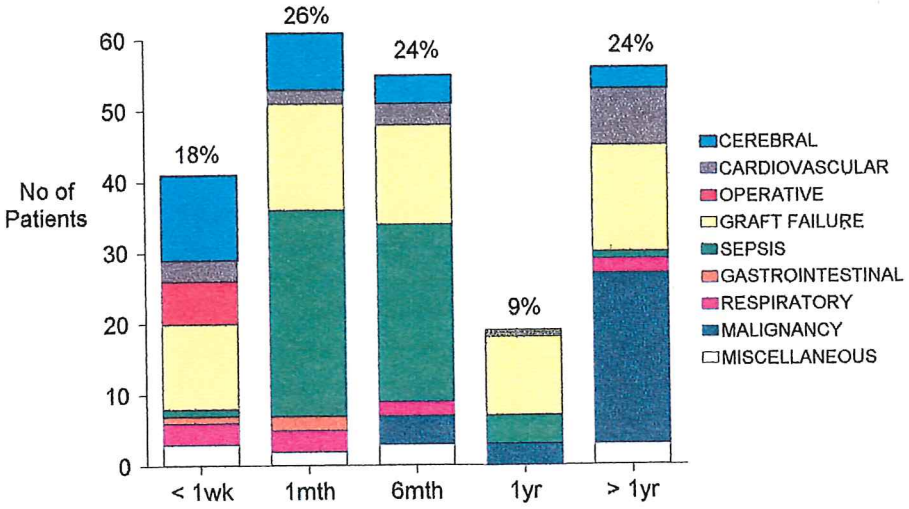


Data to 30/06/98

CAUSE OF DEATH

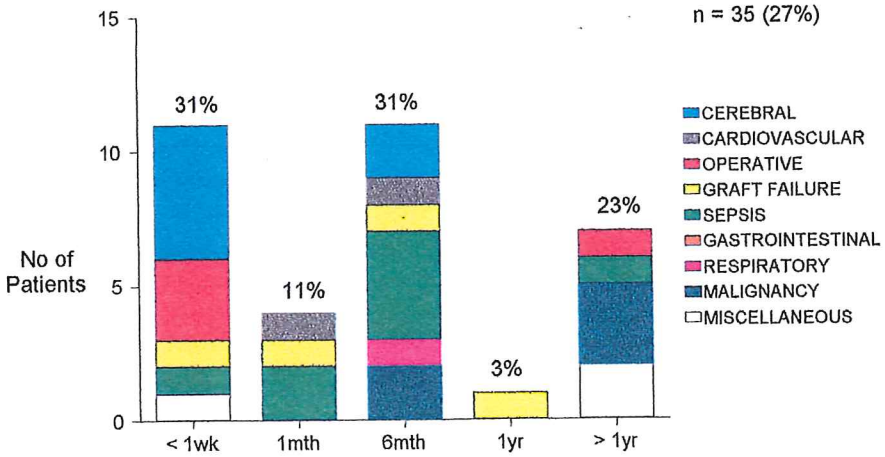
AUSTRALIAN CITIZENS

n = 234 (25%)



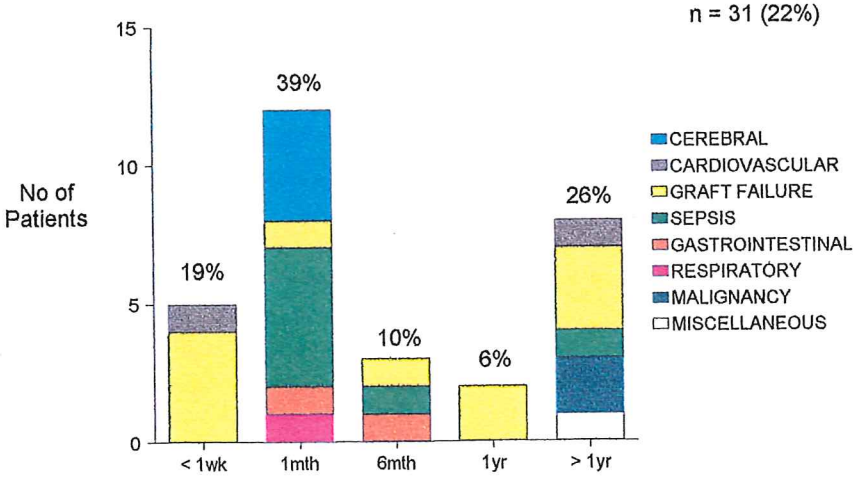
NZ CITIZENS

n = 35 (27%)



