

## **CHAPTER 1**

### **BLOOD AND MARROW TRANSPLANTATION**

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## **1.0 INTRODUCTION**

Haematopoietic Stem Cell Transplantation (HSCT) in Malaysia continued at a steady pace in 2007 with minor changes in practice and outcome being reflected in this annual report. All participating centres continued their close cooperation and we believe that the numbers reported truly reflected the HSCT activity which occurred for the year 2007.

The recipients of HSCT continued to be largely a young population but access to patients aged more than 60 years widened. Indications for HSCT were concordant with worldwide practice where acute leukaemia tops the list. Unlike countries in USA, Europe and Japan, use of unrelated donors was still limited to a small percentage of the total HSCT performed perhaps reflecting the lack of human and medical resources available in Malaysia.

## **1.1 STOCK AND FLOW**

The total number of HSCT performed in 2007 was 135, a number which was only marginally higher than the 127 transplants performed in the preceding year and not exceeding 147 which was the highest number achieved in the year 2005. In comparison to worldwide practice where an annual increase of 10 to 15% is being reported, that increment was not reflected in the Malaysian figures. Although the number of patients lost to follow-up had been reported as zero for the past 20 years, that figure probably requires closer study and attention.

Malaysia saw HSCT at a rate of 5 per million population which is relatively very low compared with developed countries. The low numbers reflect the lack of hospital beds for HSCT and the waiting list for patients requiring transplantation is a real challenge particularly in government hospitals.

The total number of centres performing HSCT remained at 11 as in the year 2006. The centre for adult transplantation in Hospital Kuala Lumpur was transferred to Ampang General Hospital in December 2006 and hence the number of HSCT in Hospital Kuala Lumpur saw a drastic decline in 2007. Out of the 11 centres, three dedicated to paediatric HSCT contributed 34% of the total HSCT activities. As the number of adult centres continue to increase this percentage is expected to decrease to mirror that seen in the developed world.

Table 1.1.1: Stock and Flow of Blood and Marrow Transplantation, 1987-2007

Year	87	88	89	90	91	92	93	94	95	96
New transplant patients	8	6	22	5	12	21	19	25	30	28
Deaths	1	1	6	6	1	2	9	5	17	11
Lost to follow- up	0	0	0	0	0	0	0	0	0	0
Alive at 31 <sup>st</sup> December	7	12	28	27	38	57	67	87	100	117

Year	97	98	99	00	01*	02	03	04	05	06	07
New transplant patients	33	49	62	94	108	114	128	139	147	127	135
Deaths	15	16	15	31	47	30	51	45	40	25	24
Lost to follow- up	0	0	0	0	0	0	0	0	0	0	0
Alive at 31 <sup>st</sup> December	135	168	215	278	338	422	499	592	698	800	908

\*1 patient in year transplant 2001 with no death date

\*\*Out of 1312 patients who underwent transplantation, there were 50 patients with early death before day 30 of transplant

Figure 1.1.1: Stock and Flow of Blood and Marrow Transplantation, 1987-2007

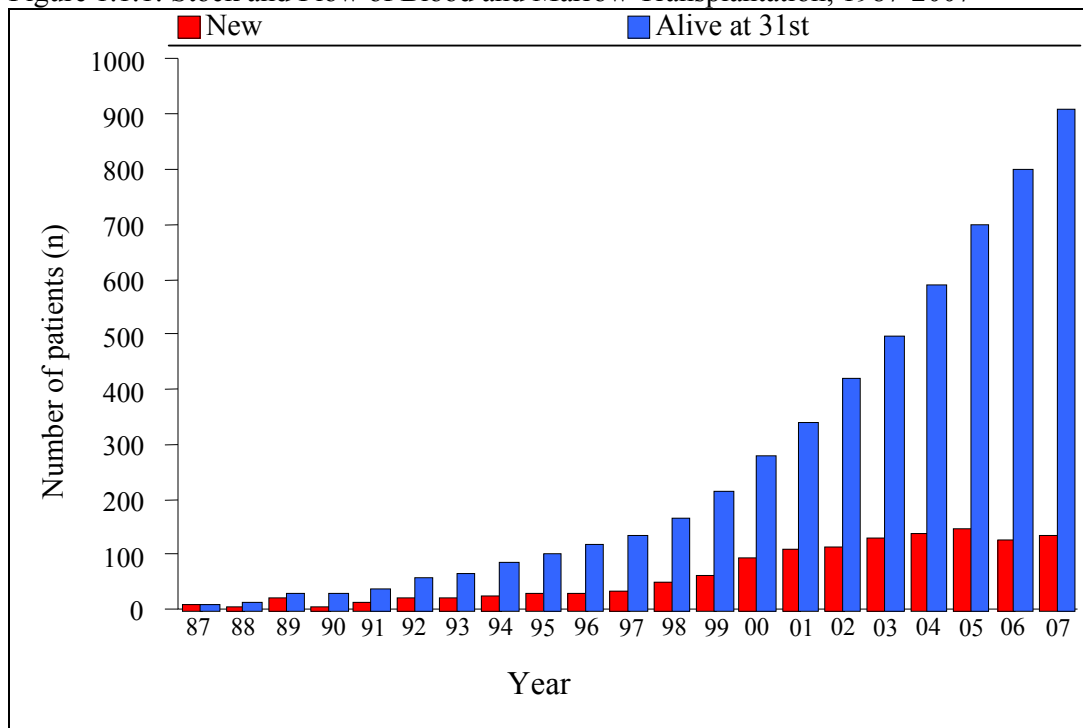


Table 1.1.2: New Transplant Rate per million population (pmp), 1987-2007

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
New transplant patients	8	6	22	5	12	21	19	25	30	28
New transplant rate pmp	0	0	1	0	1	1	1	1	1	1

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
New transplant patients	33	49	62	94	108	114	128	139	147	127	135
New transplant rate pmp	2	2	3	4	4	5	5	5	6	5	5

Figure 1.1.2: New Transplant Rate per million population (pmp), 1987-2007

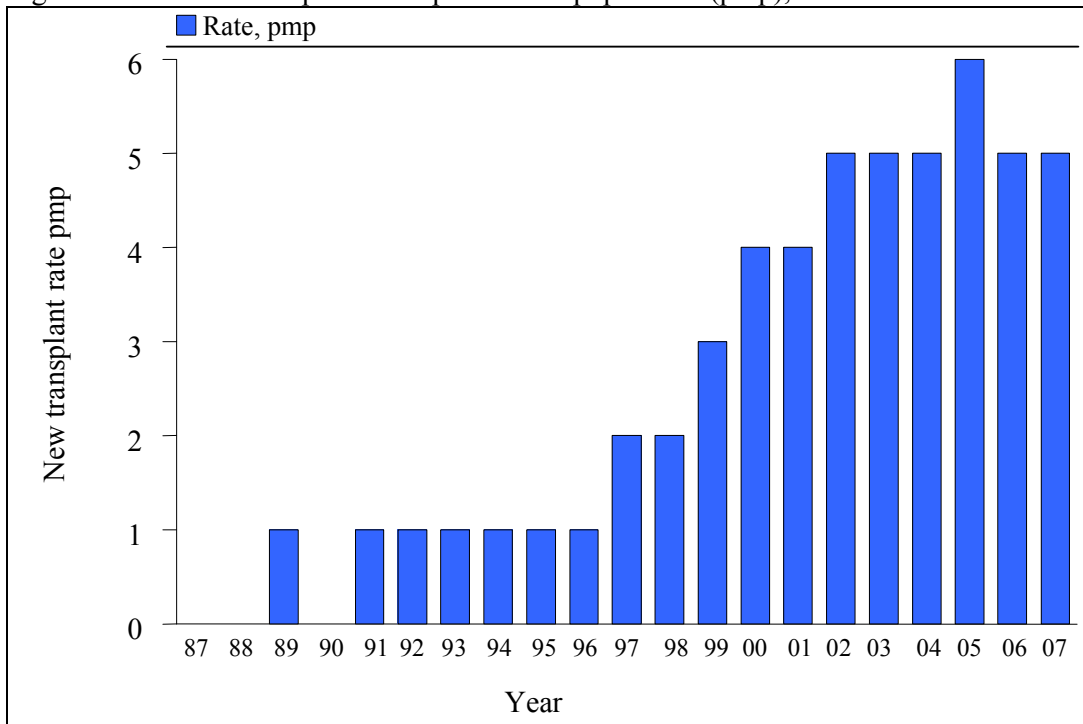


Table 1.1.3: Distribution of Patients by Centre, 1987-2007

Year	1987		1988		1989		1990		1991		1992		1993	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
KLA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KLP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UKM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SJA	0	0	0	0	1	5	0	0	0	0	0	0	0	0
UMA	0	0	0	0	0	0	0	0	0	0	0	0	1	5
UMP	8	100	6	100	21	95	5	100	12	100	21	100	18	95
GMC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LWE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SJP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ASH	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hospital Ampang	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
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>19</b>	<b>100</b>

Year	1994		1995		1996		1997		1998		1999		2000	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
KLA	0	0	0	0	0	0	0	0	0	0	6	10	15	16
KLP	4	16	10	33	10	36	9	27	16	33	19	31	16	17
UKM	0	0	0	0	0	0	0	0	0	0	2	3	9	10
SJA	0	0	0	0	0	0	0	0	0	0	5	8	19	20
UMA	4	16	7	23	6	21	9	27	15	31	11	18	13	14
UMP	17	68	13	43	11	39	15	45	18	37	19	31	22	23
GMC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LWE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SJP	0	0	0	0	1	4	0	0	0	0	0	0	0	0
ASH	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hospital Ampang	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
<b>TOTAL</b>	<b>25</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>33</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>94</b>	<b>100</b>

Year	2001		2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
KLA	20	19	28	25	35	27	41	29	44	30	20	16
KLP	18	17	20	18	19	15	22	16	21	14	27	21
UKM	12	11	9	8	11	9	14	10	17	12	9	7
SJA	17	16	20	18	23	18	21	15	23	16	22	17
UMA	20	19	16	14	11	9	10	7	14	10	11	9
UMP	21	19	20	18	20	16	16	12	13	9	18	14
GMC	0	0	0	0	0	0	2	1	2	1	4	3
LWE	0	0	0	0	0	0	6	4	1	1	2	2
SJP	0	0	1	1	9	7	6	4	12	8	6	5
ASH	0	0	0	0	0	0	0	0	0	0	1	1
Hospital Ampang	0	0	0	0	0	0	0	0	0	0	7	6
Others*	0	0	0	0	0	0	1	1	0	0	0	0
<b>TOTAL</b>	<b>108</b>	<b>100</b>	<b>114</b>	<b>100</b>	<b>128</b>	<b>100</b>	<b>139</b>	<b>100</b>	<b>147</b>	<b>100</b>	<b>127</b>	<b>100</b>

**BLOOD MARROW TRANSPLANTATION**

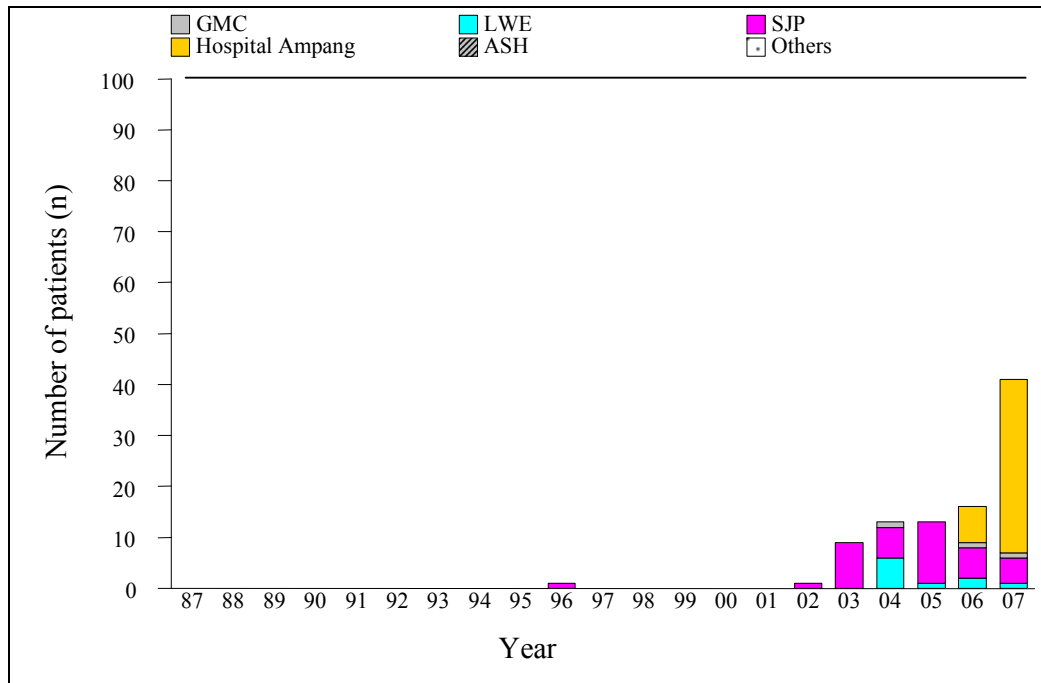
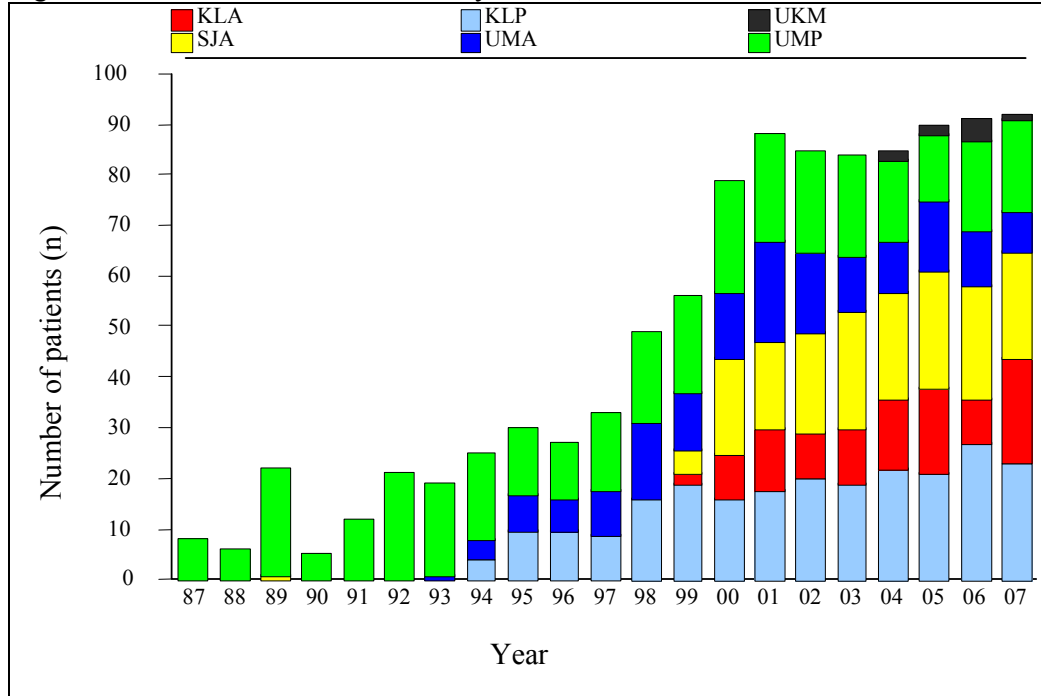
Year	2007		Total	
	No.	%	No.	%
KLA	2	1	211	16
KLP	23	17	234	18
UKM	21	16	104	8
SJA	21	16	172	13
UMA	8	6	156	12
UMP	18	13	332	25
GMC	1	1	9	1
LWE	1	1	10	1
SJP	5	4	40	3
ASH	1	1	2	0
Hospital Ampang	34	25	41	3
Others*	0	0	1	0
<b>TOTAL</b>	<b>135</b>	<b>100</b>	<b>1312</b>	<b>100</b>

