

AUSTRALIA & NEW ZEALAND

LIVER TRANSPLANT REGISTRY



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

DATA TO 31-12-2006

COORDINATING CENTRE

ANZLT Registry
Princess Alexandra Hospital
Ipswich Rd
WOOLLOONGABBA, QLD, 4102

www.anzltr.org

Professor Stephen Lynch
Ms Glenda Balderson
Ms Debra Cormack

Editor
Editor/Liaison Officer
Graphics

Phone (61-7) 3240 2385
Fax (61-7) 3240 2999

G.Balderson
G.Balderson

Email Glenda_Balderson@health.qld.gov.au
G.Balderson@mailbox.uq.edu.au

MANAGEMENT COMMITTEE

Associate - Professor L. Delreviere
Sir Charles Gairdner Hospital, WA

Professor R.M. Jones
Austin Hospital, VIC

Professor S.V.Lynch
Princess Alexandra Hospital, QLD

Professor G.W. McCaughan
Royal Prince Alfred Hospital, NSW

Professor S. Munn
Auckland Hospital, NEW ZEALAND

Dr. R. Padbury
Flinders Medical Centre, SA

MS G.A. Balderson
Princess Alexandra Hospital, QLD

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STATISTICAL METHODS

Kaplan-Meier survival curves have been produced using SPSS® for Windows™ Release 15.0, SPSS Inc.

ACKNOWLEDGMENT

The Cancer Registry is maintained at Transplantation Services, Royal Prince Alfred Hospital, Sydney. Report prepared by Pamela Dilworth and Dr Deborah Verran.

Director: Professor G.W McCaughan
All queries to: Dr Deborah Verran

Email deborah@email.cs.nsw.gov.au

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Preface

We are pleased to present the 18th Report of the Australia and New Zealand Liver Transplant Registry (ANZLTR). This report contains data to the 31st December 2006 and analyses the cumulative data since the establishment of the first liver transplantation unit in Australia or New Zealand in 1985.

The Australia and New Zealand Liver Transplant Registry (ANZLTR) is a collaborative effort of the liver transplantation centres in Australia (Adelaide, Brisbane, Melbourne, Perth, Sydney) and New Zealand (Auckland). The Registry is supervised by the Management Committee who are involved in the ongoing supervision of the development of the Registry. The members of the Management Committee are listed on the front page.

Donor data have been supplied by the Australia and New Zealand Organ Donor Registry and we thank them for their collaboration.

The Editors would also like to thank the staff of all the Liver Transplant Units who now contribute their data by direct entry into the ANZLTR database. A full list of the Units and their contact information can be found in Appendix I. In particular we are grateful to the efforts of Pamela Dilworth, Program Manager for her continuing contribution to the maintenance of the Cancer Registry which is based at the Royal Prince Alfred Hospital, Sydney and who, together with Dr Deborah Verran, prepares the Cancer Report.

The registry now has some financial support and we are grateful to the Commonwealth Department of Health and Aging for their financial contribution.

Comments are always welcome and should be forwarded to the Coordinating Centre at the contact information listed on the front page as should requests for further copies of this Report. The report is now also available on the ANZLTR public web site www.anzltr.org from where the report can be downloaded. Slides are available on request from the Coordinating Centre.

Stephen Lynch
Glenda Balderson

Summary

Page

5. Between January 1985 and 31st December 2006, 2886 orthotopic liver transplants (OLT) were performed in Australia and New Zealand on 2677 patients, 2188 adult patients (> 15 years) [82%] and 489 children [18%]. The median age of all recipients was 46 years. The ages ranged from 24 days to 73.1 years. There is a significant difference in gender distribution between children (M=47%) and adults (M=63%)
6. There was a decrease in the total number of new paediatric patients transplanted in 2006 compared with 2005 but an increase in the number of new adult patients.
7. The trend to increasing age of adult recipients in recent years continued and the overall adult median age is now 48.9 years. The median age of new adult recipients in 2005-06 was 51.6 years.
- 8-9. Only three more transplants were performed in 2006 then in 2005. Split grafts now make a significant contribution to the total number of paediatric transplants performed providing 12 of 27 [44%] grafts in 2006 and 96 of 560 [17%] overall. In children, other reduced size grafts have been used in 276 [49%] cases including 17 living donor grafts. One child has been treated with liver cell implantation. Of adult patients, 136 have received reduced size grafts - 108 split liver grafts (including 1 as auxiliary graft), 24 other reduced size grafts (1 as auxiliary graft) and 4 living donor grafts. One domino transplant of a whole liver has been performed.
- 10-11 Overall chronic viral hepatitis (CVH) is the most common primary indication for liver transplantation. In children biliary atresia (BA) is the most common primary disease. In adults chronic viral hepatitis is the primary disease in 28% of recipients. Full details of specific diagnoses categories by age group are listed in the Appendices - Metabolic disorders (Appendix II), Other diseases (Appendix III), Fulminant Hepatic Failure (Appendix IV). The number of patients transplanted for non alcoholic fatty liver disease [NAFLD/NASH] continued to increase with 9 new patients in 2006 (Appendix III).
- 12-14. Fewer adult patients with a primary diagnosis of Hepatitis B but more with a diagnosis of Hepatitis C were transplanted in 2005-06 compared with the previous era.- 2000-04, 35% primary diagnosis CVH [25% Hepatitis C, 8% Hepatitis B and 2% Hepatitis B,C,D]; in 2005 -06, 33% primary diagnosis CVH [27% Hep C, 4% Hep B, 2% Hep B/C/D]. When patients with either primary or secondary diagnosis of Hepatitis B ,C or both are included, the overall incidence of CVH in new adult patients in 2005- 06 was 42%.
15. Current 1 year patient survival of all patients is 87% at 1 year, 79% at 5 years and 70% at 10 years. Children had a significantly better survival rate than adults.
16. Whilst older children had superior survival than infants and babies, older adult recipients (60-65 and >65 years) had poorer longer term outcomes.
- 17-18. Patient survival in 2000-04 cohort shows continued improvement in outcome for the first 5 years compared with earlier cohorts. This is seen in both children and adults.
19. The type of primary graft,(whole , reduced or split liver), had no effect on patient survival in either children or adults.
20. Children weighing < 8 kg at the time of transplant had inferior early survival compared to heavier patients.
21. Adult patients transplanted for biliary atresia or hepatitis virus coinfections had the best long term survival while those whose primary disease was malignancy had a significantly lower survival rate. Longer term survival for patients transplanted for Hepatitis C was also lower.
22. In children, patient survival was similar for all disease groups. There were no differences in survival between adults and children transplanted for fulminant hepatic failure [acute and sub-acute] with 5 year survival of 74%.



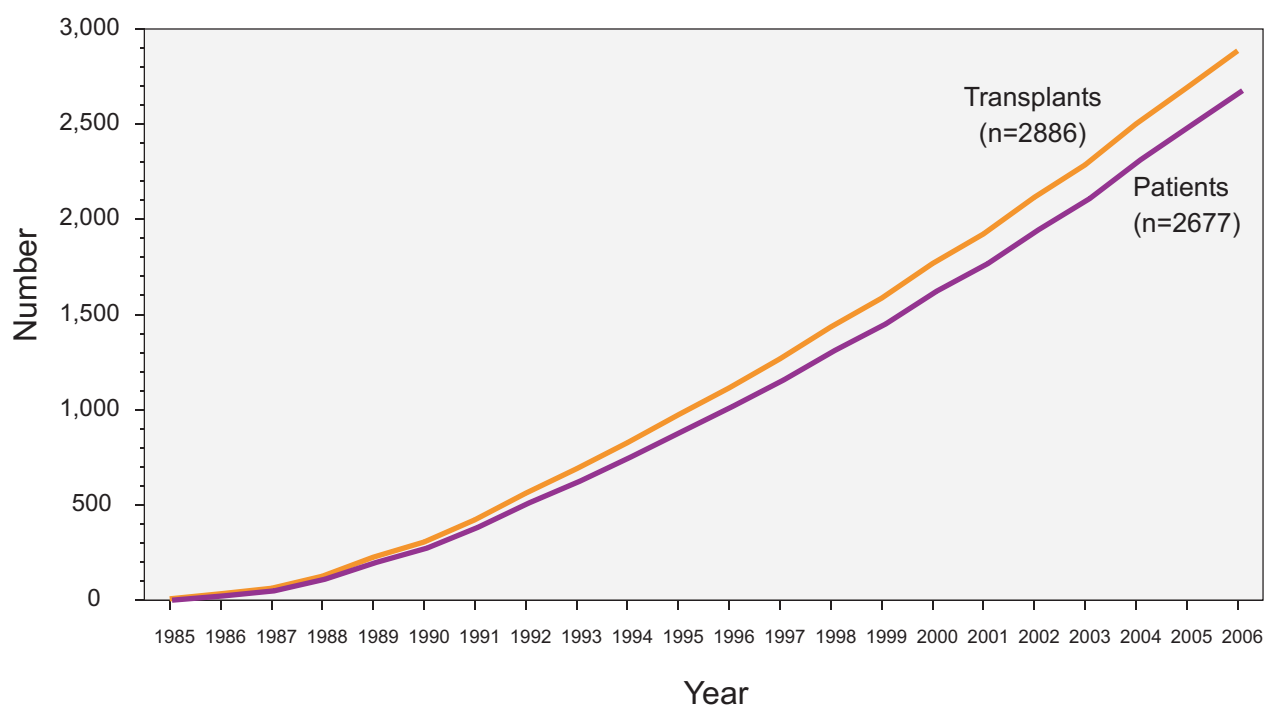
Summary

23. Recent cohorts of adult patients with a primary diagnosis of hepatitis B show a significantly improved survival which is not seen in adult patients with hepatitis C as primary disease. Patient transplanted for malignancy continue to have a poor outcome.
24. Twenty two patients have received a living donor graft, 15 children and 5 adults as a primary graft and two children as a second or third graft. Patient survival was 90% and graft survival 85%.
25. Graft survival was significantly worse in second and third grafts.
26. Both split and other reduced grafts had lower graft survival in the early post-transplant years in both children and adults but had an improving longer term outcome particularly for split grafts.
27. Vascular complications and rejection were the commonest indications for retransplantation. Thirteen percent of retransplants were due to poor early graft function. Recurrent disease was the indication for retransplantation in 9% of cases [3% PSC,PBC and 6% HBV,HCV].
- 28-29. Overall, sepsis is the most frequent cause of death. Full details of Miscellaneous and Other Graft Failure deaths are listed in Appendix V. Forty-two percent of all deaths occurred within 6 months of transplant. Early graft failure was due to poor or no early graft function. By 1 year malignancy and graft failure from recurrent disease or chronic rejection cause most deaths.
30. There was a slight rise in the in number of cadaveric donors in 2006 resulting an increase in transplants from 2005. Twelve cadaveric grafts were split in 2005.
31. Donor age has significantly increased in recent years. Long term graft survival was lower in grafts from donors aged 61-65y but not those aged over 65y.
32. The numbers of patients waiting for transplant remains high. At the end of 2006, 132 patients were awaiting a transplant compared with 145 at 31st December 2005. Delistings due to death, becoming too ill or tumour (HCC) progression were 10%. Forty-two patients were listed as urgent in 2006 [16 Category 1 and 26 Category 2]. In 2006 the majority of urgently listed patients received a timely transplant.
- 33-34. Waiting times continue to increase with some patients waiting years to receive a graft. Blood group O patients tend to have the longest waiting times.
- 35-38. Five hundred and fifteen patients (18%) have had a pre- or post-transplant cancer. One hundred and twenty eight (4%) of patients were transplanted for liver malignancy (Primary Malignancy) and thirty (23% of these patients) died from this cancer.
- 38-40. Two hundred and sixty two patients had a liver cancer as a secondary diagnosis (Secondary Malignancy) and thirty six [14% of these patients] have died from this cancer. Hepatocellular carcinoma was the most common secondary malignancy (230), however those with cholangiocarcinoma (24) had significantly poorer survival.
- 41 -44. De novo non skin cancers (136) have developed in 130 (5%) patients and 52 [40%] have died from this cancer. Cancers of the alimentary tract and lymphoma predominate. Lower GI cancers account for 60% of alimentary tract cancers. Patients with either de novo non skin cancers or liver cancers have significantly worse long term survival. Alimentary tract cancers are the most common irrespective of the pre transplant liver disease.
- 44-45. Three hundred and ten (11%) patients have developed 1927 skin cancers with 182 patients having multiple skin cancer types. The cumulative risk of diagnosis on any cancer post transplant is approaching 40% by 20 years.

Section 1

Demographic Data

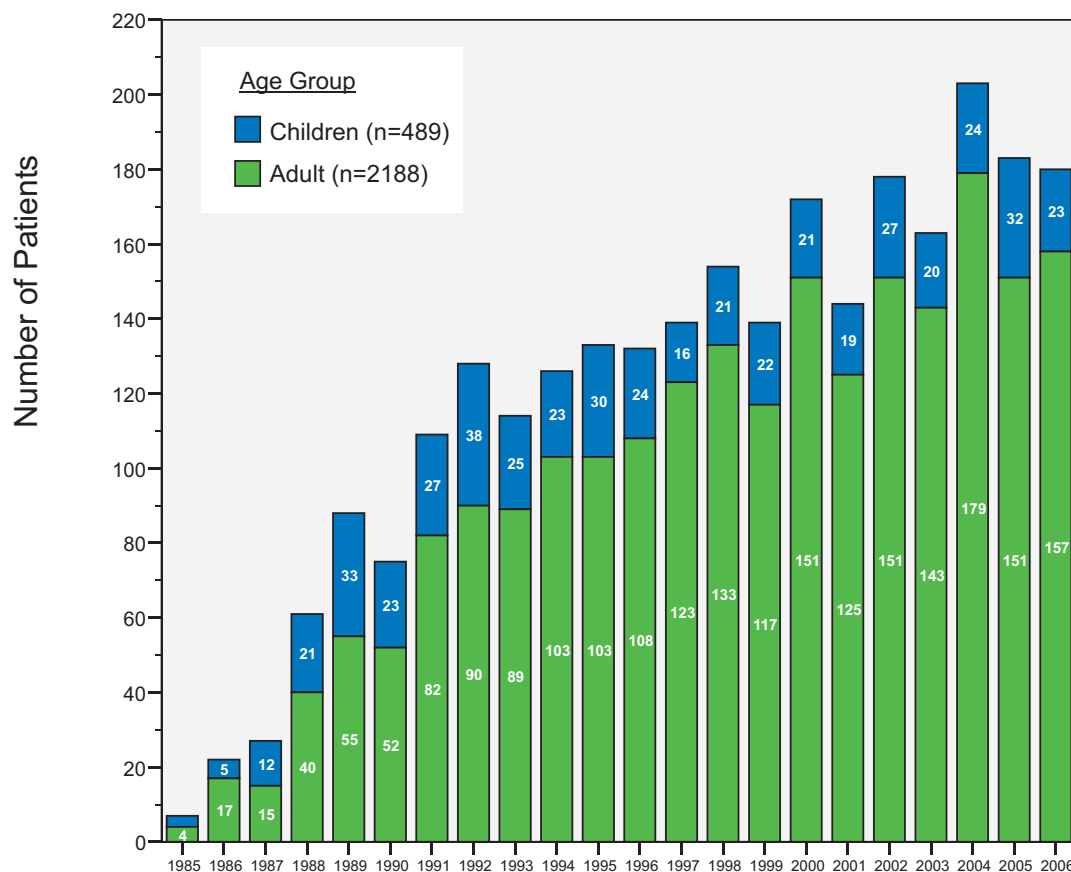




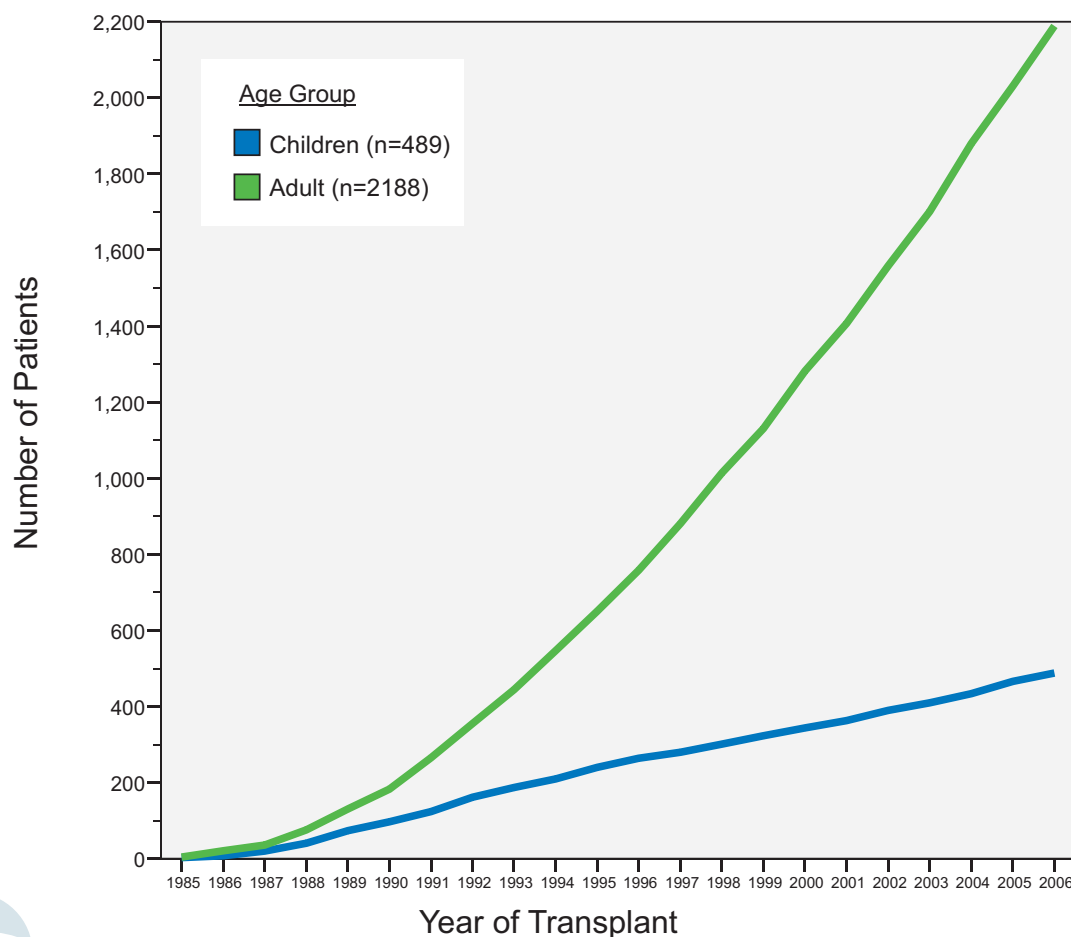
Summary Statistics - Age and Gender

ALL PATIENTS

	Children	Adults	Total
Patients	489	2188	2677
Age			
<i>Mean ± SD</i>	4.4 ± 4.2	47.2 ± 11.8	39.4 ± 19.8
<i>Median</i>	2.5y	48.9y	46y
<i>Range</i>	24d -14.9y	15.0 - 73.1y	24d - 73.1y
Gender			
<i>Female</i>	259 (53%)	814 (37%)	1073 (40%)
<i>Male</i>	230 (47%)	1375 (63%)	1604 (60%)
Surviving	385 (79%)	1610 (74%)	1995 (75%)

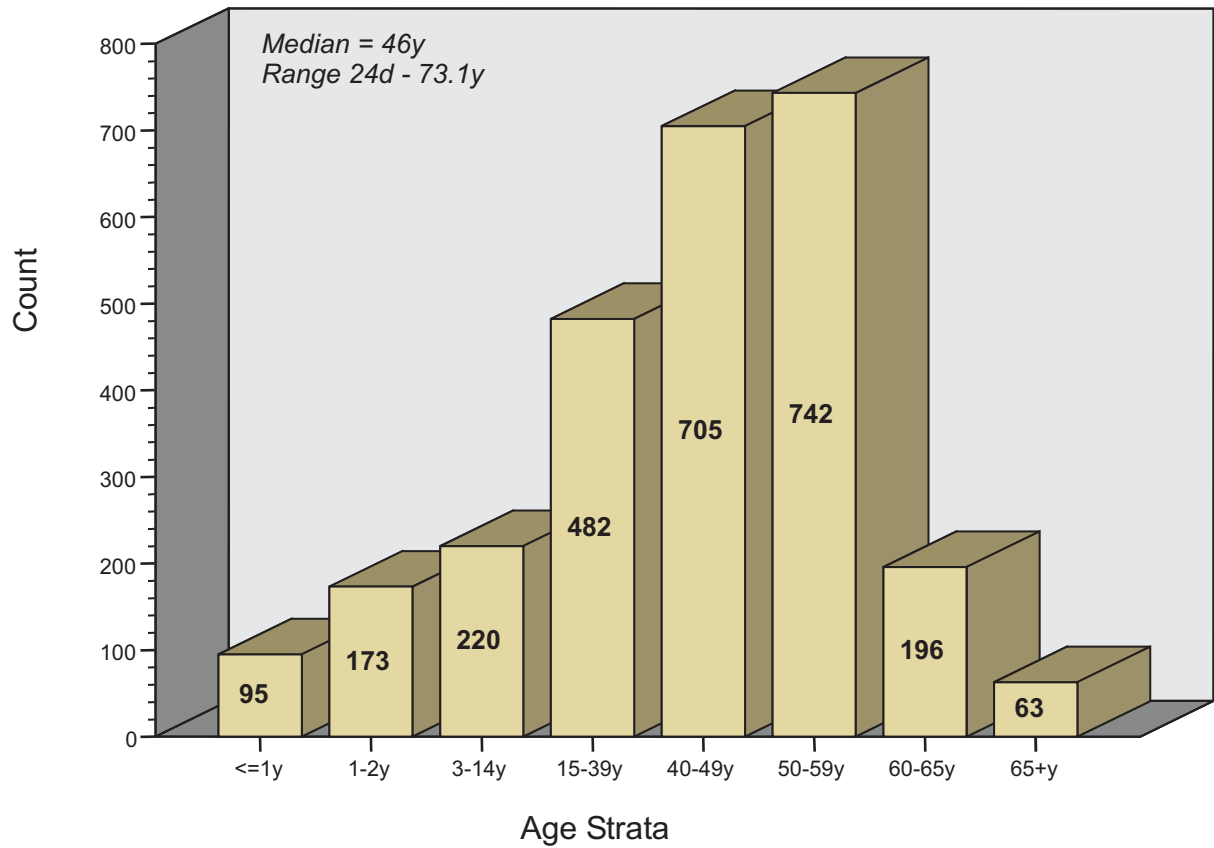


Cumulative Number of New Patients

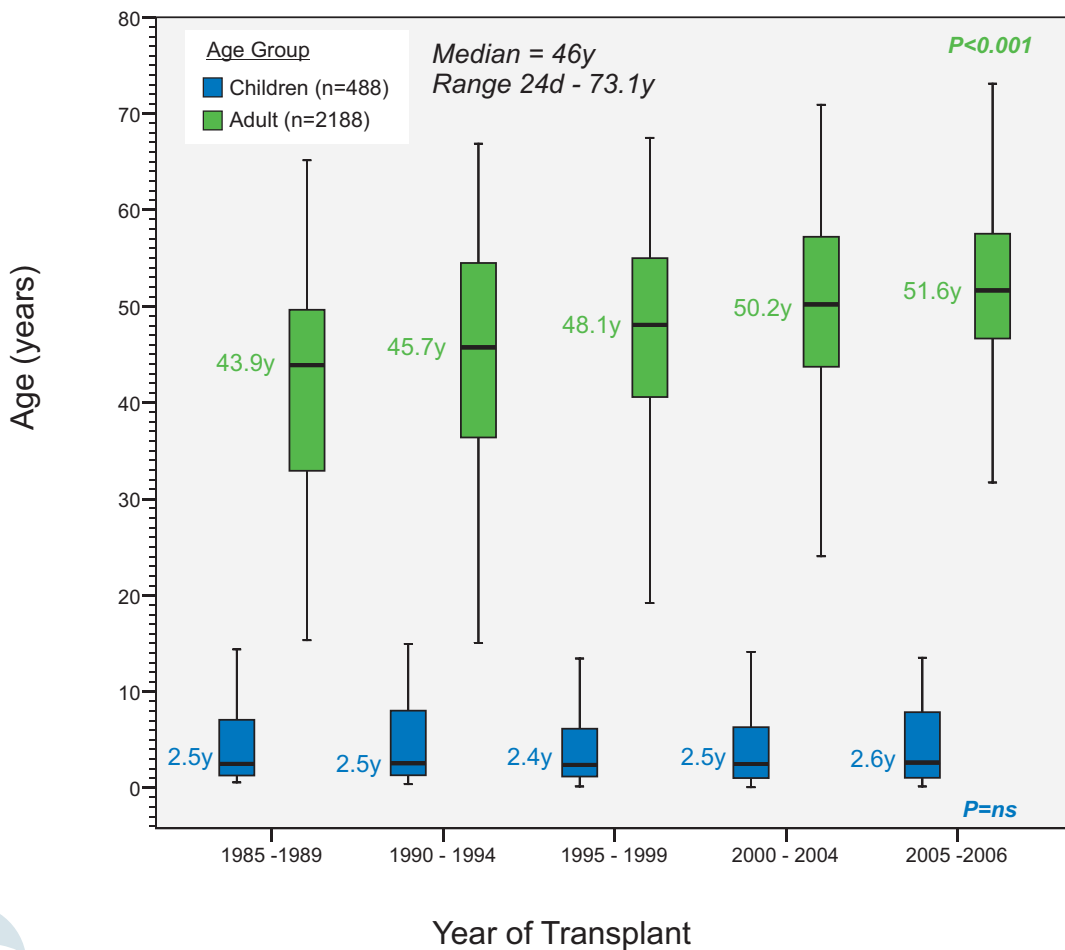


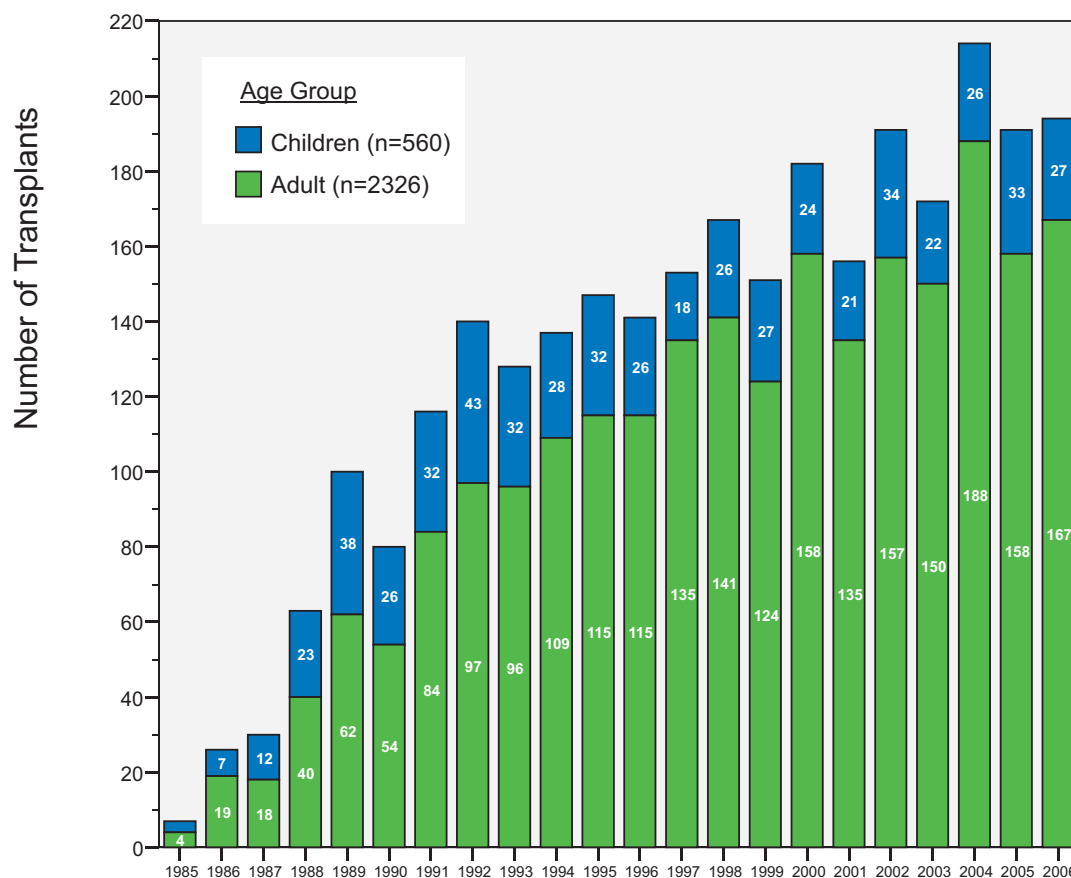
Number of Recipients By Age at Primary Transplant

