

CHAPTER 3

HEART AND LUNG TRANSPLANTATION

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HEART TRANSPLANTATION

3.1 STOCK AND FLOW

Table 3.1.1a: Stock and Flow of Heart Transplantation, 1997-2012

Year	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	11	12
New transplant patients	1	3	2	3	4	0	2	0	1	1	1	0	1	0	3	0
Deaths	0	1	0	3	1	3	1	0	0	1	0	0	1	0	0	1
Retransplanted	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Lost to follow up	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alive at 31 st December	1	3	5	5	8	5	6	6	7	7	8	8	8	8	11	10

Note: The same patient was re-transplanted in the year 2007, thus only counted as one

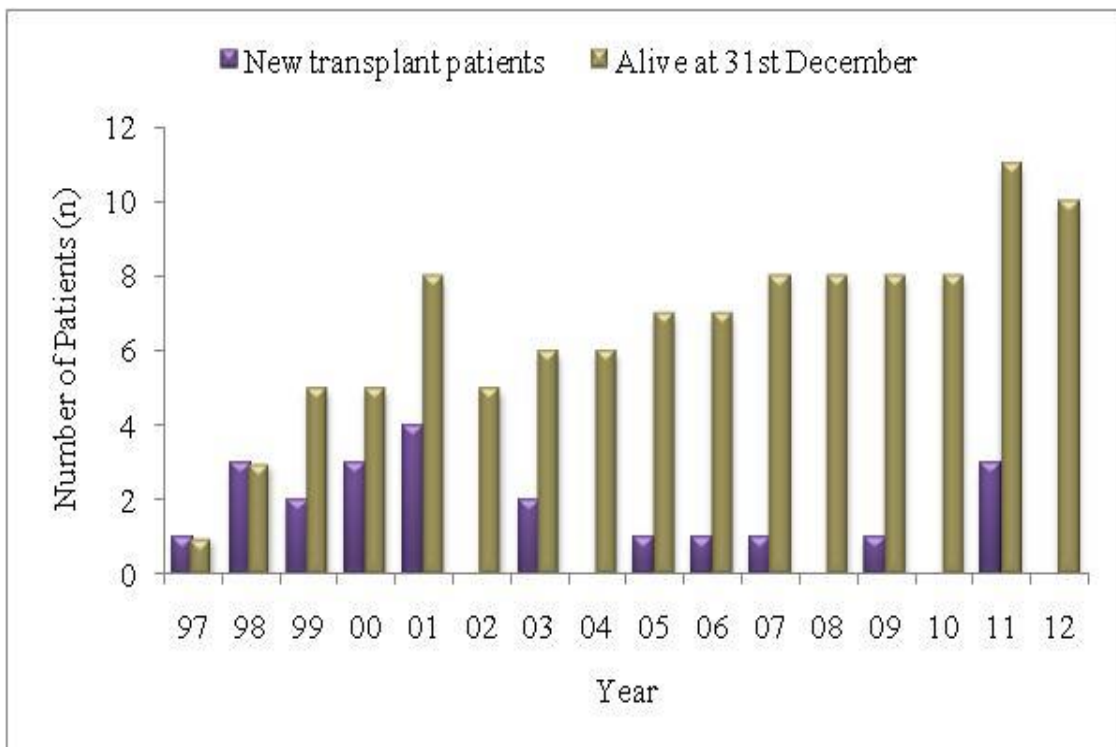


Figure 3.1.1a: Stock and Flow of Heart Transplant, 1997-2012

3.2 RECIPIENTS' CHARACTERISTICS

Table 3.2.1a: Distribution of Patients by Gender, 1997-2012

Year	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Gender	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	No.
Male	1	3	0	2	2	0	2	0	1	1	0	0	0	0	3	0	15
Female	0	0	2	1	2	0	0	0	0	0	1	0	1	0	0	0	7
TOTAL	1	3	2	3	4	0	2	0	1	1	1	0	1	0	3	0	22

Note: The same patient was re-transplanted in the year 2007, thus only counted as one