\*Others include Royal Perth Hospital

KLA	Hospital Kuala Lumpur, (Adult)
KLP	Hospital Kuala Lumpur, Institute Paediatrics (Paed)
UKM	Hospital Universiti Kebangsaan Malaysia
SJA	Sime Darby Medical Centre (Adult)
UMA	University of Malaya Medical Centre (Adult)
UMP	University of Malaya Medical Centre (Paed)
GMC	Gleneagles Medical Centre, Penang
LWE	Lam Wah Ee Hospital, Penang
SJP	Sime Darby Medical Centre (Paed)
ASH	Ampang Puteri Specialist Hospital



Figure 1.1.3: Distribution of Patients by Centre, 1987-2007



**1.2 RECIPIENTS' CHARACTERISTICS**

In 2007, 64% of recipients were male. The ethnic breakdown was 41%, 39% and 10% for Chinese, Malay and Indian patients respectively. Since 2000 when patients aged >60 years were offered HSCT, the number of patients in this age group steadily increased over the ensuing years and reached an all time high of 8% in 2007. The median age of recipients was 16 years with a range of 1 month to 70 years. Indications for HSCT were 69% for malignant disorders with the commonest diseases being acute leukaemia followed by lymphoma and multiple myeloma.

Table 1.2.1: Distribution of Patients by Gender, 1987-2007

Year	1987		1988		1989		1990		1991		1992		1993		1994	
Gender	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Male	7	88	4	67	12	55	3	60	7	58	13	62	13	68	16	64
Female	1	13	2	33	10	45	2	40	5	42	8	38	6	32	9	36
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>19</b>	<b>100</b>	<b>25</b>	<b>100</b>

Year	1995		1996		1997		1998		1999		2000		2001		2002	
Gender	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Male	11	37	15	54	18	55	33	67	36	58	54	57	66	61	62	54
Female	19	63	13	46	15	45	16	33	26	42	40	43	42	39	52	46
<b>TOTAL</b>	<b>30</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>33</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>94</b>	<b>100</b>	<b>108</b>	<b>100</b>	<b>114</b>	<b>100</b>

Year	2003		2004		2005		2006		2007		Total	
Gender	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Male	71	55	83	60	69	47	75	59	87	64	755	58
Female	57	45	56	40	78	53	52	41	48	36	557	42
<b>TOTAL</b>	<b>128</b>	<b>100</b>	<b>139</b>	<b>100</b>	<b>147</b>	<b>100</b>	<b>127</b>	<b>100</b>	<b>135</b>	<b>100</b>	<b>1312</b>	<b>100</b>

Figure 1.2.1: Distribution of Patients by Gender, 1987-2007

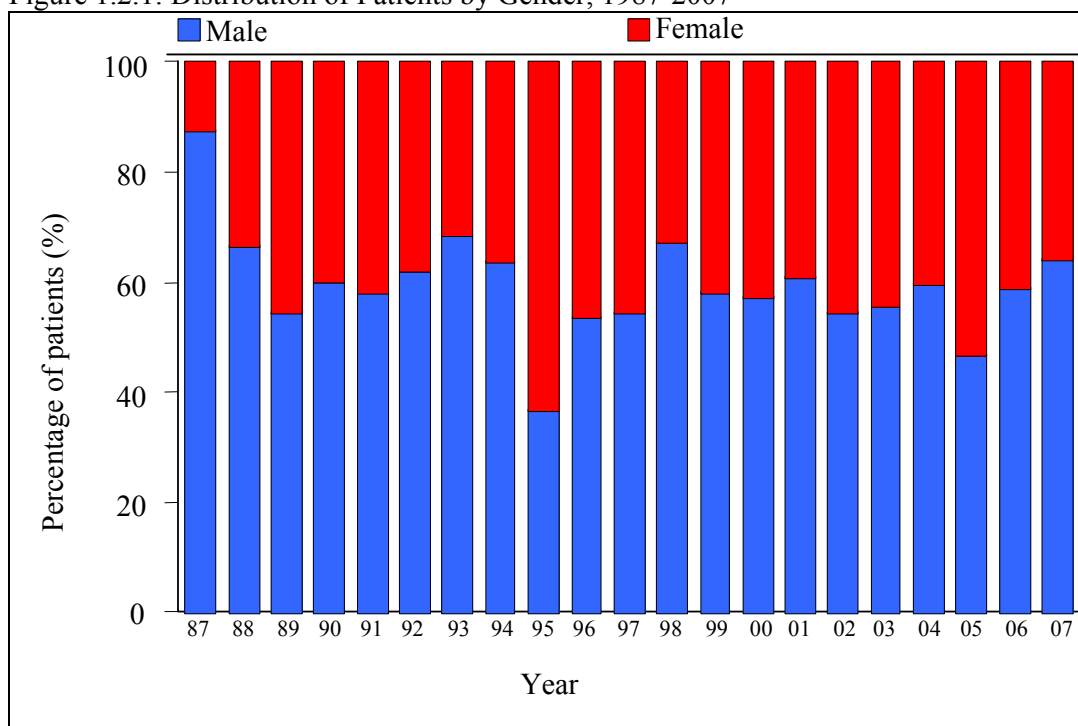


Table 1.2.2: Distribution of Patients by Ethnic Group, 1987-2007

Year	1987		1988		1989		1990		1991		1992		1993	
Race	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Malay	2	25	4	67	13	59	2	40	4	33	4	19	3	16
Chinese	5	63	2	33	8	36	3	60	7	58	10	48	10	53
Indian	1	13	0	0	0	0	0	0	1	8	4	19	1	5
Bumiputra Sabah	0	0	0	0	1	5	0	0	0	0	2	10	3	16
Bumiputra Sarawak	0	0	0	0	0	0	0	0	0	0	0	0	2	11
Others	0	0	0	0	0	0	0	0	0	0	1	5	0	0
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>19</b>	<b>100</b>

Year	1994		1995		1996		1997		1998		1999		2000	
Race	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Malay	9	36	7	23	8	29	9	27	20	41	31	50	33	35
Chinese	12	48	14	47	11	39	20	61	24	49	26	42	48	51
Indian	0	0	3	10	6	21	0	0	4	8	4	6	7	7
Bumiputra Sabah	4	16	1	3	0	0	1	3	0	0	0	0	3	3
Bumiputra Sarawak	0	0	0	0	3	11	0	0	0	0	0	0	0	0
Others	0	0	5	17	0	0	3	9	1	2	1	2	3	3
<b>TOTAL</b>	<b>25</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>33</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>94</b>	<b>100</b>

Year	2001		2002		2003		2004		2005		2006	
Race	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Malay	47	44	37	32	46	36	51	37	54	37	56	44
Chinese	48	44	65	57	65	51	63	45	67	46	48	38
Indian	8	7	8	7	6	5	9	6	14	10	9	7
Bumiputra Sabah	1	1	1	1	4	3	8	6	5	3	7	6
Bumiputra Sarawak	1	1	1	1	4	3	7	5	5	3	2	2
Others	3	3	2	2	3	2	1	1	2	1	5	4
<b>TOTAL</b>	<b>108</b>	<b>100</b>	<b>114</b>	<b>100</b>	<b>128</b>	<b>100</b>	<b>139</b>	<b>100</b>	<b>147</b>	<b>100</b>	<b>127</b>	<b>100</b>

Year	2007		Total	
Race	No.	%	No.	%
Malay	53	39	493	38
Chinese	55	41	611	47
Indian	14	10	99	8
Bumiputra Sabah	6	4	47	4
Bumiputra Sarawak	1	1	26	2
Others	6	4	36	3
<b>TOTAL</b>	<b>135</b>	<b>100</b>	<b>1312</b>	<b>100</b>

Figure 1.2.2: Distribution of Patients by Ethnic Group, 1987-2007

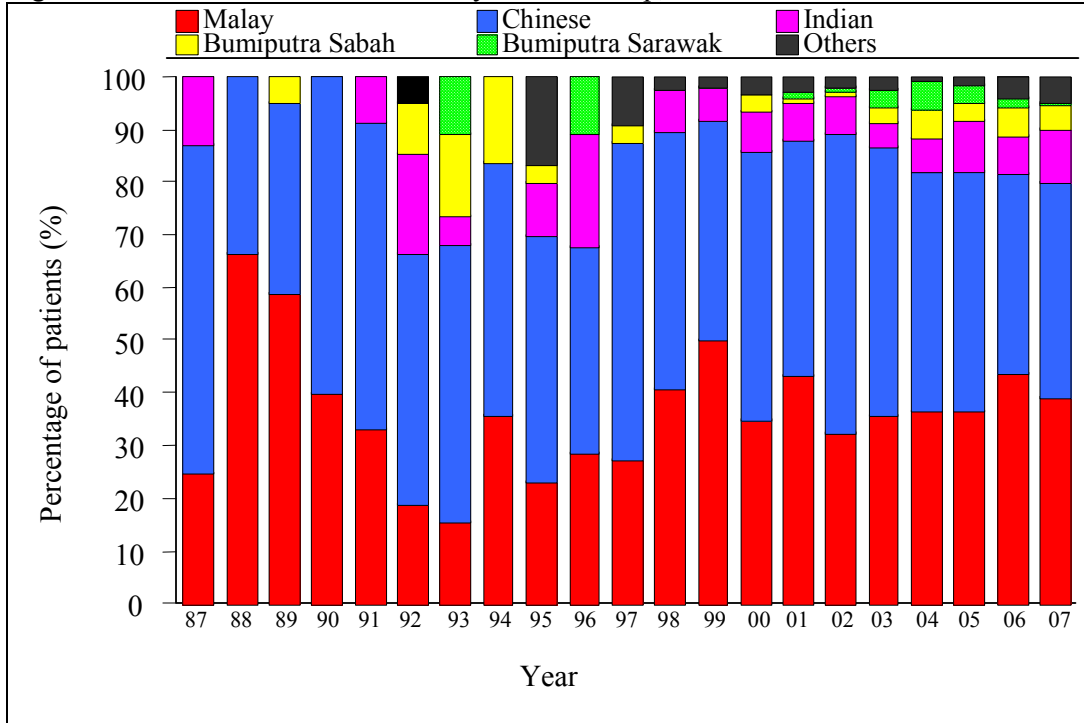


Table 1.2.3: Distribution of Patients by Age Group, 1987-2007

Year	1987		1988		1989		1990		1991		1992		1993	
Age group	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-9	4	50	4	67	17	77	5	100	10	83	15	71	9	47
10-19	4	50	2	33	5	23	0	0	2	17	6	29	10	53
20-39	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40-59	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥60	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>19</b>	<b>100</b>
Mean	9		7		8		6		6		7		9	
SD	4		3		3		3		4		4		5	
Median	9		8		8		6		6		6		10	
Minimum	2		2		1		2		1		1		1	
Maximum	15		10		13		9		13		14		17	

Year	1994		1995		1996		1997		1998		1999		2000	
Age group	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-9	11	44	12	40	13	46	19	58	21	43	28	45	27	29
10-19	11	44	13	43	12	43	8	24	16	33	15	24	27	29
20-39	3	12	4	13	3	11	5	15	12	24	12	19	19	20
40-59	0	0	1	3	0	0	1	3	0	0	7	11	20	21
≥60	0	0	0	0	0	0	0	0	0	0	0	0	1	1
<b>TOTAL</b>	<b>25</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>33</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>94</b>	<b>100</b>
Mean	11		13		11		12		13		17		23	
SD	7		9		9		12		10		15		17	
Median	11		11		11		6		10		11		18	
Minimum	1		3		1		1		5 months		1		1	
Maximum	29		41		37		45		39		57		61	