N=2676

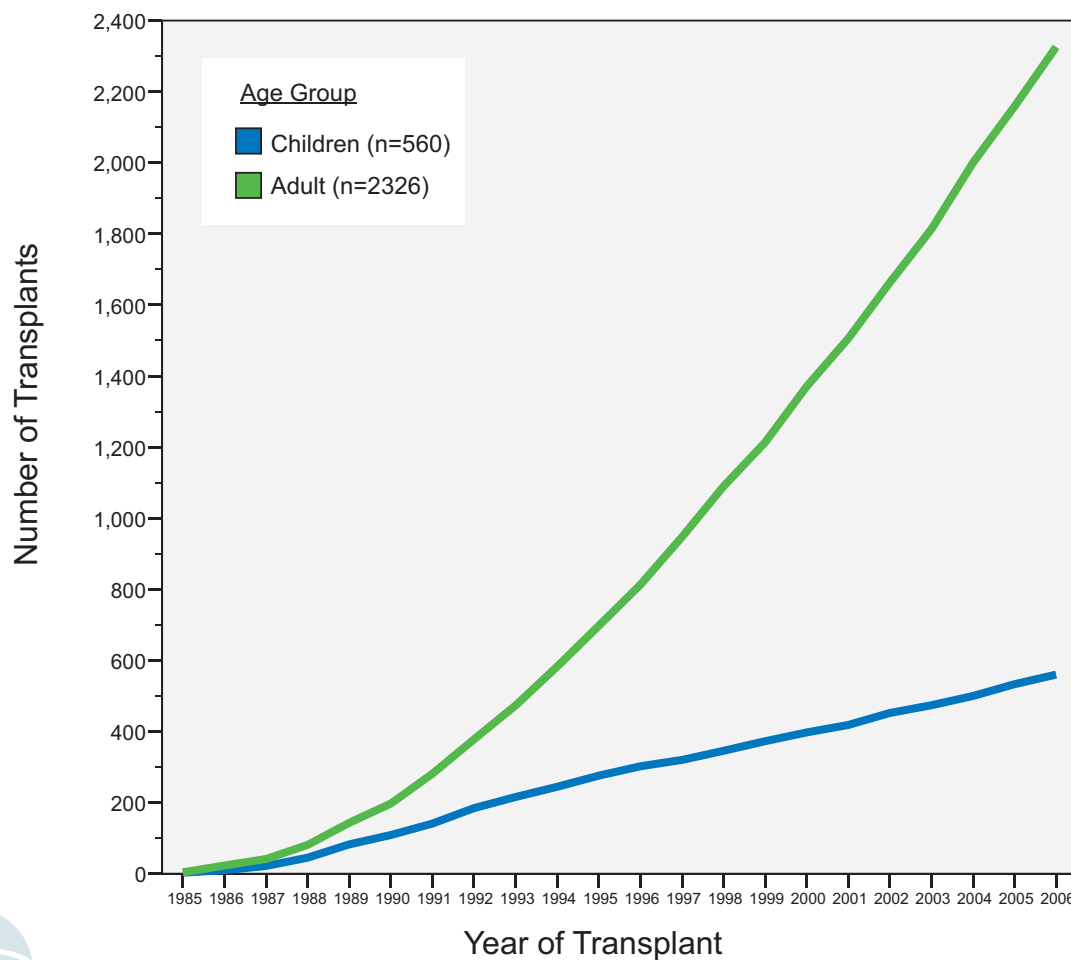


Age at Primary Transplant by Era

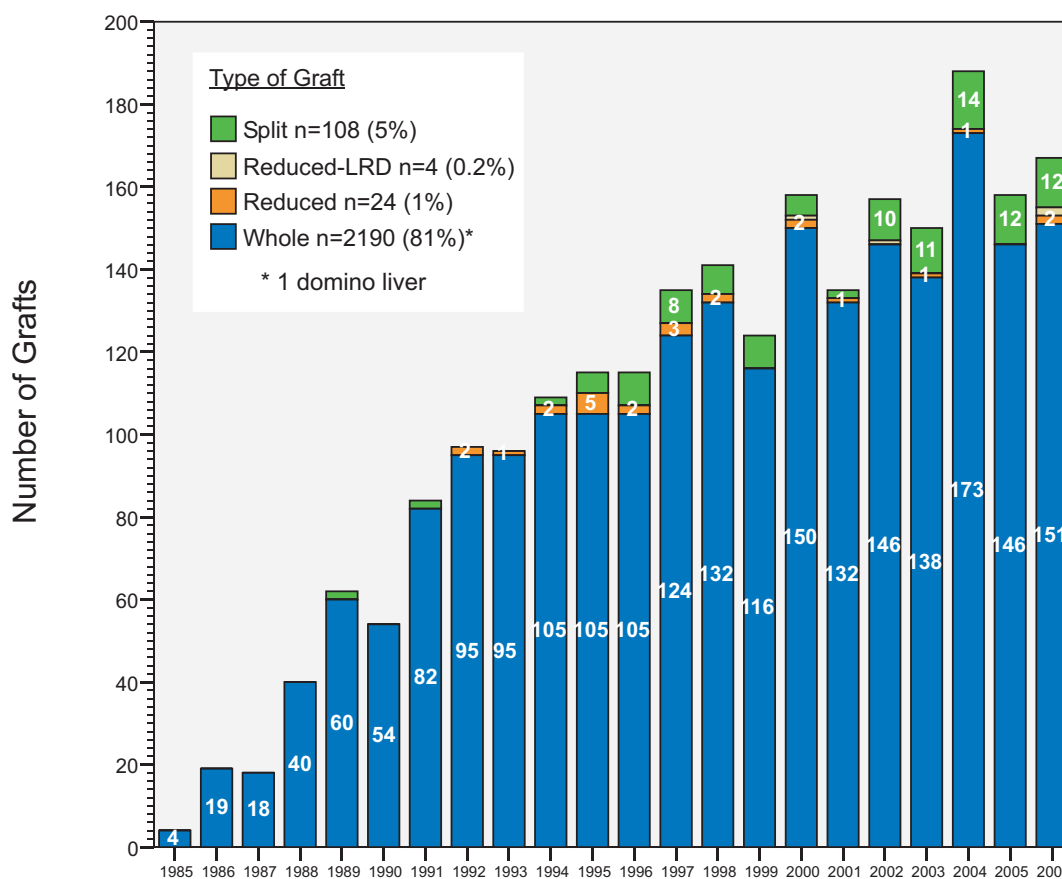
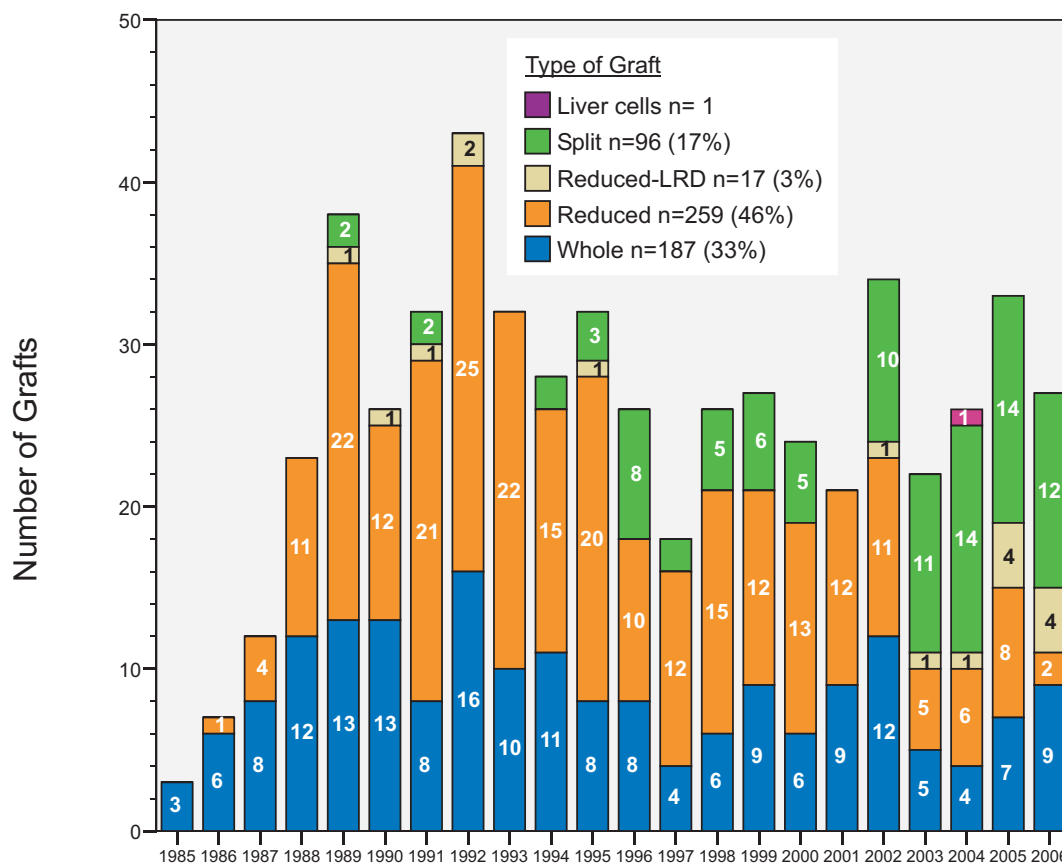




Cumulative Number of Transplants



Type of Graft by Year Split vs Reduced vs Whole



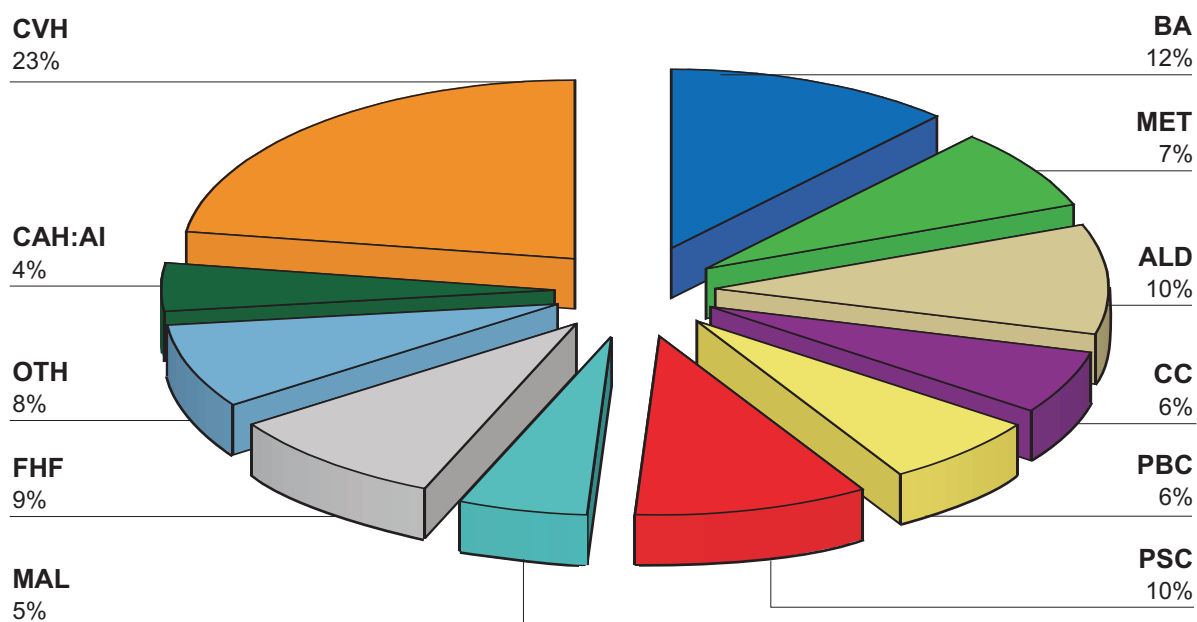
Year of Transplant



Section 2

Primary Diagnosis





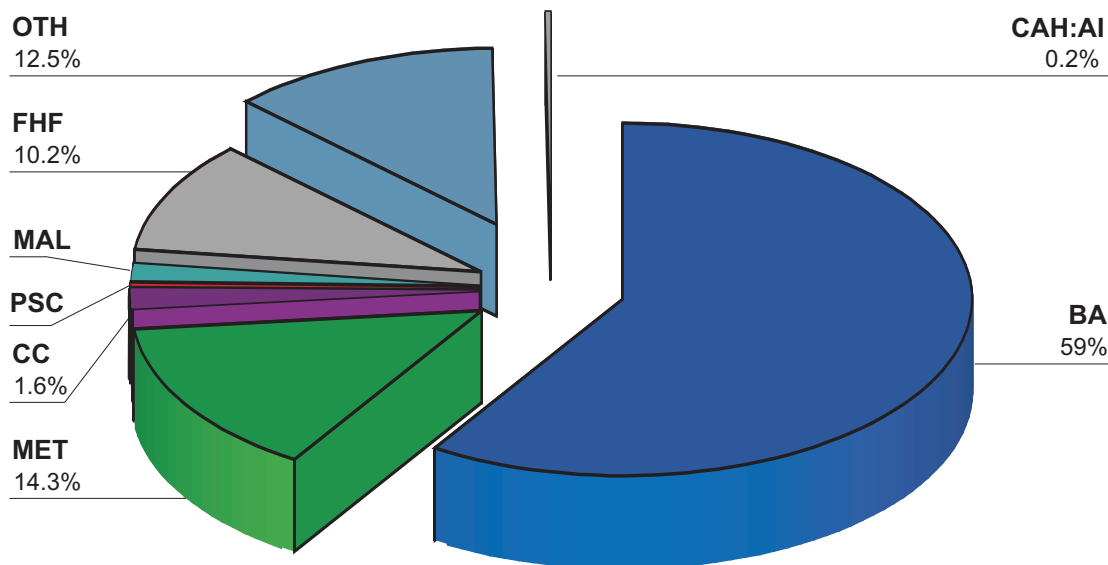
Diagnosis Group

BA	- Biliary atresia
MET	- Metabolic diseases*
ALD	- Alcoholic cirrhosis
CC	- Cryptogenic cirrhosis
PBC	- Primary biliary cirrhosis
PSC	- Primary sclerosing cholangitis
MAL	- Malignancy
FHF	- Fulminant hepatic failure*
OTH	- Other diseases*
CAH : AI	- Chronic active hepatitis [autoimmune]
CVH	- Chronic viral hepatitis

* See Appendices for details

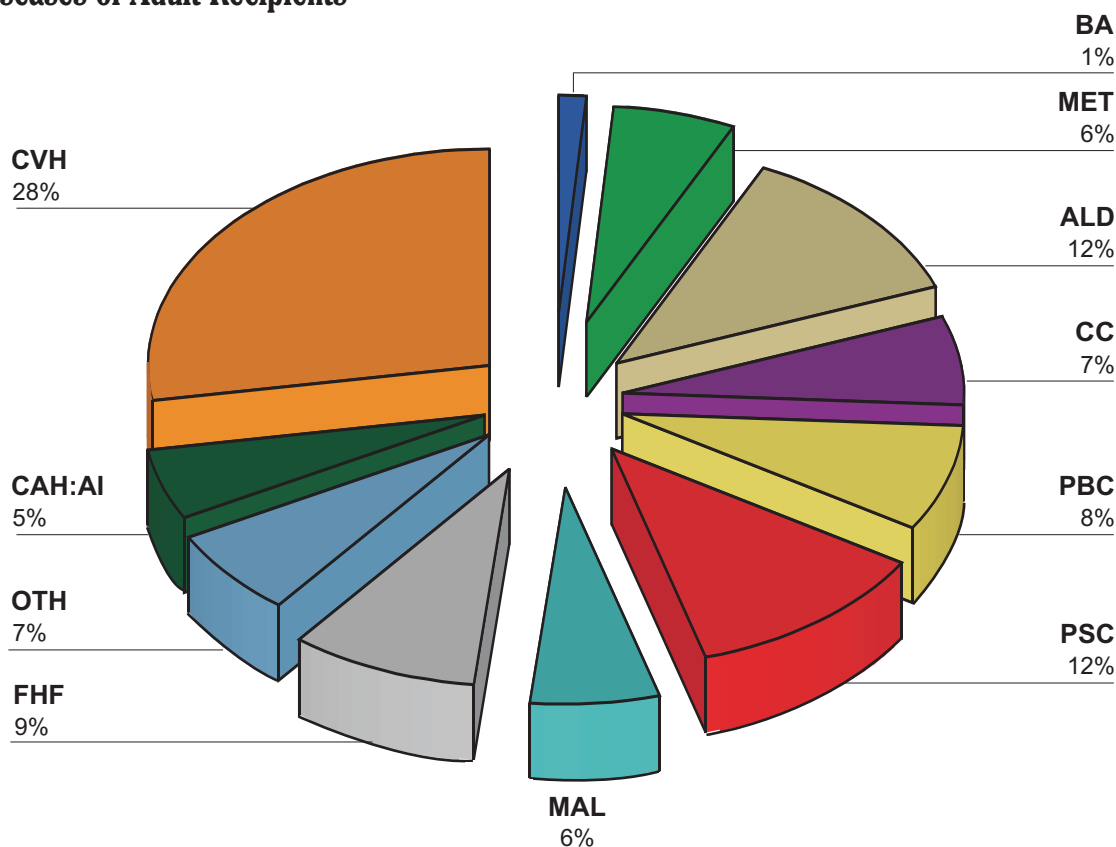
Primary Diseases of Children

n = 489



Primary Diseases of Adult Recipients

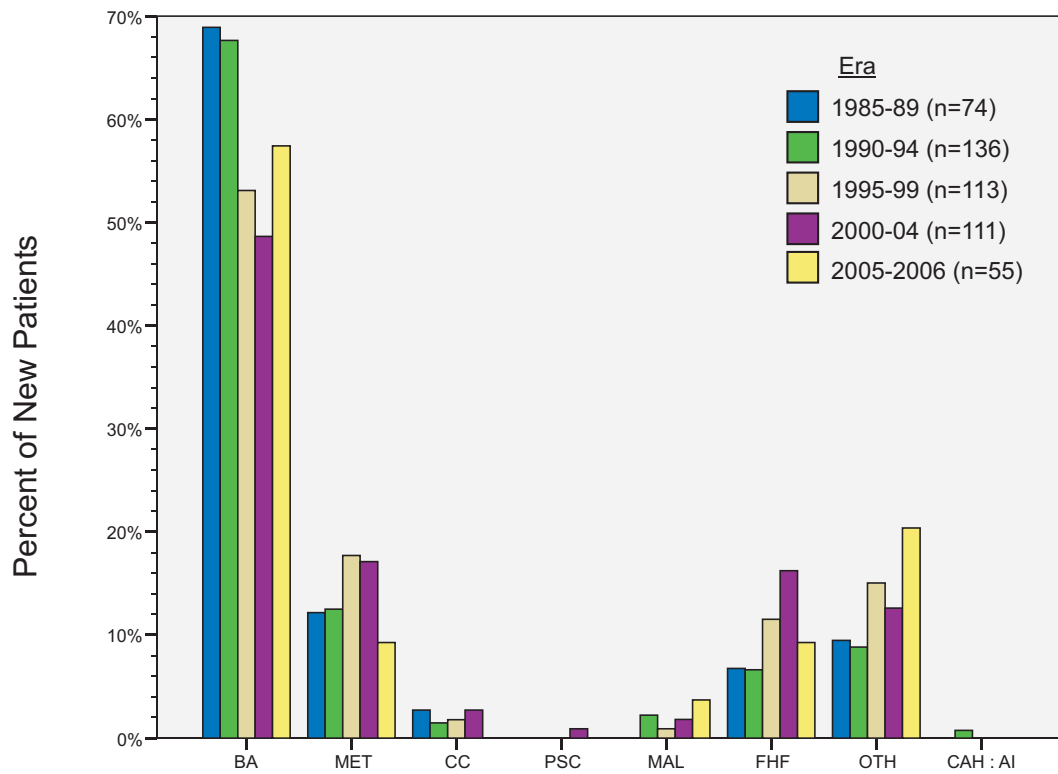
n = 2188



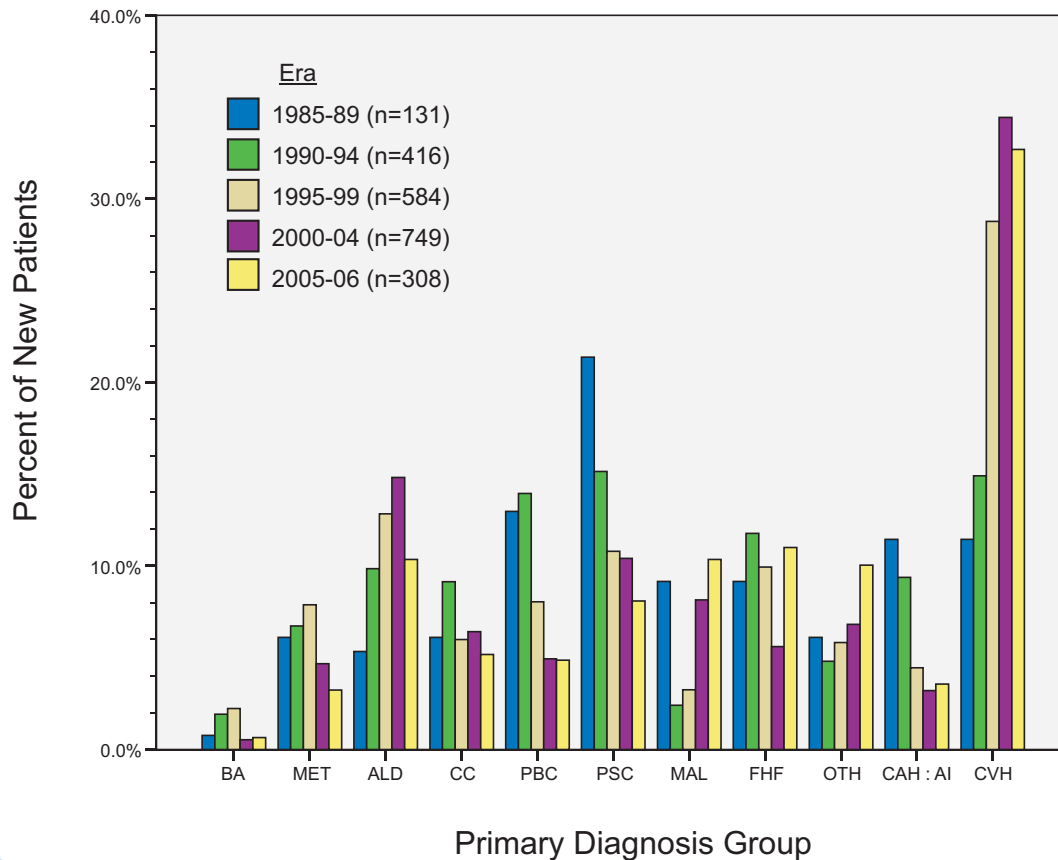
Diagnosis Group

BA	- Biliary atresia	PSC	- Primary sclerosing cholangitis
MET	- Metabolic diseases	MAL	- Malignancy
ALD	- Alcoholic cirrhosis	FHF	- Fulminant hepatic failure
CC	- Cryptogenic cirrhosis	OTH	- Other diseases
PBC	- Primary biliary cirrhosis	CAH : AI	- Chronic active hepatitis [autoimmune]
		CVH	- Chronic viral hepatitis

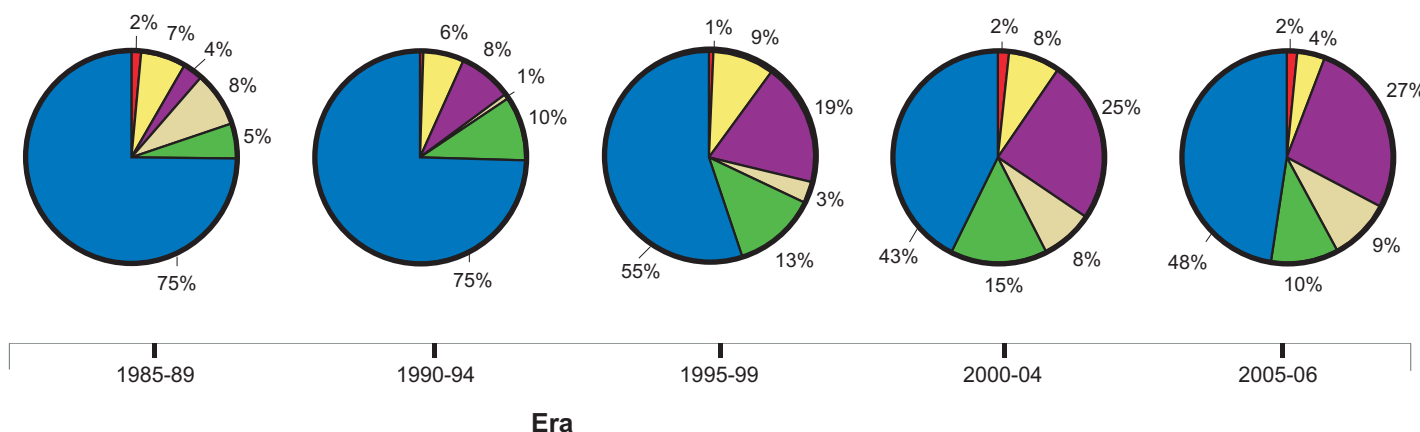
Children (n=489)



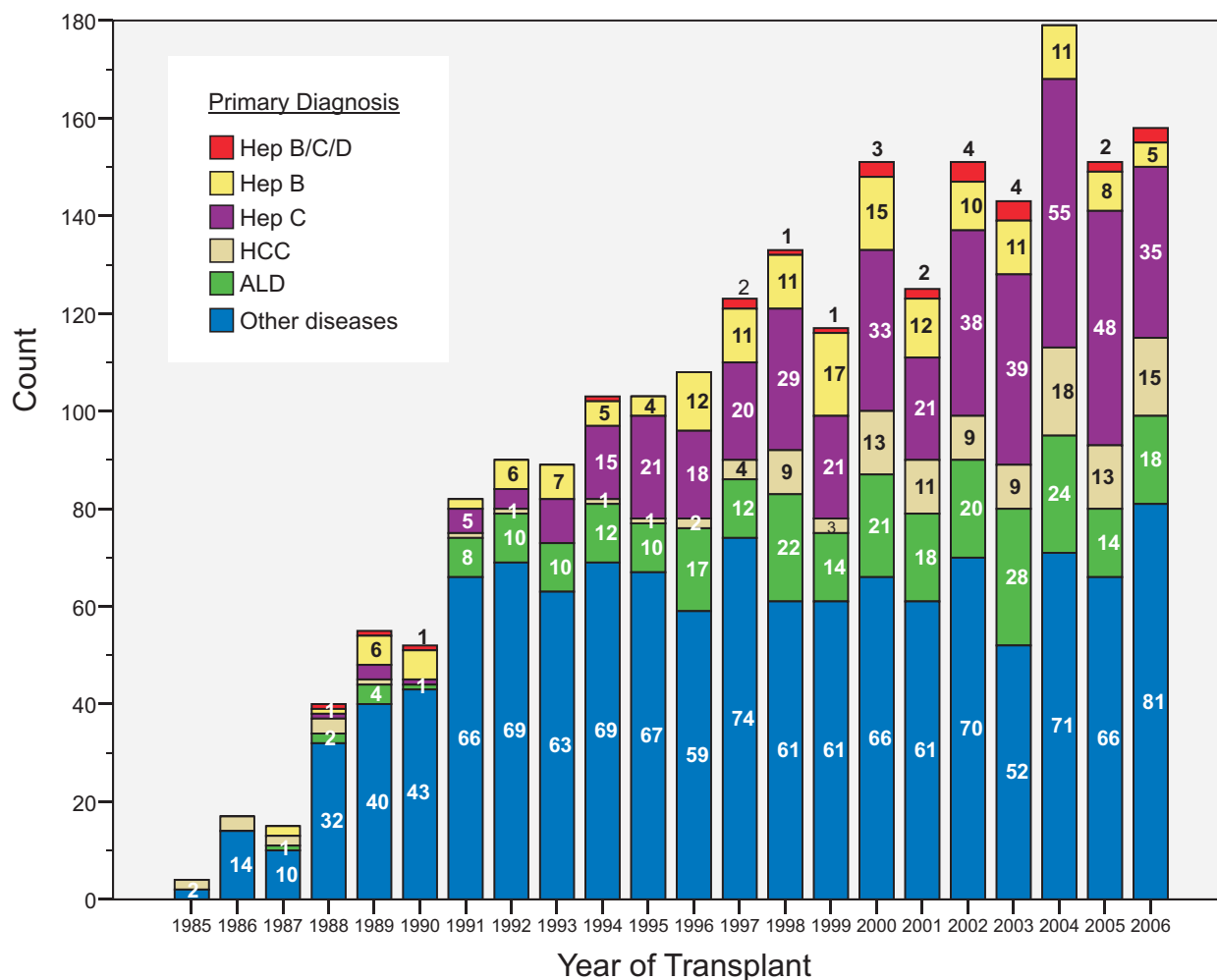
Adults (n = 2188)