Table 3.2.2a: Distribution of Patients by Ethnic Group, 1997-2012

Year	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Ethnic group	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Malay	0	0	1	1	2	0	0	0	1	0	0	0	0	0	2	0	7
Chinese	0	0	0	1	0	0	1	0	0	0	1	0	1	0	1	0	5
Indian	1	3	1	1	2	0	1	0	0	1	0	0	0	0	0	0	10
TOTAL	1	3	2	3	4	0	2	0	1	1	1	0	1	0	3	0	22

Note: The same patient was re-transplanted in the year 2007, thus only counted as one

Table 3.2.3a: Distribution of Patients by Age, 1997-2012

Year	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Age, years	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
0-19	0	0	2	1	1	0	0	0	1	0	1	0	0	0	0	0	6
20-39	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
40-59	1	1	0	2	3	0	2	0	0	1	0	0	1	0	1	0	12
≥60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	3	2	3	4	0	2	0	1	1	1	0	1	0	3	0	22
Mean	51	40	15	37	38	-	46	-	15	44	14	-	41	-	36	0	35
SD	-	9	1	22	17	-	8	-	-	-	-	-	-	-	13	0	15
Median	51	37	15	44	43	-	46	-	15	44	14	-	41	-	33	0	40
Minimum	51	33	15	13	14	-	40	-	15	44	14	-	41	-	25	0	13
Maximum	51	50	16	55	54	-	52	-	15	44	14	-	41	-	50	0	54

Age=date of transplant-date of birth

Note: The same patient was re-transplanted in the year 2007, thus only counted as one

Age for 2007 patient was same for 1st and 2nd transplant

Table 3.2.4a: Distribution of Patients by Primary Diagnosis, 1997-2012

Year	97	98	99	2000	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Primary diagnosis	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ischaemic Cardiomyopathy	1	3	0	1	1	0	2	0	0	1	0	0	0	0	0	0	9
Idiopathic Dilated Cardiomyopathy	0	0	2	1	2	0	0	0	1	0	0	0	0	0	1	0	7
Restrictive Cardiomyopathy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
End Stage Valvular Heart Disease	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2
Hypertrophic Cardiomyopathy	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Others	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	3
TOTAL	1	3	2	3	4	0	2	0	1	1	1	0	1	0	3	0	22

Note: The same patient was re-transplanted in the year 2007, thus only counted as one

3.3 TRANSPLANT PRACTICES

Table 3.3.1a: Distribution of Patients by Heart Procedure, 1997-2012.

Year	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Heart Procedure	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Orthotopic Bicaval	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
Orthotopic Traditional	0	2	2	3	4	0	2	0	1	1	1	0	1	0	1	0	18
Heterotopic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	3	2	3	4	0	2	0	1	1	1	0	1	0	3	0	22

Table 3.3.2a: Distribution of Patients by Immunosuppressive Used, 1997-2012

Year	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	Total
Type of immunosuppressive	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Steroids																	
Prednisolone	1	3	2	3	4	0	1	0	1	0	1	0	1	0	3	0	20
Methylprednisolone	1	3	2	3	4	0	2	0	1	1	2	0	1	0	3	0	23
Calcineurin Inhibitors																	
Neoral®	1	3	2	3	4	0	1	0	1	1	1	0	1	0	3	0	21
Tacrolimus (FK506)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Antimetabolites																	
Azathioprine (AZA)	1	3	2	3	4	0	2	0	0	1	0	0	0	0	0	0	16
Mycophenolate Mofetil (MMF)	0	0	0	0	1	0	0	0	1	0	2	0	1	0	3	0	8
Anti-lymphocyte Receptor Antibodies																	
Anti-thymocyte globulin (ATG)	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Simulect	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TOTAL patients at notification	1	3	2	3	4	0	2	0	1	1	1	0	1	0	3	0	22