Year	2001		2002		2003		2004		2005		2006	
Age group	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-9	23	21	30	26	42	33	26	19	29	20	40	31
10-19	28	26	25	22	18	14	41	29	31	21	26	20
20-39	40	37	36	32	47	37	52	37	51	35	31	24
40-59	16	15	23	20	21	16	18	13	35	24	25	20
≥60	1	1	0	0	0	0	2	1	1	1	5	4
<b>TOTAL</b>	<b>108</b>	<b>100</b>	<b>114</b>	<b>100</b>	<b>128</b>	<b>100</b>	<b>139</b>	<b>100</b>	<b>147</b>	<b>100</b>	<b>127</b>	<b>100</b>
Mean	23		23		22		23		26		24	
SD	16		16		15		15		16		19	
Median	22		22		23		20		25		18	
Minimum	1 month		1		5 months		1		1		1	
Maximum	64		55		52		70		66		69	

Year	2007		Total	
Age group	No.	%	No.	%
0-9	38	28	423	32
10-19	22	16	322	25
20-39	25	19	340	26
40-59	39	29	206	16
≥60	11	8	21	2
<b>TOTAL</b>	<b>135</b>	<b>100</b>	<b>1312</b>	<b>100</b>
Mean	29		21	
SD	21		17	
Median	27		16	
Minimum	1		1 month	
Maximum	68		70	

Age=date of transplant – date of birth

Figure 1.2.3: Distribution of Patients by Age Group, 1987-2007

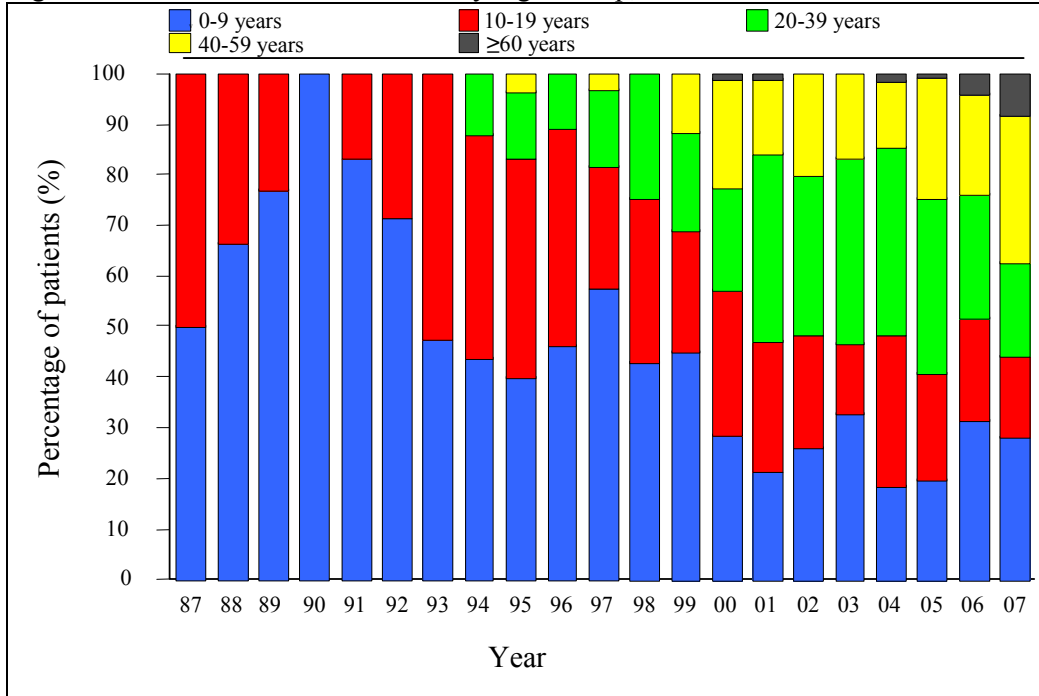


Table 1.2.4: Distribution of Patients by Primary Diagnosis, 1987-2007

Year	1987		1988		1989		1990		1991		1992		1993	
Diagnosis	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Acute leukaemia	5	63	4	67	8	36	2	40	1	8	4	19	6	32
Chronic leukaemia	0	0	0	0	1	5	1	20	1	8	4	19	2	11
Hypoplastic anaemia	2	25	0	0	4	18	0	0	4	33	5	24	4	21
Erythrocytic disorders	0	0	0	0	1	5	1	20	1	8	1	5	0	0
Lymphoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solid tumors	0	0	0	0	0	0	0	0	0	0	3	14	1	5
Myelodysplasia	0	0	0	0	0	0	0	0	0	0	0	0	1	5
Haemoglobinopathy	1	13	2	33	7	32	1	20	4	33	4	19	2	11
Multiple myeloma	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	1	5	0	0	1	8	0	0	3	16
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>19</b>	<b>100</b>

Year	1994		1995		1996		1997		1998		1999		2000	
Diagnosis	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Acute leukaemia	8	32	10	33	13	46	11	33	23	47	28	45	37	39
Chronic leukaemia	4	16	5	17	5	18	6	18	7	14	7	11	13	14
Hypoplastic anaemia	5	20	8	27	4	14	5	15	4	8	5	8	11	12
Erythrocytic disorders	0	0	0	0	1	4	0	0	0	0	0	0	0	0
Lymphoma	0	0	0	0	0	0	2	6	5	10	6	10	19	20
Solid tumors	1	4	1	3	0	0	1	3	2	4	5	8	2	2
Myelodysplasia	2	8	0	0	0	0	0	0	1	2	0	0	1	1
Haemoglobinopathy	5	20	5	17	5	18	6	18	2	4	4	6	7	7
Multiple myeloma	0	0	0	0	0	0	0	0	0	0	3	5	1	1
Others	0	0	1	3	0	0	2	6	5	10	4	6	3	3
<b>TOTAL</b>	<b>25</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>33</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>94</b>	<b>100</b>

Year	2001		2002		2003		2004		2005		2006	
Diagnosis	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Acute leukaemia	48	44	48	42	42	33	46	33	54	37	38	30
Chronic leukaemia	18	17	19	17	19	15	22	16	13	9	11	9
Hypoplastic anaemia	7	6	4	4	5	4	12	9	5	3	14	11
Erythrocytic disorders	0	0	1	1	2	2	0	0	0	0	0	0
Lymphoma	23	21	20	18	28	22	35	25	34	23	23	18
Solid tumors	0	0	3	3	2	2	0	0	2	1	3	2
Myelodysplasia	4	4	4	4	3	2	6	4	4	3	4	3
Haemoglobinopathy	4	4	8	7	17	13	9	6	16	11	11	9
Multiple myeloma	1	1	4	4	4	3	3	2	8	5	10	8
Others	3	3	3	3	6	5	6	4	11	7	13	10
<b>TOTAL</b>	<b>108</b>	<b>100</b>	<b>114</b>	<b>100</b>	<b>128</b>	<b>100</b>	<b>139</b>	<b>100</b>	<b>147</b>	<b>100</b>	<b>127</b>	<b>100</b>

Year	2007		Total	
Diagnosis	No.	%	No.	%
Acute leukaemia	46	34	482	37
Chronic leukaemia	5	4	163	12
Hypoplastic anaemia	8	6	116	9
Erythrocytic disorders	0	0	8	1
Lymphoma	25	19	220	17
Solid tumors	3	2	29	2
Myelodysplasia	1	1	31	2
Haemoglobinopathy	10	7	130	10
Multiple myeloma	12	9	46	4
Others	25	19	87	7
<b>TOTAL</b>	<b>135</b>	<b>100</b>	<b>1312</b>	<b>100</b>

#	Diagnosis	Categorisation
1	Acute leukaemia, unclassified	Acute leukaemia
2	Acute undifferentiated leukaemia	
3	Acute Lymphocytic Leukaemia (ALL)	
4	Acute Myelogenous Leukaemia (AML) denovo	
5	AML post-chemotherapy	
6	AML post-MDS	
7	Chronic lymphocytic leukaemia	Chronic leukaemia
8	Chronic myeloid leukaemia	
9	Aplastic anaemia	Hypoplastic anaemia
10	Fanconi's anaemia	
11	Diamond-Blackfan anaemia	Erythrocytic Disorders
12	Congenital Dyserythropoeitic Anaemia (CDA)	
13	Hodgkin's lymphoma	Lymphoma
14	Non-Hodgkin's lymphoma, Aggressive	
15	Non-Hodgkin's lymphoma, Indolent	
16	Carcinoma, breast	Solid tumors
17	Carcinoma, ovary	
18	Germ Cell Tumour (GCT)-testicular	
19	GCT-primary non-testis	
20	Ewing's sarcoma	
21	Glioma	
22	Hepatoblastoma	
23	Neuroblastoma	
24	Rhabdomyosarcoma	
25	Soft tissue sarcoma (non-RMS)	
26	Wilms tumour	
27	Primitive Neuroectodermal Tumour (NET)	
28	Juvenile Myelomonocytic leukaemia	Myelodysplasia
29	Myelodysplastic syndrome (MDS)	
30	Myelofibrosis	
31	Thalassaemia major	Haemoglobinopathy
32	Sickle Cell Anaemia	
33	Multiple myeloma	Multiple myeloma
34	Haemophagocytic Lymphohistiocytosis Syndrome	Others
35	Congenital Immunodeficiencies	
36	Osteopetrosis	
37	Others	



### 1.3 TRANSPLANT PRACTICES

For the first time in 20 years, the number of allogeneic and autologous HSCT were equivalent whereas allogeneic transplants had previously dominated. Most of the autologous HSCT were for adult recipients.

The predominance of peripheral blood as the stem cell source was again seen in 79% of the total HSCT, a preference which had been shown since the year 2000. The HLA matching for the 67 allogeneic transplants were 91%, 4%, 3% and 1% respectively for 0, 1, 2 and 3 antigen mismatches. Sibling donors were seen in 58 HSCT while the remaining 9 were from unrelated donors with cord blood donors predominating.

Table 1.3.1: Distribution of Patients by Graft Number, 1987-2007

Year	1987		1988		1989		1990		1991		1992		1993	
Graft number	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	8	100	6	100	19	86	4	80	9	75	19	90	18	95
2	0	0	0	0	2	9	1	20	3	25	2	10	1	5
3	0	0	0	0	1	5	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>19</b>	<b>100</b>

Year	1994		1995		1996		1997		1998		1999		2000	
Graft number	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	24	96	29	97	28	100	31	94	47	96	61	98	91	97
2	1	4	1	3	0	0	1	3	1	2	1	2	3	3
3	0	0	0	0	0	0	1	3	1	2	0	0	0	0
<b>TOTAL</b>	<b>25</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>33</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>94</b>	<b>100</b>

Year	2001		2002		2003		2004		2005		2006	
Graft number	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	103	95	113	99	125	98	134	98	121	98	114	97
2	5	5	1	1	3	2	3	2	2	2	2	2
3	0	0	0	0	0	0	0	0	0	0	1	1
<b>TOTAL</b>	<b>108</b>	<b>100</b>	<b>114</b>	<b>100</b>	<b>128</b>	<b>100</b>	<b>137</b>	<b>100</b>	<b>123</b>	<b>100</b>	<b>117</b>	<b>100</b>

Year	2007		Total	
Graft number	No.	%	No.	%
1	107	98	1211	97
2	2	2	35	3
3	0	0	4	0
<b>TOTAL</b>	<b>109</b>	<b>100</b>	<b>1250</b>	<b>100</b>

Figure 1.3.1: Distribution of Patients by Graft Number, 1987-2007

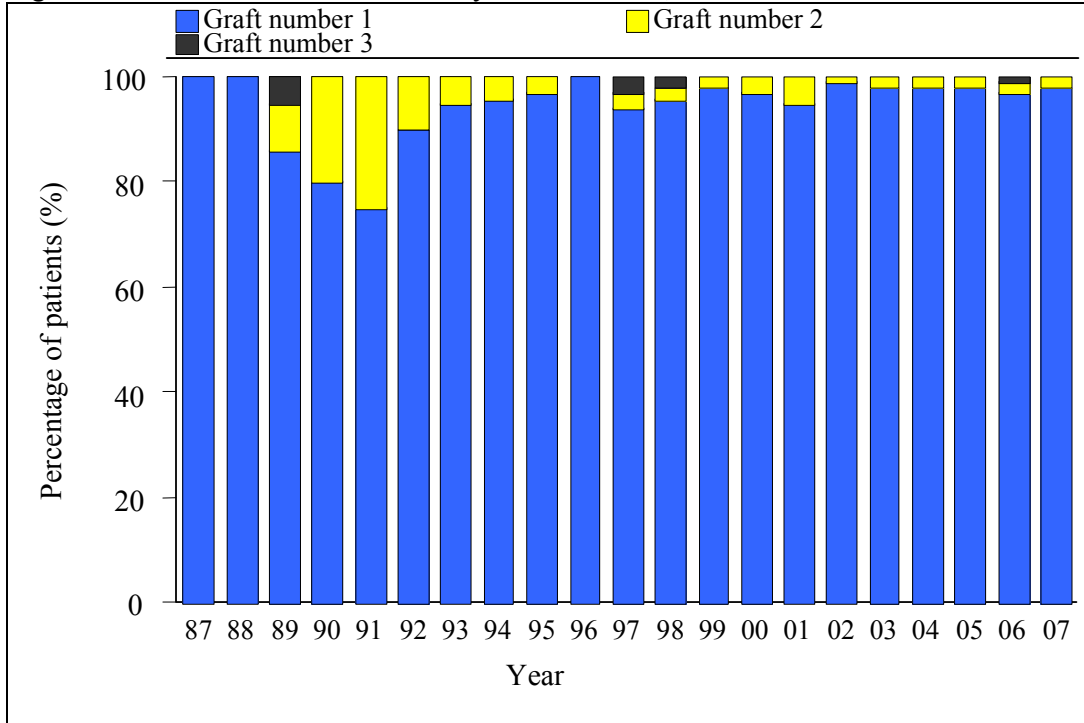


Table 1.3.2: Distribution of Patients by Transplantation Type, 1987-2007

Year	1987		1988		1989		1990		1991		1992		1993	
Type of transplant	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Allogeneic + Syngeneic	8	100	6	100	21	95	5	100	12	100	20	95	18	95
Autologous	0	0	0	0	1	5	0	0	0	0	1	5	1	5
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>19</b>	<b>100</b>