OTHER CITIZENS

n = 31 (22%)



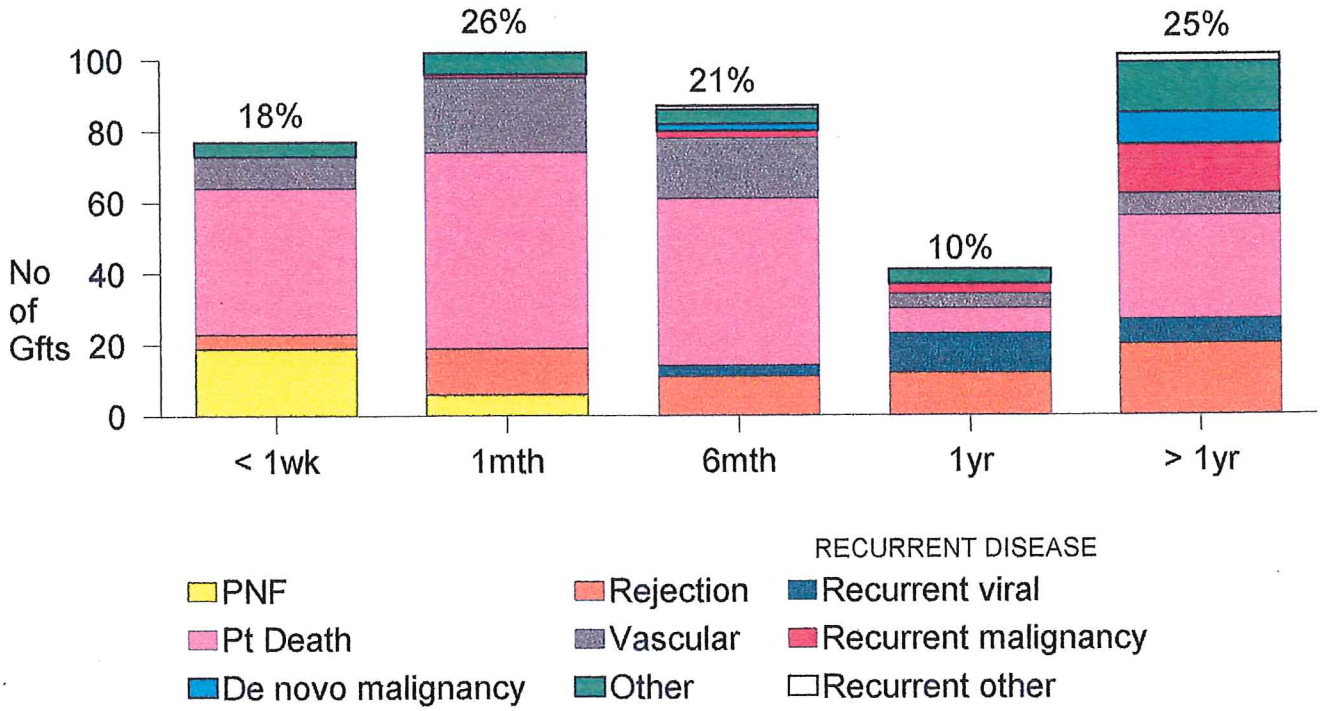
Data to 3

Section 5

Cause of graft failure

CAUSE OF GRAFT FAILURE

ALL GRAFTS n = 411 (31%)