Adult Diagnosis

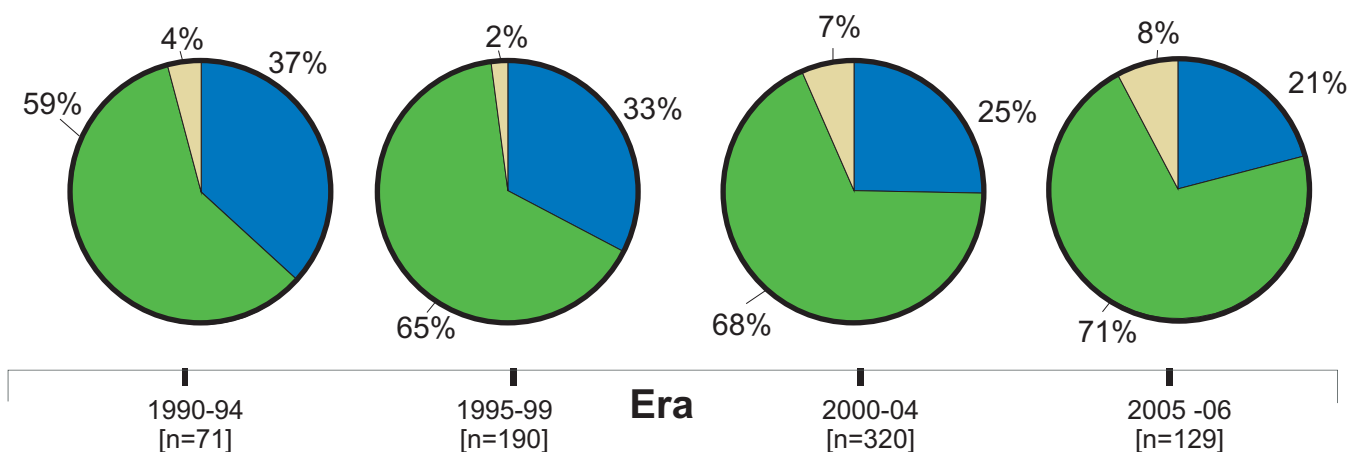


Adult Primary Diagnosis by Year

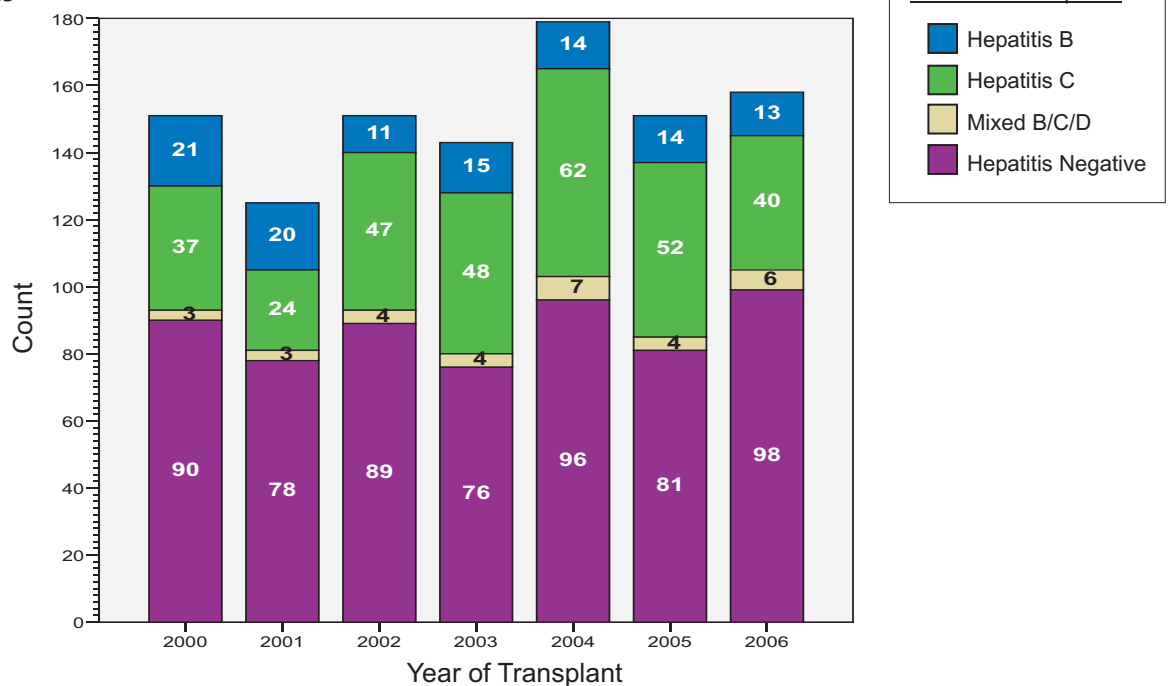


Primary Diagnosis		n =	Secondary / Tertiary diagnosis				
			Hepatitis C	Hepatitis B	Hepatitis B,C	HCC	ALD
Hepatitis C		416		5		82	96
Hepatitis B		162	4			44	4
Hepatitis BD/BC/BCD		26				2	5
HCC + cirrhosis		121	49	47	4		11
ALD		266	10	2		25	
Other		1197	11	3		35	19
TOTAL		2188					

Type of Chronic Viral Hepatitis in Adult Patients



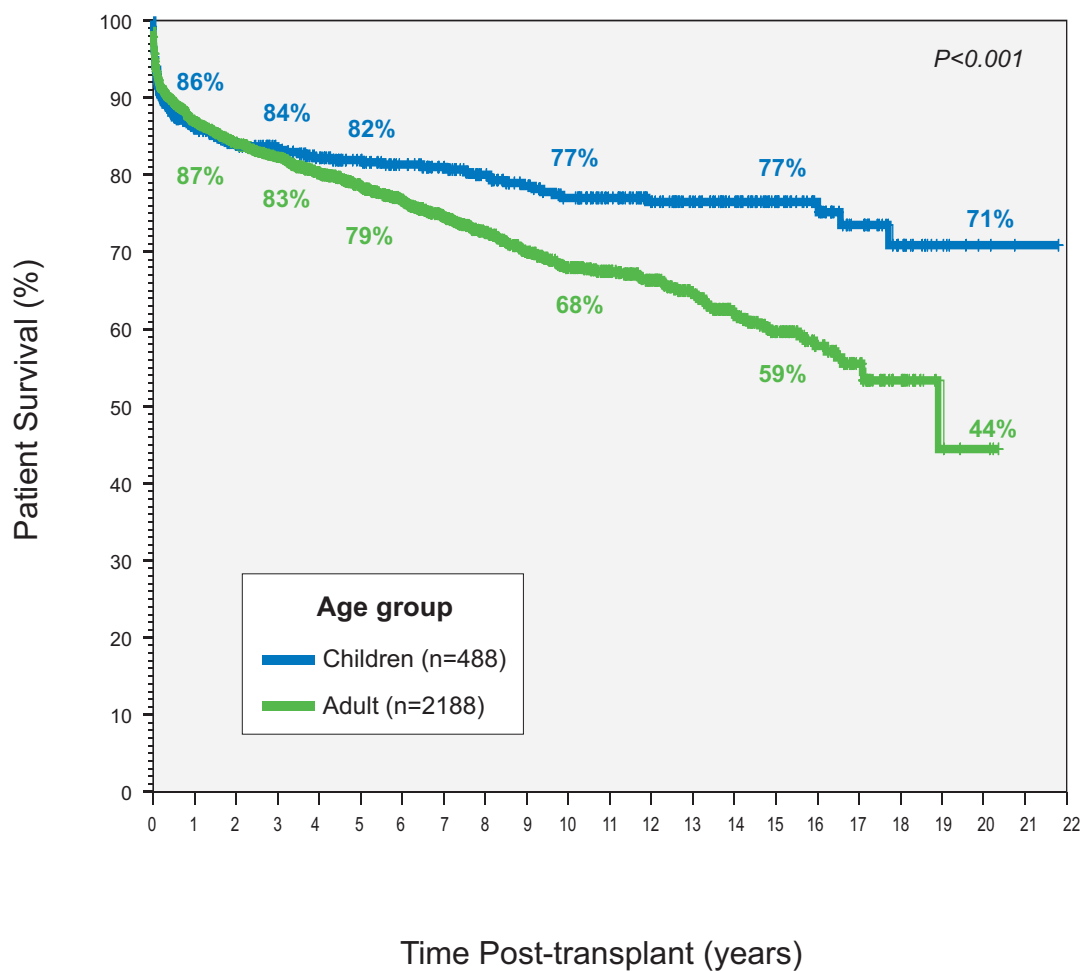
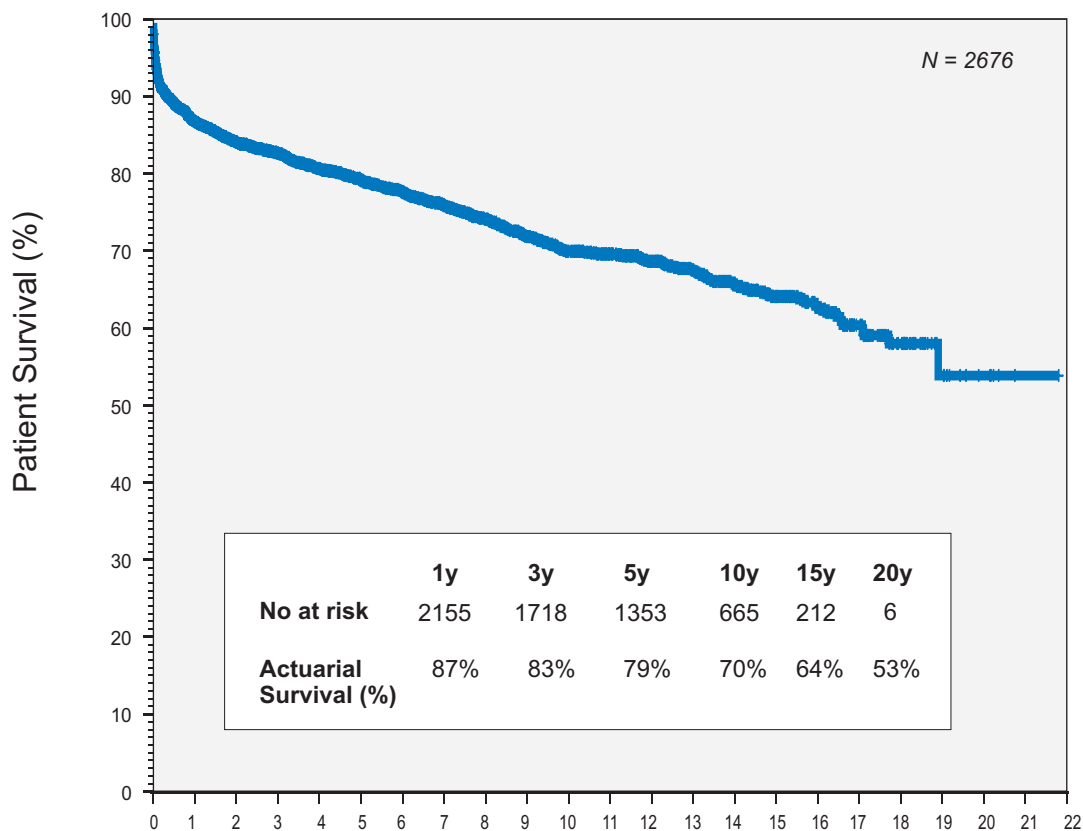
Hepatitis diagnosis

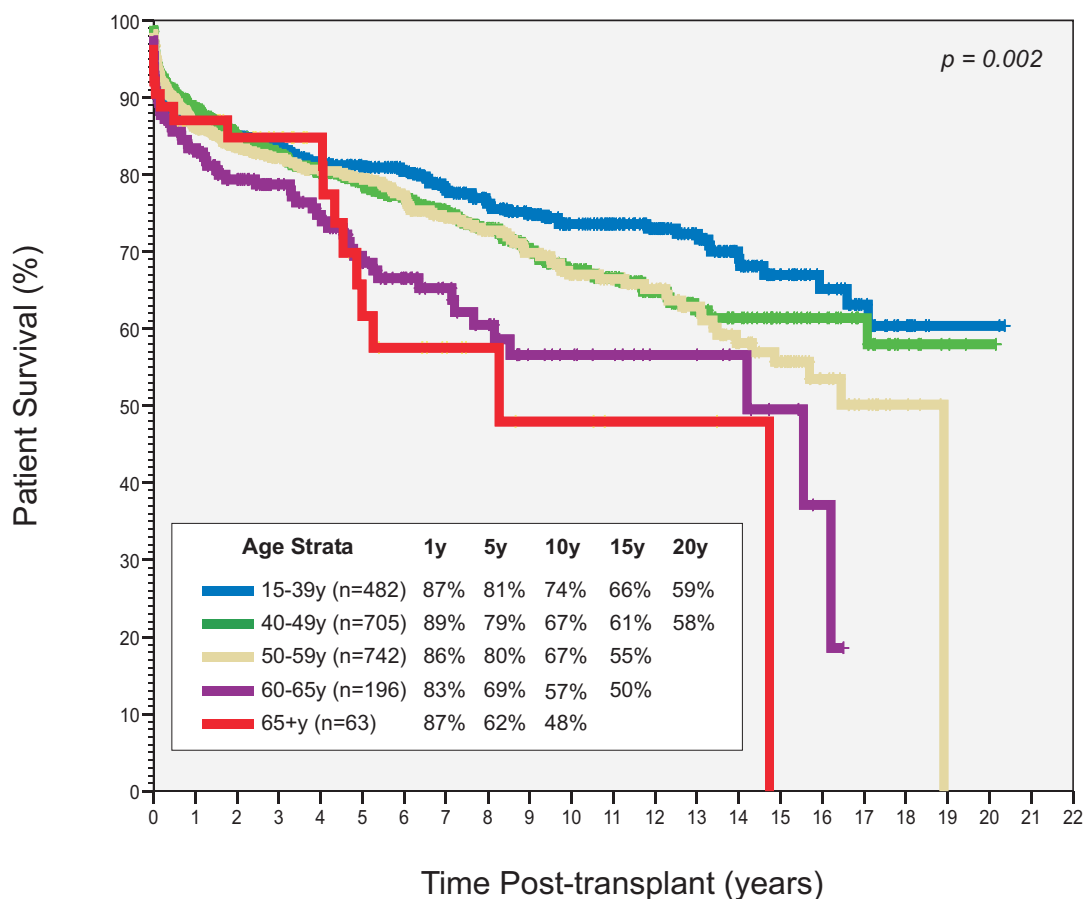
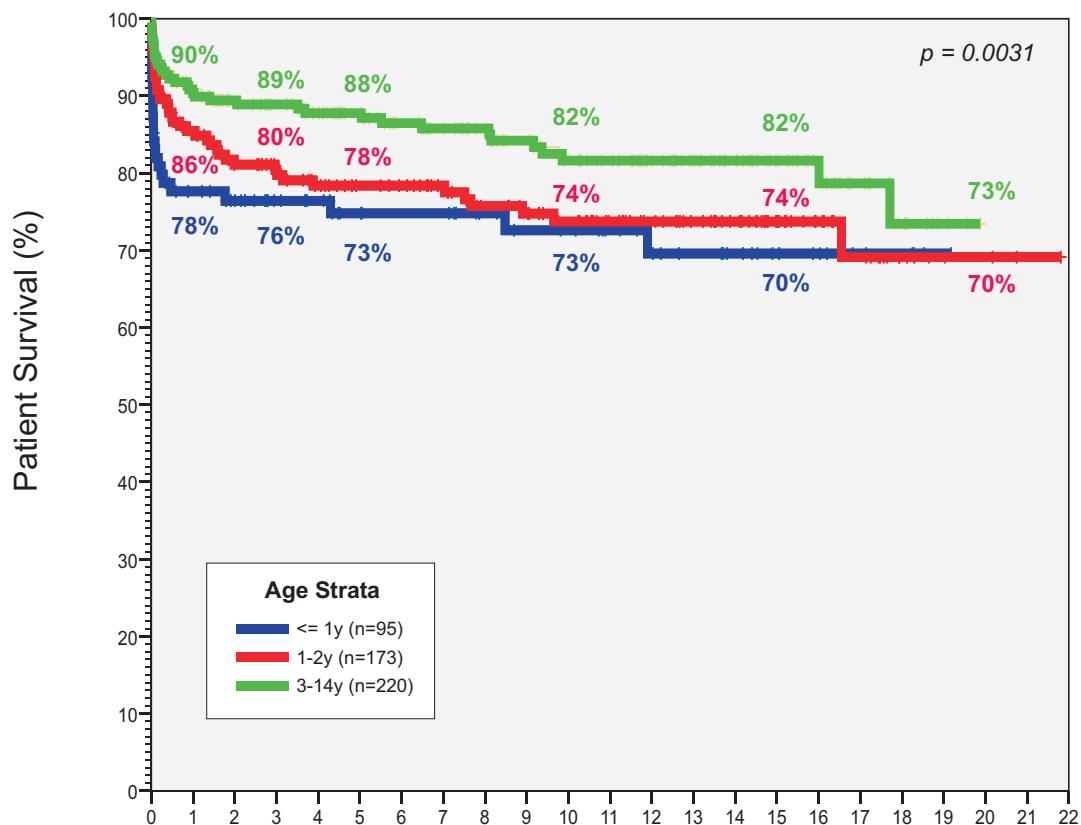