Year	1994		1995		1996		1997		1998		1999		2000	
Type of transplant	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Allogeneic + Syngeneic	24	96	29	97	26	93	27	82	32	65	44	71	56	60
Autologous	1	4	1	3	2	7	6	18	17	35	18	29	38	40
<b>TOTAL</b>	<b>25</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>33</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>94</b>	<b>100</b>

Year	2001		2002		2003		2004		2005		2006	
Type of transplant	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Allogeneic + Syngeneic	75	69	75	66	84	66	90	65	90	61	84	66
Autologous	33	31	39	34	44	34	49	35	57	39	43	34
<b>TOTAL</b>	<b>108</b>	<b>100</b>	<b>114</b>	<b>100</b>	<b>128</b>	<b>100</b>	<b>139</b>	<b>100</b>	<b>147</b>	<b>100</b>	<b>127</b>	<b>100</b>

Year	2007		TOTAL	
Type of transplant	No.	%	No.	%
Allogeneic + Syngeneic	67	50	893	68
Autologous	68	50	419	32
<b>TOTAL</b>	<b>135</b>	<b>100</b>	<b>1312</b>	<b>100</b>

Figure 1.3.2: Distribution of Patients by Transplantation Type, 1987-2007

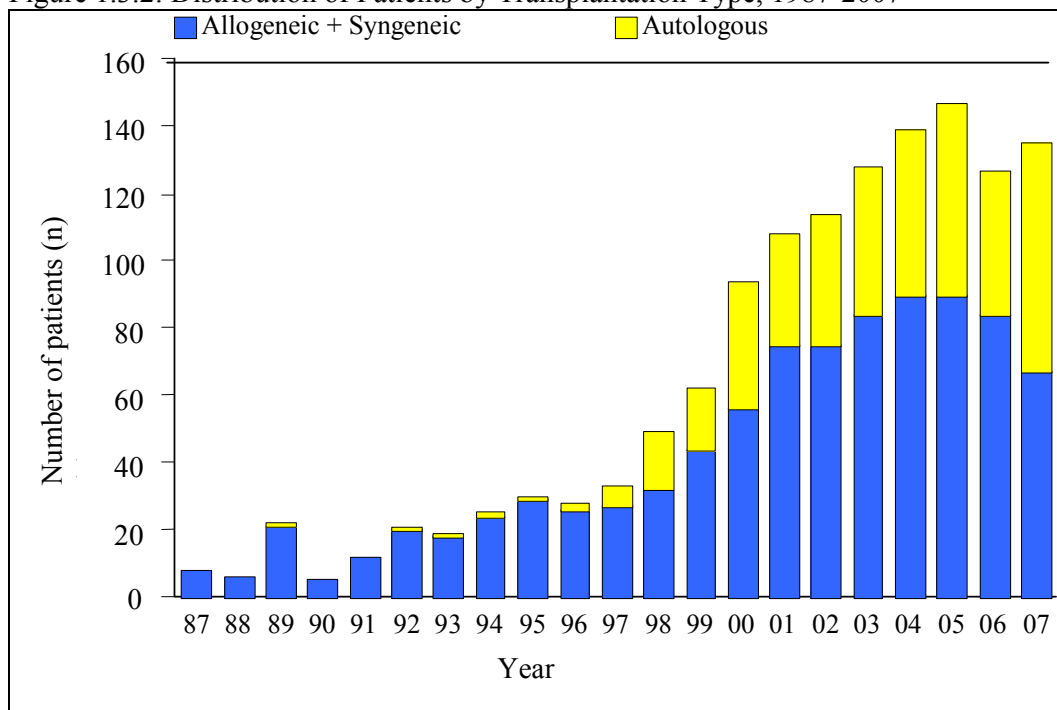


Table 1.3.3: Type of Transplant by Centre, 1987-2007

Type of transplant Centre	Allogeneic + Syngeneic		Autologous		TOTAL	
	No.	%	No.	%	No.	%
KLA	109	12	102	24	211	16
KLP	205	23	29	7	234	18
UKM	56	6	48	11	104	8
SJA	63	7	109	26	172	13
UMA	103	12	53	13	156	12
UMP	294	33	38	9	332	25
GMC	4	0	5	1	9	1
LWE	9	1	1	0	10	1
SJP	35	4	5	1	40	3
ASH	1	0	1	0	2	0
Hospital Ampang	13	1	28	7	41	3
Others*	1	0	0	0	1	0
<b>TOTAL</b>	<b>893</b>	<b>100</b>	<b>419</b>	<b>100</b>	<b>1312</b>	<b>100</b>

\* Others include Royal Perth Hospital

Figure 1.3.3: Type of Transplant by Centre, 1987-2007

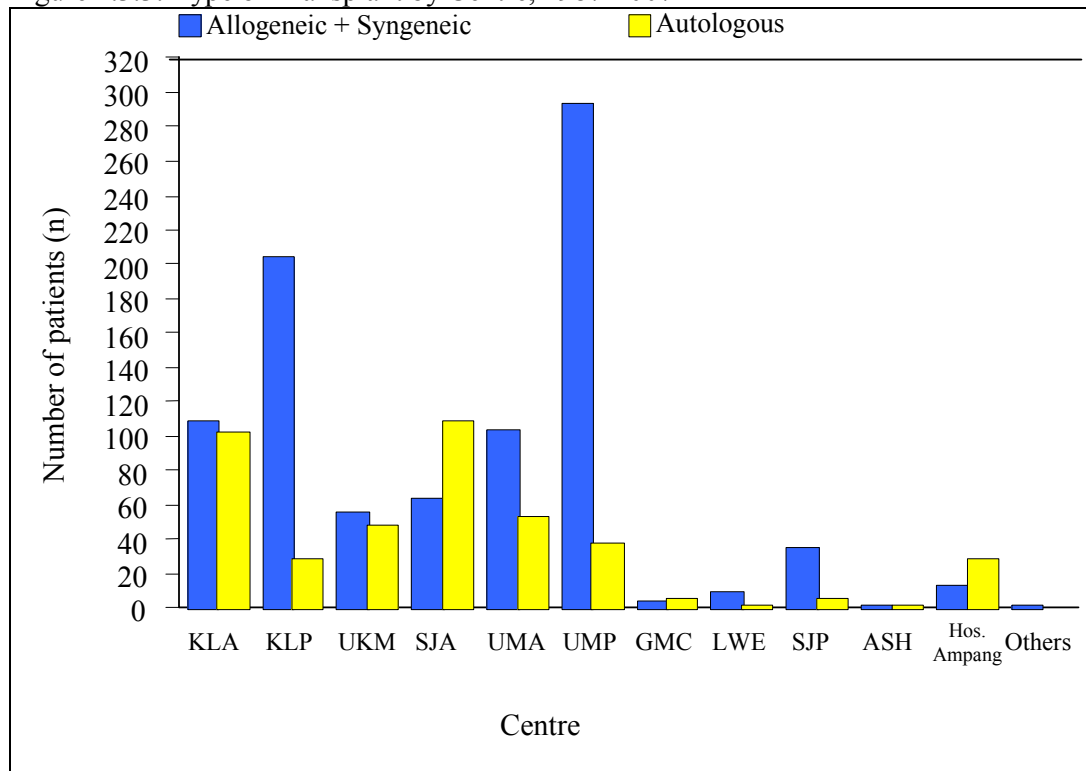


Table 1.3.4: Source of Stem Cells, 1987-2007

Year	1987		1988		1989		1990		1991	
Transplant source	No.	%	No.	%	No.	%	No.	%	No.	%
Marrow	8	100	6	100	22	100	5	100	12	100
PBSC / Marrow + PBSC	0	0	0	0	0	0	0	0	0	0
Cord blood / Marrow + cord	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>

Year	1992		1993		1994		1995		1996	
Transplant source	No.	%	No.	%	No.	%	No.	%	No.	%
Marrow	21	100	19	100	25	100	30	100	28	100
PBSC / Marrow + PBSC	0	0	0	0	0	0	0	0	0	0
Cord blood / Marrow + cord	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>21</b>	<b>100</b>	<b>19</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>28</b>	<b>100</b>

Year	1997		1998		1999		2000		2001	
Transplant source	No.	%	No.	%	No.	%	No.	%	No.	%
Marrow	24	73	25	51	37	60	31	33	30	28
PBSC / Marrow + PBSC	7	21	23	47	23	37	57	61	74	69
Cord blood / Marrow + cord	2	6	1	2	2	3	6	6	4	4
<b>TOTAL</b>	<b>33</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>62</b>	<b>100</b>	<b>94</b>	<b>100</b>	<b>108</b>	<b>100</b>

Year	2002		2003		2004		2005		2006	
Transplant source	No.	%	No.	%	No.	%	No.	%	No.	%
Marrow	31	27	44	34	30	22	24	16	17	13
PBSC / Marrow + PBSC	79	69	79	62	100	72	116	79	100	79
Cord blood / Marrow + cord	4	4	5	4	9	6	7	5	10	8
<b>TOTAL</b>	<b>114</b>	<b>100</b>	<b>128</b>	<b>100</b>	<b>139</b>	<b>100</b>	<b>147</b>	<b>100</b>	<b>127</b>	<b>100</b>

Year	2007		Total	
Transplant source	No.	%	No.	%
Marrow	23	17	492	38
PBSC / Marrow + PBSC	106	79	764	58
Cord blood / Marrow + cord	6	4	56	4
<b>TOTAL</b>	<b>135</b>	<b>100</b>	<b>1312</b>	<b>100</b>

Figure 1.3.4: Source of Stem Cells, 1987-2007

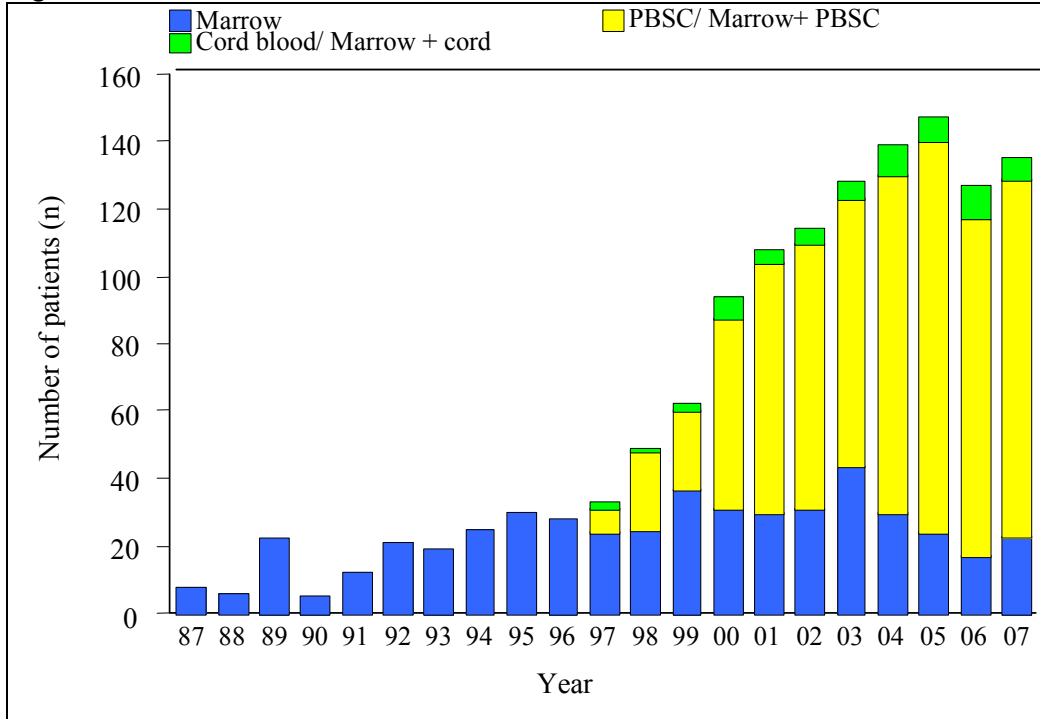


Table 1.3.5: Distribution of Patients by HLA Match, 1987-2007

Year	1987		1988		1989		1990		1991	
HLA Match	No.	%	No.	%	No.	%	No.	%	No.	%
Identical	8	100	6	100	21	100	5	100	12	100
1 AG	0	0	0	0	0	0	0	0	0	0
2 AG	0	0	0	0	0	0	0	0	0	0
≥3 AG Disparate	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>

Year	1992		1993		1994		1995		1996	
HLA Match	No.	%	No.	%	No.	%	No.	%	No.	%
Identical	20	100	18	100	23	96	29	100	26	100
1 AG	0	0	0	0	1	4	0	0	0	0
2 AG	0	0	0	0	0	0	0	0	0	0
≥3 AG Disparate	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>20</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>26</b>	<b>100</b>