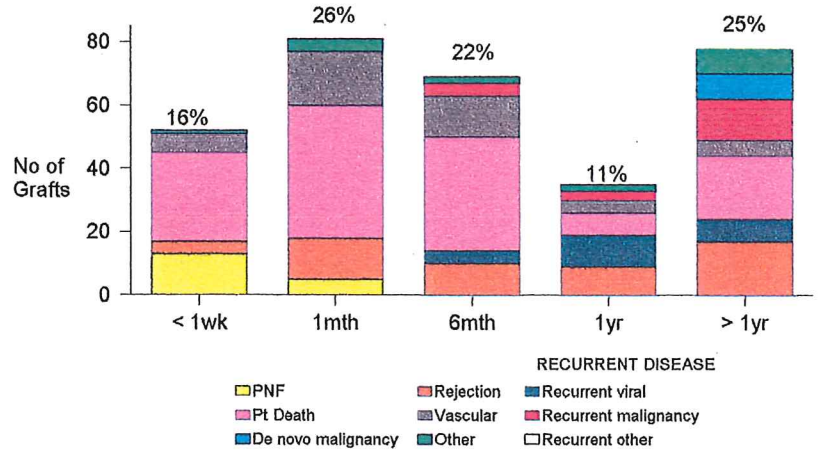


Data to 30/06/98

CAUSE OF GRAFT FAILURE

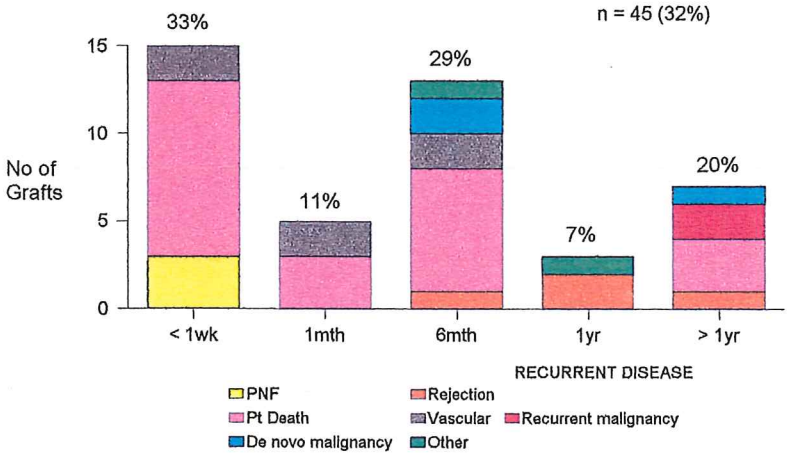
AUSTRALIAN CITIZENS

n = 318 (31%)



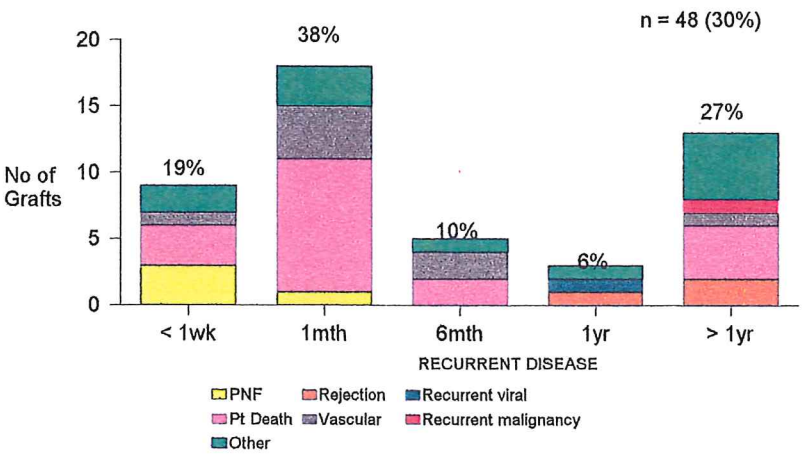
NZ CITIZENS

n = 45 (32%)



OTHER CITIZENS

n = 48 (30%)



