

CHAPTER 4

LIVER TRANSPLANTATION

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Contents

4.0 Introduction

4.1 Stock and Flow of Liver Transplantation

4.2 Recipients' Characteristics

- Demographics
- Primary Diagnosis

4.3 Transplant Practices

- Type of Transplant
- Immunosuppressive Therapy

4.4 Transplant Outcomes

- Patient Survival
- Causes of Death

Table 4.1.1 Stock and Flow of Liver Transplantation, 1993-2010

Year	93	94	95	96	97*	98	99	2000	01	02	03**	04	05	06	07	08	09	10
New transplant patients	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4
Deaths	0	0	3	4	1	1	4	1	2	5	1	5	6	4	3	2	4	2
Re-transplant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lost to follow up	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Functioning graft at 31st December	1	2	7	16	18	19	23	25	28	33	37	48	46	50	54	58	62	64

*1 patient who was alive until 5/12/1997 is recorded dead with missing date of death

** 1 patient who had transplanted in 2003 is recorded as dead with missing date of death

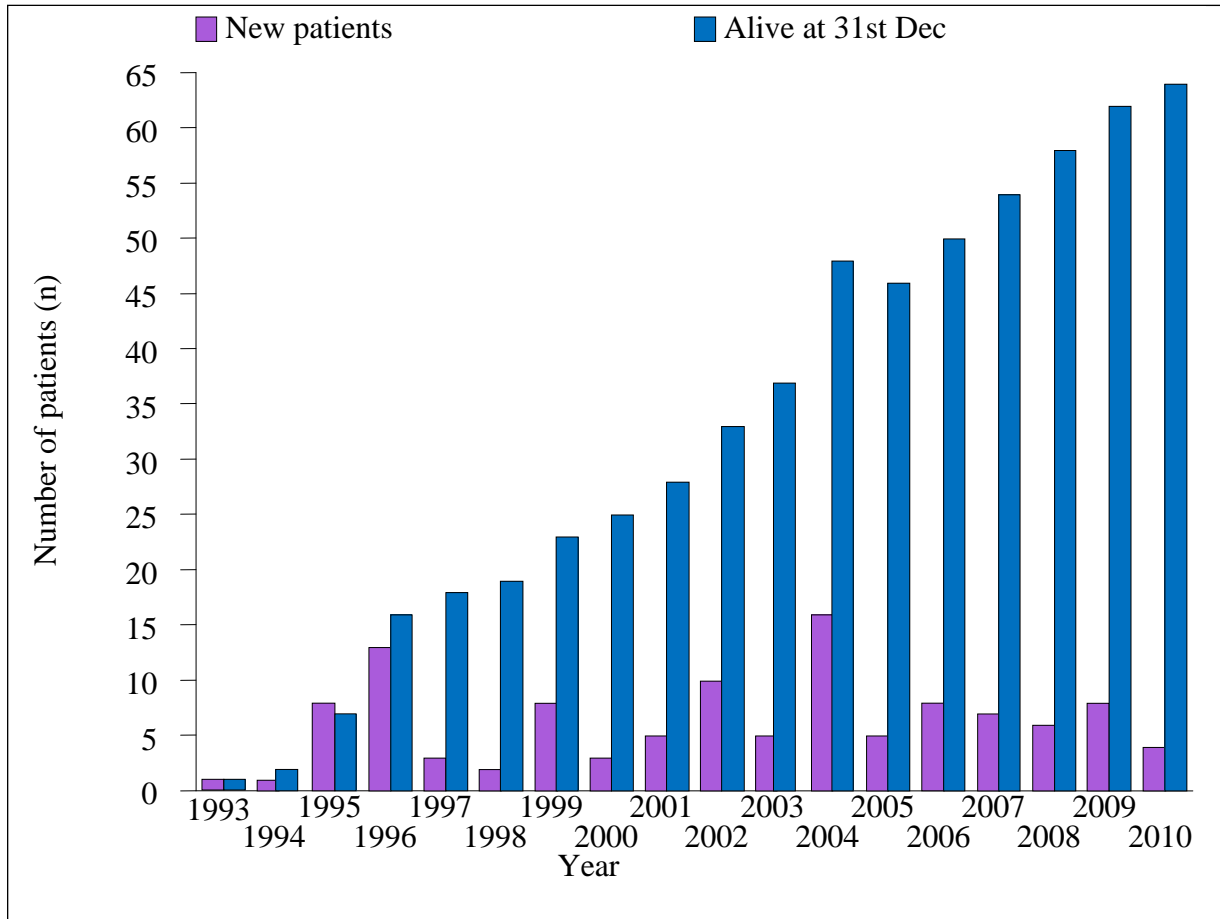


Figure 4.1.1 Stock and Flow of Liver Transplantation, 1993-2010

Table 4.1.2 Distribution of Patients by Place of Transplant, 1993-2010

Place of transplant	Year (No.)																			TOTAL
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10		
Local	0	0	8	10	1	1	8	3	5	9	2	14	5	8	7	5	6	4	96	
Overseas	1	1	0	3	2	1	0	0	0	1	3	2	0	0	0	1	2	0	17	
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4	113	

Table 4.1.3 Distribution of Patients by Centres for Liver Transplantation, 1993-2010

Transplant Centre	Year (No.)																			TOTAL
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10		
Sime Darby Medical Centre, Subang Jaya	0	0	8	10	1	1	8	3	5	6	2	7	0	0	0	0	0	0	51	
Hospital Selayang, Department of Hepatobiliary	0	0	0	0	0	0	0	0	0	3	0	7	5	8	7	5	6	4	45	
Royal Children's Hospital, Brisbane	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
National University Hospital, Singapore	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	2	0	5	
Queensland Liver Transplant Service, Australia	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
King's Collage Hospital, UK	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Tianjin, China	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	
Asian Centre for Liver Disease & Transplantation, Singapore	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	4	
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4	113	

Table 4.2.1 Distribution of Patients by Gender, 1993-2010

Gender	Year (No.)																			TOTAL
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10		
Male	0	0	6	5	2	1	3	1	2	7	5	10	2	6	3	1	1	1	56	
Female	1	1	2	8	1	1	5	2	3	3	0	6	3	2	4	5	7	3	57	
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4	113	