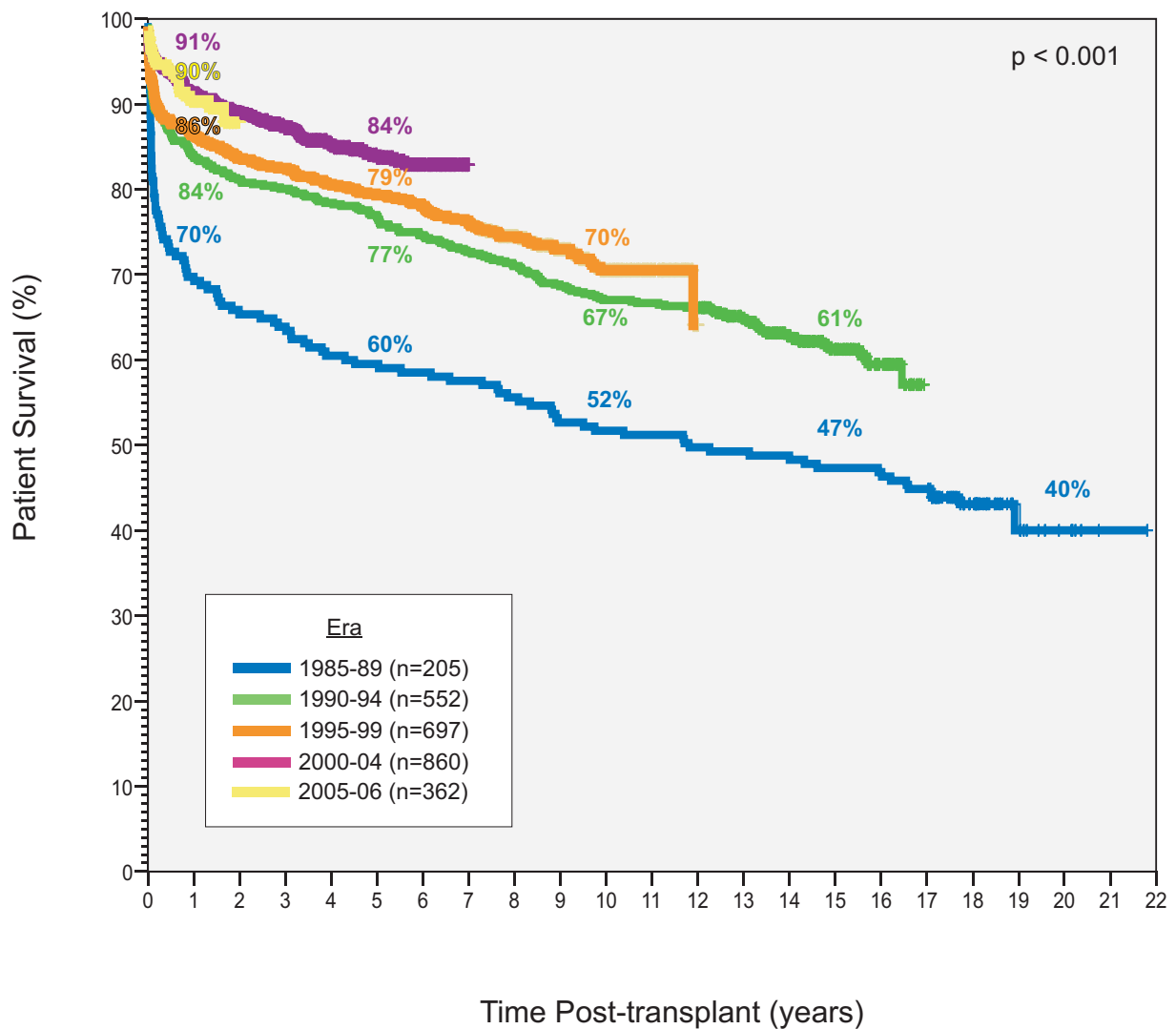
Section 3

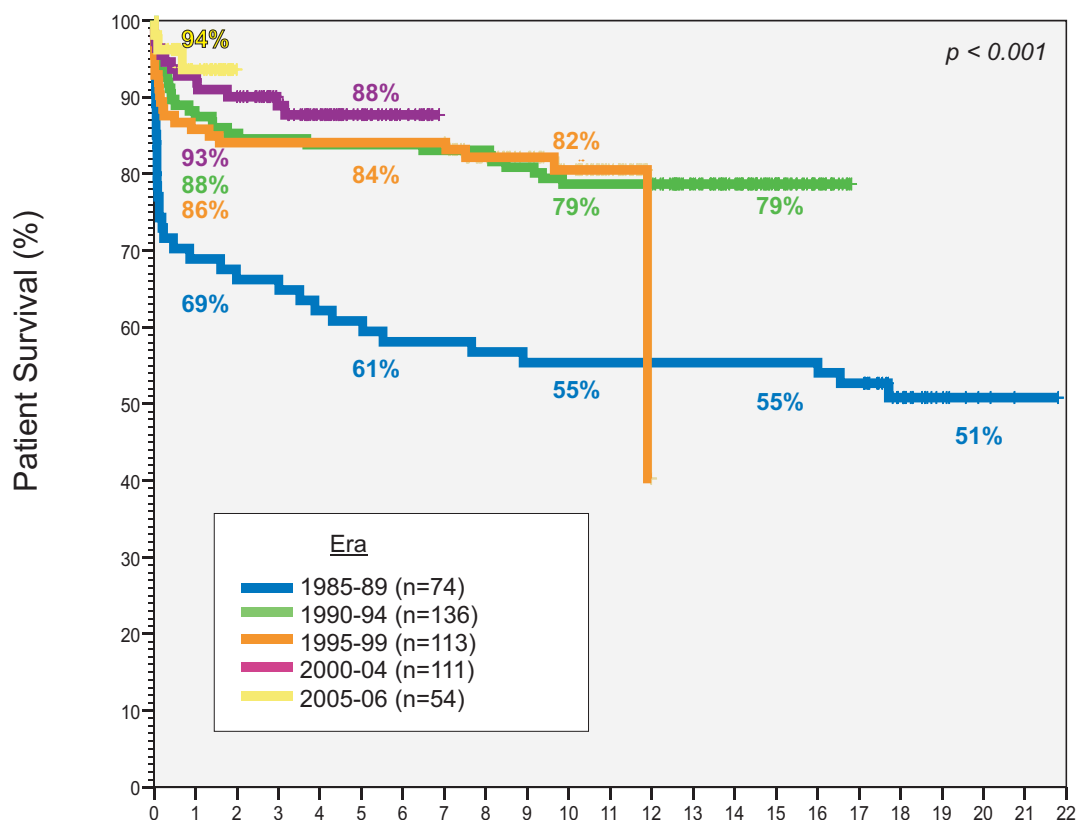
Patient Survival



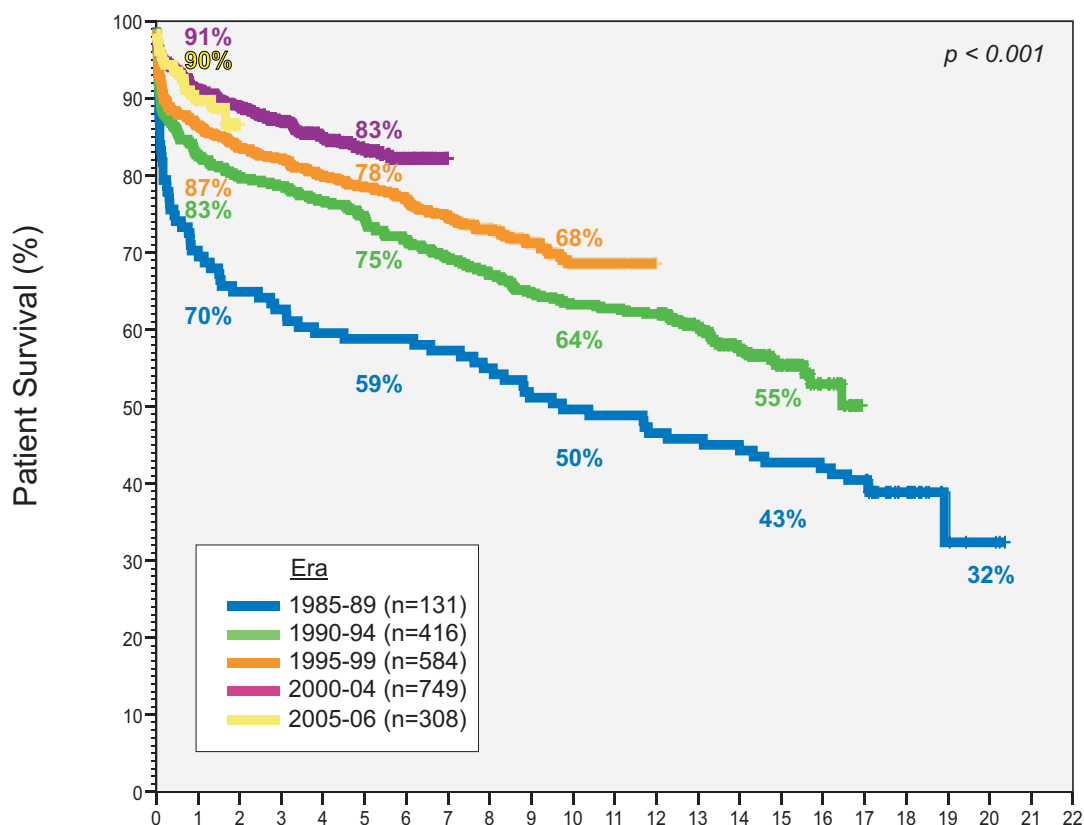




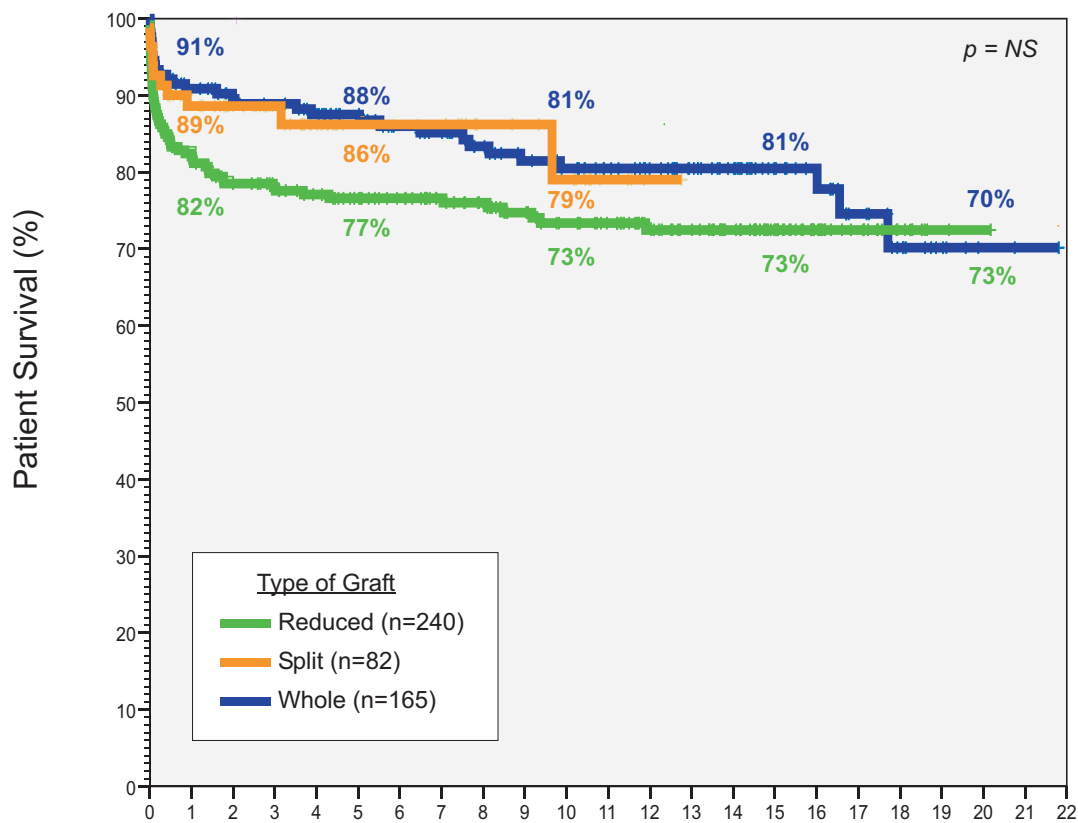




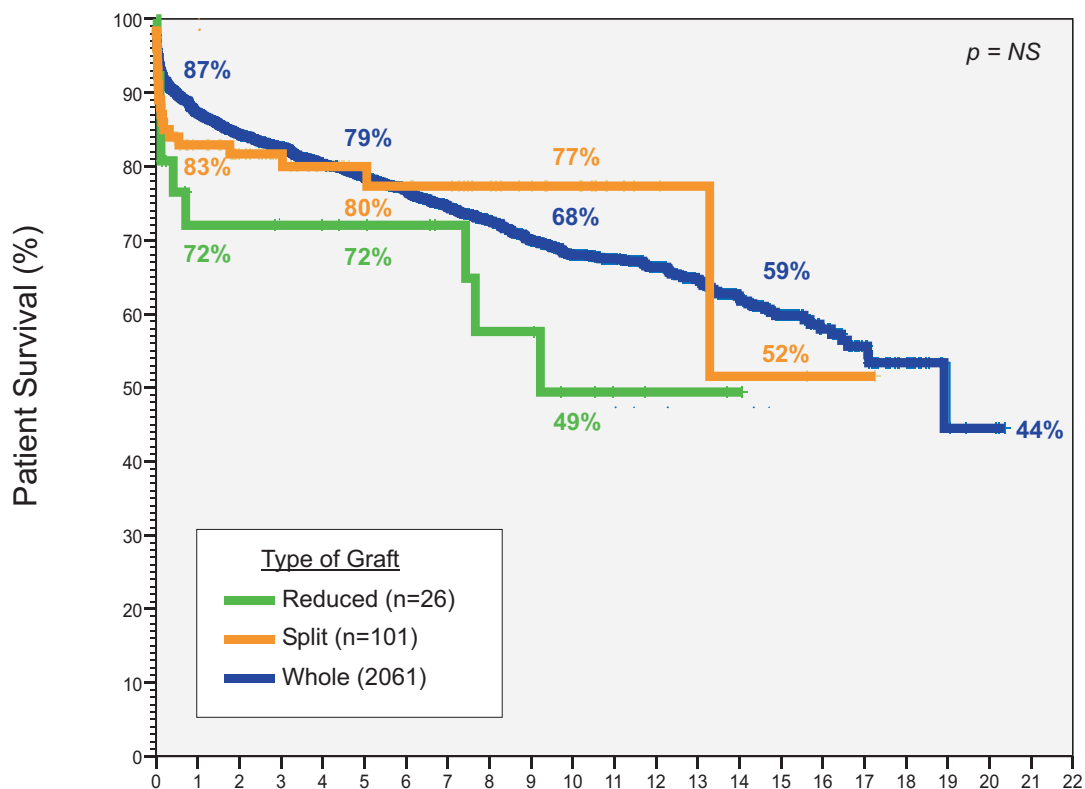
Patient Survival - Adults



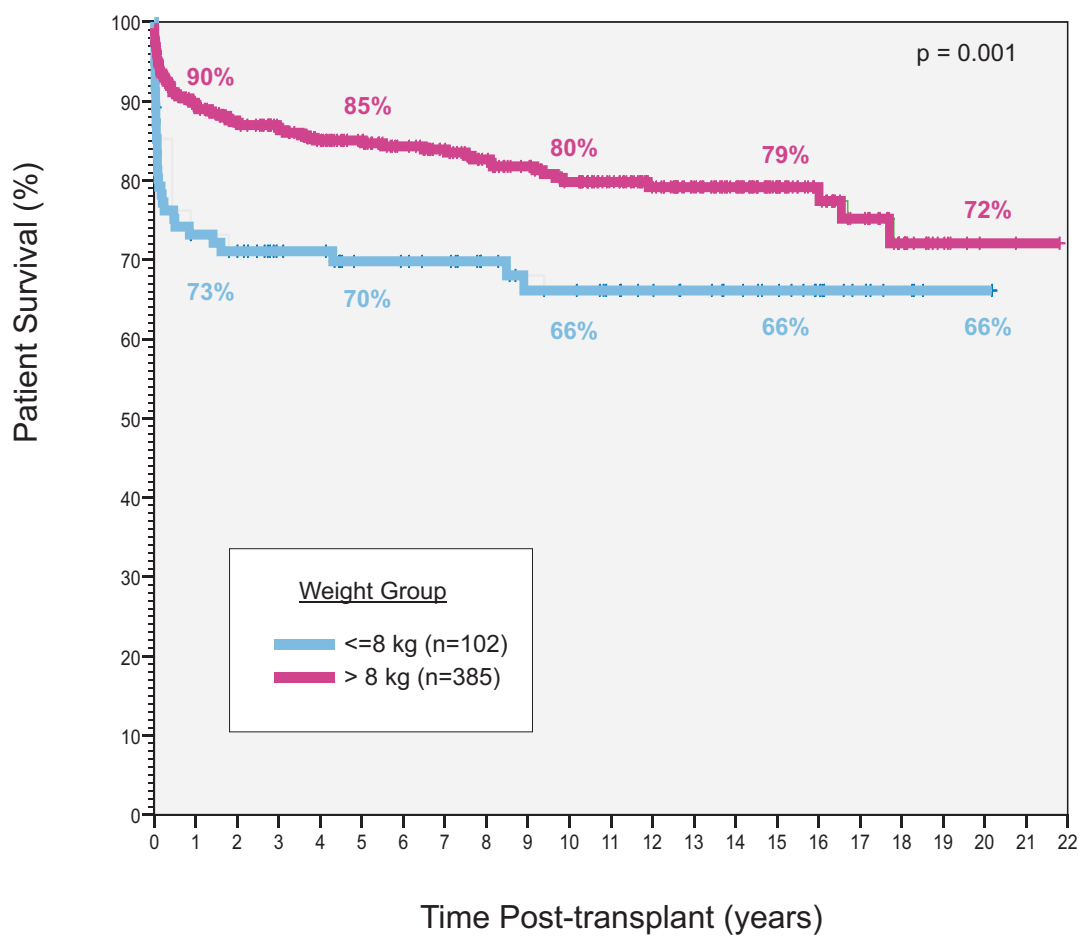
Children - n = 488



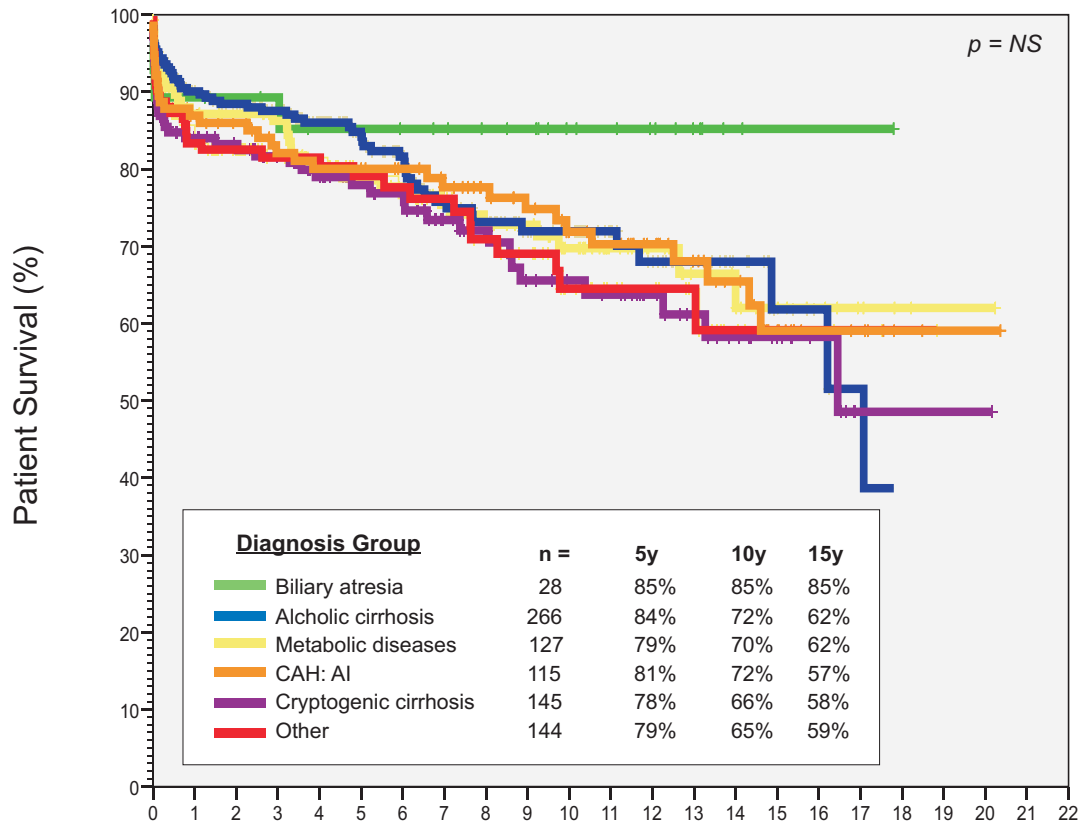
Adults - n = 2188



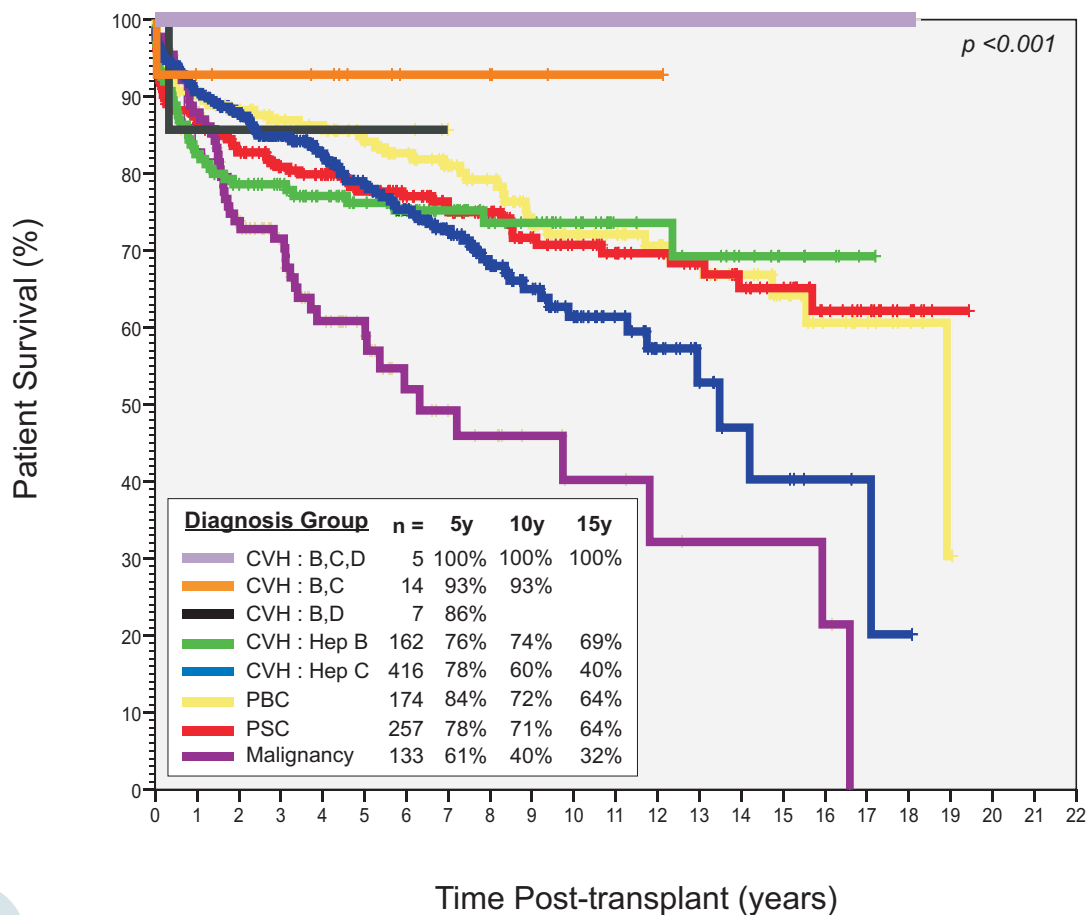
Time Post-transplant (years)



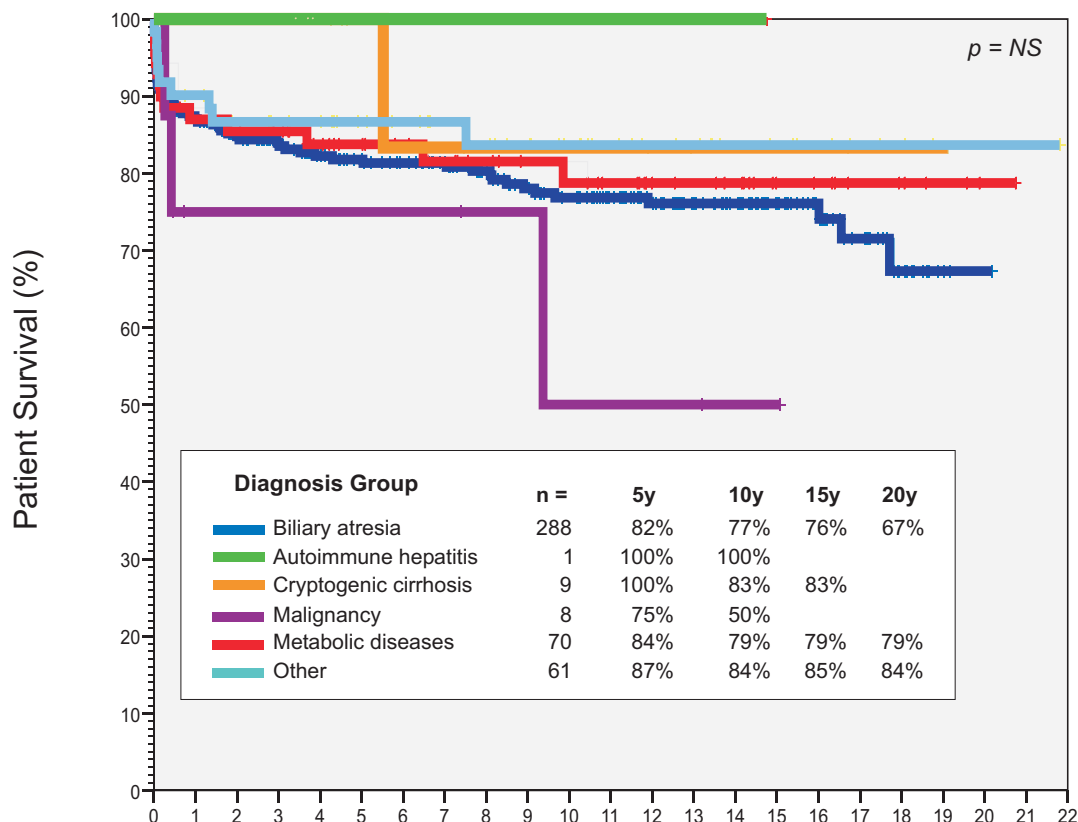
(1) Adults [excluding FHF] - n=825



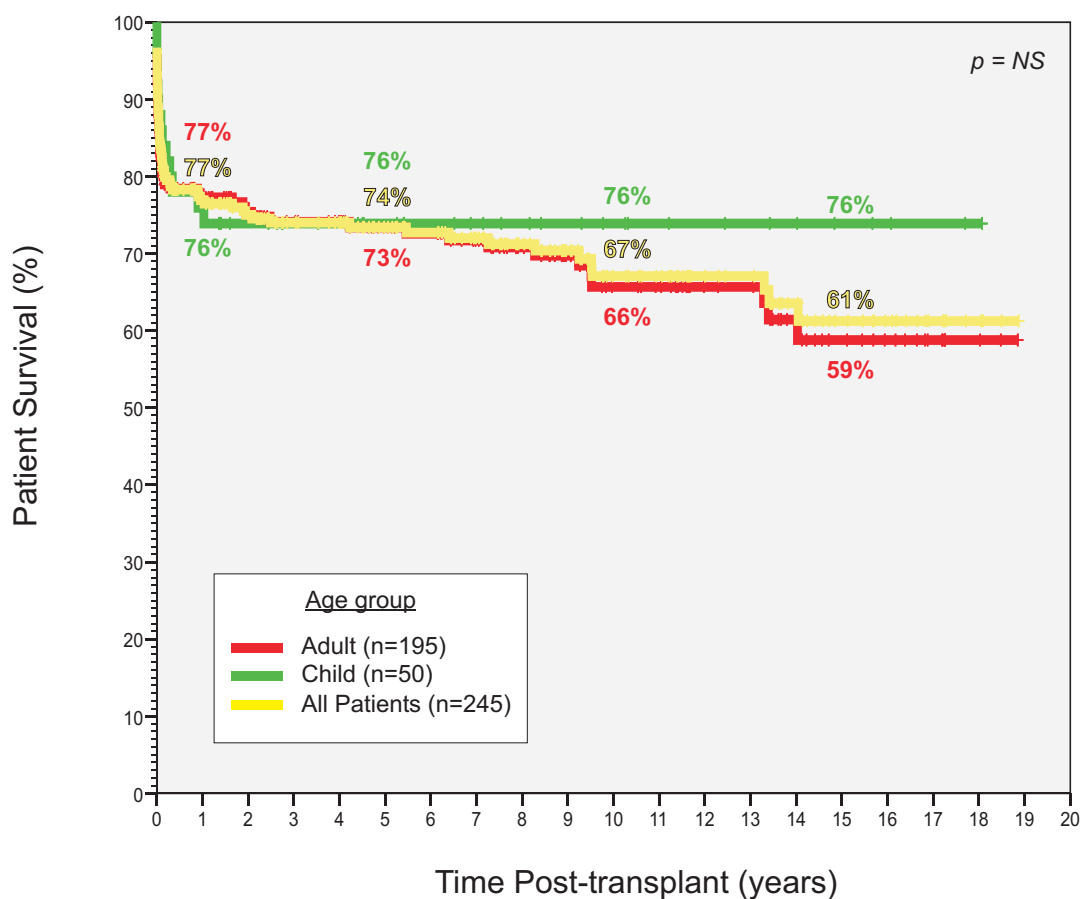
(2) Adults [excluding FHF] - n=1168

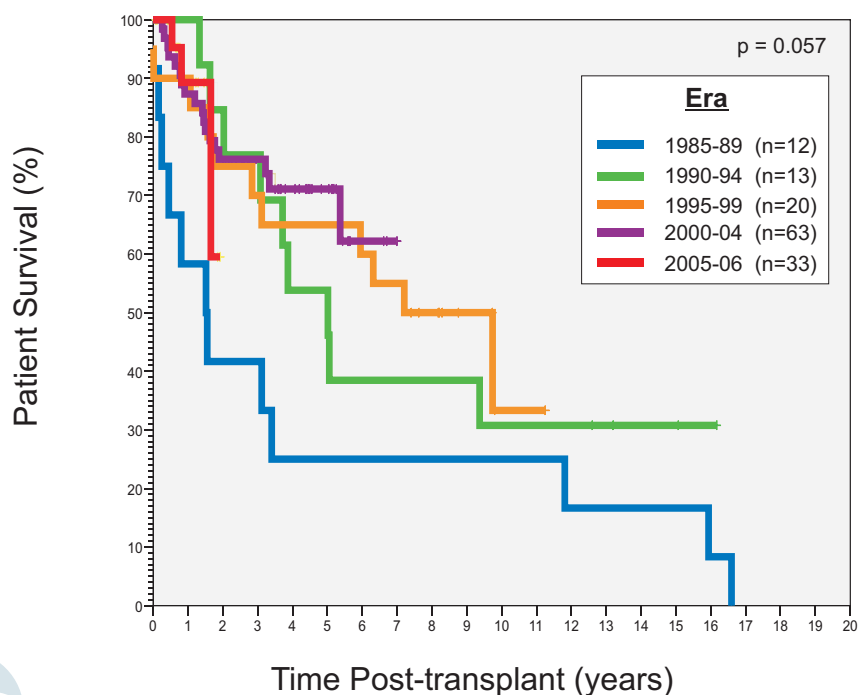
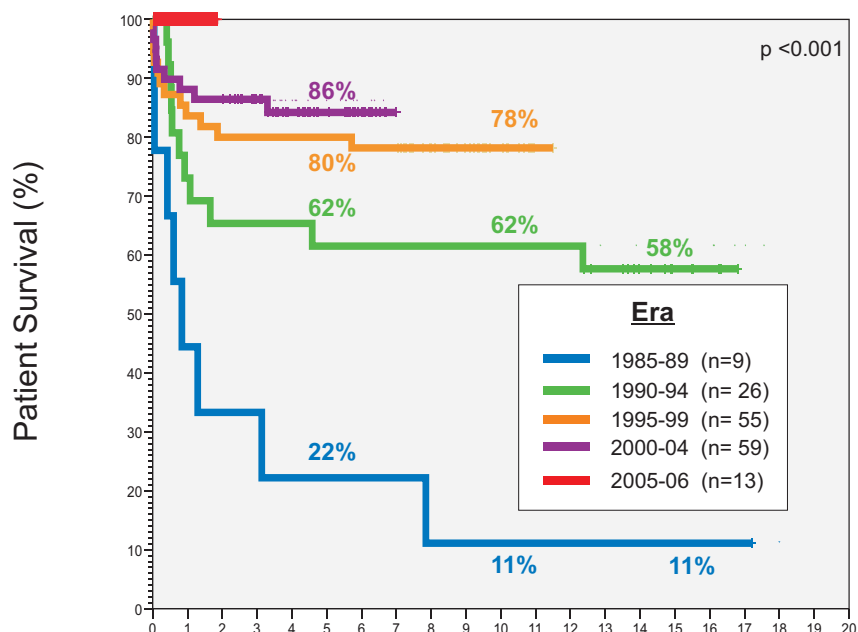
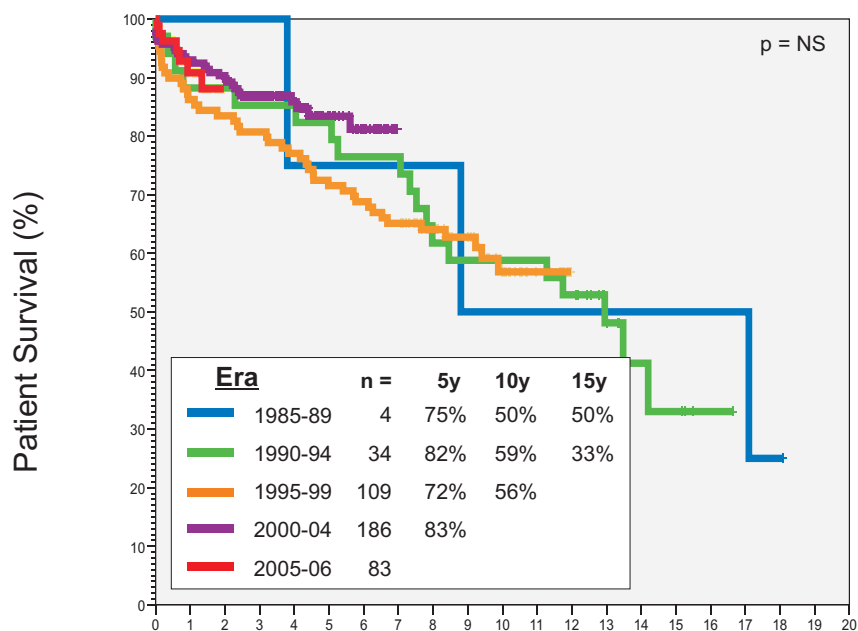