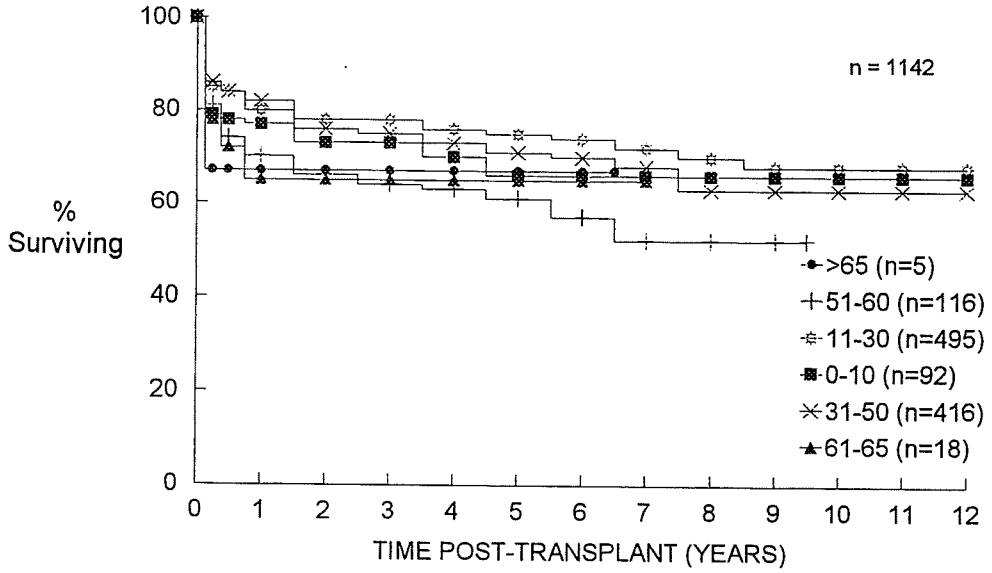
Data to 30/06/98

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	22	153
1998 (June)	14	18	9	10	5	13	69

Data to 30/06/98

Section 7

Liver Transplantation and Cancer

TYPES OF CA IN LIVER Tx RECIPIENTS

n = 1221

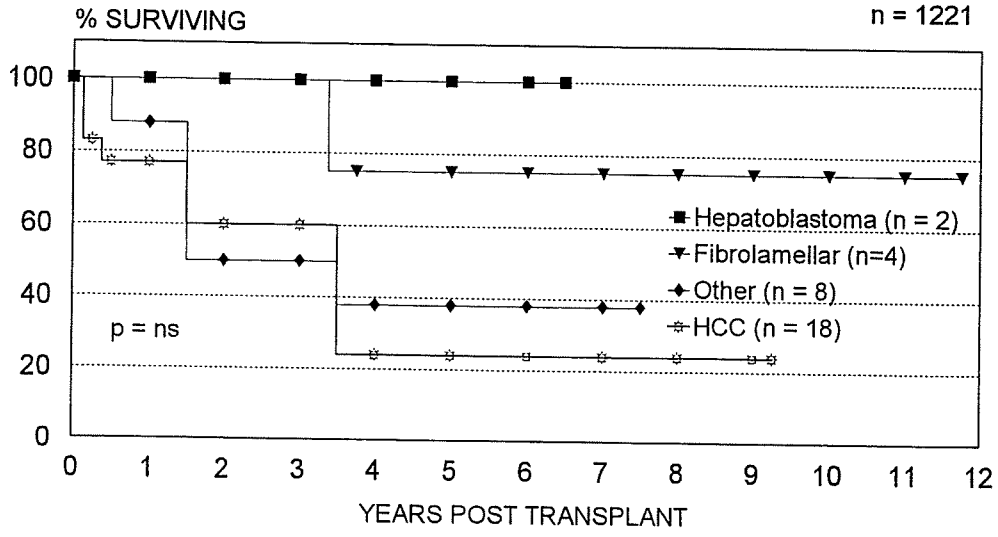
PRIMARY LIVER CA	32 (3%)	
INCIDENTAL CA	58 (5%)	
TOTAL	90 (7%)	
RECURRENT CA	31 (3%)	
DE NOVO CA	39 (3%)	41 (Ca)
SKIN CA	112 (9%)	352 (Ca)
TOTAL	176 (14%)	