Year	1997		1998		1999		2000		2001	
HLA Match	No.	%	No.	%	No.	%	No.	%	No.	%
Identical	25	93	31	97	40	91	52	93	69	92
1 AG	2	7	0	0	3	7	0	0	4	5
2 AG	0	0	1	3	1	2	4	7	1	1
≥3 AG Disparate	0	0	0	0	0	0	0	0	1	1
<b>TOTAL</b>	<b>27</b>	<b>100</b>	<b>32</b>	<b>100</b>	<b>44</b>	<b>100</b>	<b>56</b>	<b>100</b>	<b>75</b>	<b>100</b>

Year	2002		2003		2004		2005		2006	
HLA Match	No.	%	No.	%	No.	%	No.	%	No.	%
Identical	70	93	79	94	83	92	85	94	78	93
1 AG	3	4	3	4	3	3	4	4	4	5
2 AG	2	3	2	2	4	4	1	1	2	2
≥3 AG Disparate	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>75</b>	<b>100</b>	<b>84</b>	<b>100</b>	<b>90</b>	<b>100</b>	<b>90</b>	<b>100</b>	<b>84</b>	<b>100</b>

Year	2007		TOTAL	
HLA Match	No.	%	No.	%
Identical	61	91	841	94
1 AG	3	4	30	3
2 AG	2	3	20	2
≥3 AG Disparate	1	1	2	0
<b>TOTAL</b>	<b>67</b>	<b>100</b>	<b>893</b>	<b>100</b>

**Table 1.3.6: Distribution of Patients by Allogeneic Donor Relationship, 1987-2007**

Year	1987		1988		1989		1990		1991	
Allogeneic Donor Relationship	No.	%	No.	%	No.	%	No.	%	No.	%
Sibling	8	100	6	100	21	100	5	100	11	92
Unrelated	0	0	0	0	0	0	0	0	0	0
▪ Marrow	0	0	0	0	0	0	0	0	0	0
▪ PBSC / Marrow + PBSC	0	0	0	0	0	0	0	0	0	0
▪ Cord blood / Marrow + cord	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	1	8
<b>TOTAL</b>	<b>8</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>12</b>	<b>100</b>

Year	1992		1993		1994		1995		1996	
Allogeneic Donor Relationship	No.	%	No.	%	No.	%	No.	%	No.	%
Sibling	20	100	18	100	22	92	29	100	26	100
Unrelated	0	0	0	0	0	0	0	0	0	0
▪ Marrow	0	0	0	0	0	0	0	0	0	0
▪ PBSC / Marrow + PBSC	0	0	0	0	0	0	0	0	0	0
▪ Cord blood / Marrow + cord	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	2	8	0	0	0	0
<b>TOTAL</b>	<b>20</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>26</b>	<b>100</b>

Year	1997		1998		1999		2000		2001	
Allogeneic Donor Relationship	No.	%	No.	%	No.	%	No.	%	No.	%
Sibling	26	96	32	100	44	100	55	98	72	96
Unrelated	1	4	0	0	0	0	1	2	3	4
▪ Marrow	0	0	0	0	0	0	0	0	0	0
▪ PBSC / Marrow + PBSC	0	0	0	0	0	0	0	0	0	0
▪ Cord blood / Marrow + cord	1	100	0	0	0	0	1	100	3	100
Others	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>27</b>	<b>100</b>	<b>32</b>	<b>100</b>	<b>44</b>	<b>100</b>	<b>56</b>	<b>100</b>	<b>75</b>	<b>100</b>

Year	2002		2003		2004		2005		2006	
Allogeneic Donor Relationship	No.	%	No.	%	No.	%	No.	%	No.	%
Sibling	71	95	81	96	81	90	82	91	73	87
Unrelated	4	5	3	4	9	10	8	9	11	13
▪ Marrow	0	0	0	0	1	11	2	25	2	18
▪ PBSC / Marrow + PBSC	0	0	0	0	2	22	1	13	1	9
▪ Cord blood / Marrow + cord	4	100	3	100	6	67	5	63	8	73
Others	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>75</b>	<b>100</b>	<b>84</b>	<b>100</b>	<b>90</b>	<b>100</b>	<b>90</b>	<b>100</b>	<b>84</b>	<b>100</b>

Year	2007		TOTAL	
Allogeneic Donor Relationship	No.	%	No.	%
Sibling	58	87	841	94
Unrelated	9	13	49	5
▪ Marrow	1	11	6	12
▪ PBSC / Marrow + PBSC	2	22	6	12
▪ Cord blood / Marrow + cord	6	67	37	76
Others	0	0	3	0
<b>TOTAL</b>	<b>67</b>	<b>100</b>	<b>893</b>	<b>100</b>

\*excluding autologous, including syngeneic



### 1.4 TRANSPLANT OUTCOMES

Mortality for the 135 HSCT was reported at 17.7%. The commonest causes of death were underlying disease, sepsis and graft-versus-host disease which accounted for 42%, 21% and 4% of all deaths respectively. These causes were similar to the results seen in the CIBMTR (Center for International Blood and Marrow Transplant Research) but the percentage of 21% for sepsis was disproportionately high. In fact the relatively high percentage of septic deaths over the past 5 years should alert transplant centres to audit their clinical practice and policies.

Table 1.4.1: Distribution of Patients by Cause of Death, 1987-2007

Year	1987		1988		1989		1990		1991	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sepsis	1	100	0	0	0	0	0	0	1	100
GVHD	0	0	0	0	0	0	1	17	0	0
Underlying disease	0	0	0	0	6	100	5	83	0	0
Haemorrhage	0	0	1	100	0	0	0	0	0	0
VOD	0	0	0	0	0	0	0	0	0	0
Organ Failure	0	0	0	0	0	0	0	0	0	0
Interstitial pneumonitis	0	0	0	0	0	0	0	0	0	0
Secondary malignancy	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1</b>	<b>100</b>	<b>1</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>1</b>	<b>100</b>

Year	1992		1993		1994		1995		1996	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sepsis	1	50	2	22	1	20	4	23	6	55
GVHD	0	0	0	0	0	0	4	23	0	0
Underlying disease	0	0	6	67	3	60	3	18	3	27
Haemorrhage	0	0	1	11	0	0	2	12	1	9
VOD	0	0	0	0	0	0	1	6	1	9
Organ Failure	1	50	0	0	1	20	2	12	0	0
Interstitial pneumonitis	0	0	0	0	0	0	0	0	0	0
Secondary malignancy	0	0	0	0	0	0	1	6	0	0
Others	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>2</b>	<b>100</b>	<b>9</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>17</b>	<b>100</b>	<b>11</b>	<b>100</b>

Year	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sepsis	5	33	1	6	6	40	2	6	4	9
GVHD	0	0	2	13	1	7	2	6	4	9
Underlying disease	9	60	11	69	7	46	22	72	33	70
Haemorrhage	0	0	1	6	0	0	3	10	2	4
VOD	0	0	0	0	0	0	1	3	2	4
Organ Failure	1	7	0	0	1	7	0	0	0	0
Interstitial pneumonitis	0	0	1	6	0	0	1	3	2	4
Secondary malignancy	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>15</b>	<b>100</b>	<b>16</b>	<b>100</b>	<b>15</b>	<b>100</b>	<b>31</b>	<b>100</b>	<b>47</b>	<b>100</b>

Year	2002		2003		2004		2005		2006	
Cause of death	No.	%	No.	%	No.	%	No.	%	No.	%
Sepsis	4	13	14	27	10	22	9	23	8	32
GVHD	3	10	5	10	9	20	7	18	2	8
Underlying disease	19	64	28	55	23	51	16	40	11	44
Haemorrhage	0	0	0	0	2	5	2	5	1	4
VOD	0	0	0	0	0	0	0	0	3	12
Organ Failure	3	10	2	4	0	0	1	2	0	0
Interstitial pneumonitis	0	0	1	2	0	0	2	5	0	0
Secondary malignancy	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	2	5	0	0
Unknown	1	3	1	2	1	2	1	2	0	0
<b>TOTAL</b>	<b>30</b>	<b>100</b>	<b>51</b>	<b>100</b>	<b>45</b>	<b>100</b>	<b>40</b>	<b>100</b>	<b>25</b>	<b>100</b>

Year	2007		Total	
Cause of death	No.	%	No.	%
Sepsis	5	21	84	21
GVHD	1	4	41	10
Underlying disease	10	42	215	54
Haemorrhage	0	0	16	4
VOD	0	0	8	2
Organ Failure	0	0	12	3
Interstitial pneumonitis	0	0	7	2
Secondary malignancy	0	0	1	0
Others	8	33	10	3
Unknown	0	0	4	1
<b>TOTAL</b>	<b>24</b>	<b>100</b>	<b>398</b>	<b>100</b>