Table 3.3.3a: Immunosuppressive Used at Time of Last Follow-up up to 2012

Year of follow up*	2004	2005	2006	2007	2008	2009	2010	2011	2012
Type of immunosuppressive	n	n	n	n	n	n	n	n	n
Steroids									
Prednisolone	3	4	4	3	4	3	3	2	1
Methylprednisolone	1	1	0	0	2	2	1	0	0
Everolimus	0	0	0	0	0	0	0	1	0
Calcineurin Inhibitors									
Cyclosporin A	0	0	0	0	0	0	0	0	0
Neoral®	6	6	7	7	7	7	7	6	10
FK506	0	0	0	0	1	1	1	1	1
Antimetabolites									
Azathioprine (AZA)	3	3	3	3	2	2	1	1	1
Mycophenolate Mofetil (MMF)	3	3	5	5	6	6	6	6	9
TOTAL patients at follow-up	6	6	7	7	8	8	8	8	11

*Data according to year of follow up of transplanted patients

Table 3.3.4a: Duration of Waiting Time on Waiting List, 1997-2012

Year	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Duration (months)*	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
<5	0	2	1	0	1	0	1	0	0	0	0	0	0	0	2	0	7
5≤10	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	4
10≤15	0	0	0	1	0	0	0	0	0	1	1	0	1	0	0	0	4
15<20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
20≤25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25≤30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30≤35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35≤40	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
40≤45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45≤50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50≤55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55≤60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60≤65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TOTAL	1	2	2	2	2	0	2	0	1	1	1	0	1	0	3	0	18
Mean	6	2	4	15	5	-	20	-	9	10	13	-	13	-	21	-	11
SD	-	0	1	6	5	-	25	-	-	-	0	-	-	-	34	-	7
Median	6	2	4	15	5	-	20	-	9	10	13	-	13	-	2	-	15
Minimum	6	2	3	10	1	-	2	-	9	10	13	-	13	-	1	-	1
Maximum	6	2	5	19	8	-	37	-	9	10	13	-	13	-	61	-	61

*Duration=date of transplant-date added to wait list

3.4 TRANPLANT OUTCOMES

Table 3.4.1: Post Transplant Events at Last Follow-up up to 2012

Year of transplant*	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Type of post transplant events	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Drug Treated Hypertension	0	1	1	0	2	0	1	0	1	0	0	0	0	0	1	0	7
Bone Disease (Symptomatic)	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Chronic Liver Disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cataracts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diabetes	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3
Renal Dysfunction	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Stroke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drug-Treated Hyperlipidaemia	0	1	1	0	2	0	1	0	1	0	1	0	1	0	3	0	11
TOTAL patients at follow-up	0	1	1	0	2	0	1	0	1	0	1	0	1	0	3	0	11

*Data according to year of transplant of patient

Table 3.4.2: Post Transplant Malignancies at Follow-up up to 2012

Year of transplant*	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Type of post transplant malignancies	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Donor related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recurrence of pre-transplant tumor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
De novo solid tumor	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
De novo lymphoproliferative	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Skin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total patients at follow up	0	1	1	0	2	0	1	0	1	0	1	0	1	0	3	0	11

*Data according to year of transplant of patient

Table 3.4.3: Non-compliance at Follow-up up to 2012

Year of transplant*	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Non-compliance during follow-up	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
• Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• No	0	1	1	0	2	0	1	0	1	0	1	0	1	0	3	0	8
TOTAL patients at follow-up	0	1	1	0	2	0	1	0	1	0	1	0	1	0	3	0	11
<i>Areas of non-compliance:</i>																	
• Immunosuppress-ion medication	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• Patient unable to afford immunosuppress-ion medications	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• Other medication	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• Other therapeutic regimen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL patients with noncompliance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Data according to year of transplant of patient

Table 3.4.4: Patient Treated for Rejection at Follow-up up to 2012

Year of transplant*	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Patient treated for rejection	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
• Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
• No	0	1	1	0	2	0	1	0	1	0	0	0	1	0	0	0	7
TOTAL patients at follow-up	0	1	1	0	2	0	1	0	1	0	1	0	1	0	3	0	11
<i>Number of rejection events</i>																0	
• 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL patients with rejection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Data according to year of transplant of patient

Table 3.4.5a: Distribution of Patients by Time of Deaths, 1997-2012

Year of discharge	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Time of deaths*	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
<3 months (at discharge)	0	1	0	2	0	1	1	0	0	1	0	0	0	0	0	0	6
3-<6 months	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 months-1 year	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
>1 year	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	1	4
TOTAL patients who died	0	1	0	3	1	3	1	0	0	1	0	0	1	0	0	1	12