PRIMARY LIVER MALIGNANCY

n =1221

TYPE OF CA	No	DIED	DIED OF CA
HEPATOCELLULAR CA	18	9	7 (39%)
LAMELLAR VARIANT	4	1	1 (25%)
CARCINOID	4	2	2 (50%)
ENDOCRINE	2	2	2 (100%)
HEPATOBLASTOMA	2	0	0
ANGIOSARCOMA	1	1	1 (100%)
EPITHELOID HAEMANGIOMA	1	0	0
TOTALS	32 (3%)	15 (47%)	12 (38%)

PRIMARY LIVER CA



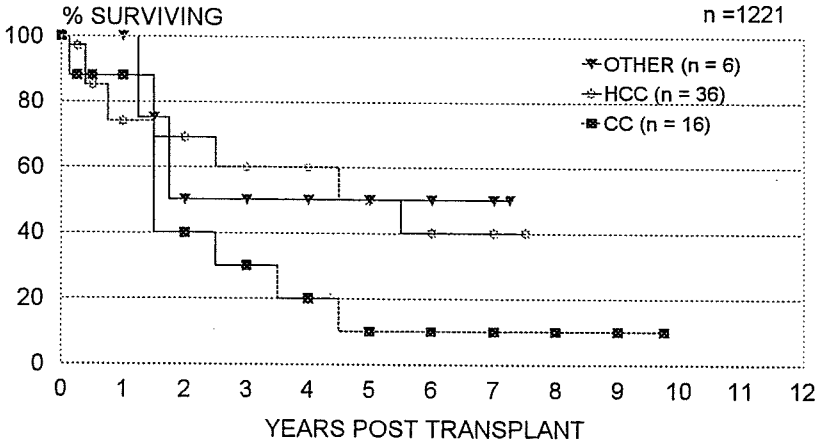
Data to 30/06/98

INCIDENTAL CA

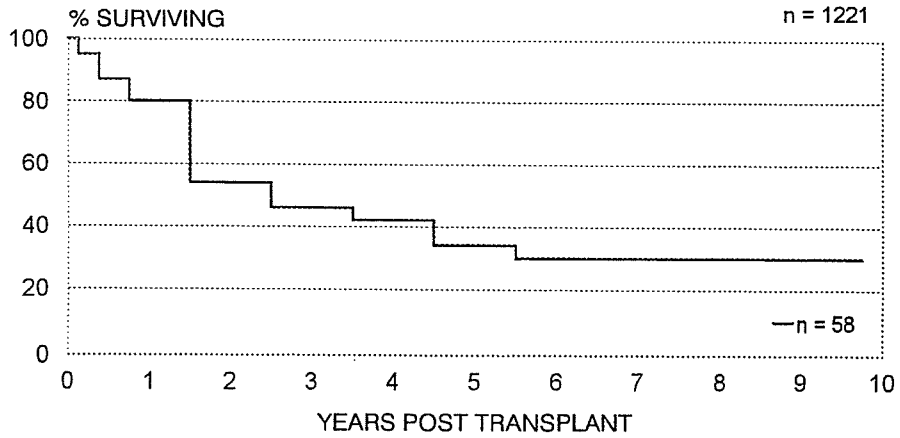
n = 1221

	NO	DIED	DIED OF CA
HEPATOCELLULAR CA	36	9	3 (13%)
CHOLANGIO CA	16	8	7 (73%)
ANGIOSARCOMA	1	1	1 (100%)
ADENOCARCINOMA	1	0	0
HEPATOBLASTOMA	2	0	0
FIBROLAMELLAR	1	0	0
DESMOID	1	0	0
TOTALS	58 (5%)	23 (40%)	15 (26%)