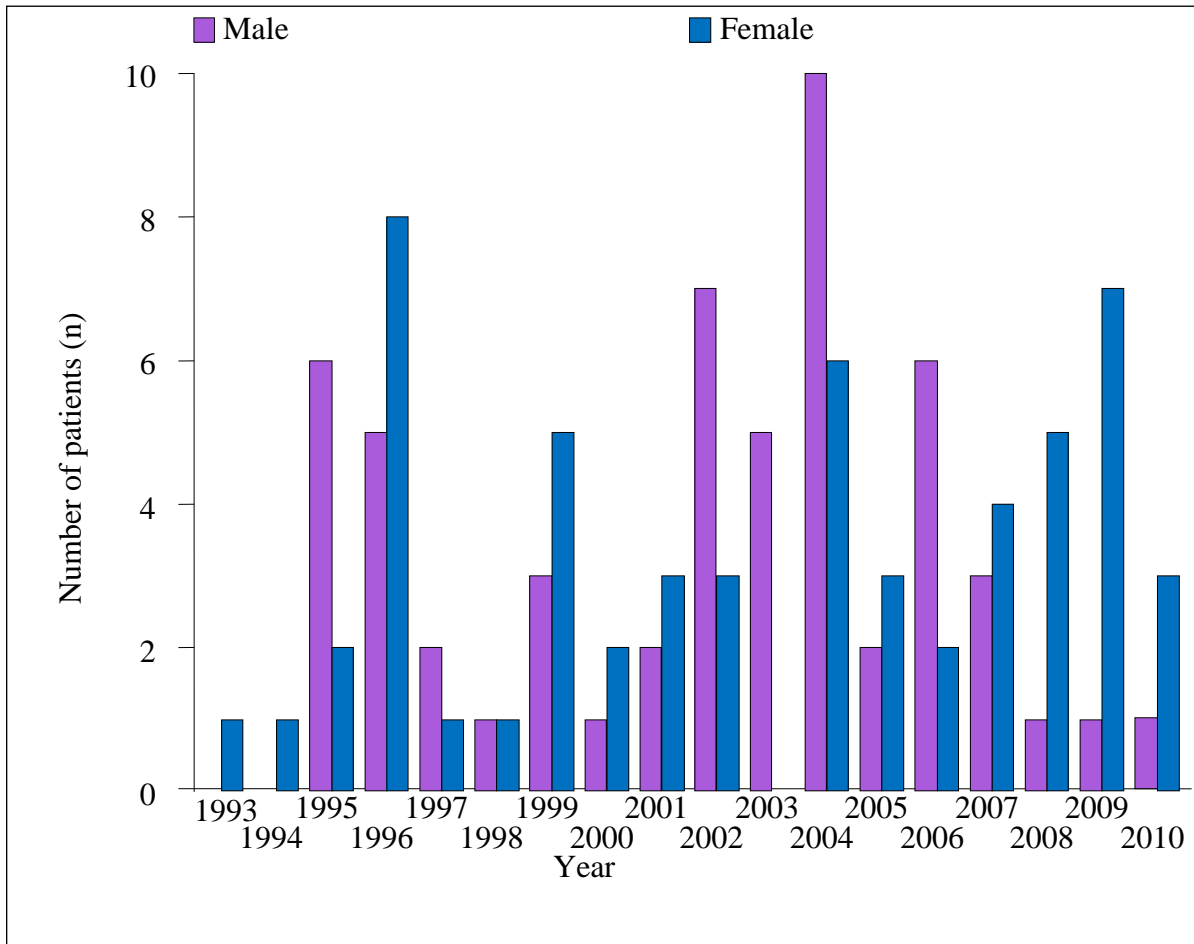


Figure 4.2.1 Distribution of Patients by Gender, 1993-2010

Table 4.2.2 Distribution of Patients by Ethnic Group, 1993-2010

Ethnic group	Year (No.)																			TOTAL
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10		
Malay	0	1	2	3	1	0	4	1	2	3	1	11	3	3	2	2	1	2	42	
Chinese	1	0	6	8	2	1	2	2	3	6	4	5	1	3	4	4	7	1	60	
Indian	0	0	0	2	0	1	1	0	0	0	0	0	1	2	1	0	0	1	9	
Others	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4	113	