*Time=Date of death–date of transplant

Table 3.4.6: Patient Survival, 1997-2012

Year of Transplant Interval	1997-2012	
	% Survival	SE
1 year	58	0.10
3 year	52	0.11
5 year	46	0.11
10 year	37	0.12

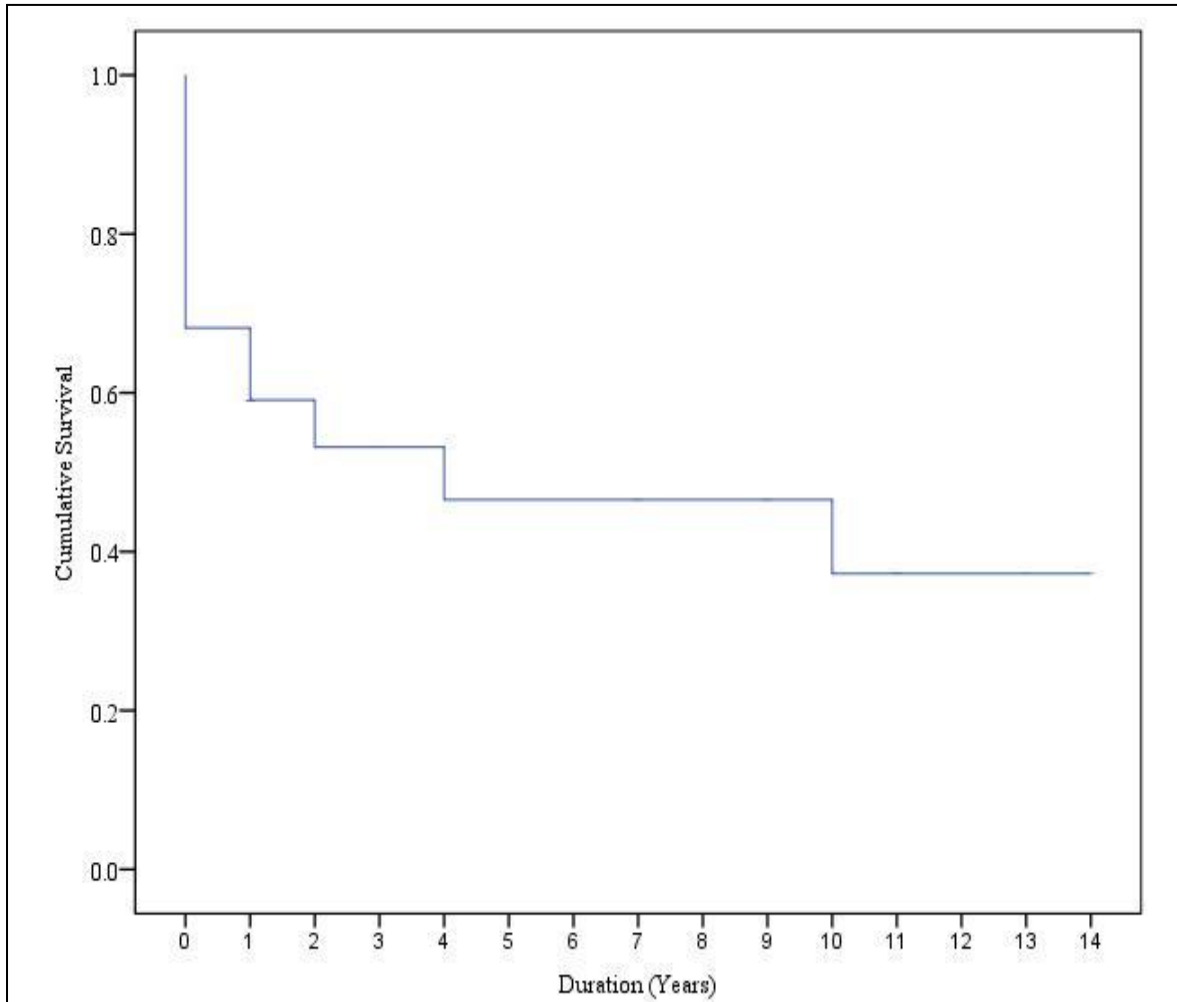


Figure 3.4.6: Patient Survival, 1997-2012

Table 3.4.7: Cause of Death at Discharge, 1997-2012

Year	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	TOTAL
Cause of death	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Hyperacute rejection	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Multi organ failure	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Respiratory failure secondary to septicaemia	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Respiratory failure, renal function and liver failure, ARDS, septicaemia	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Septicaemia, multiorgan failure	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Graft failure	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTAL patients who died at discharge	0	1	0	2	0	1	1	0	0	1	0	0	0	0	0	6

Table 3.4.8: Cause of Death at Follow-up, 1997-2012

Year	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	TOTAL