Figure 1.4.1: Patient Survival by Year of Transplant, 1987-2007

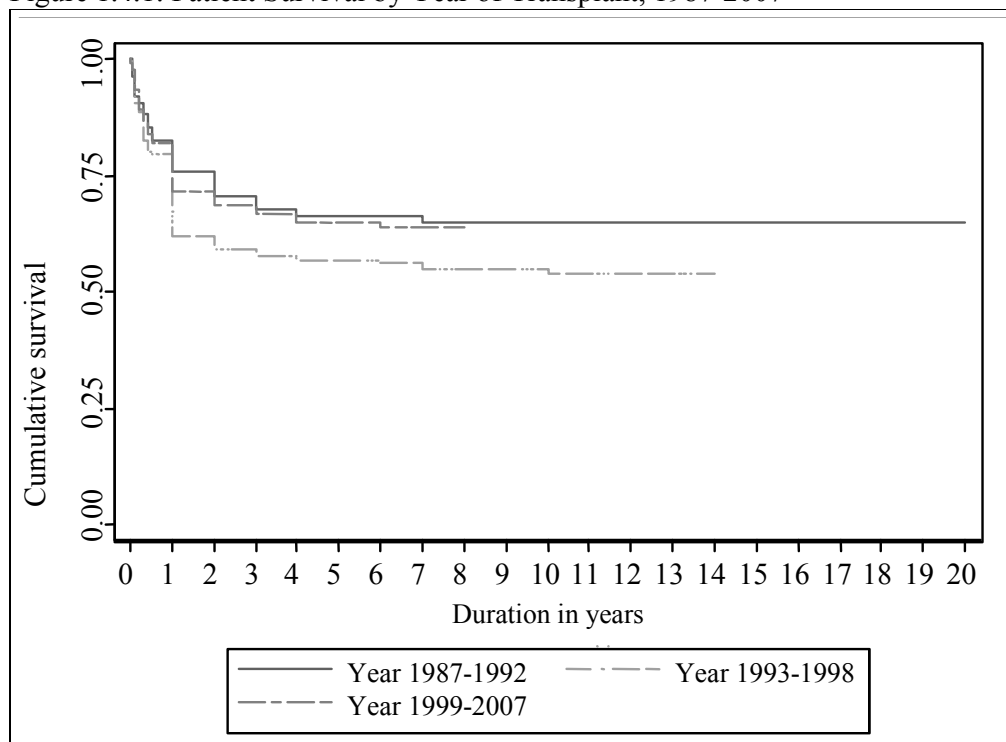


Figure 1.4.2: Patient Survival by Gender, 1987-2007

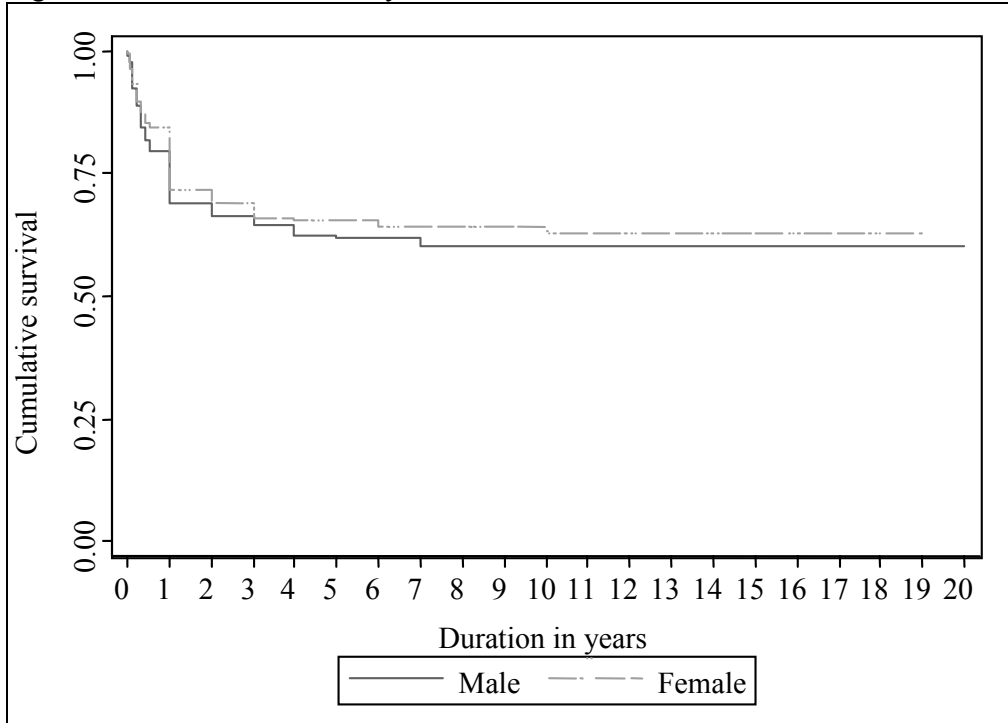


Figure 1.4.3: Patient Survival by Age Group, 1987-2007

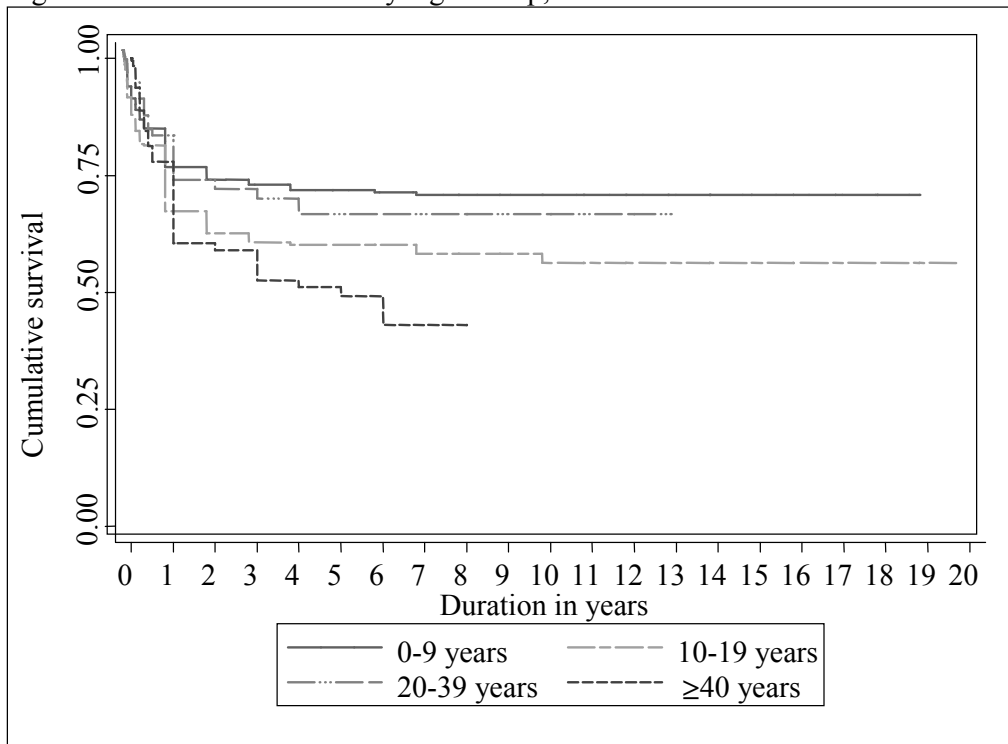
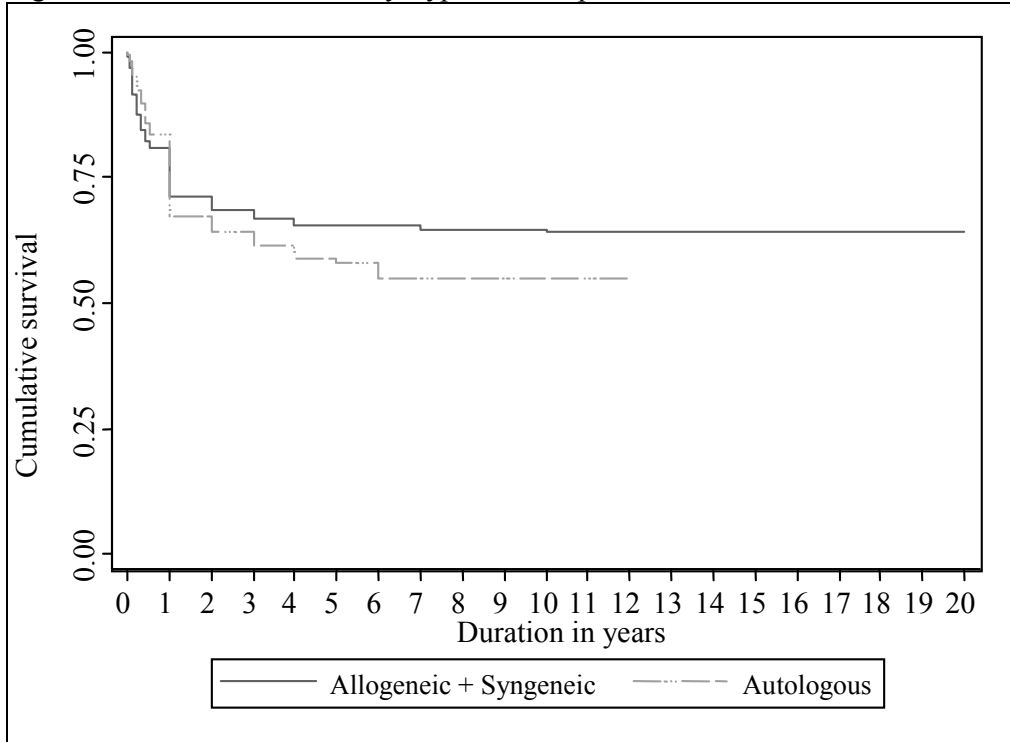


Figure 1.4.4: Patient Survival by Type of Transplant, 1987-2007



### 1.5 DISEASE-FREE SURVIVAL

Figures 1.5.1 to 1.5.7 depict the disease-free survival for individual diseases while figures 1.5.8 to 1.5.14 show the DFS between paediatric and adult patients. Superior DFS rates were seen in paediatric patients for all diseases except acute lymphoblastic leukaemia and aplastic anaemia. The reasons for the poorer outcome for paediatric recipients with these two disorders were not apparent but may be explained by the remission state at transplant and would merit further analysis in future reports.

Figure 1.5.1: Disease-free Survival for Acute Myeloid Leukaemia, 1987-2007  
(Allogeneic vs. Autologous)

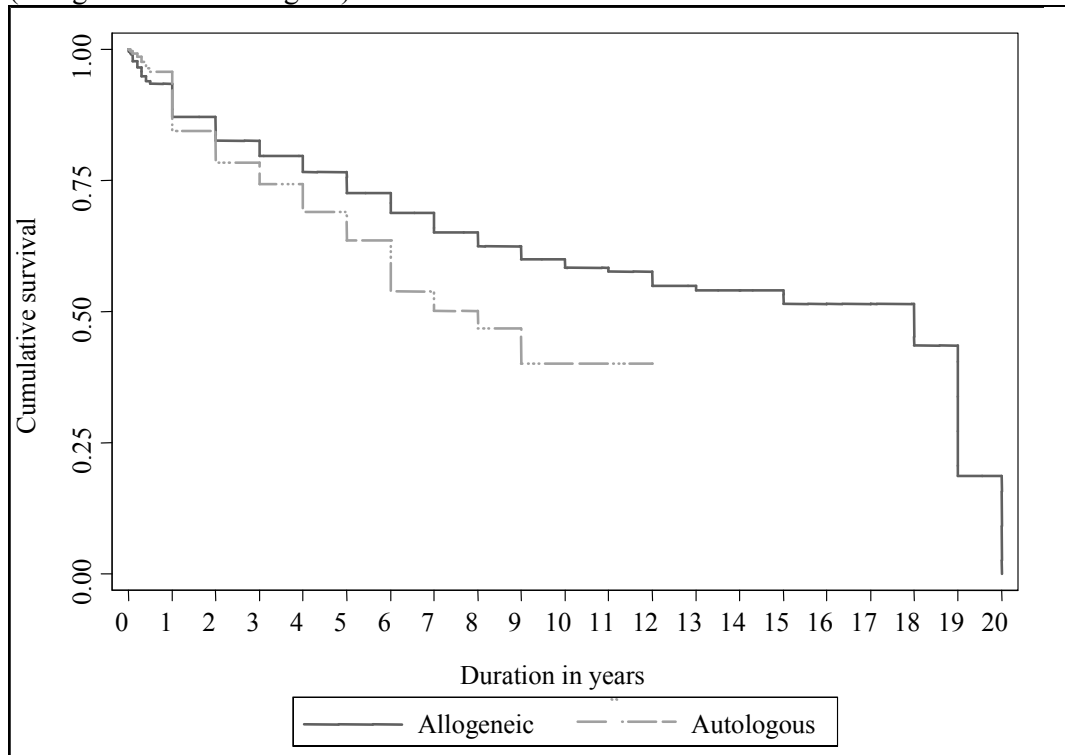


Figure 1.5.2: Disease-free Survival for Acute Lymphoblastic Leukaemia, 1987-2007 (Allogeneic)

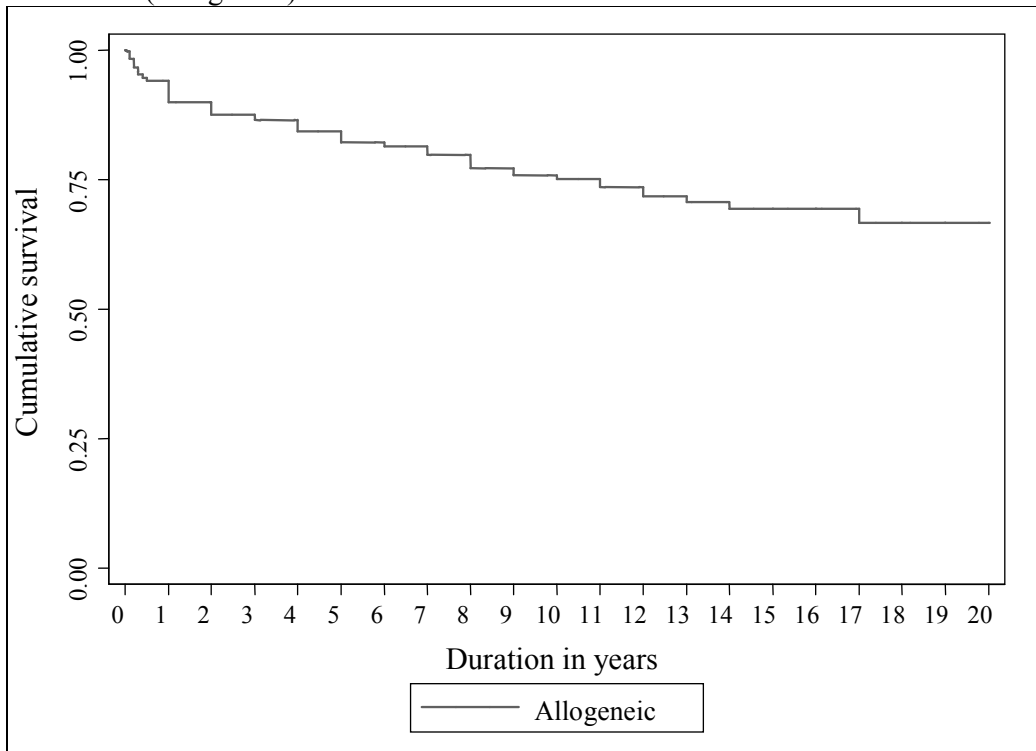


Figure 1.5.3: Disease-free Survival for Thalassemia, 1987-2007 (Allogeneic)

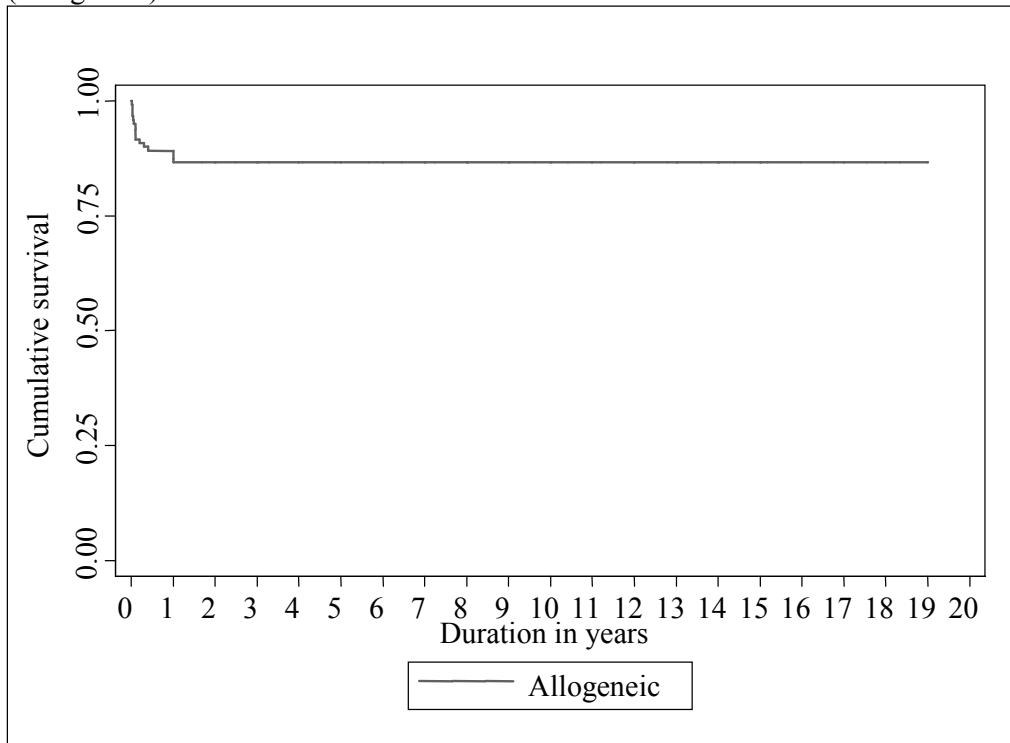


Figure 1.5.4: Disease-free Survival for Non-Hodgkin's Lymphoma, 1987-2007  
(Allogeneic vs. Autologous)