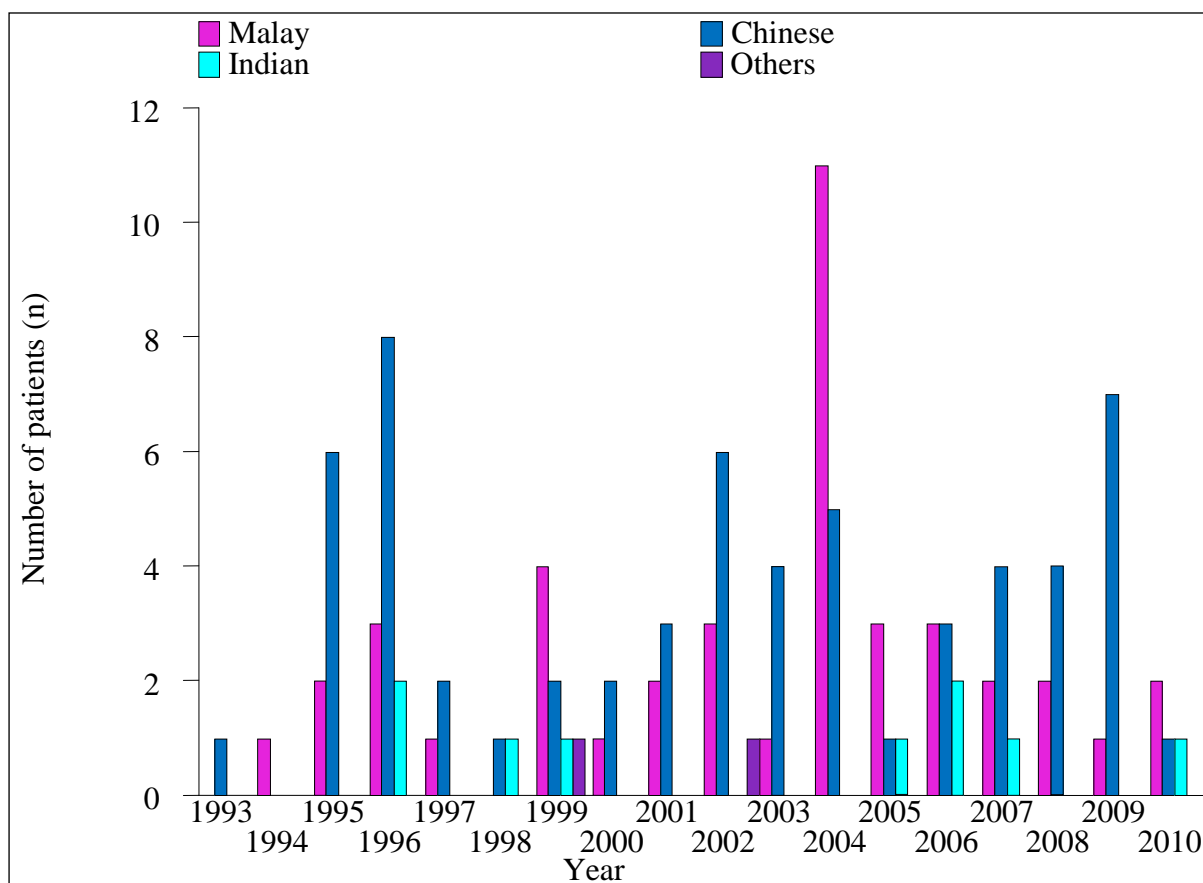


Figure 4.2.2 Distribution of Patients by Ethnic Group, 1993-2010

Table 4.2.3 Distribution of Patients by Age, 1993-2010

Age group	Year (No.)																		
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	TOTAL
<1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	0	5
1-4	1	1	3	11	3	2	5	3	5	6	1	8	2	4	4	1	3	0	63
5-9	0	0	3	1	0	0	2	0	0	2	1	3	2	1	1	1	2	2	21
10-14	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	0	1	0	6
15-19	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2	4
20-39	0	0	1	0	0	0	0	0	0	1	0	0	0	2	1	3	1	0	9
40-59	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	3
≥60	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4	113
Mean	2	4.4	9.2	3.8	1.8	2.3	4.4	1.4	2.2	10.4	26.9	12.5	4.5	12.2	9.5	13.9	8.6	14.6	9.1
SD	-	-	9.2	3.6	0.7	1.4	4.8	0.1	1.6	14.2	32.7	21.6	2.9	15.2	12.8	11.3	8.2	5.9	13.8
Median	2	4.4	5.4	2.3	2	2.3	2.2	1.5	1.8	4	9.3	3.4	4.5	4.3	4.7	15.7	6.6	14.6	3.7
Minimum	2	4.4	2.2	1.6	1.1	1.4	1.1	1.3	1	1.3	11.8 months	11.8 months	11.9 months	1.5	1.5	10.6 months	8.9 months	9.1	8.9 months
Maximum	2	4.4	30	14.1	2.4	3.3	15	1.6	4.9	46	72.7	73.9	8.1	38.8	37.5	25.9	26.9	19.9	73.9