INCIDENTAL CA

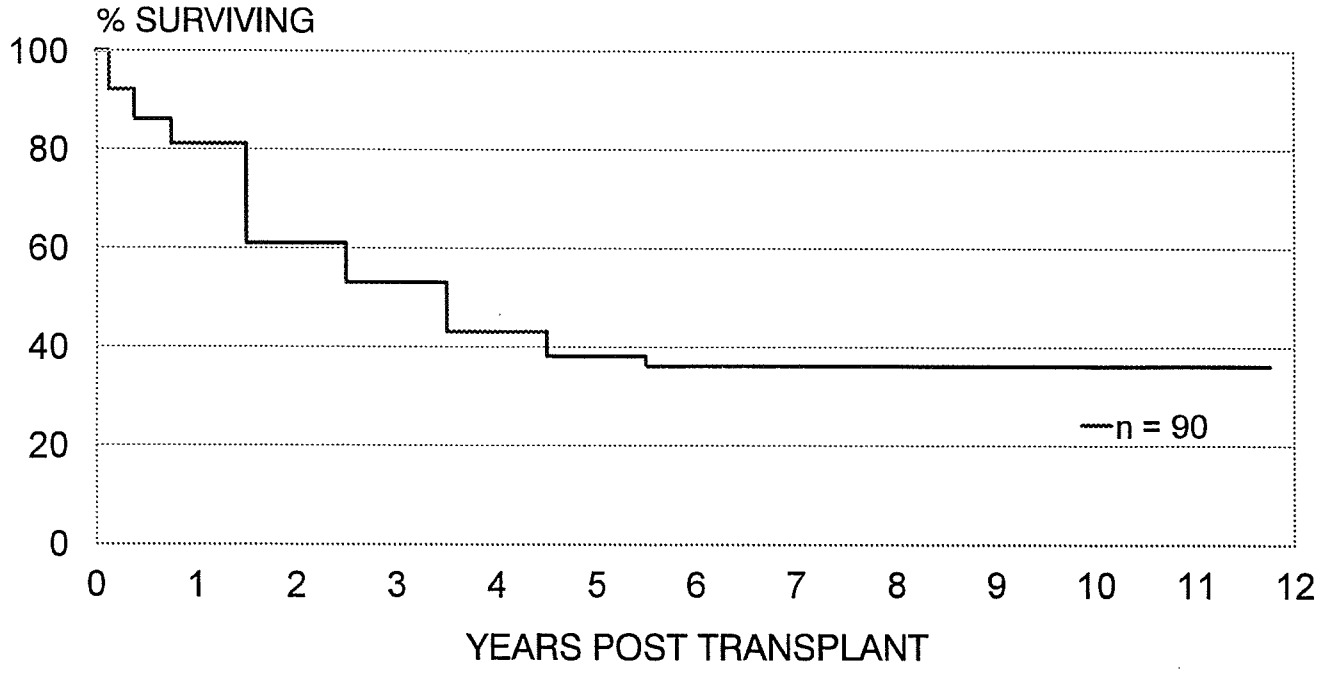


INCIDENTAL CA



Data t

PRE-TX LIVER CA (PRIMARY AND INCIDENTAL)