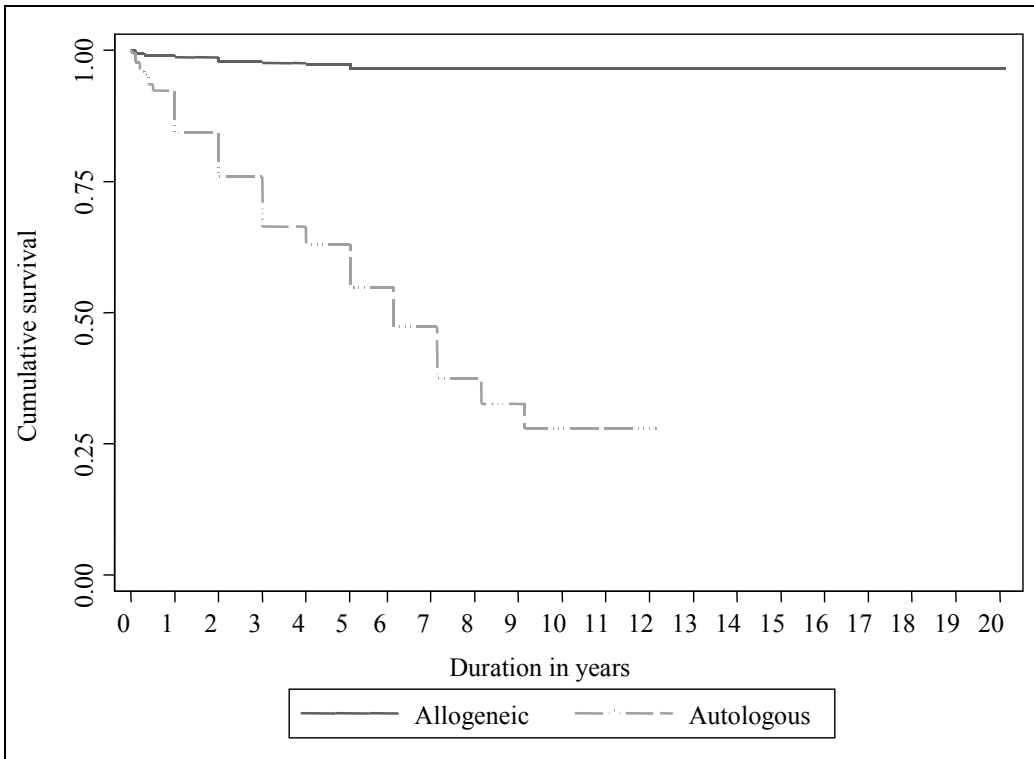


Figure 1.5.5: Disease-free Survival for Hodgkin's Disease, 1987-2007 (Autologous)

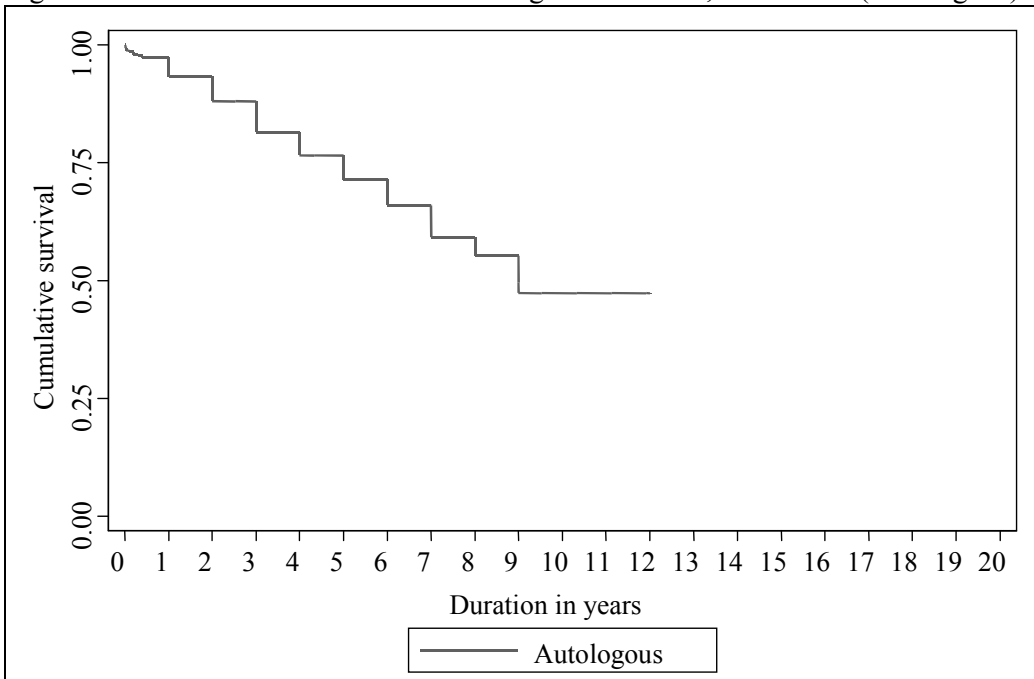


Figure 1.5.6: Disease-free Survival for Chronic Myeloid Leukaemia, 1987-2007 (Allogeneic)

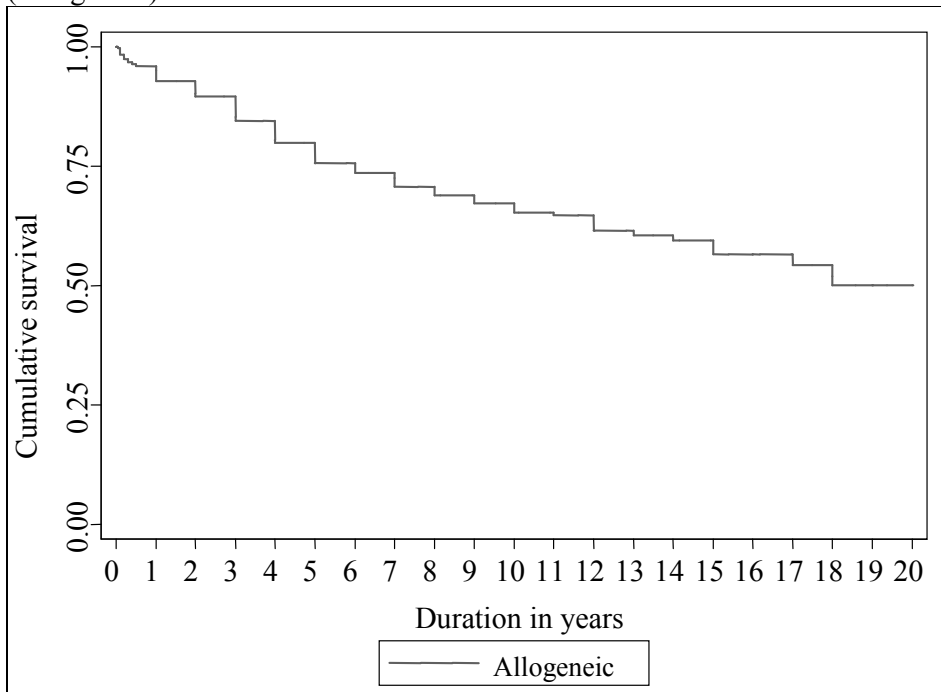


Figure 1.5.7: Disease-free Survival for Aplastic Anaemia, 1987-2007 (Allogeneic)

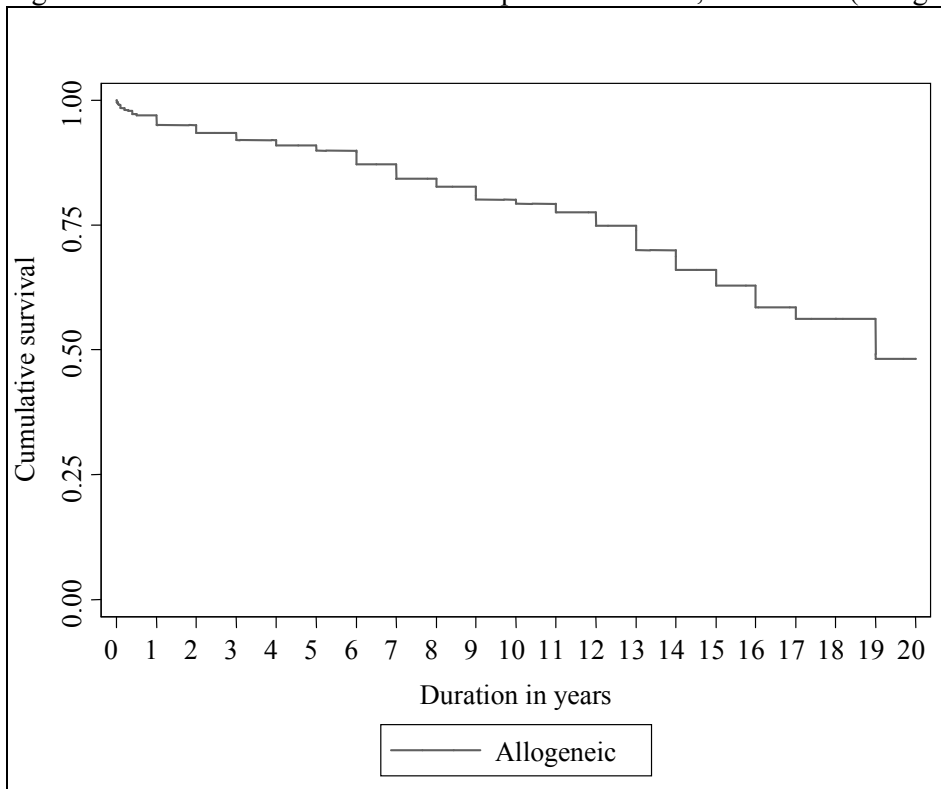
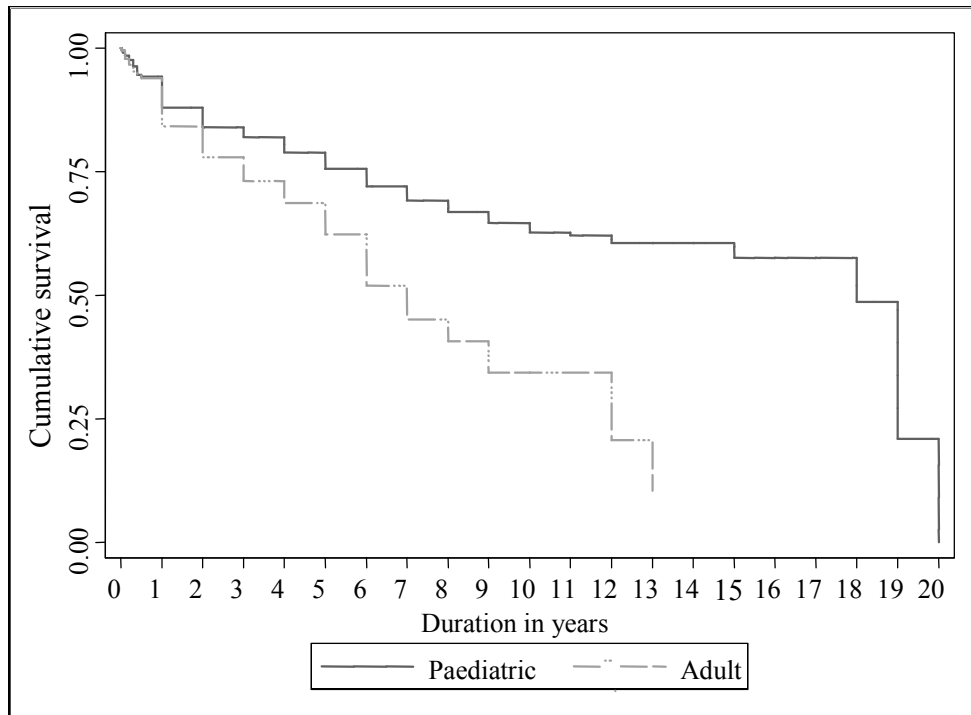


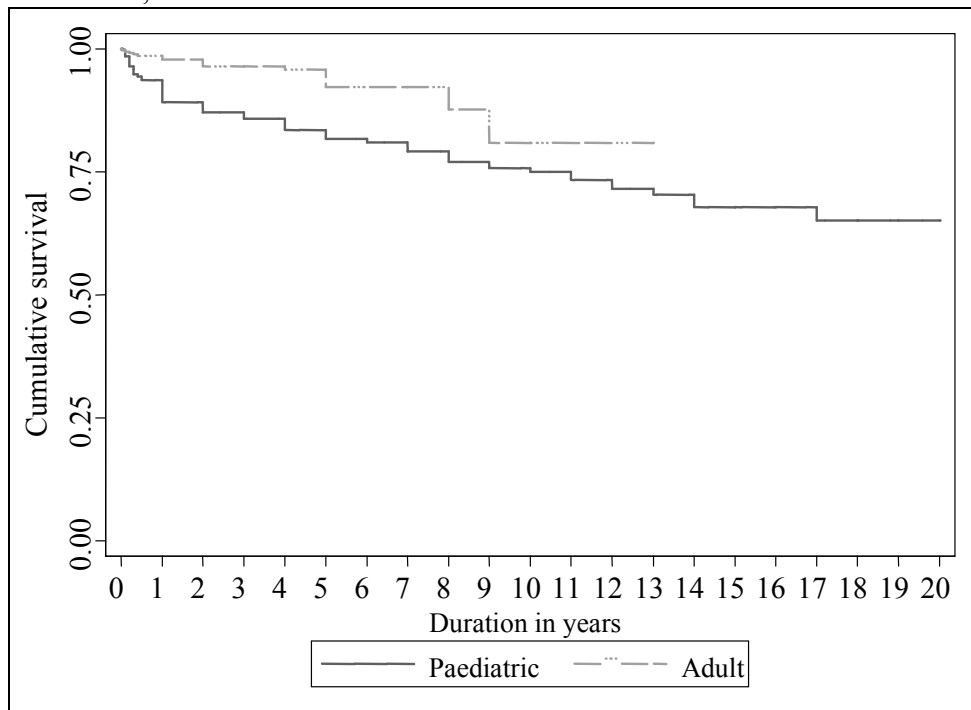


Figure 1.5.8: Disease-free Survival by Age Group for Acute Myeloid Leukaemia, 1987-2007