** Age=date if transplant – date of birt

Table 4.2.4 Primary Diagnosis, 1993-2010

Primary diagnosis	Year (No.)																		
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	TOTAL
Biliary atresia	1	1	7	12	3	1	7	2	5	6	2	10	4	2	6	4	3	1	77
Metabolic liver disease	0	0	1	1	0	0	0	0	0	2	0	2	0	0	0	0	1	0	7
Cholestatic liver disease	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	1	4
Primary biliary cirrhosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Primary sclerosing cholangitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Autoimmune hepatitis	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Chronic hepatitis B	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	5
Chronic hepatitis C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alcoholic liver disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malignancies	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	1	5
Acute liver failure	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	4
Idiopathic/Cryptogenic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Others	0	0	0	0	0	0	0	0	0	2	0	1	1	4	1	3	4	1	17
TOTAL	1	1	8	13	3	2	8	3	5	11	7	17	6	9	7	7	9	5	122

** 9 patients have more than one primary disease

Table 4.2.5 Indication for Transplantation, 1993-2010

Indication for transplantation	Year (No.)																		
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	TOTAL
Recurrent encephalopathy	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3
Uncontrolled bleeding varices	0	0	0	7	1	0	4	1	1	0	0	2	0	0	0	0	0	0	16
Intractable ascites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spontaneous bacterial peritonitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poor liver function	1	1	7	11	3	1	8	3	5	9	3	11	4	1	4	1	4	0	77
Malignancy	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	2
Unacceptable quality of life	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	2	0	5
Failure to thrive and growth retardation in paediatric patients	0	0	6	10	3	2	6	3	5	7	2	10	3	1	0	1	5	1	65
Others	0	0	0	0	0	0	0	0	0	0	0	1	2	8	3	5	6	3	28
No data	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	4
TOTAL	1	1	14	28	7	3	19	7	11	19	7	26	10	10	7	8	17	5	200

** 43 patients had 1 indication for transplant, 70 had more than 1 indication for transplantation

Table 4.2.6 Recipients' Blood Group, 1993-2010

Blood group	Year (No.)																			TOTAL
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10		
A	0	1	2	0	0	0	3	0	1	3	1	4	1	4	2	1	1	1	25	
B	0	0	1	2	0	1	2	0	1	1	0	1	1	3	3	1	1	1	19	
AB	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	1	0	5	
O	0	0	2	5	1	0	3	3	3	5	1	8	2	1	2	2	2	1	41	
No data	1	0	3	5	2	0	0	0	0	1	3	2	0	0	0	2	3	1	23	
TOTAL	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4	113	

Table 4.3.1 Distribution of Patients by Type of Donors, 1993-2010

Type of donor	Year (No.)																			TOTAL
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10		
Cadaveric	1	0	0	3	1	0	0	0	0	1	1	4	2	4	4	4	6	3	34	
Living Related - Mother	0	1	5	2	1	2	5	2	2	2	2	7	1	1	0	0	2	1	36	
Living Related - Father	0	0	2	7	1	0	2	0	2	3	0	1	1	3	3	2	0	0	27	
Living Related - Daughter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Living Related - Son	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	
Living Related - Brother	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Living Related - Sister	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Living Related - Monozygotic twin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Living Related - Dizygotic twin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Living Related - Others	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Living Related - Emotionally	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Living Unrelated	0	0	1	1	0	0	1	1	1	3	0	3	0	0	0	0	0	0	11	
TOTAL patients	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4	113	