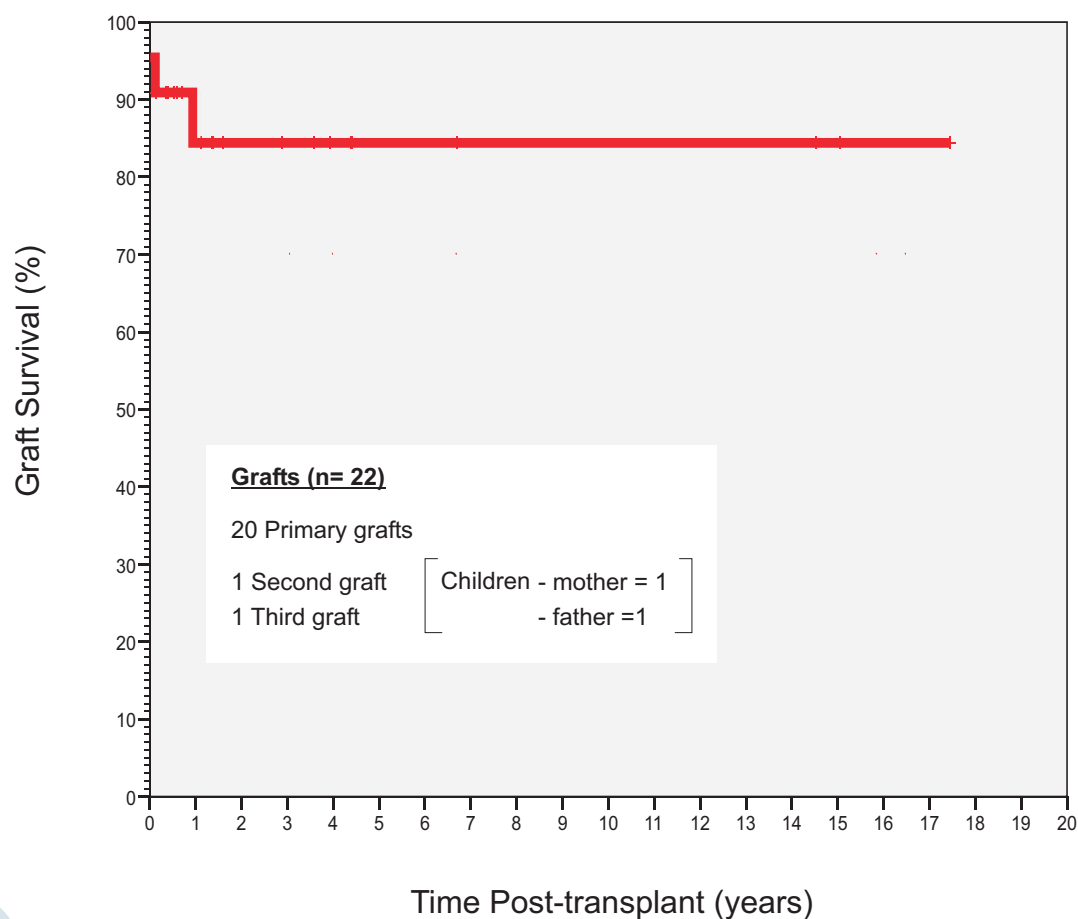
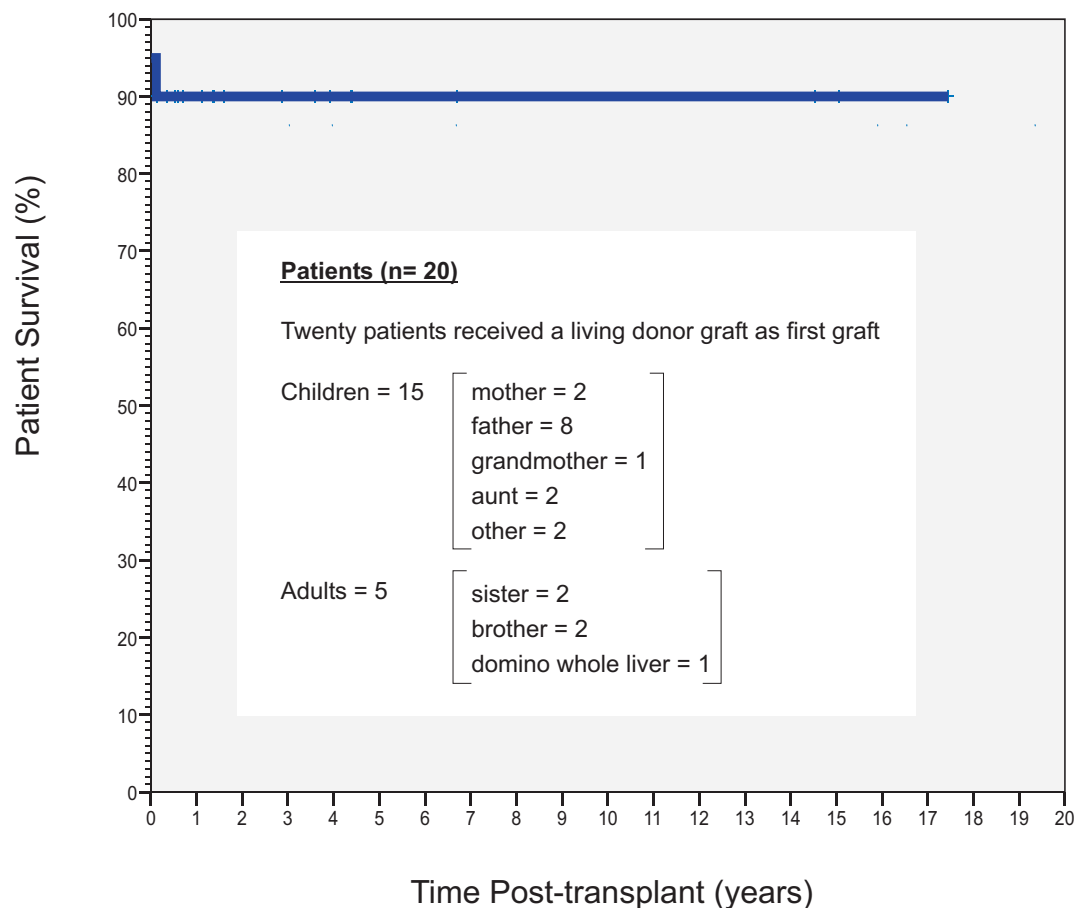
(3) Paediatric recipients [excluding FHF] - n=438



(4) Fulminant hepatic failure (n=245)



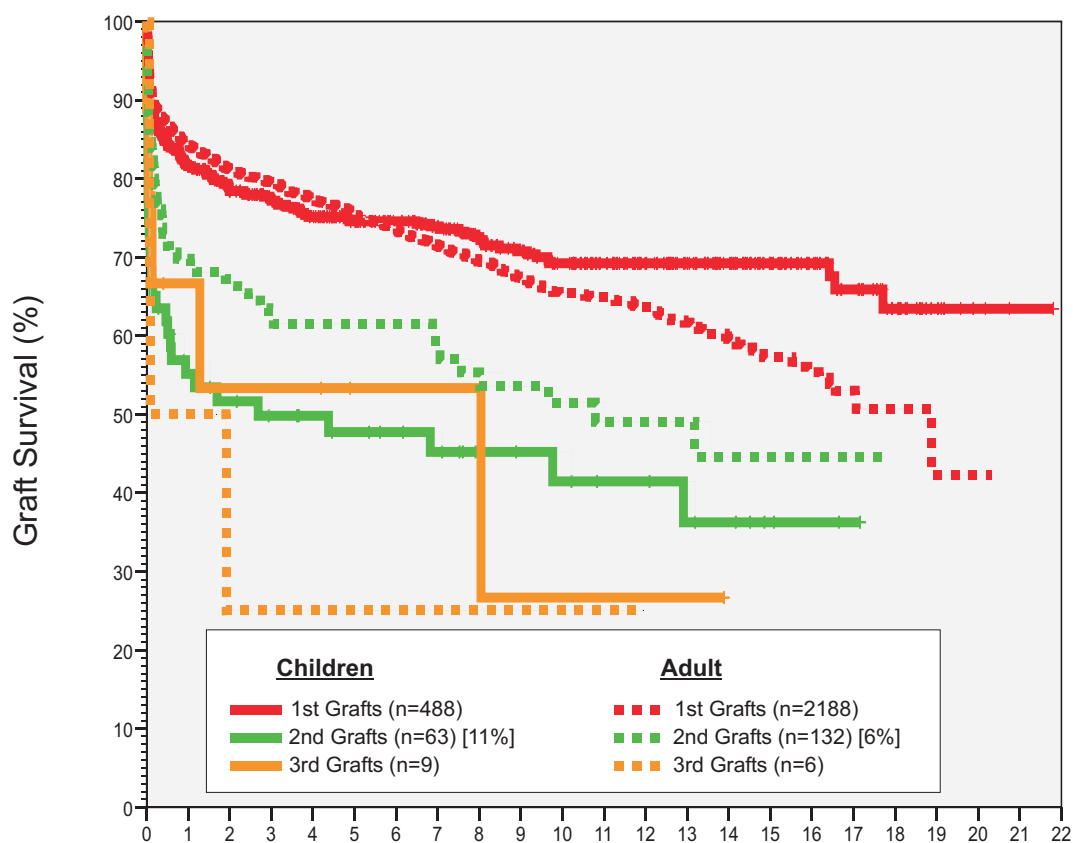
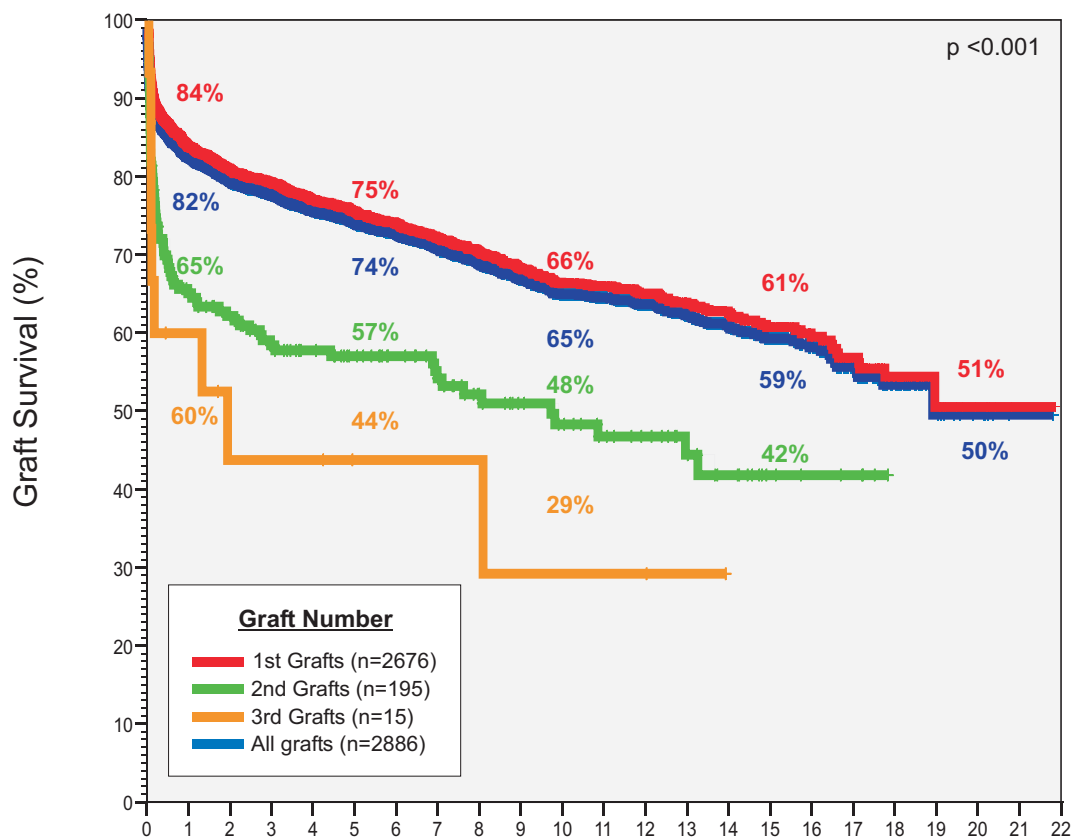




Section 4

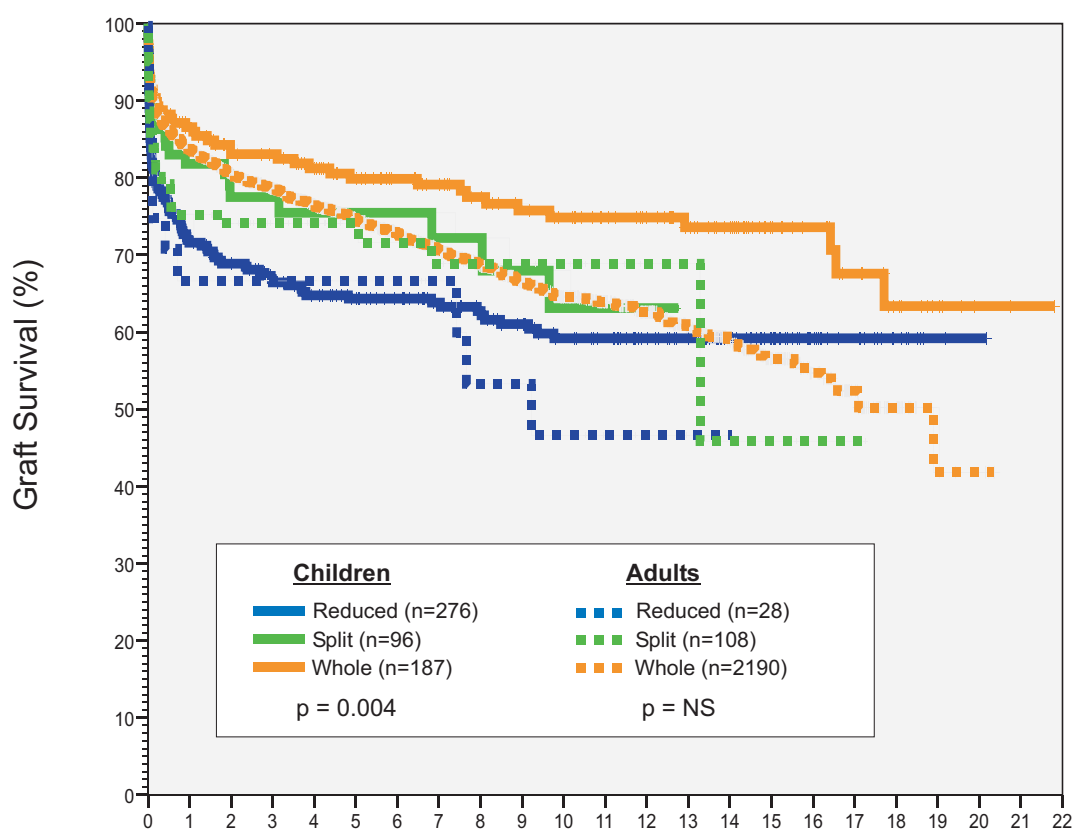
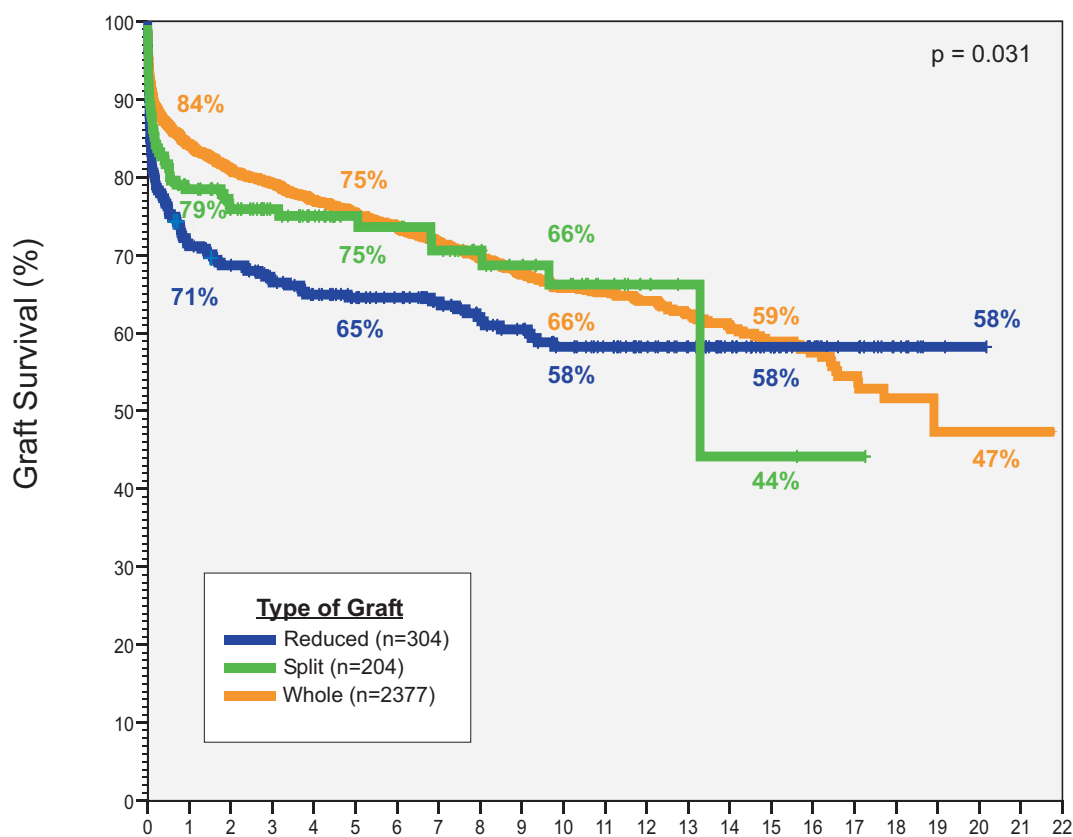
Graft Outcome





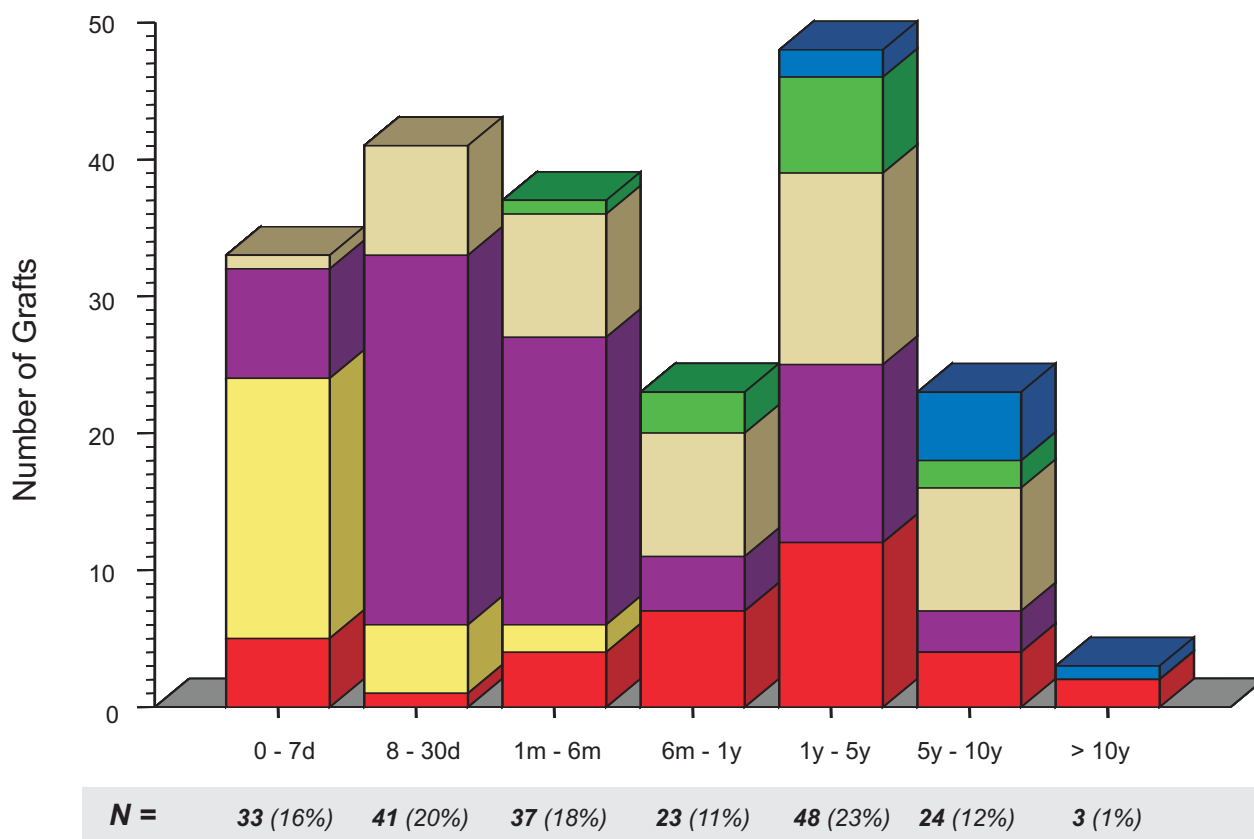
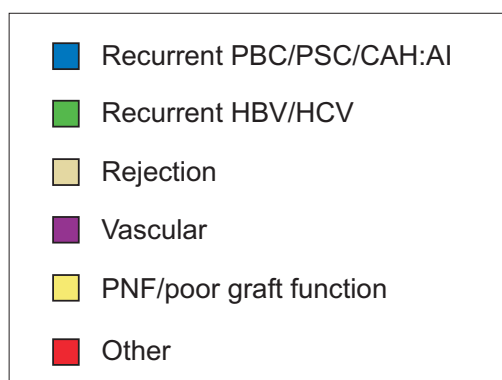
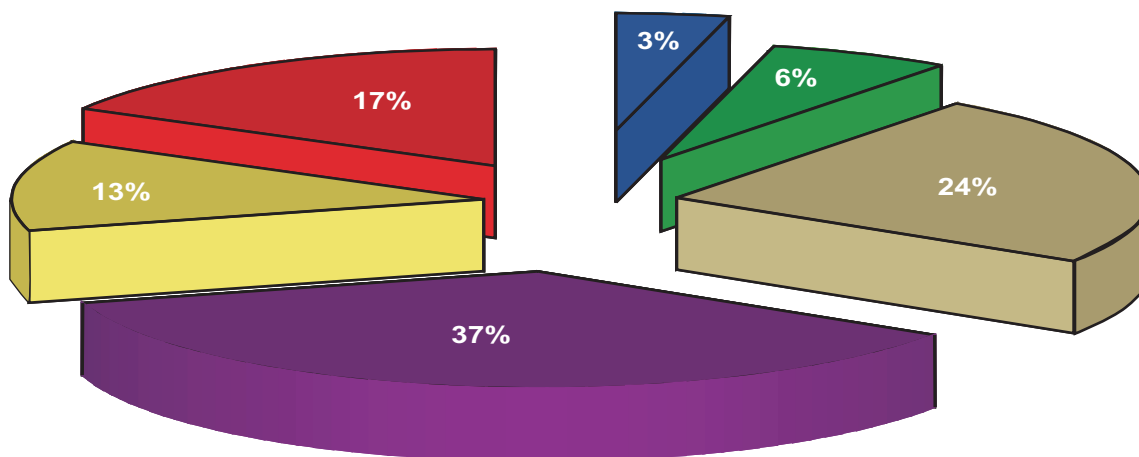
Time Post-transplant (years)

All grafts (n = 2886)



Indication for Retransplantation

n = 209 (194 2nd grafts, 15 3rd grafts)

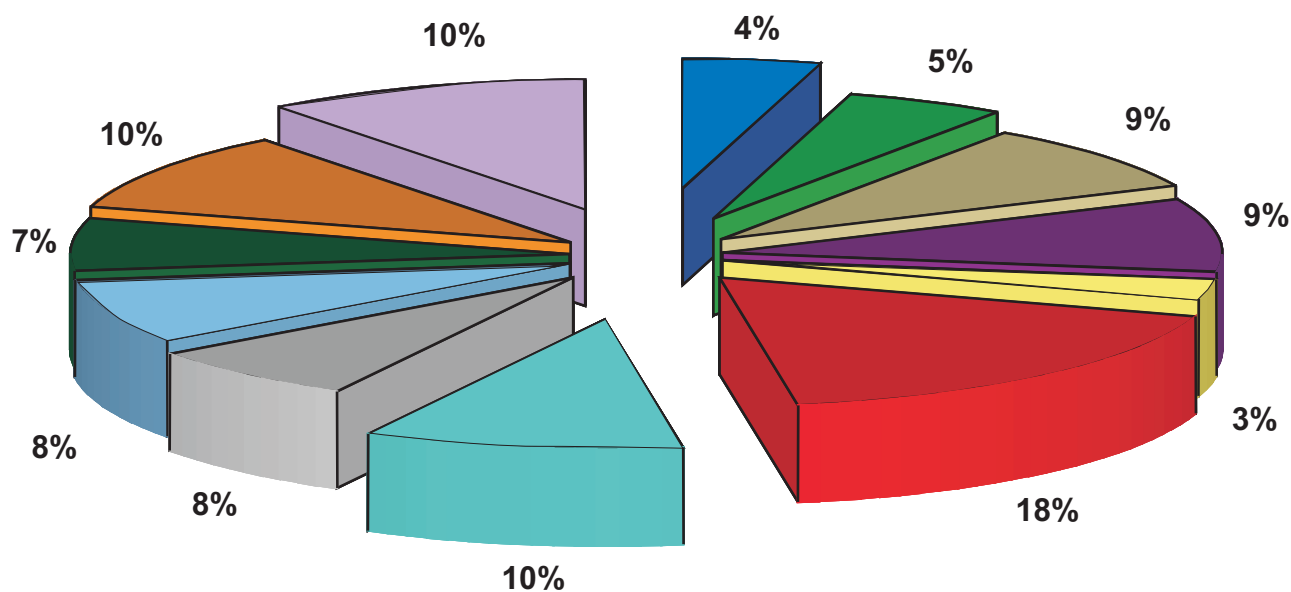
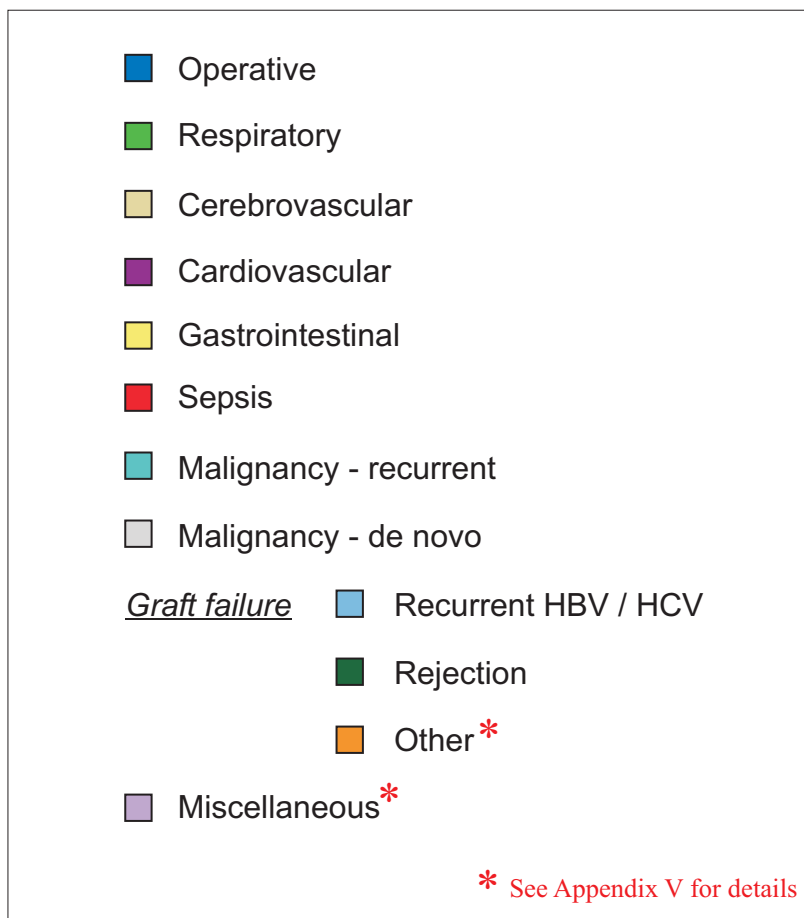