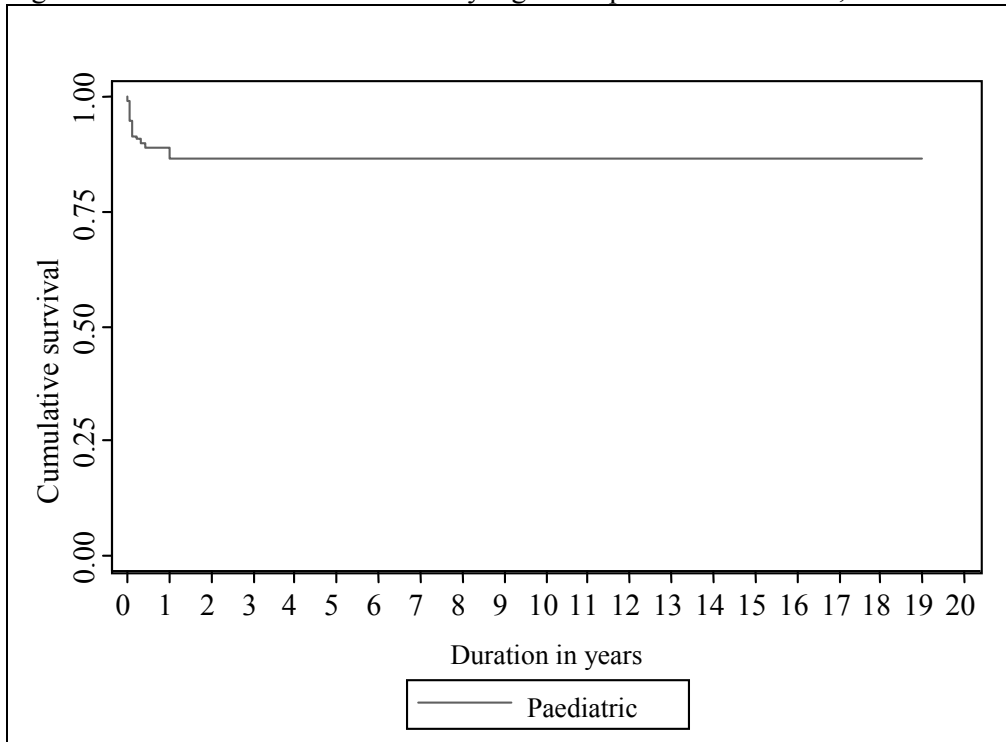
Paediatric is defined as age  $\leq 18$  years and adult age  $> 18$  years

Figure 1.5.9: Disease-free Survival by Age Group for Acute Lymphoblastic Leukaemia, 1987-2007



Paediatric is defined as age  $\leq 18$  years and adult age  $> 18$  years

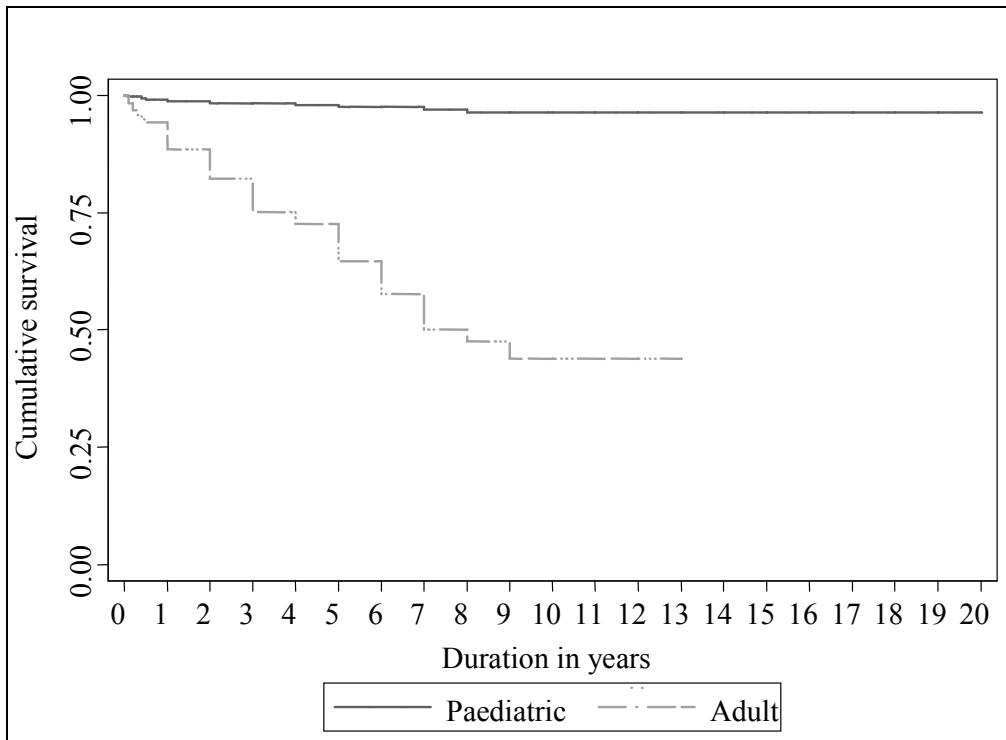
Figure 1.5.10: Disease-free Survival by Age Group for Thalassaemia, 1987-2007



No adult cases reported for Thalassaemia

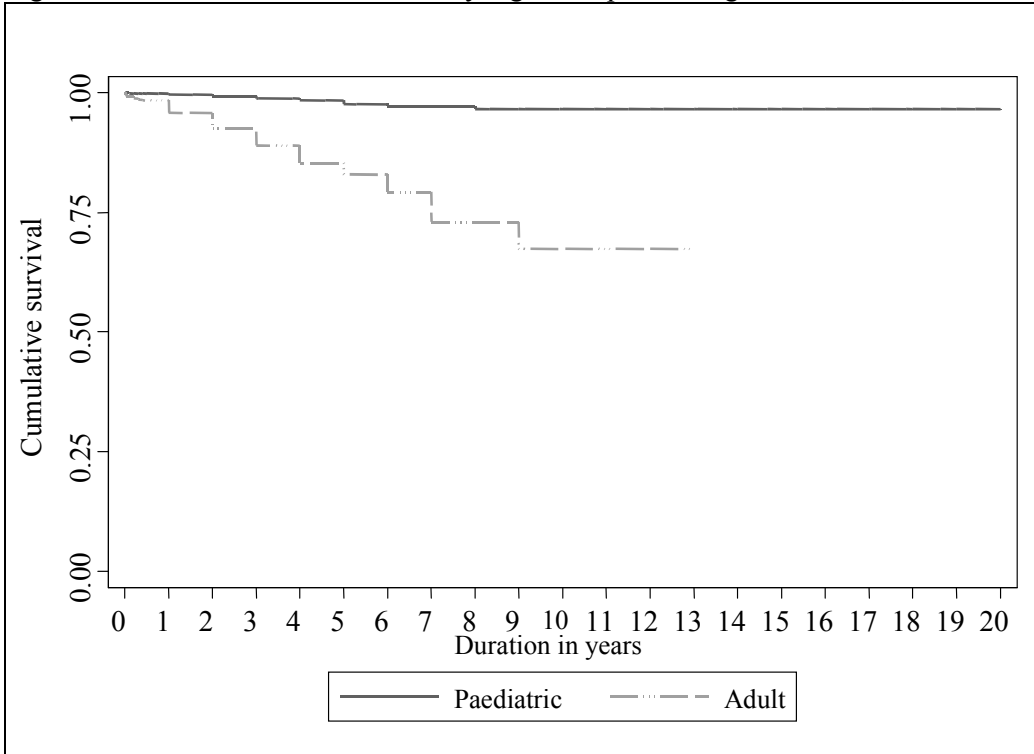
Paediatric is defined as age  $\leq 18$  years and adult age  $> 18$  years

Figure 1.5.11: Disease-free Survival by Age Group for Non-Hodgkin's Lymphoma, 1987-2007



Paediatric is defined as age  $\leq 18$  years and adult age  $> 18$  years

Figure 1.5.12: Disease-free Survival by Age Group for Hodgkin's Disease, 1987-2007



Paediatric is defined as age  $\leq 18$  years and adult age  $> 18$  years

Figure 1.5.13: Disease-free Survival by Age Group for Chronic Myeloid Leukaemia, 1987-2007

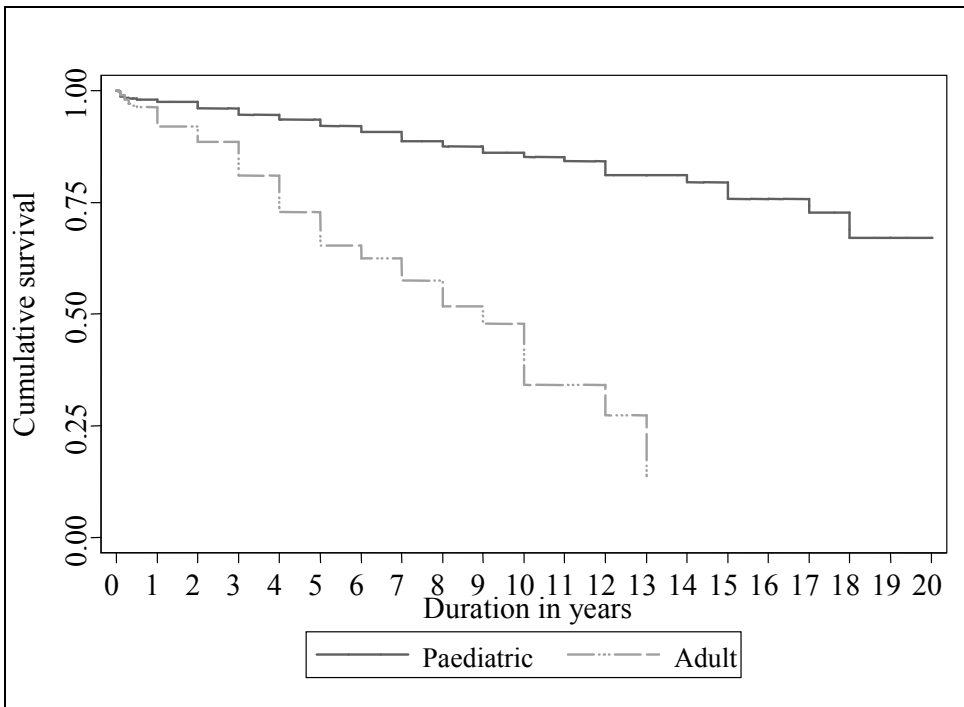
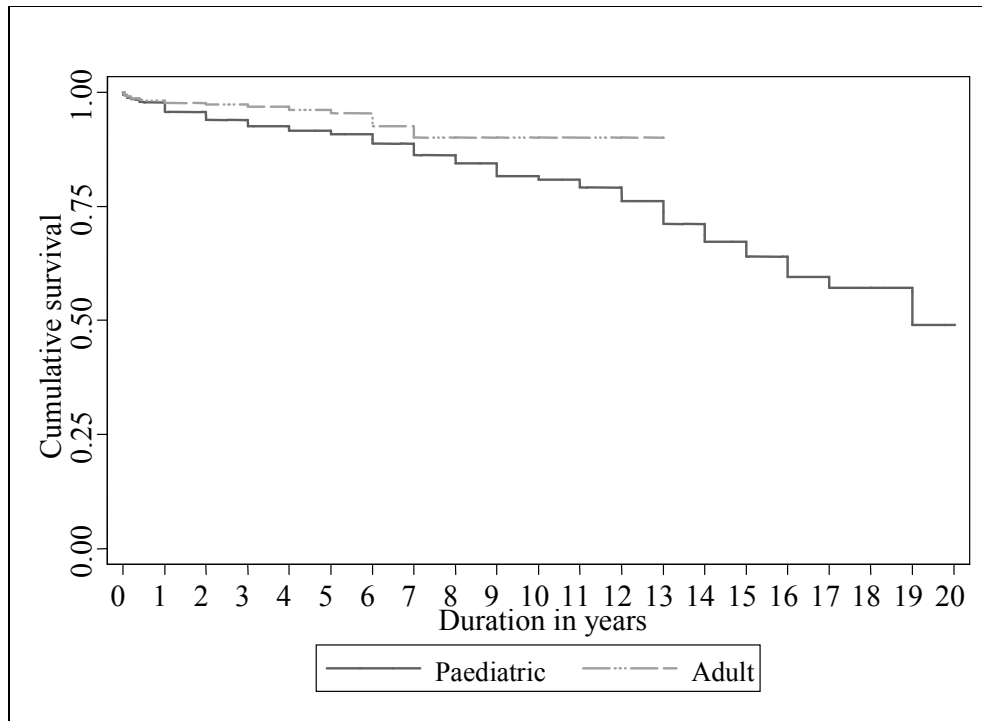


Figure 1.5.14: Disease-free Survival by Age Group for Aplastic Anaemia, 1987-2007



Paediatric is defined as age ≤18 years and adult age >18 years

**1.6 Conclusion**

Most of the DFS outcomes reported were comparable to centres in the developed world. Our data did not show greater breakdown in terms of remission status for malignant diseases and we look forward to more detailed analysis in future reports.

All participating centres should be congratulated for their efforts in maintaining good data for this registry. Some of the data have been used for presentations at international conferences and also contribute to the Asia-Pacific Bone Marrow Transplant Registry. A small number of transplant units in Malaysia report individually to the European BMT Registry or the CIBMTR (Center for International Blood and Marrow Transplant Research).

The challenges which we faced in meeting the needs of patients who require HSCT in 2007 included a lack of HSCT beds resulting in a significant waiting list even for patients who have matched sibling donors identified. Some patients lacked financial resources to pursue the option of unrelated donor transplantations and hence were deprived of a potential chance of cure. Hopefully these challenges will spur the HSCT community in Malaysia to greater efforts to meet the needs of patients.