Data to 30/06/98

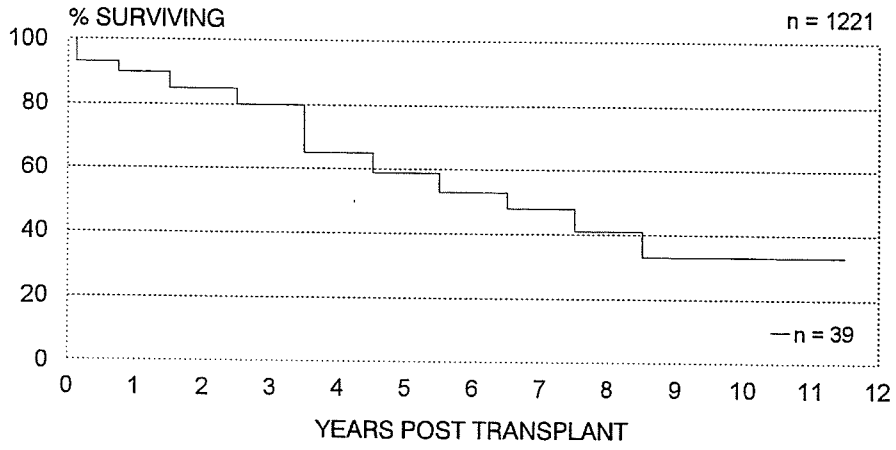
DE NOVO NON SKIN CA POST TX

n = 1221

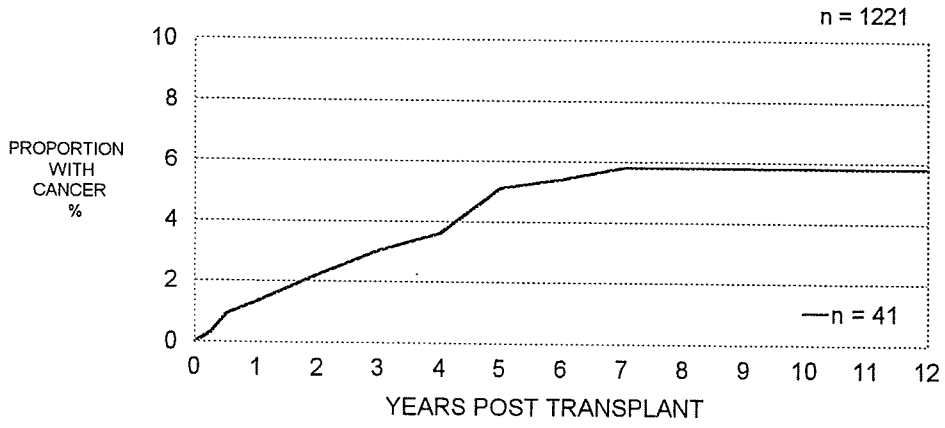
	NO	DIED	DIED OF CA
NON HODGKINS LYMPHOMA	15 (37%)	10	7
KAPOSI SARCOMA	3	1	0
DIGESTIVE ORGANS	9	3	1
GLOTTIS	1	0	0
STOMACH	1	1	0
COLON	6	2	1
APPENDIX	1	0	0
GENITO-URINARY	5	1	0
BLADDER	1	0	0
TESTIS	1	0	0
KIDNEY	2	1	0
PROSTATE	1	0	0
RESPIRATORY	1	1	1
LEUKAEMIA	1	1	1
BREAST	1	0	0
ENDOCRINE	4	1	1
CERVIX	1	0	0
CEREBRAL	1	1	1
TOTALS	41 in 39 (3%) pts	19 (46%)	12 (29%)

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

DE NOVO NON SKIN CA POST TX



DE NOVO NON SKIN CA POST TX



Data to 30/06/98

POST-Tx NON SKIN CANCER IN LIVER RECIPIENTS

n =1221

	PATIENTS WITH CA PRESENT AT Tx	PATIENTS WITH CA DEVELOPED POST Tx
PRIMARY LIVER CA	32 (3%)	16 (50% of PCA)
INCIDENTAL CA	58 (5%)	15 (26% of ICA)
DE NOVO		39 (3% of PTS)
	90 (7%)	70 (6% of PTS)

CAUSES OF DEATH
BY TIME FOLLOWING LTx

n = 1221

CAUSE OF DEATH	FROM TIME OF TX	>1 YEAR POST -TX
GRAFT FAILURE	82 (28%)	18 (25%)
SEPSIS	71 (24%)	3 (4%)
CEREBRAL CATASTROPHE	40 (14%)	3 (4%)
MALIGNANCY	38 (13%)	29 (41%)
CARDIOVASCULAR	22 (7%)	9 (13%)
OTHER	42 (14%)	9 (13%)
TOTALS	295 (24%)	71 (8%)