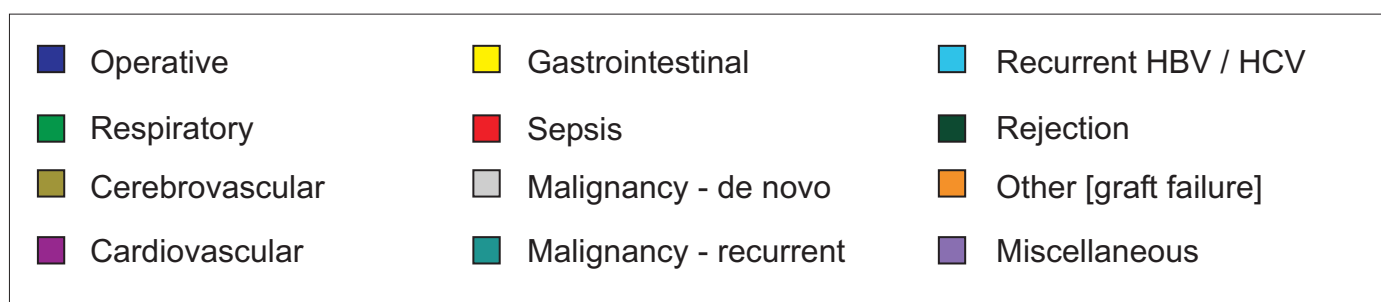
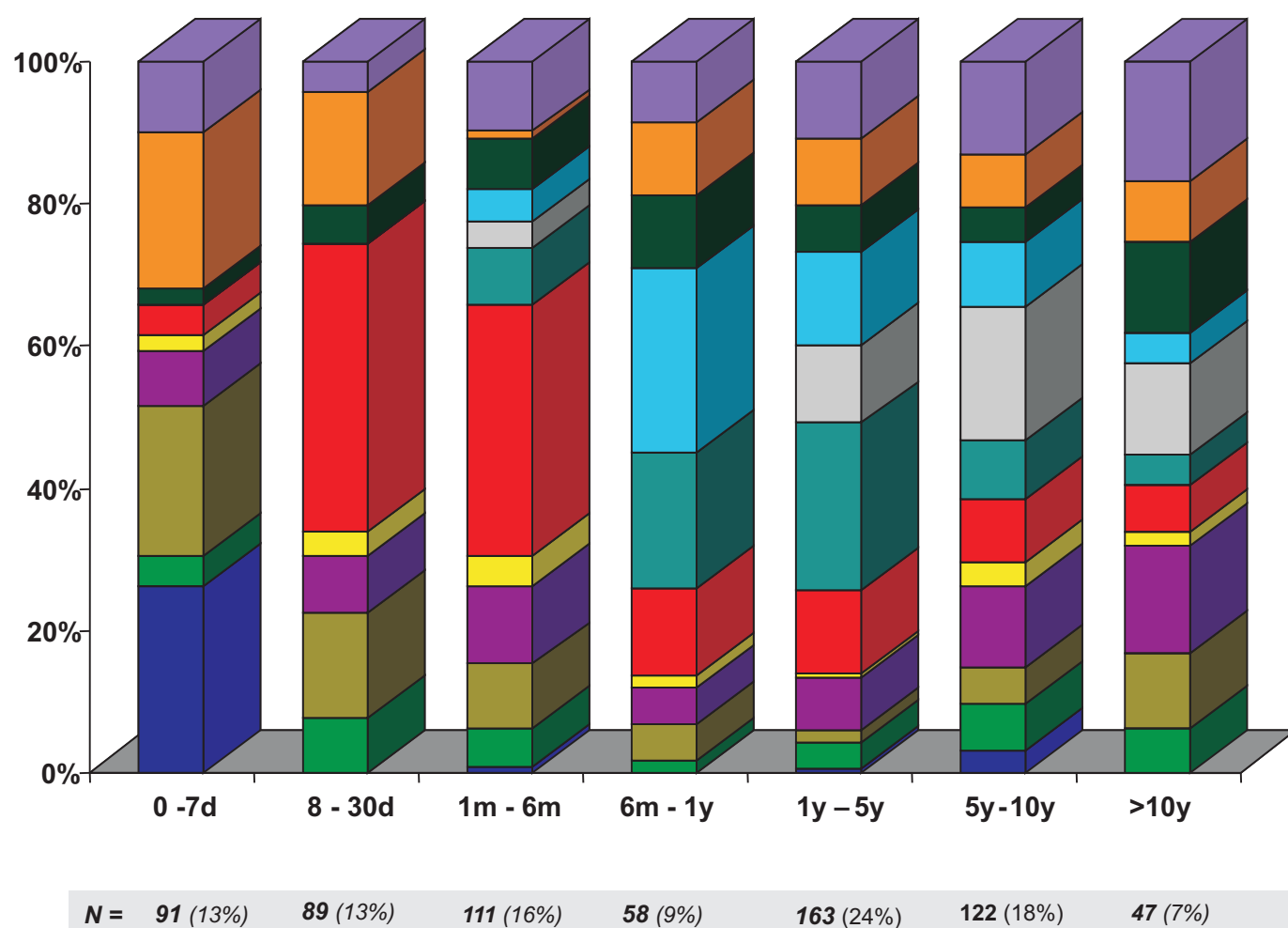
Section 5

Cause of Patient Death



All Patients n = 681





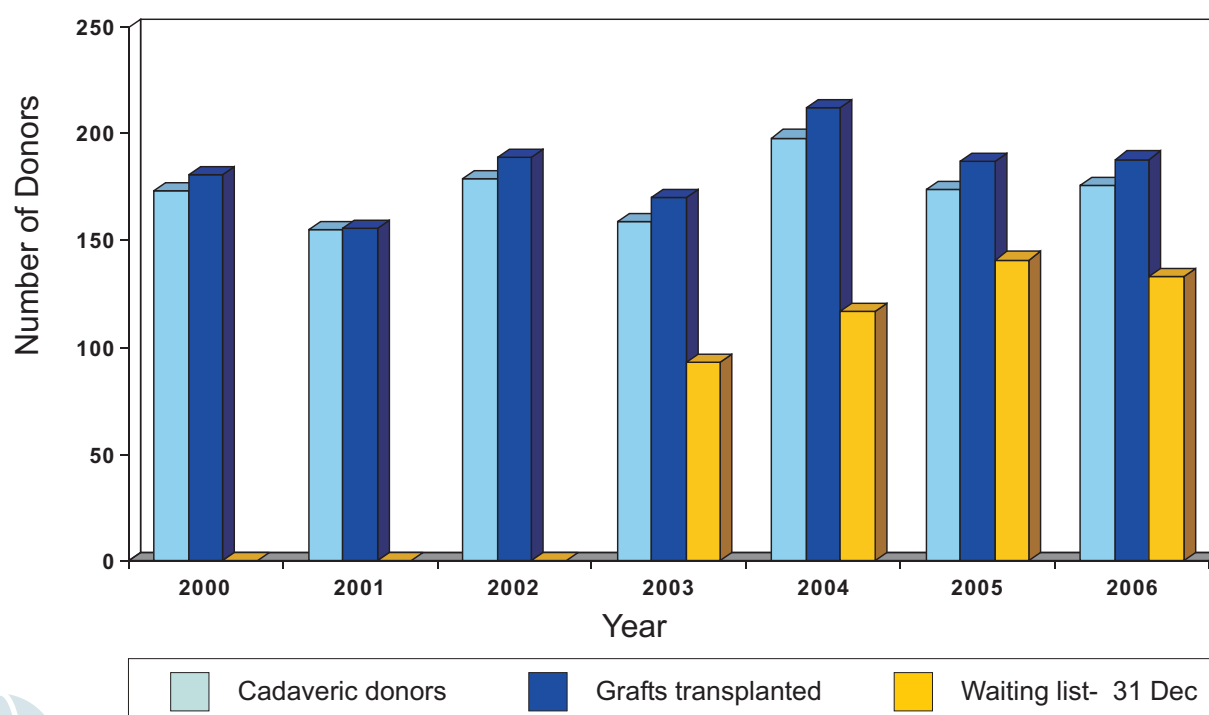
Section 6

Donor Information



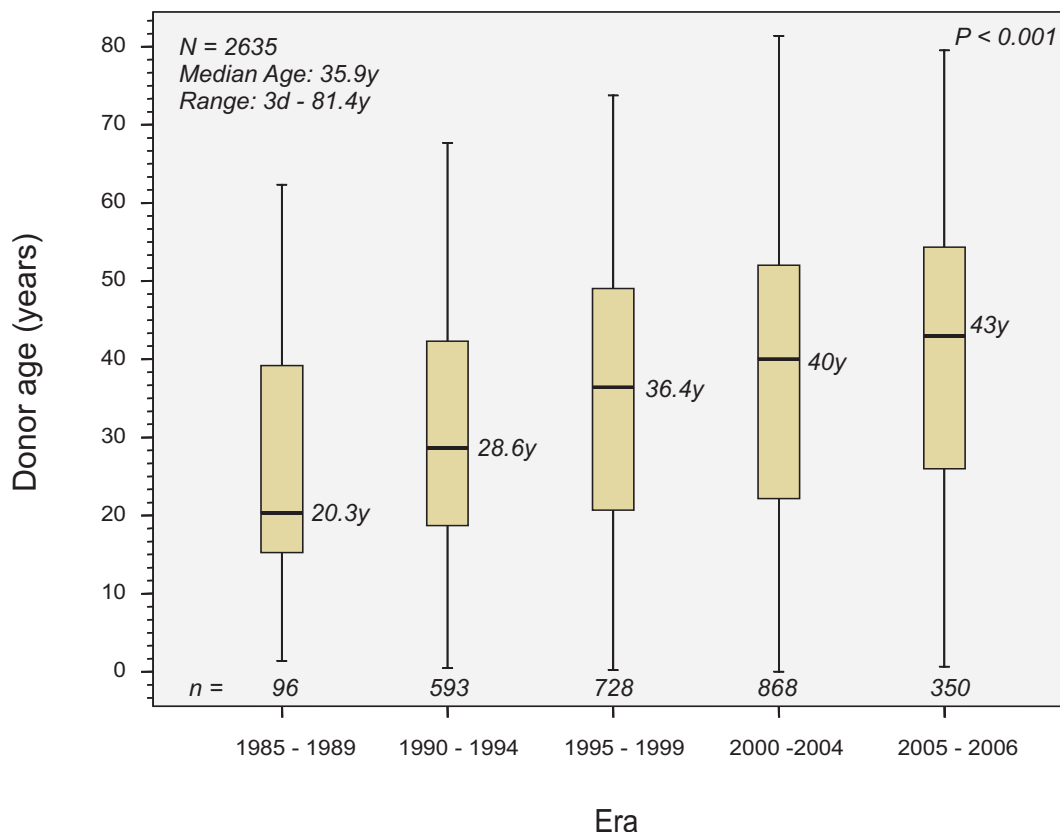
	QLD	NSW/ACT	VIC/TAS	SA/NT	WA	NZ	TOTAL
1990	22	27	16	5		7	77
1991	29	35	20	6	8	11	109
1992	43	32	18	9	8	24	134
1993	28	40	25	12	6	16	127
1994	29	39	23	12	10	21	134
1995	29	44	24	17	8	21	143
1996	26	37	19	17	10	24	133
1997	31	49	19	19	8	22	148
1998	29	44	27	22	13	27	162
1999	15	31	31	29	11	27	144
2000	26	51	26	24	12	34	173
2001	37	40	26	14	9	29	155
2002	34	42	38	24	11	30	179
2003	34	32/3	29/2	13	15	31	159
2004	30	49/4	35/1	26/1	17	35	198
2005	24	36/8	38/2	17/3	25	21	174
2006	28	34/3	39/6	25	17	24	176

Grafts from cadaver donors



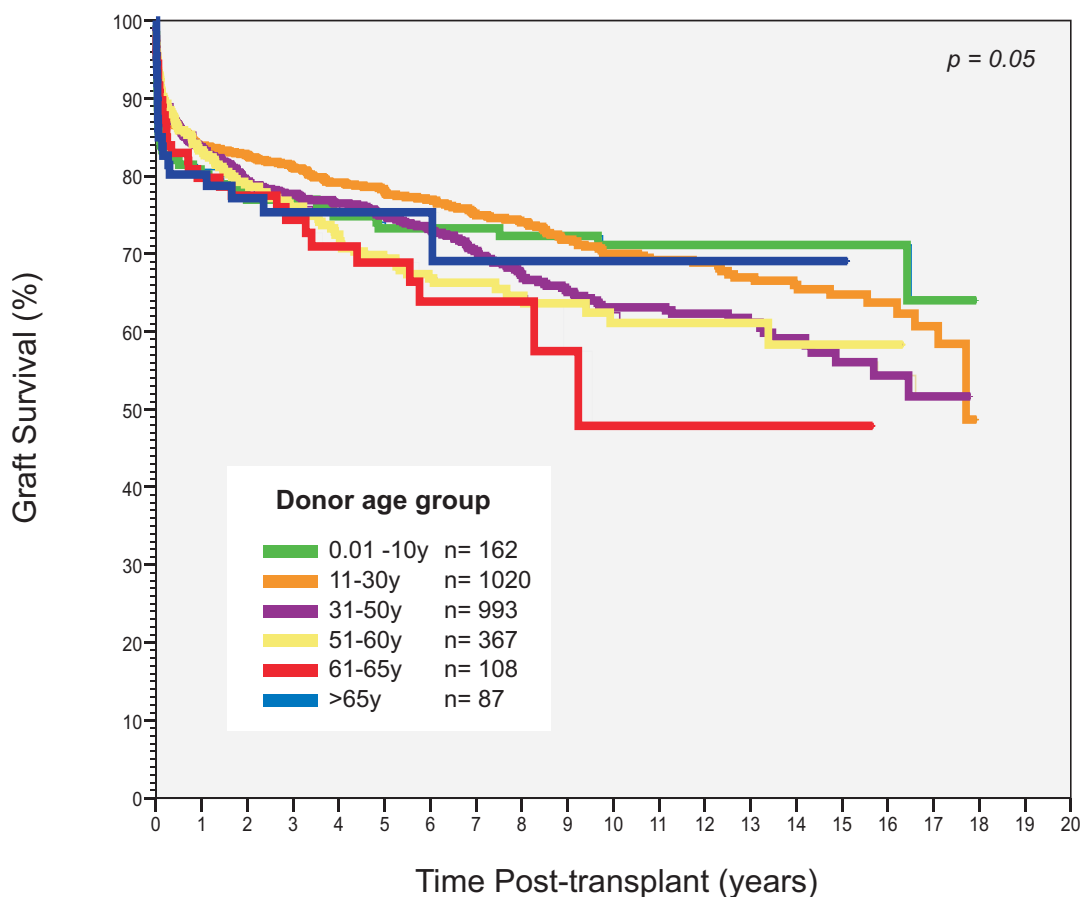
Donor Age by ERA

N = 2635



Graft Survival by Donor Age

N = 2737



Section 7

Waiting List



Waiting List Activity

[Data 1/1/04 - 31/12/06]

Activity	2004	2005	2006		
Listed at 1 January	93	117	145	-	TOTAL 2006
New listings	279	291	-	258	
TOTAL	372	408	145	258	403
OUTCOME					
Transplant	214 [58%]	191 [47%]	80	114	194 [48%]
Delisted	41 [10%]	72 [18%]	37	40	77 [19%]
Died on list	14	26	5	13	18
Too sick	8	9	9	4	13
Tumour progression	2	9	4	4	8
Improved	8	15	8	8	16
Other	9	13	11	11	22*
Still listed at 31 Dec	117 [32%]	145 [35%]	28	104	132 [33%]

[*Other: Further investigations 11; New medical complication - 7; Declined Tx - 2, Other treatment - 1, Ongoing alcohol - 1]

Outcome of Urgent Listing

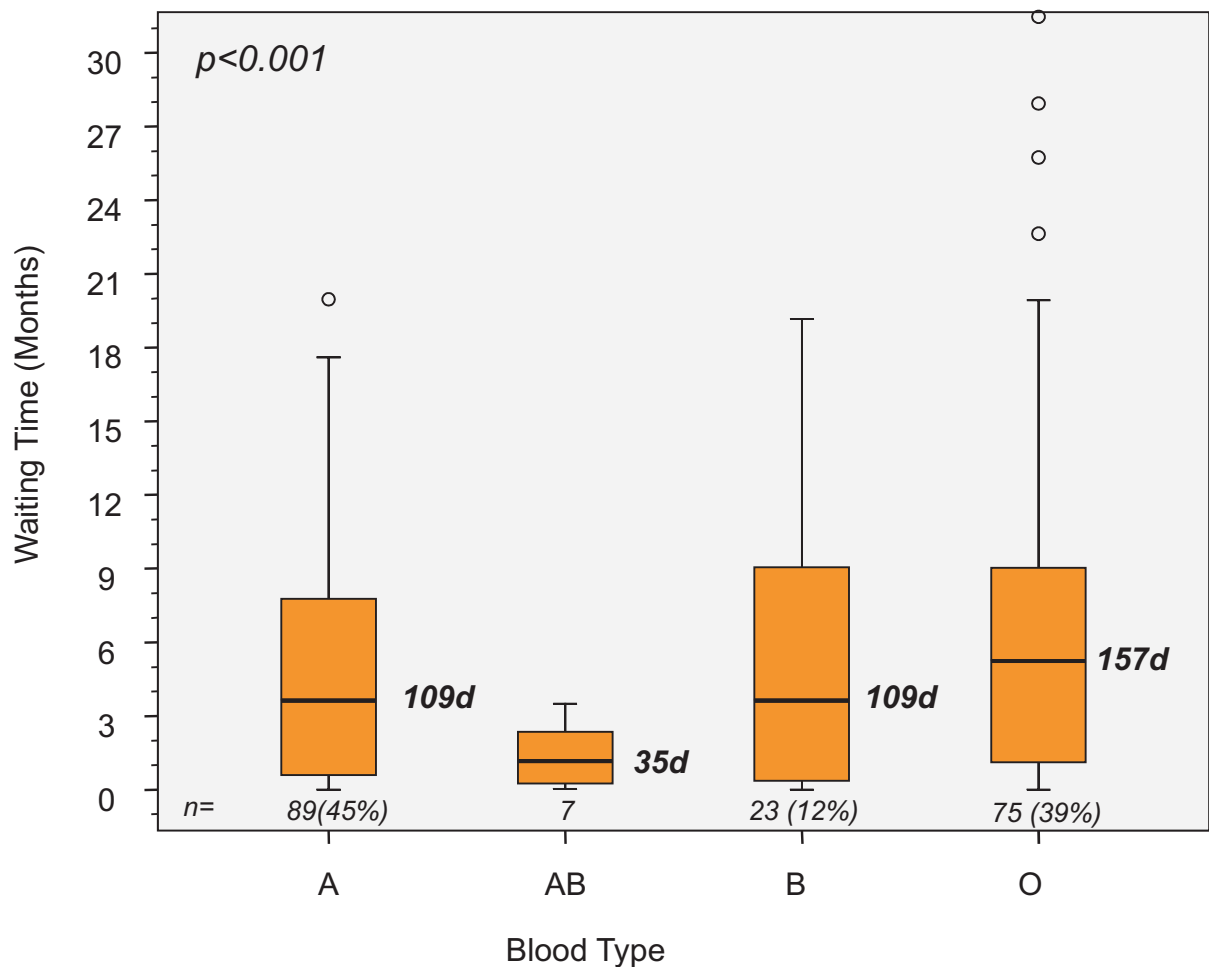
OUTCOME	CATEGORY 1		CATEGORY 2	
	2005 (n=14)	2006 (n=16)	2005 (n=31)	2006 (n=26)
TRANSPLANTED	4 } 64%	12 } 88%	20 } 68%	21 } 88%
IMPROVED	5 }	2 }	1 }	2 }
DIED	5	2	10	2
OTHER TREATMENT	-	-	-	1

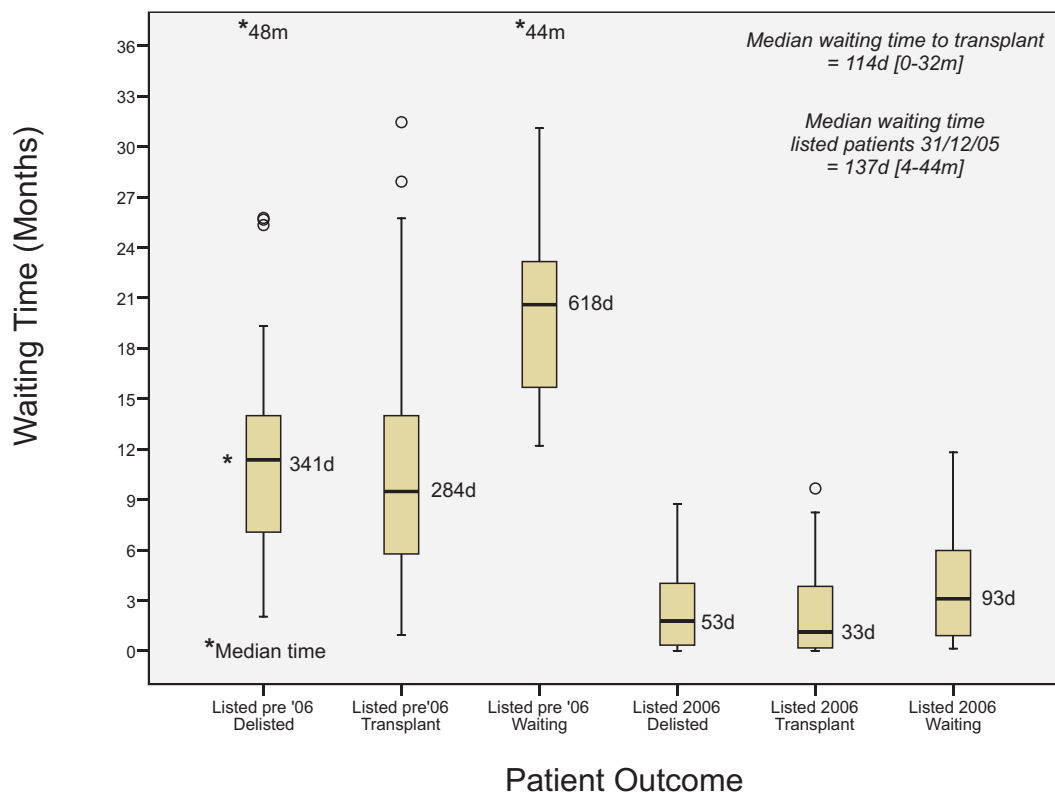
	Blood Group				
	A	O	B	AB	TOTAL
n=	151 (37.5%)*	186 (46%)	56 (14%)	10 (2.5%)	403
Not transplanted	62	111	33	3	209
Transplanted	89 (59%)**	75 (40%)	23 (41%)	7 (70%)	194

* % of total number listed

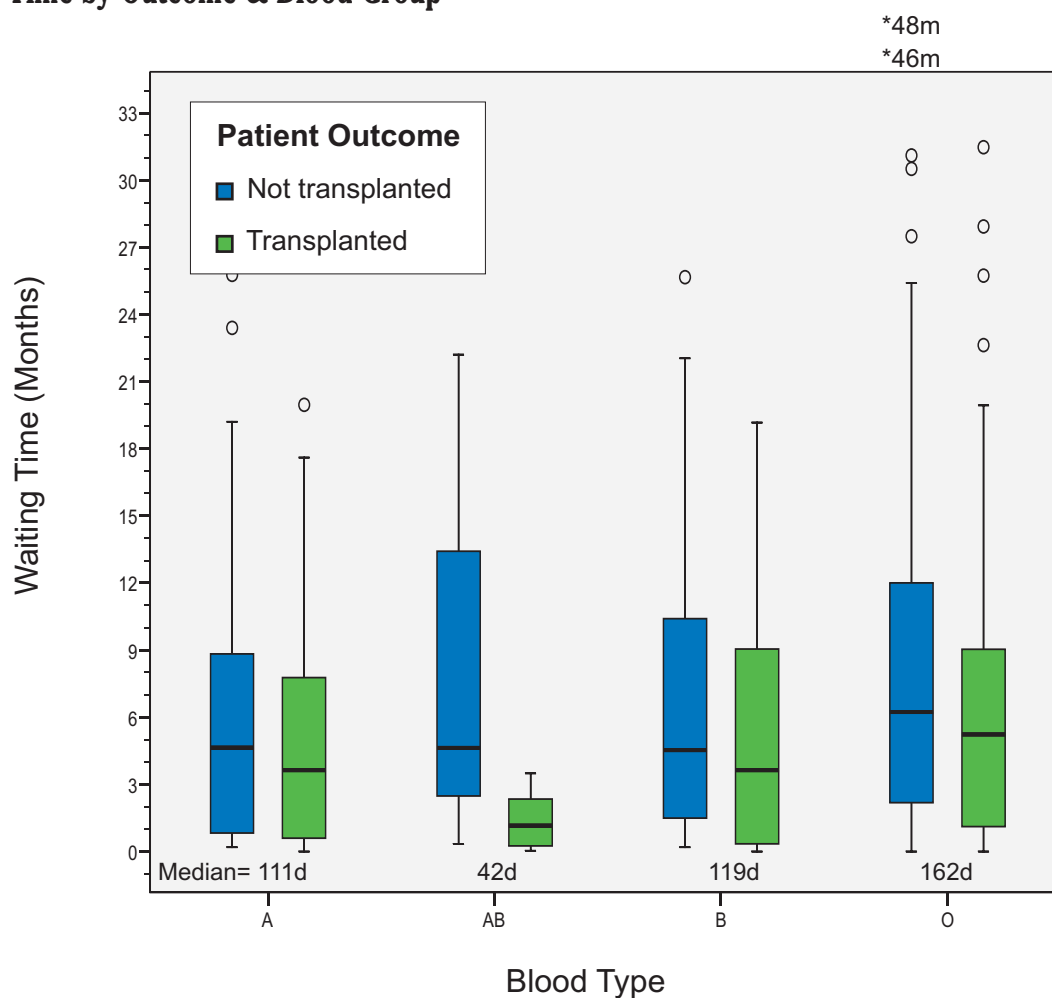
** % of blood group

Waiting Time to Transplant 2006





Waiting Time by Outcome & Blood Group



Section 8

Liver Transplantation and Cancer



Cancer in Liver Transplant Recipients

N = 2677

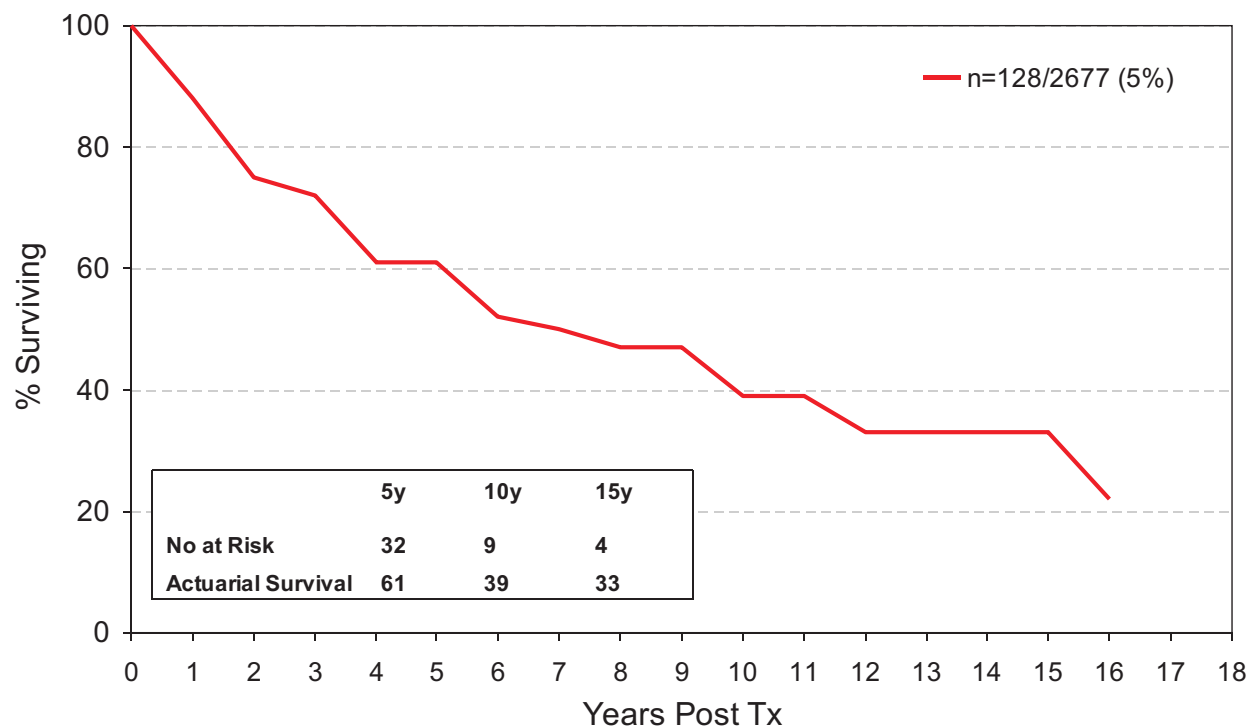
At Tx		
Tx for Liver Ca	128	(5%)
Liver Ca as a Secondary Diagnosis	262	(10%) 263 Ca
Total	387	(14%)
Post Tx		
Recurrent Liver Ca	75	(2.8% of all pts, 19% of pts with Ca at Tx)
De Novo Ca	130	(5%) 136 Ca
Skin Ca	310	(11%)
Total	515	(18%)
Multiple Ca	67	
Transferred from Donor	2	
Developed non skin Ca < 90days	8	