Table 4.3.2 Immunosuppressive Drug Treatment at Transplantation, 1993-2010

Immunosuppressive drugs	Year (No.)																			TOTAL
	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10		
Steroids	0	0	2	5	0	2	5	2	5	5	1	12	5	8	6	5	6	2	71	
Azathioprine	0	0	0	0	0	0	0	0	0	0	0	4	5	8	4	2	0	0	23	
Cyclosporin A	1	1	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6	
Tacrolimus (FK506)	0	0	3	7	2	2	8	2	5	9	5	12	5	8	5	4	7	3	87	
Mycophenolate Mofetil (MMF)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	2	6	
Rapamycin	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3	
Monoclonal/Polyclonal Antibodies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Anti IL2 Antibodies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
No data	0	0	4	3	1	0	0	0	0	1	0	4	0	0	1	0	0	0	14	
TOTAL patients	1	1	8	13	3	2	8	3	5	10	5	16	5	8	7	6	8	4	113	

Note: 41 patients had 1 type of drug, 47 patients had 2 types, 25 patients had 3 types

Table 4.4.1 Patient Survival by Year of Transplant, 1993-2010

Interval (months)	Year of transplant			
	1993-1998		1999-2010	
	% Survival	SE	% Survival	SE
1	82	7	82	4
6	71	9	71	5
12	71	9	70	5

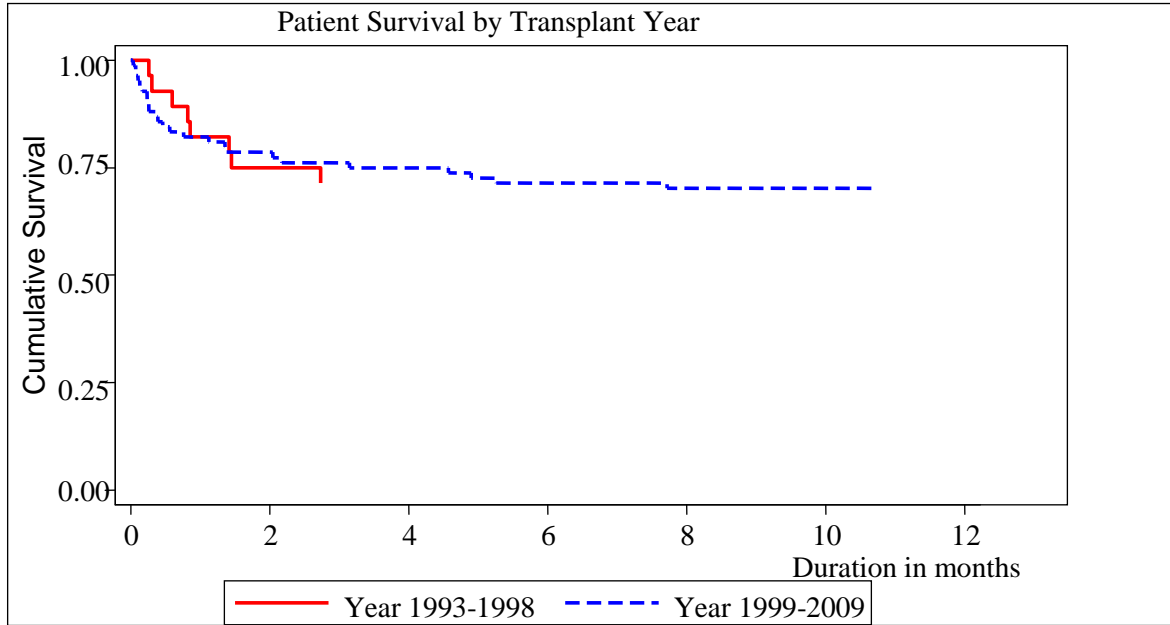


Figure 4.4.1 Patient Survival by Year of Transplant, 1993-2010

Table 4.4.2 Patient Survival by Gender, 1993-2010

Interval (months)	Gender			
	Male		Female	
	% Survival	SE	% Survival	SE
1	82	5	82	5
6	71	6	72	6
12	69	6	72	6