Cause of death	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Severe Bleeding	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Lung cancer, small cell type bronchopneumonia	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Rejection due to non compliance	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Sudden death due most likely to graft CAD	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
Unknown	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
TOTAL patients who died at follow up	0	0	0	1	1	2	0	0	0	0	0	0	1	0	0	1	6

LUNG TRANSPLANTATION

Table 3.1.1b: Stock and Flow of Lung Transplantation, 2005-2012

Year	2005	2006	2007	2008	2009	2010	2011	2012
New Heart and Lung Transplant Patients	0	0	1	0	0	0	3	0
New Lung Transplant Patients	1	1	1	0	0	1	1	0
Deaths	0	1	1	0	0	2	1	1
Retransplanted	0	0	0	0	0	0	0	0
Lost to follow up	0	0	0	0	0	0	0	0
Alive at 31 st December	1	1	2	2	2	1	4	3

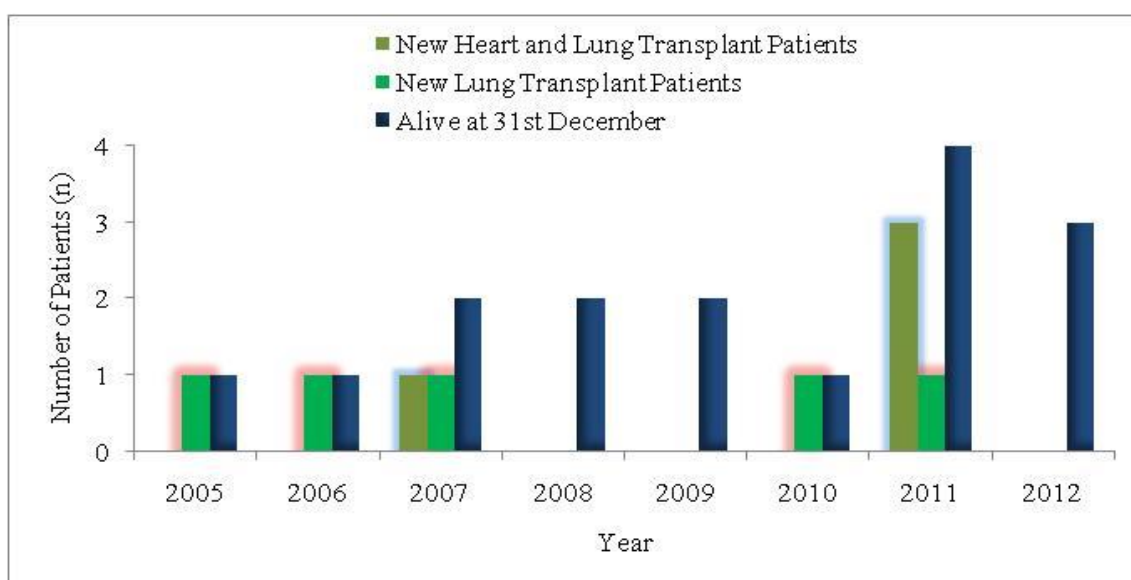


Figure 3.1.1b Stock and Flow of Lung Transplant and Heart Lung Transplant

3.2 RECIPIENTS' CHARACTERISTICS

Table 3.2.1b: Distribution of Patients by Gender, 2005-2012

Year	2005	2006	2007	2008	2009	2010	2011	2012	TOTAL
Gender	n	n	n	n	n	n	n	n	n
Male	1	1	1	0	0	0	3	0	6
Female	0	0	1	0	0	1	1	0	3
TOTAL	1	1	2	0	0	1	4	0	9