SKIN CA POST LTx

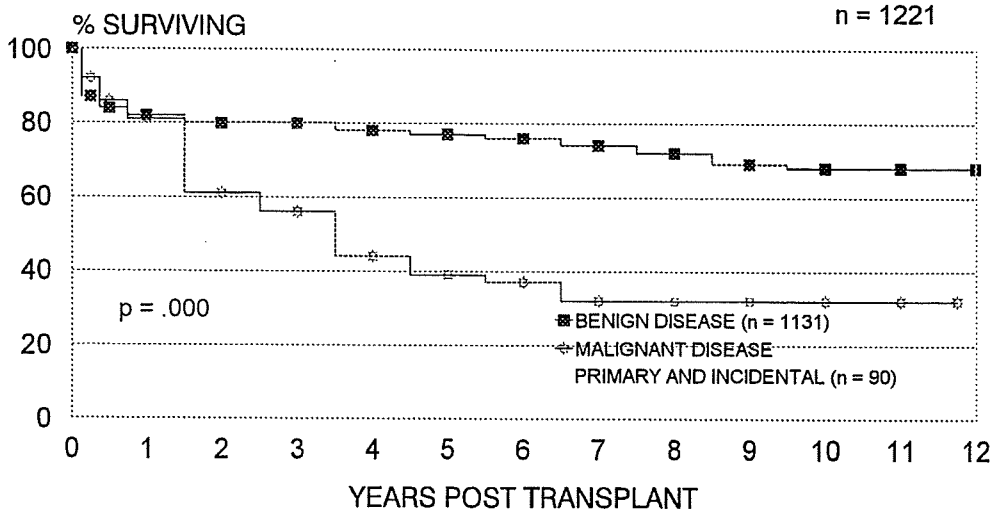
n = 1221

TYPE	CANCERS	PATIENTS
BCC	153	60
SCC	196	63
MELANOMA	3	3
TOTALS	352	112 ** (9%)

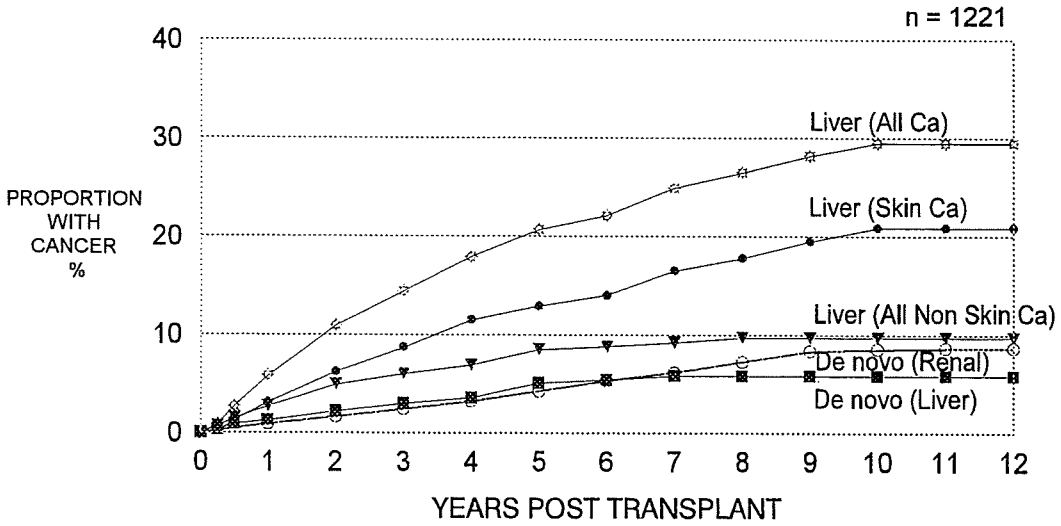
** 64 pts had multiple skin cancer types

PATIENT SURVIVAL

PATIENTS WITH BENIGN DISEASE VERSUS THOSE WITH PRIMARY OR INCIDENTAL CA



CANCER DEVELOPMENT FOLLOWING LIVER Tx AND RENAL Tx. AUSTRALIA.



Data to 30/06/98

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
New Zealand