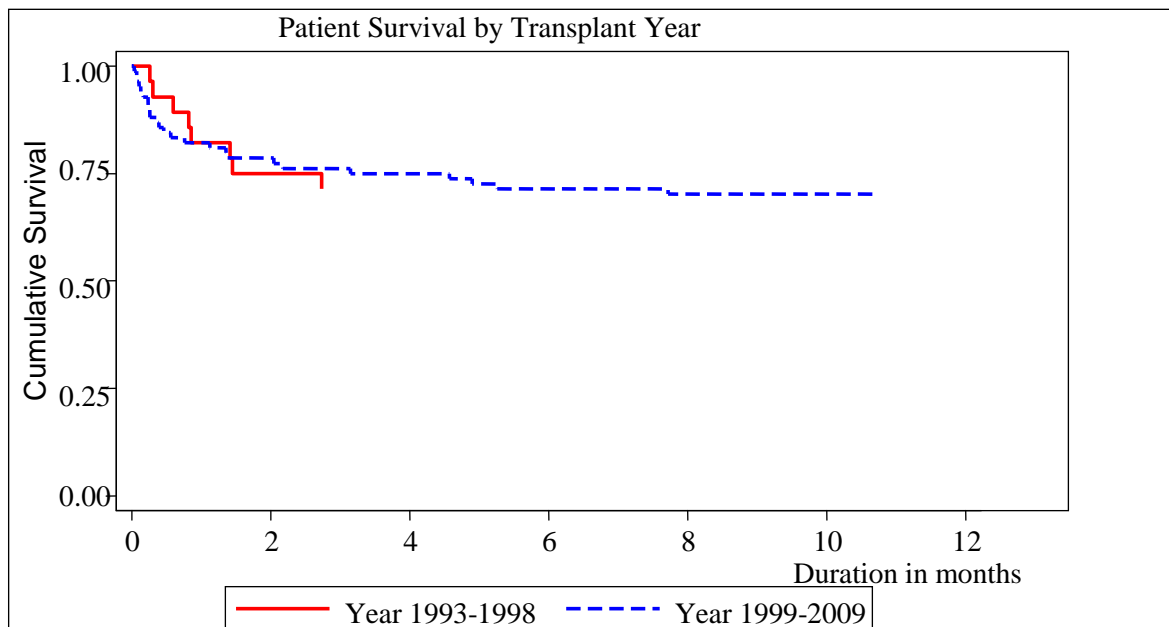


Figure 4.4.2 Patient Survival by Gender, 1993-2010

Table 4.4.3 Patient Survival by Age Group, 1993-2010

Interval (months)	Age Group			
	0-9 years		≥10 years	
	% Survival	SE	% Survival	SE
1	80	4	91	6
6	69	5	83	8
12	69	5	78	9