Table 3.2.2b: Distribution of Patients by Ethnic Group, 2005-2012

Year	2005	2006	2007	2008	2009	2010	2011	2012	TOTAL
Ethnic group	n	n	n	n	n	n	n	n	n
Malay	0	0	1	0	0	0	2	0	3
Chinese	0	0	0	0	0	0	1	0	1
Indian	1	1	0	0	0	1	1	0	4
Bumiputra Sarawak	0	0	1	0	0	0	0	0	1
TOTAL	1	1	2	0	0	1	4	0	9

Table 3.2.3b: Distribution of Patients by Age, 2005-2012

Year	2005	2006	2007	2008	2009	2010	2011	2012	TOTAL
Age, years	n	n	n	n	n	n	n	n	n
0-19	0	0	1	0	0	0	0	0	1
20-39	0	1	1	0	0	0	2	0	4
40-59	1	0	0	0	0	1	2	0	4
≥60	0	0	0	0	0	0	0	0	0
TOTAL	1	1	2	0	0	1	4	0	9

Age=date of transplant-date of birth

Table 3.2.4b: Distribution of Patients by Primary Diagnosis, 2005-2012

Year	2005	2006	2007	2008	2009	2010	2011	2012	TOTAL
Primary diagnosis	n	n	n	n	n	n	n	n	n
Idiopathic pulmonary fibrosis	1	1	1	0	0	1	1	0	5
Idiopathic pulmonary arterial hypertension	0	0	1	0	0	0	1	0	2
Chronic obstructive pulmonary disease	0	0	0	0	0	0	0	0	0
Bronchiectasis	0	0	0	0	0	0	1	0	1
Others	0	0	0	0	0	0	1*	0	1
TOTAL	1	1	2	0	0	1	4	0	9

* ventricular septal defect (VSD) and Eisenmenger's syndrome

3.3 TRANSPLANT PRACTICES

Table 3.3.1b: Distribution of Patients by Thoracic Transplant Procedure, 2005-2012

Year	2005	2006	2007	2008	2009	2010	2011	2012	TOTAL
Heart Procedure	n	n	n	n	n	n	n	n	n
Single lung transplant	1	0	0	0	0	0	0	0	1
Double lung transplant	0	1	1	0	0	1	1	0	4
Heart-Lung transplant	0	0	1	0	0	0	3	0	4
TOTAL	1	1	2	0	0	1	4	0	9

Table 3.3.3b: Immunosuppressive Used at Time of Last Follow-up up to 2012

Year of follow up*	2005	2006	2007	2008	2009	2010	2011	2012
Type of immunosuppressive	n	n	n	n	n	n	n	n
Steroids:								
Prednisolone	1	2	2	1	0	0	0	0
Methylprednisolone	1	1	2	0	0	0	0	0
Calcineurin Inhibitors:								
Neoral®	1	2	3	0	0	0	0	0
FK506 (Tacrolimus)	0	0	0	2	2	1	0	0
Cyclosporin A	0	0	0	0	0	1	1	3
Antimetabolites:								
Mycophenolate Mofetil (MMF)	1	2	3	2	0	0	1	3
TOTAL patients at follow-up	1	2	3	2	2	1	1	3

*Data according to year of follow up of transplanted patients

3.4 TRANSPLANT OUTCOMES

Table 3.4.5b: Distribution of Patients by Time of Deaths, 2005-2012

Year of discharge	2005	2006	2007	2008	2009	2010	2011	2012	TOTAL
Time of deaths*	n	n	n	n	n	n	n	n	n
<3 months (at discharge)	0	1	1	0	0	1	1	0	4
3-<6 months	0	0	0	0	0	0	0	0	0
6 months-1 year	0	0	0	0	0	0	0	1	1
>1 year	0	0	0	0	0	1	0	0	1
TOTAL patients who died	0	1	1	0	0	2	1	1	6

*Time=Date of death-date of transplant