Primary Liver Cancer

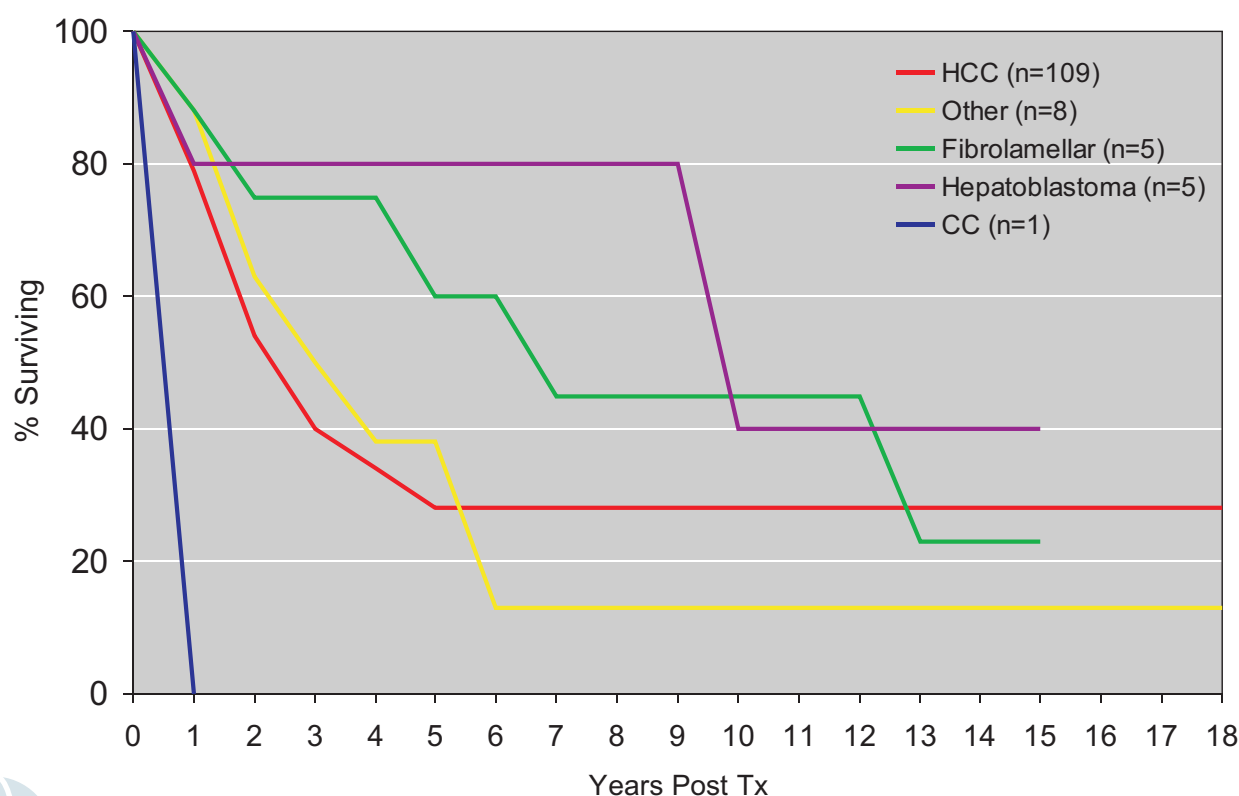
N = 2677

TYPE OF CA	No	DIED	DIED OF THIS CA
HEPATOCELLULAR CA	109	34	19 (18%)
LAMELLA VARIANT	5	4	2 (40%)
HEPATOBLASTOMA	5	2	1 (20%)
CARCINOID	4	4	4 (100%)
CHOLANGIOCARCINOMA	1	1	1 (100%)
ANGIOSARCOMA	1	1	1 (100%)
EPITHELOID HAEMANGIOENDOTHELIOMA	1	0	0
GASTRINOMA	1	1	1 (100%)
PANCREATIC ISLET CELL	1	1	1 (100%)
TOTALS	128 (5% of pts)	48 (38% of those with PCa)	30 (23% of those with PCa)

Overall Survival
Primary Liver Cancer
N = 2677
n = 128 (5%)



Primary Liver Cancer Survival
N = 2677
n = 128 (5%)



Primary Liver Cancer Survival

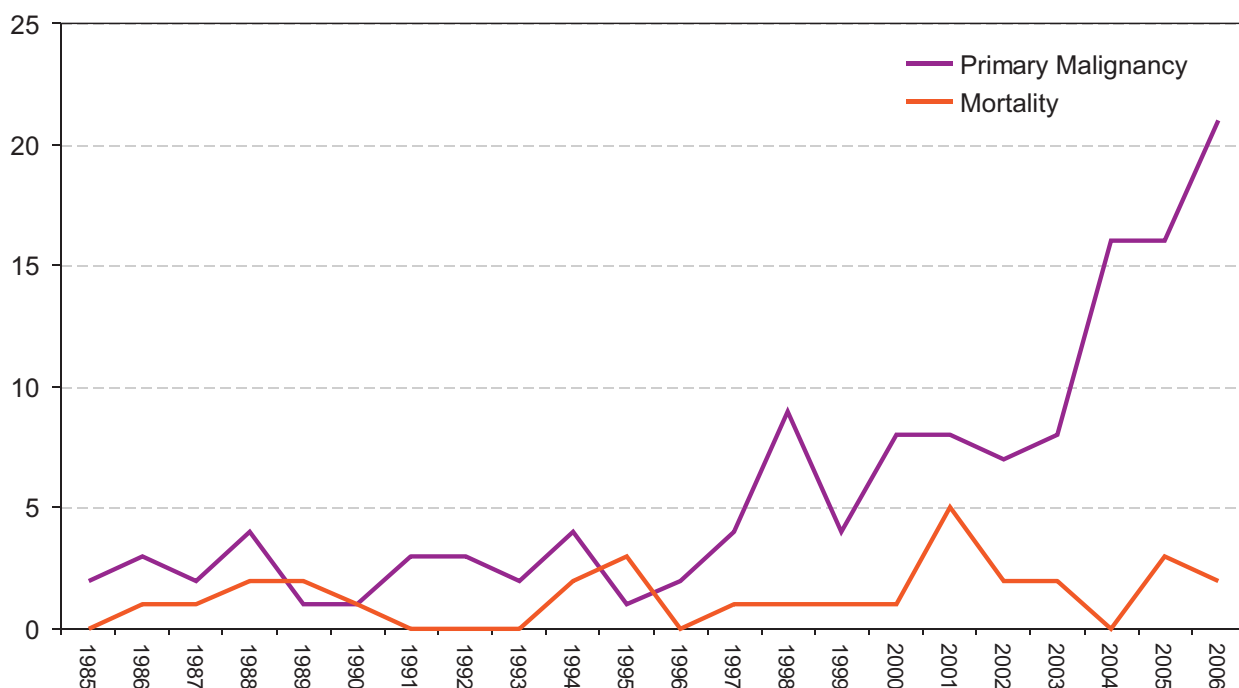
N = 2677

		5y	10yr	15yr
HCC (n=110)	n	24	5	2
	% Surviving	23	38	38
Other (n=8)	n	4	2	2
	% Surviving	38	13	13
Hepatoblastoma (n=5)	n	4	3	2
	% Surviving	80	40	40
Fibrolamellar (n=5)	n	4	4	2
	% Surviving	60	60	40
CC (n=1)	n	0		
	% Surviving	0		

Primary Liver Cancer Incidence and Mortality

N = 2677

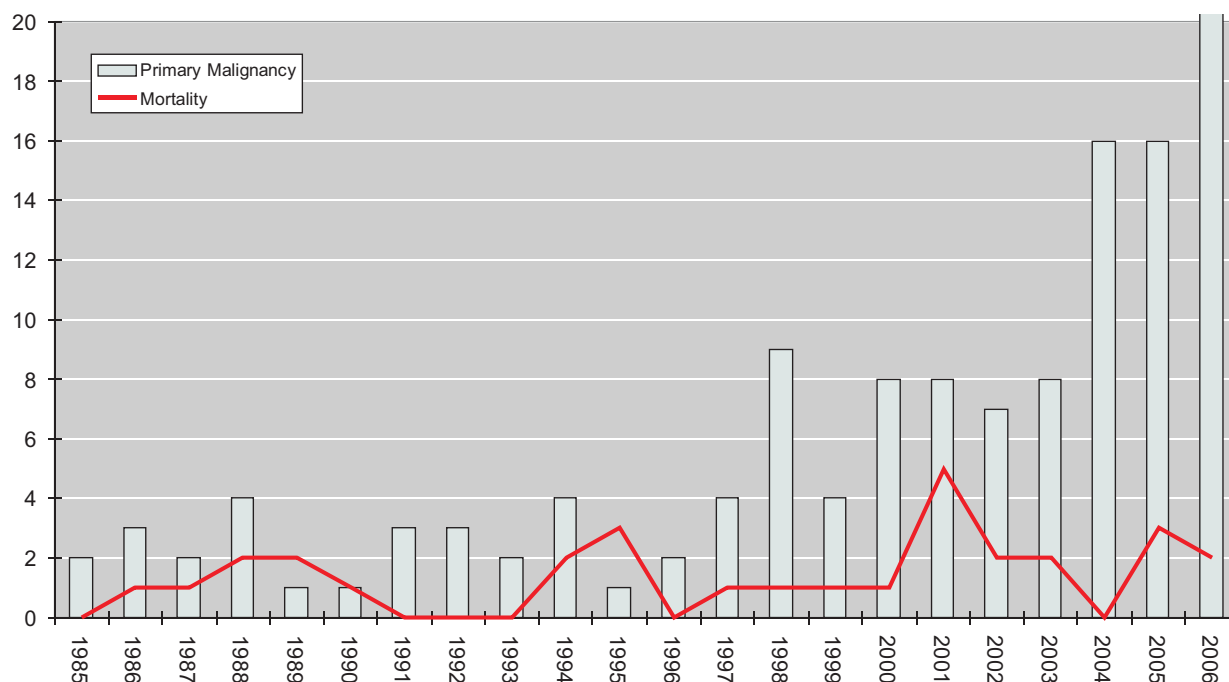
n = 128 (5%)



Primary Liver Cancer Incidence and Mortality

N = 2677

n = 128 (5%)

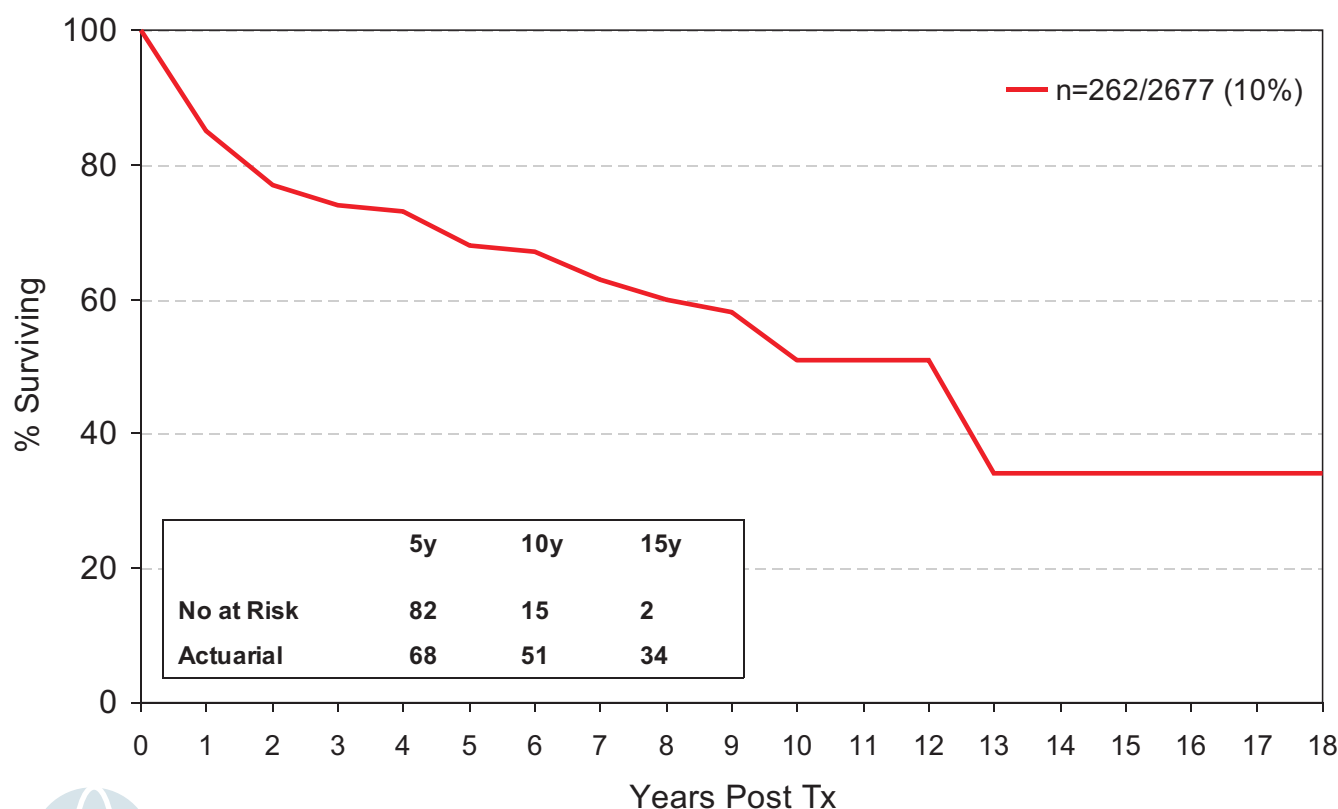


Overall Survival

Liver Cancer as a Secondary Diagnosis

N = 2677

n = 262 (10%)

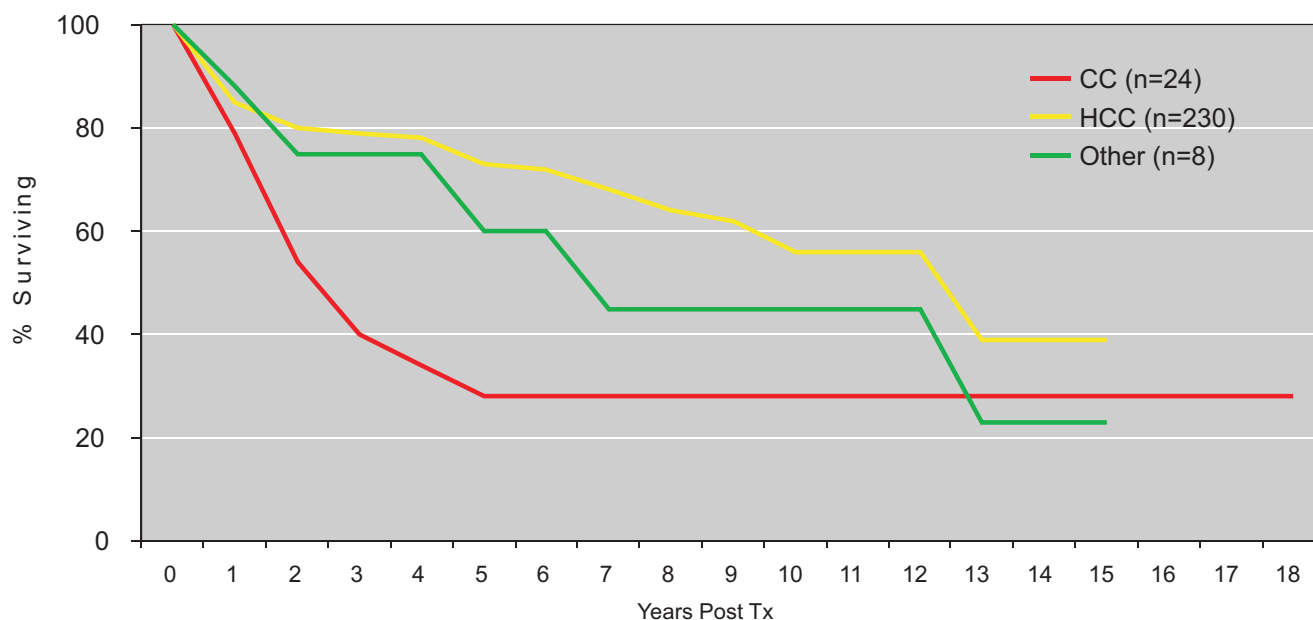


Liver Cancer as a Secondary Diagnosis N = 2677

	No	Died	Died of This Cancer
HEPATOCELLULAR CA*	230	62	21 (9%)
CHOLANGIO CA	24	16	13 (54%)
ADENOCARCINOMA	3	3	0
HEPATOBLASTOMA*	2	1	0
FIBROLAMELLAR	2	1	1
ANGIOSARCOMA	1	1	1
EPITHELOID HAEMANGIOCA	1	0	0
Total	263* in 262 pts (10%)	84 (33% of pts with SCa)	36 (14% of pts with SCa)

* 1 patient had 2 secondary malignancies

Liver Cancer as a Secondary Diagnosis N = 2677



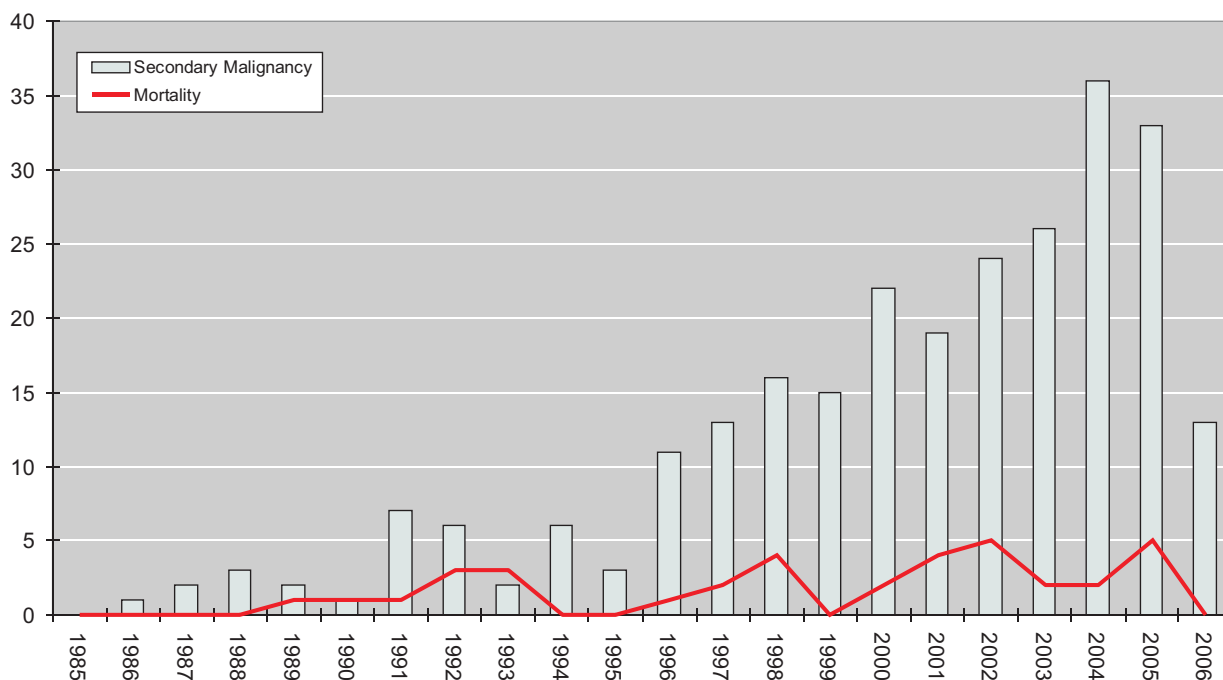
		5y	10yr	15yr
CC	n	5	3	1
	% Surviving	28	28	28
HCC	n	73	11	2
	% Surviving	73	56	39
Other	n	5	3	1
	% Surviving	60	45	45

Liver Cancer (Secondary Diagnosis)

Incidence and Mortality

N = 2677

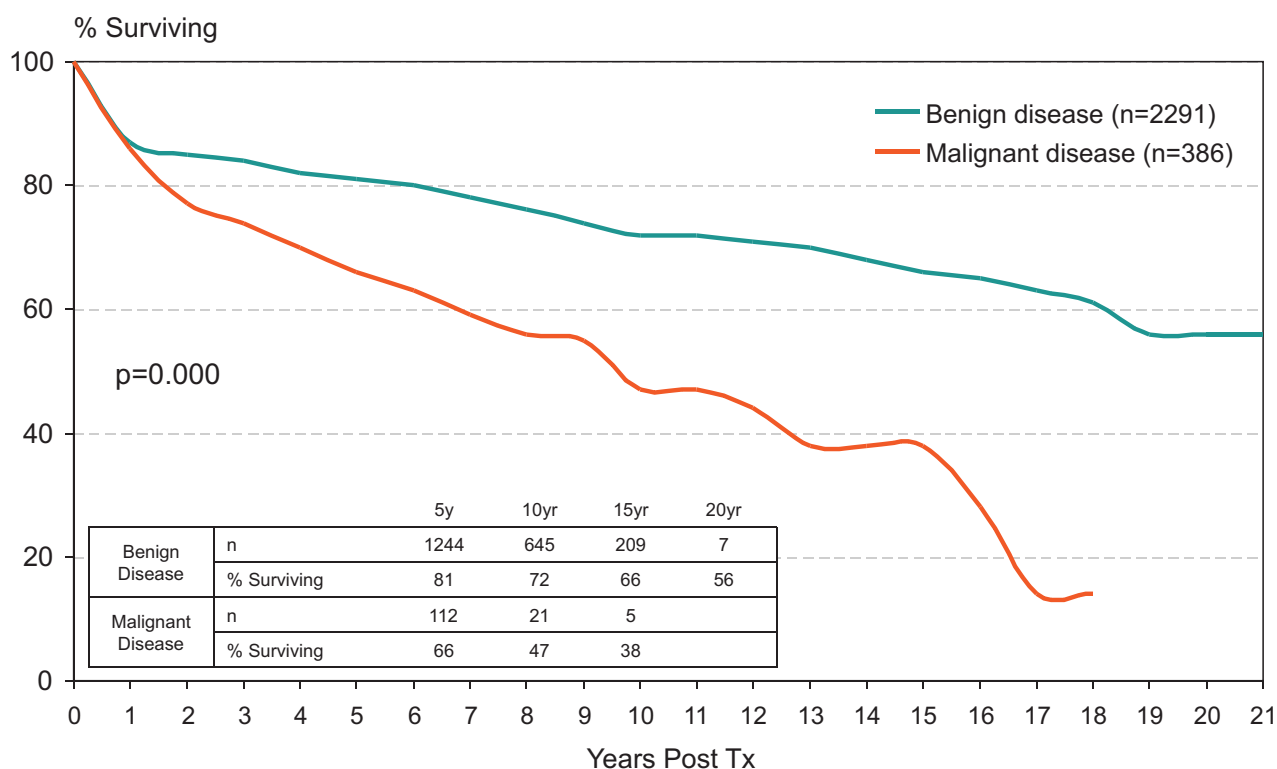
n = 262 (10%)



Patient Survival

Benign Disease vs Primary or Secondary Liver Malignancy

N = 2677



De Novo Non Skin Cancer

N = 2677

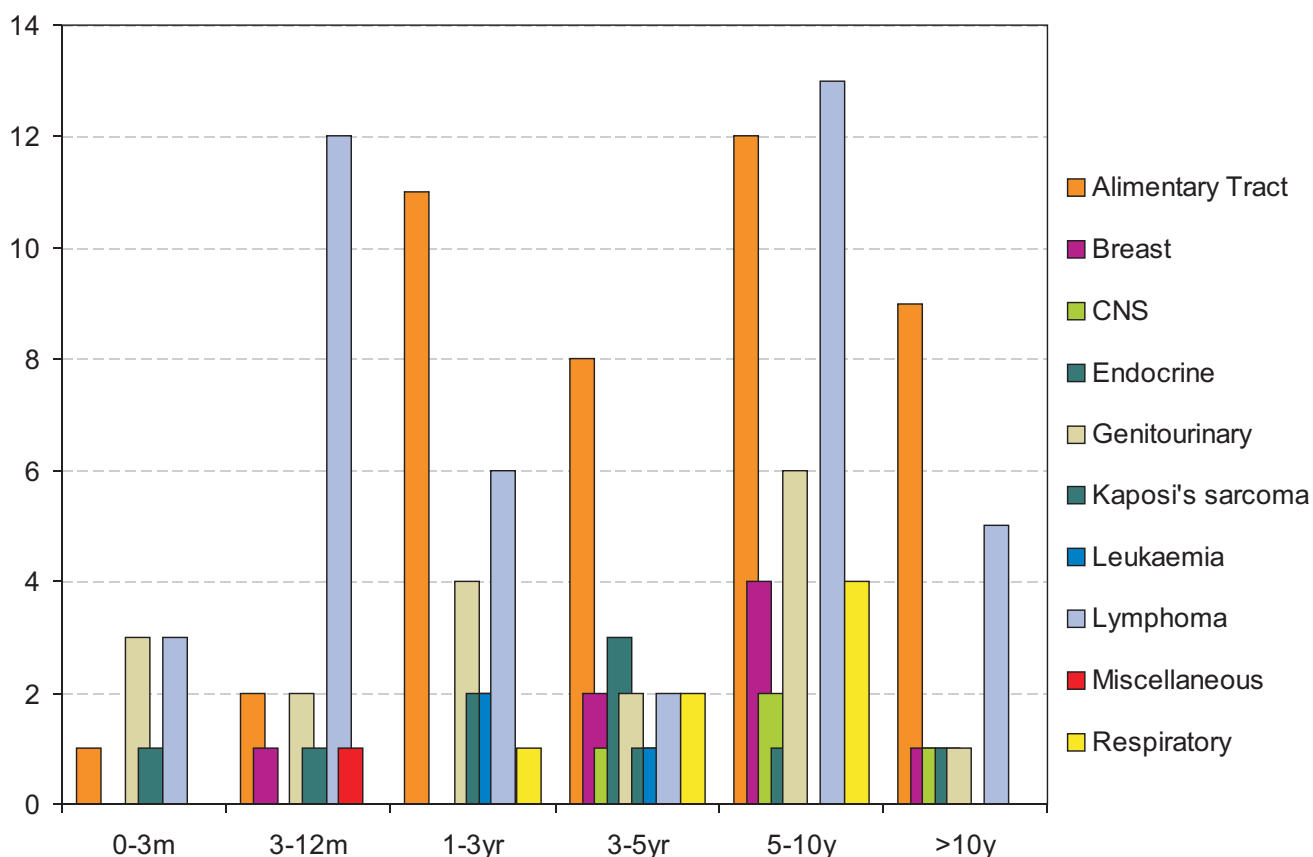
	No	Male	Female	Age of pts (yrs)	Time to diagnosis (mths)	Died of This Cancer
Alimentary*	43	29	14	12.6 – 74.8 (m 57)	3 – 173 (m 59)	22 (48%)
Lymphoma*	41	25	17	1.5 – 65.2 (m 45)	1 – 182 (m 40)	17 (48%)
Genitourinary*	18	10	8	38.5 – 70.5 (m 59)	2 – 164 (m 29)	2 (11%)
Breast	8	-	8	39.1 – 62.8 (m 50)	11 – 189 (m 79)	2 (25%)
Respiratory	7	4	3	44.7 – 61.1 (m 56)	37 – 111 (m 65)	5 (71%)
Kaposi's	5	4	1	32.1 – 64.6 (m 50)	2 – 48 (m 19)	0
Endocrine	5	2	3	35.8 – 69.5 (m 59)	47 – 144 (m 67)	2 (40%)
CNS	4	2	2	16.5 – 75 (m 47)	66 – 174 (m 93)	2 (50%)
Leukaemia	3	1	2	2.9 – 49.5 (m 33)	16 – 44 (m 30)	0
Multiple Myeloma	1	-	1	67 – 67 (m 67)	6 – 6 (m 6)	0
Total	*136 ca in 130 pts	77	59	1.5 – 75 (m 52)	1 – 189 (m 53)	52 (40% of pts with Ca)

Eight patients also had secondary liver malignancy; * 5 patients had 2 de novo malignancies