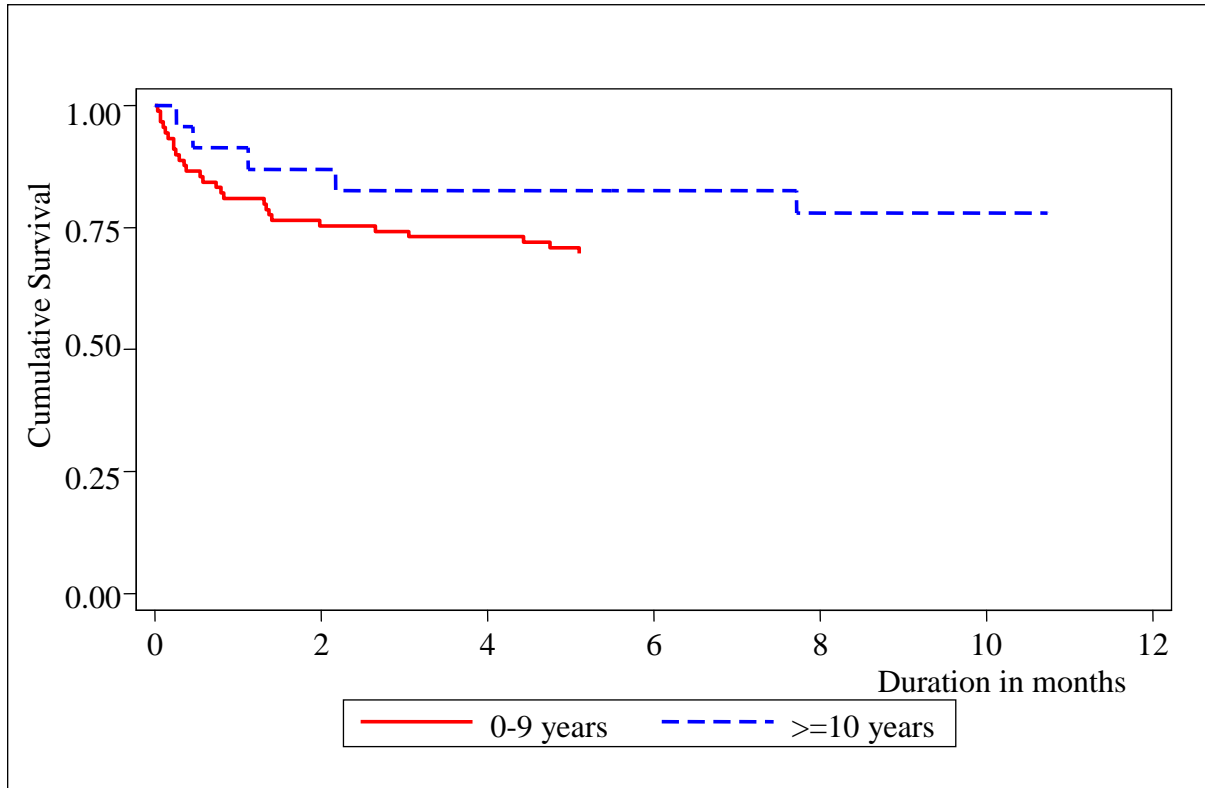


Figure 4.4.3 Patient Survival by Age Group, 1993-2010

Table 4.4.4 Distribution of Patients by Cause of Death, 1993-2010

Cause of death	93	94	95	96	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	TOTAL
Graft failure	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	3
Portal Vein Thrombosis	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Chronic graft rejection	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Intra-abdominal Bleeding	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Ischaemic liver necrosis	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Peritonitis and Septicaemia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Graft versus host reaction	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
CMV Pneumonia	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Decompensated Liver cirrhosis post liver transplant with DIVC	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Died at home	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Intra-cerebral Haemorrhage	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Intracranial Haemorrhage	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Metastasis to scalp and chest	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Oesophageal Varices / Bleeding	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Pneumonia and Respiratory Failure	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Post Transplant Lymphoproliferative Disease and Septicaemia	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Sepsis	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Sepsis severe and multi-organ failure	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Bleeding oesophageal varices	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
Septicaemia	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	4
Septicaemia and DIVC	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
Gram negative Septicaemia	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Acute liver failure secondary to portal vein thrombosis post liver transplant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Cholelithiasis	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
End stage liver failure recurrent ascending cholangitis	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Retroperitoneal Haematoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Viral Bronchopneumonia	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Acute on Chronic Liver Failure	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
Staph aureus Septicaemia, Drug induced immunodeficiency	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Hepatitis B	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Acute graft rejection, post-transplant lymphoproliferative disorder, massive upper GI bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Chronic rejection complicated by Pneumocytis pneumonia infection*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Bronchopneumonia, sepsis, renal failure*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Malignant Lymphoma post Liver Transplant*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Post liver transplant pancreatitis with portal vein thrombosis*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Sepsis secondary to bronchopneumonia underlying disease Byler's disease with ESL disease*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Unknown	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
Total death	0	0	3	4	1	1	4	1	2	5	1	5	6	4	3	2	4	2	48

*Additional cause of death