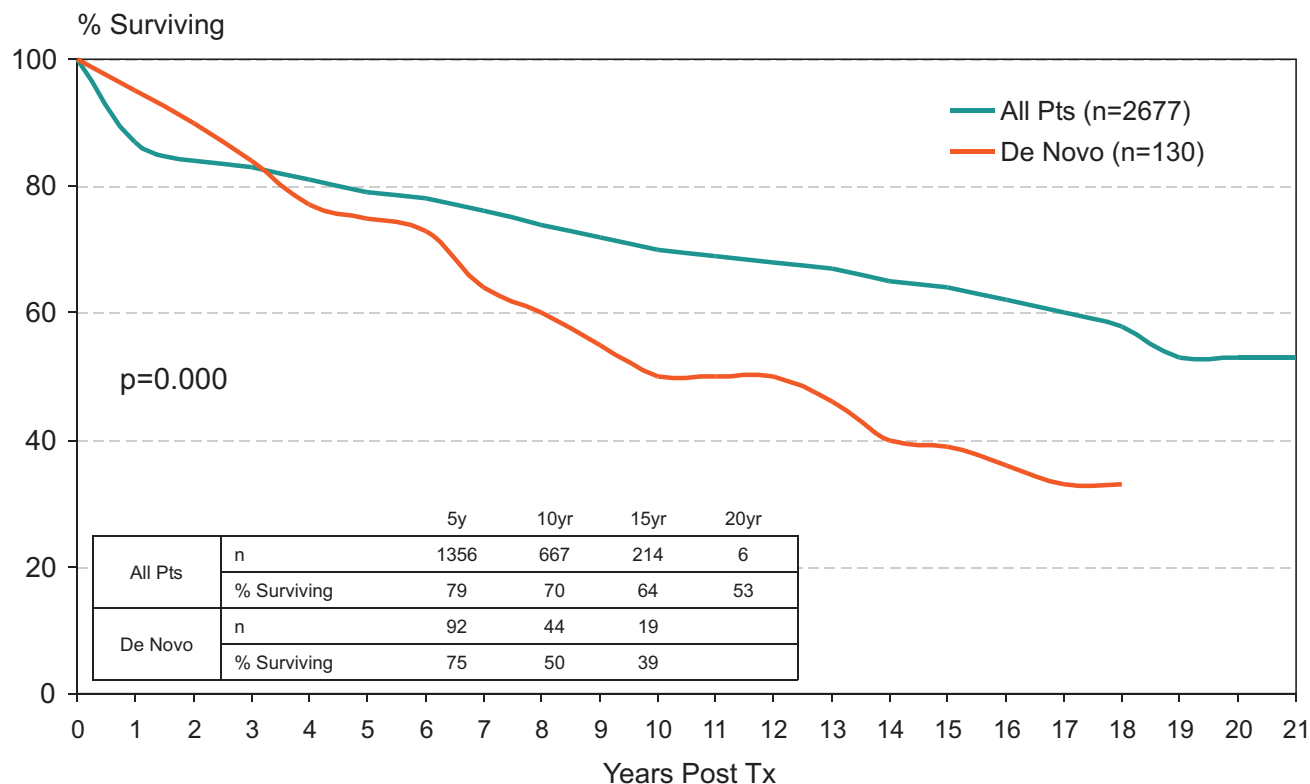
De Novo Non Skin Cancer Incidence

N = 2677

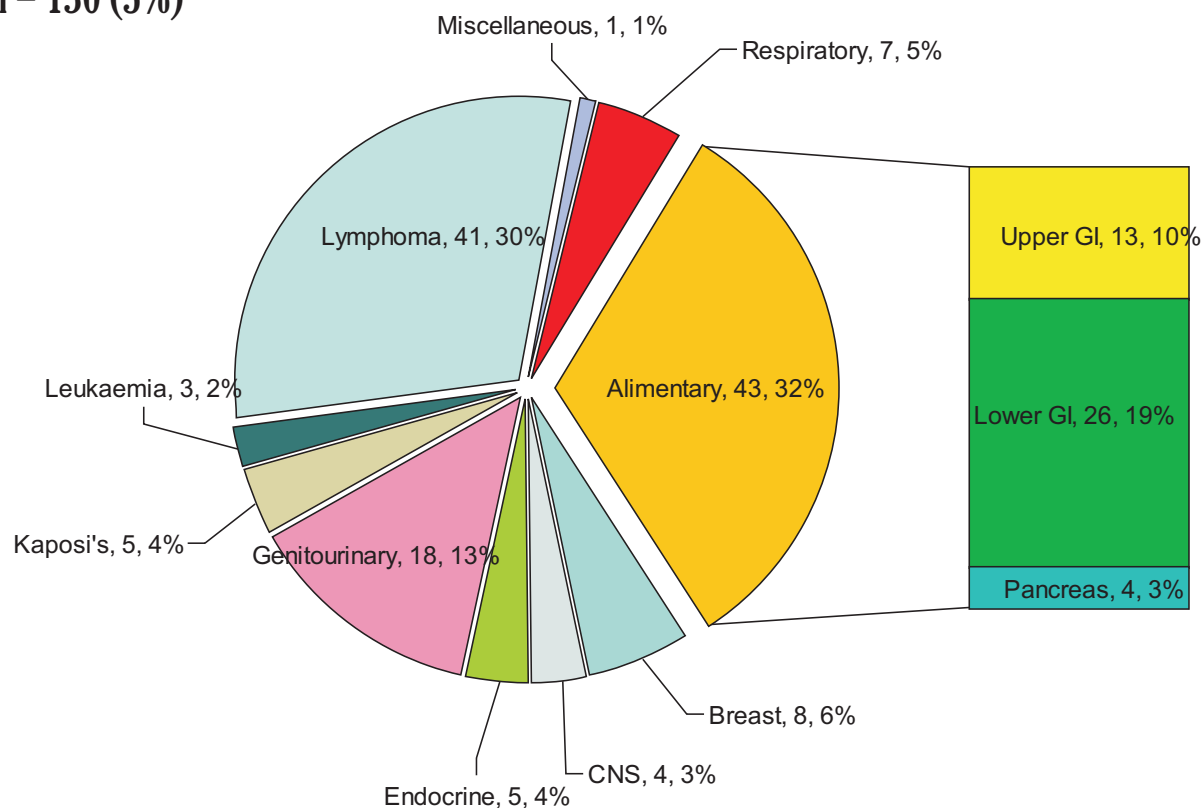
136 cancers in 130 pts (5% of all pts)



De Novo Non Skin Cancer vs All Patients N = 2677



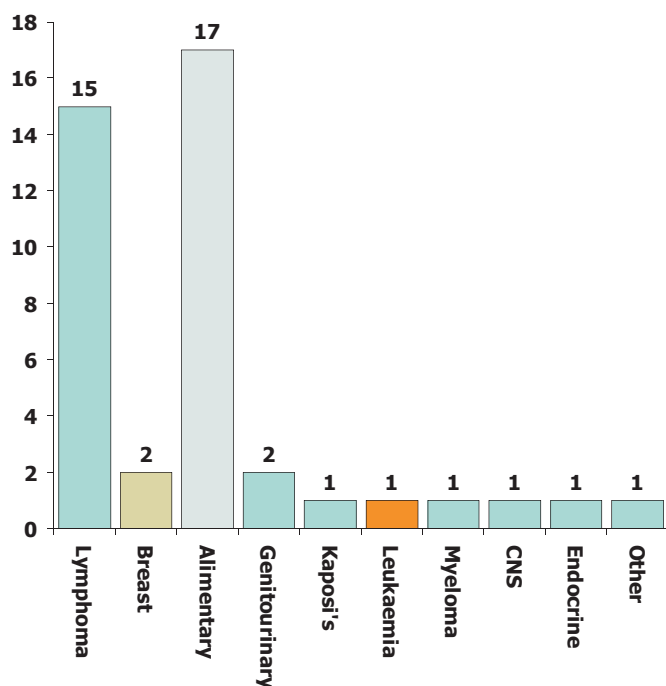
De Novo Non Skin Cancer N= 2677 n = 130 (5%)



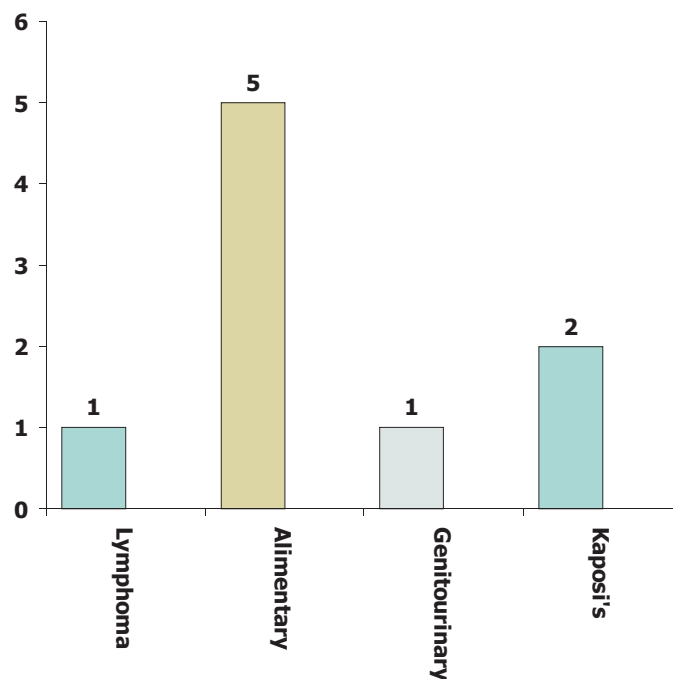
Pre Transplant Liver Disease and De Novo Non Skin Cancer

N = 2677

PSC + Auto-immune - 42 (33%)



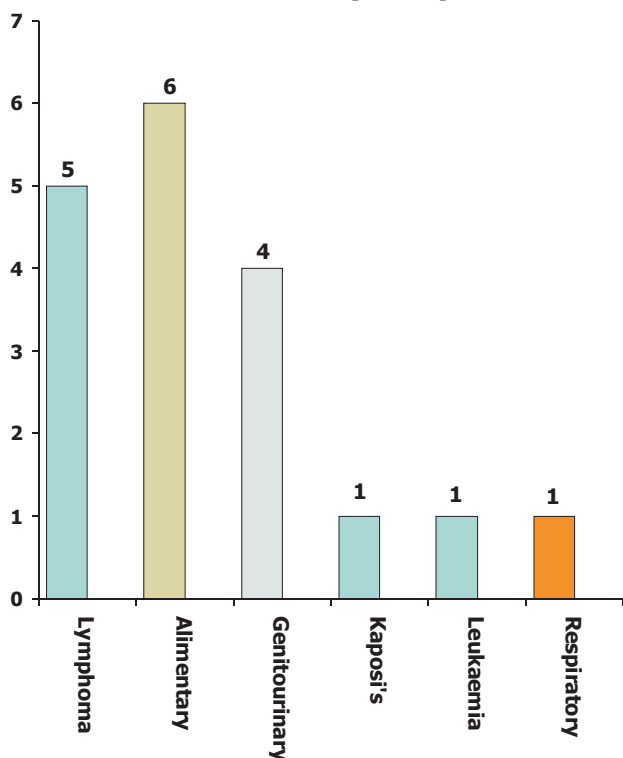
HBV - 9 (8%)



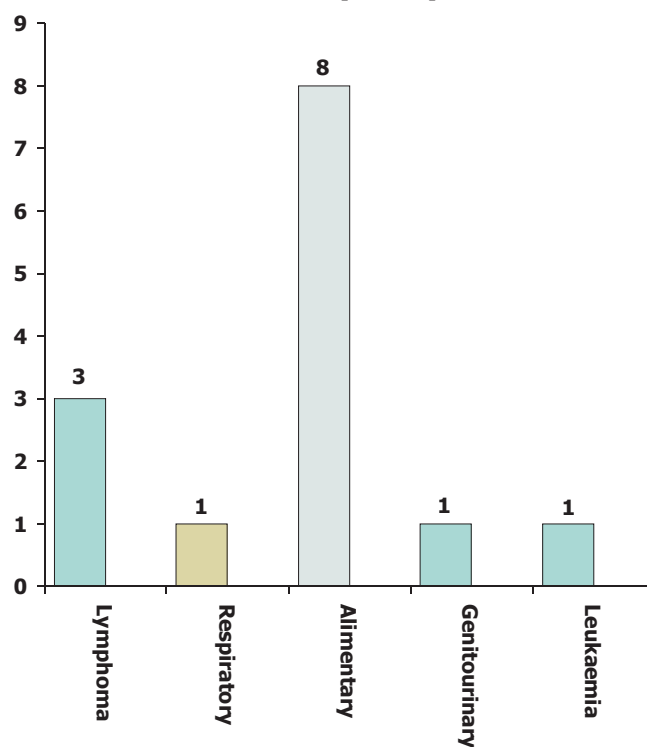
Pre Transplant Liver Disease and De Novo Non Skin Cancer

N = 2677

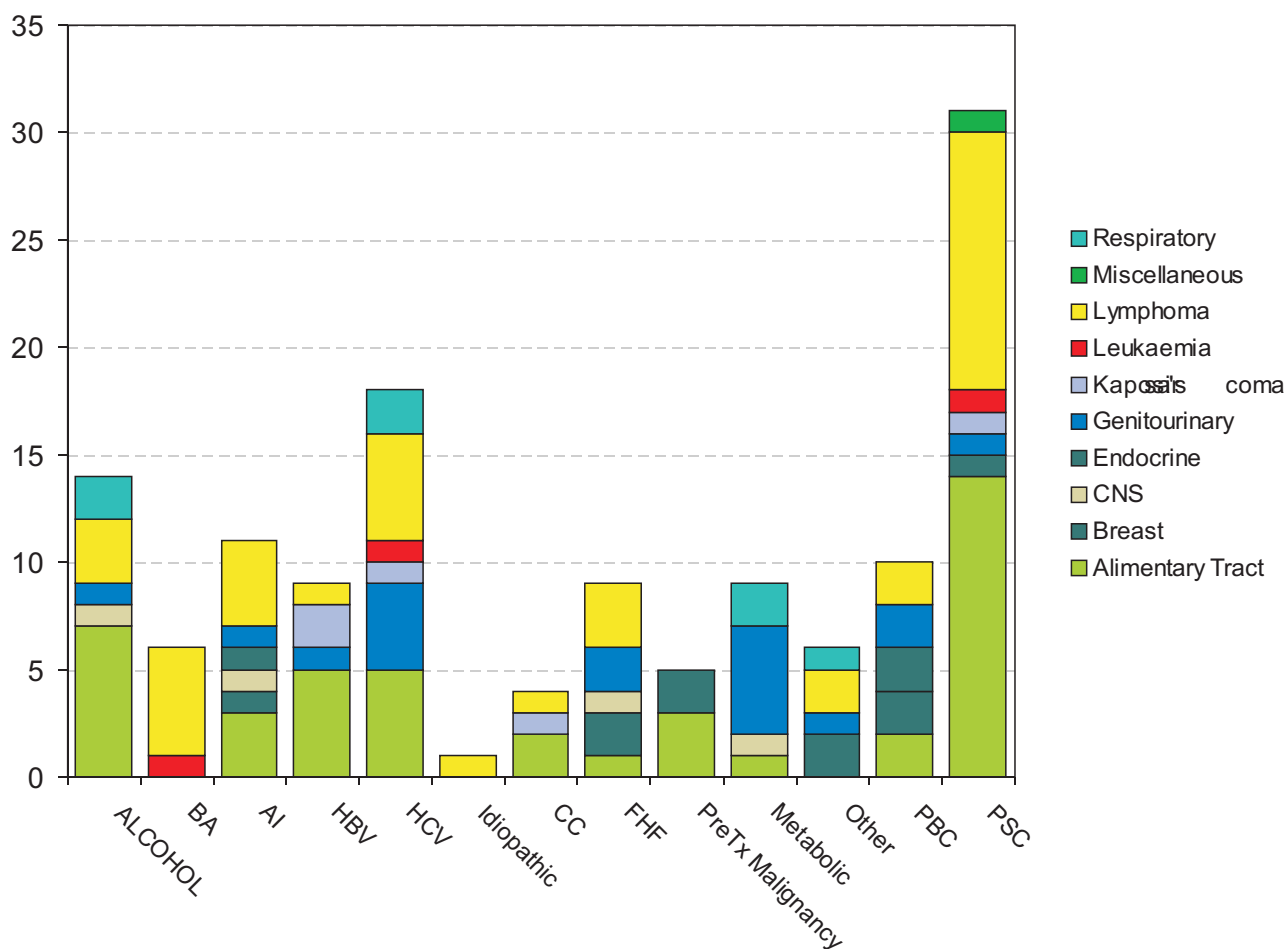
HCV - 18 (14%)



Alcohol - 14 (11%)



Pre Transplant Liver Disease and De Novo Non Skin Cancer N =2677



Skin Ca Post Ltx N= 2677

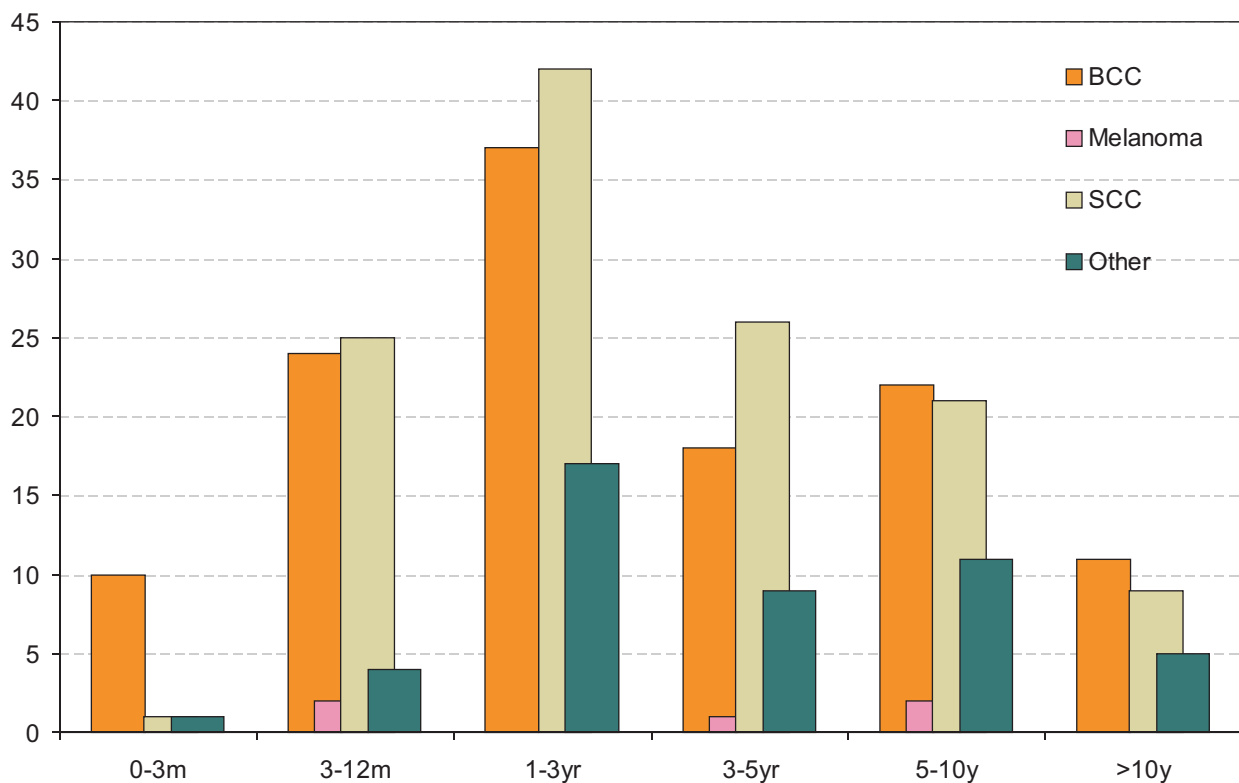
Type of Skin Cancer	Pts	Cancers
BCC	228	531
SCC	246	759
Melanoma	15	15
Total	310 (11% of all pts)**	1927

**** 182 pts had multiple skin cancer types**

Time to 1st Skin Cancer Development

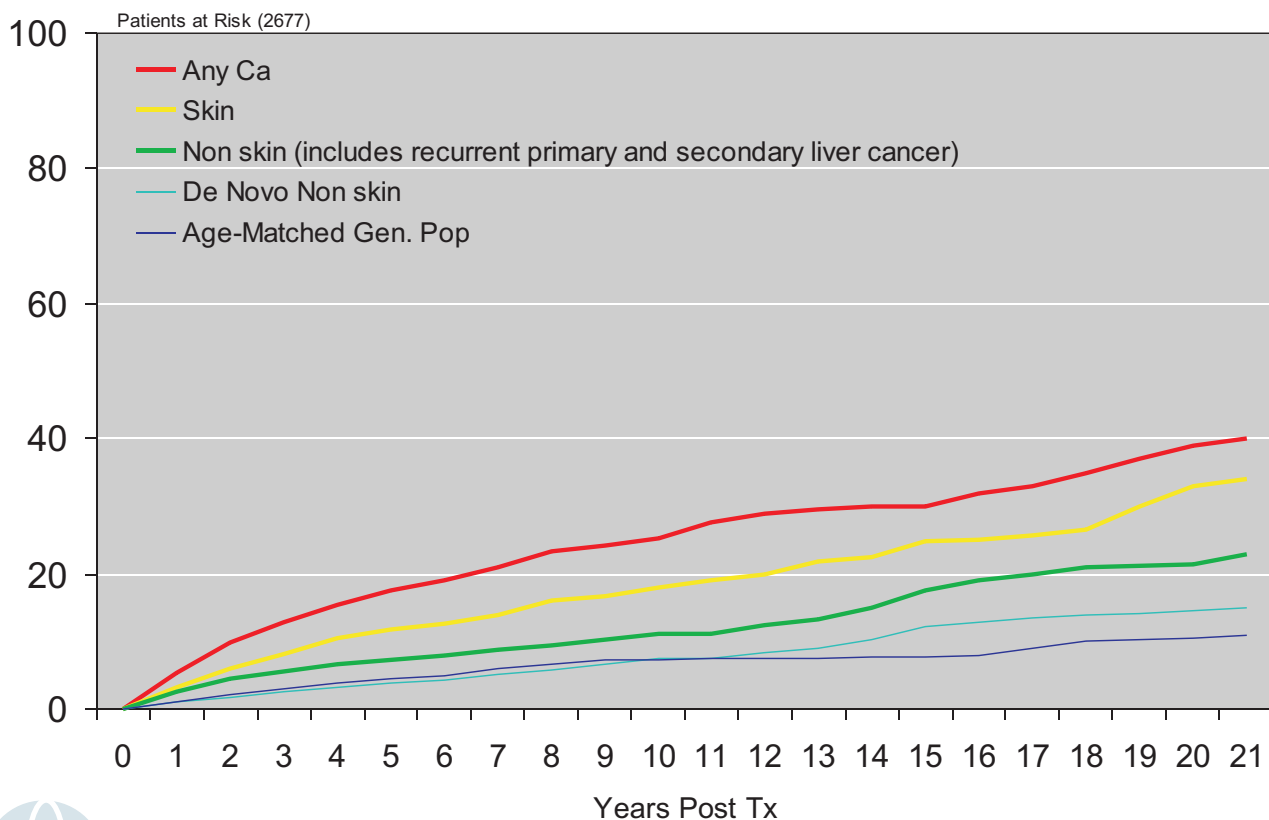
N = 2677

310 (11% of all pts)



Cumulative Risk of Diagnosis of Cancer Following Liver Tx. 1985-2006

N = 2677



Appendix I

Liver Transplant Units of Australia and New Zealand

Australian National Liver Transplant Unit		The New Children's Hospital
Royal Prince Alfred Hospital	<i>and</i>	Hawkesbury Road
Missenden Road		WESTMEAD NSW 2145
CAMPERDOWN NSW 2050		
Email: anltu@cs.nsw.gov.au		
http://www.cs.nsw.gov.au/Gastro/LiverTransplant/default.htm		

Liver Transplant Unit		Royal Children's Hospital
The Austin	<i>and</i>	Flemington Road
Studley Road		PARKVILLE VIC 3052
HEIDELBERG VIC 3084		

Queensland Liver Transplant Service		Royal Children's Hospital
Princess Alexandra Hospital	<i>and</i>	Bowen Bridge Road
Ipswich Road		HERSTON QLD 4029
WOOLLOONGABBA QLD 4102		

South Australian Liver Transplant Unit
Flinders Medical Centre
Flinders Drive
BEDFORD PARK SA 5042
http://www.flinders.sa.gov.au/flinders_centre_for_digestive_health/

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

New Zealand Liver Transplant Unit
Auckland Public Hospital
Park Road
Auckland
New Zealand
[Http://www.nzliver.org/](http://www.nzliver.org/)

Appendix II

ANZLTR PRIMARY Diagnosis Metabolic disorders by Age Group

Primary Diagnosis	Age group		Total
	Child	Adult	
-1 Antitrypsin deficiency	30	39	69
Crigler-Najjar	4	1	5
Familial amyloid polyneuropathy	0	27	27
Glycogen storage disease	0	1	1
Haemochromatosis	2	23	25
Homozygous Hypercholesterolemia	3	1	4
Indian childhood cirrhosis	1	0	1
Other *	7	1	8
Primary hyperoxaluria	5	6	11
Tyrosinemia	4	0	4
Urea cycle disorders **	7	3	10
Wilsos disease	7	26	33
Total	70	127	197

* Bile acid synthesis disorder, Protein C deficiency, methylmalonic acidemia, familial immunodeficiency, mitochondrial disease

** OTC deficiency 6; citrullinemia 4

Appendix III

ANZLTR PRIMARY Diagnosis - Other by Age Group

Primary Diagnosis	Age group		Total
	Child	Adult	
Alagille syndrome	22	1	23
Alagille non-syndromic	2	0	2
Benign liver tumour -Adenomatosis	0	1	1
Benign liver tumour-Hemangioma	0	2	2
Caroli's disease	1	12	13
Choledocal cyst	1	2	3
Cholestatic disease-Other	1	3	4
Chronic Budd Chiari	1	24	25
Congenital biliary fibrosis	1	1	2
Ductopenia	0	3	3
Granulomatous hepatitis / sarcoidosis	0	4	4
Histiocytosis X	4	0	4
Liver Trauma	0	1	1
Neonatal hepatitis	4	0	4
Nodular regenerative hyperplasia	0	4	4
Non alcoholic fatty liver (NAFLD or NASH)	0	27	27
Polycystic Liver disease	0	12	12
Polycystic liver and kidney disease	0	4	4
Progressive familial intrahepatic cholestasis(PFIC)	12	4	16
Secondary biliary cirrhosis	1	9	10
Secondary biliary cirrhosis - Hepatolithiasis	0	4	4
Secondary biliary cirrhosis - Cystic fibrosis	7	11	18
Other -specify	3	14	17
Total	60	143	203

Vanishing bile duct syndrome
 Haemangiotelangiectasia
 Veno-occlusive disease
 Chronic Active Hepatitis A
 Non-cirrhotic portal hypertension
 Kassabach-Merritt syndrome
 Arterial-venous malformation
 Hereditary haemorrhagic telangiectasia / OWRD.

Appendix IV

ANZLTR PRIMARY Diagnosis Fulminant Hepatic Failure by Age Group

Primary Diagnosis	Age group		Total
	Children	Adult	
Acute - Budd Chiari	0	2	2
Acute - Wilson's	4	11	15
Acute - -1 -AAT	2	0	2
Acute Autoimmune hepatitis	0	6	6
Acute Unknown / unspecified	33	58	91
Acute -Paracetamol	0	7	7
Acute -Other drugs	2	13	15
Acute Herbs / mushrooms	0	4	4
Acute - Hepatitis A	0	2	2
Acute - Hepatitis B	0	32	32
Acute - NonA-NonB	4	11	15
Acute - Hepatitis E	0	1	1
Acute - Post liver resection	1	1	2
Subacute - Wilson's	1	2	3
Subacute Autoimmune hepatitis	0	6	6
Subacute - Drug	0	3	3
Subacute - Unknown / unspecified	3	26	29
Subacute - Hepatitis A	0	2	2
Subacute - Hepatitis B	0	8	8
Total	50	195	245

Appendix V

ANZLTR Causes of Patient death

<u>Graft failure - other</u>		
Vascular thrombosis		18
Hepatic artery	10	
Portal vein	7	
Hepatic vein	1	
Non thrombotic infarction		3
Primary non function		19
Massive haemorrhagic necrosis		4
Recurrent disease (ALD, PSC, CAH:AI)		4
De novo Hep C		2
Biliary Complications		9
Other (PNC, immune hepatitis, outflow obstruction)		10
<u>Miscellaneous</u>		
Multiorgan failure		20
Renal Failure		13
Graft vs Host disease		5
Social (accident, suicide, non-compliance, Rx withdrawn)		11
Sudden death (cause unknown)		11
Other (Hyperkalaemia, motor neurone disease diabetes complications, drug reaction, progression FAP)		7