

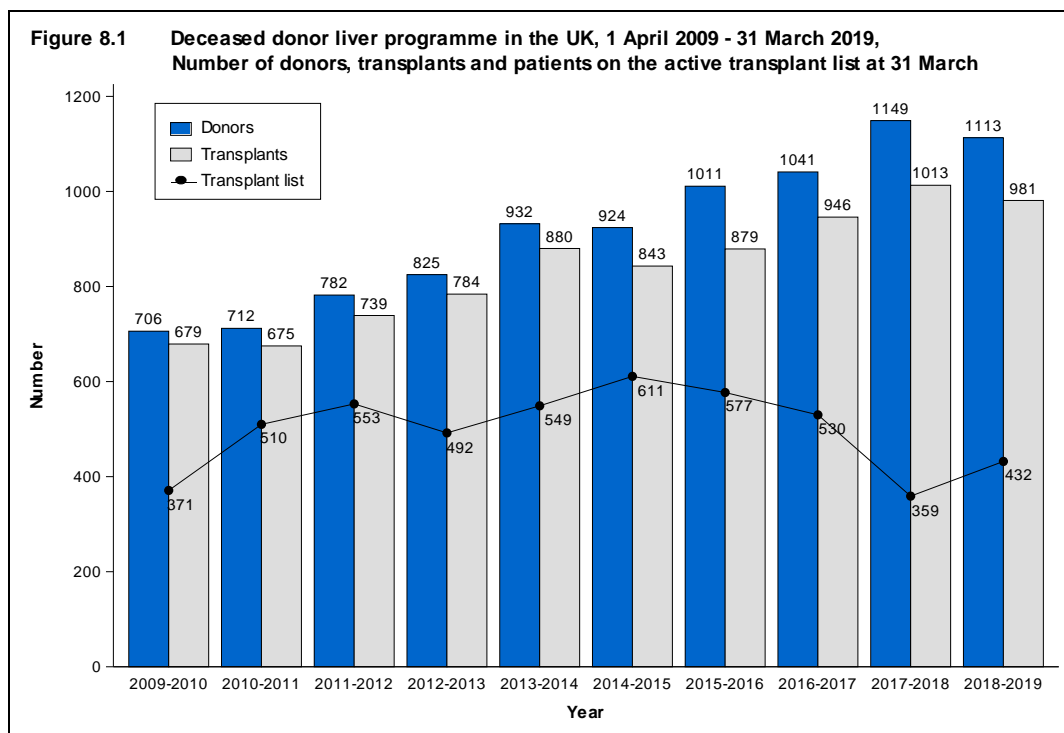
Liver Activity

Key messages

- On 20 March 2018, the new National Liver Offering Scheme (NLOS) was introduced for offering livers from donors after brain death
- The number of patients on the active liver transplant list at 31 March 2019 was 432, an increase of 20% from 2018
- The number of liver donors after brain death increased by 1% to 856, while transplants from donors after brain death fell by 2% to 794
- The number of liver donors after circulatory death fell by 14% to 257, while transplants from donors after circulatory death fell by 7% to 187

8.1 Overview

The number of deceased liver donors and transplants in the UK in the last ten years is shown in **Figure 8.1**. Over this period, there has been an increase in the number of patients registered on the active transplant list at 31 March, although this number has fallen in recent years. The numbers of donors and transplants has steadily increased over the last decade.



Intestinal transplants that used a liver are not included in the liver activity reported. However, any livers retrieved and used for such transplants are included in the liver donor activity. Liver only transplants in intestinal failure patients are included in the liver transplant activity. Intestinal transplant activity is reported in Chapter 9.

The number of deceased donors, deceased and living donor transplants, and patients on the active transplant list, by centre, is shown in **Table 8.1**. The numbers of liver donors reflect the number of organs retrieved from within each centre's allocation zone (by any retrieval team) rather than the number of retrievals made by that centre. In 2018-2019, 1,113 organ donors donated their liver for transplant: 856 donors after brain death and 257 donors after circulatory death. There were 432 patients on the active transplant list at 31 March 2019, an increase of 20% from 2018.

Overall, the number of liver transplants (either whole liver or liver lobe transplants) from donors after brain death fell by 2% to 794, and donors after circulatory death fell by 7% to 187, compared with the previous financial year. Additionally, there were 21 living liver lobe donor transplants in NHS Group 1 (13) and Group 2 (8) paediatric and adult recipients, and 1 domino donor transplant in NHS Group 1 adult recipients. One of the living donors was an altruistic non-directed donor.

Patients are prioritised as super-urgent if they require a new liver as soon as possible due to rapid failure of the native organ. Other patients are referred to as elective. There were 97 deceased donor adult super-urgent transplants in 2018-2019, representing 11% of all adult transplants. There were 20 deceased donor paediatric super-urgent transplants in 2018-2019, representing 26% of all paediatric transplants.

Table 8.1 Deceased and living liver donors and transplants, 1 April 2018 - 31 March 2019 (2017-2018) and transplant list patients at 31 March 2019 (2018) in the UK, by age group and centre

Allocation zone/ transplant centre	Deceased donors ¹						Deceased transplants						Living donor transplants		Active transplant list	
	DBD		DCD		TOTAL		DBD		DCD		TOTAL					
Adult																
Birmingham	164	(158)	66	(55)	230	(213)	181	(154)	38	(52)	219	(206)	0	(0)	117	(86)
Cambridge	86	(86)	36	(49)	122	(135)	80	(84)	38	(33)	118	(117)	0	(0)	39	(26)
Edinburgh	92	(87)	14	(19)	106	(106)	95	(90)	13	(13)	108	(103)	0	(0)	37	(33)
King's College	198	(205)	56	(64)	253	(269)	161	(151)	43	(51)	204	(202)	5	(5)	102	(91)
Leeds	152	(161)	41	(70)	193	(231)	81	(126)	21	(25)	102	(151)	1	(3)	43	(40)
Newcastle	58	(29)	7	(11)	65	(40)	25	(32)	3	(5)	28	(37)	0	(0)	18	(8)
Royal Free	85	(106)	28	(18)	113	(124)	97	(102)	27	(14)	124	(116)	0	(2)	40	(41)
TOTAL	835	(832)	248	(286)	1083	(1118)	720	(739)	183	(193)	903	(932)	6²	(10)³	396	(325)
Paediatric																
Birmingham	6	(2)	2	(3)	8	(5)	20	(21)	1	(1)	21	(22)	3	(3)	14	(6)
Cambridge	0	(2)	2	(3)	2	(5)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
Edinburgh	1	(1)	0	(0)	1	(1)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
King's College	5	(5)	2	(6)	7	(11)	37	(34)	3	(6)	40	(40)	8	(12)	16	(21)
Leeds	7	(6)	2	(1)	9	(7)	17	(18)	0	(0)	17	(18)	5	(5)	6	(7)
Newcastle	0	(1)	1	(0)	1	(1)	0	(1)	0	(0)	0	(1)	0	(0)	0	(0)
Royal Free	2	(1)	0	(0)	2	(1)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
TOTAL	21	(18)	9	(13)	30	(31)	74	(74)	4	(7)	78	(81)	16⁴	(20)⁵	36	(34)

¹ Includes donors whose livers were retrieved by other teams

² Includes 1 and 5 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

³ Includes 4 and 5 living liver lobe transplants, and 1 and 0 domino transplants in NHS Group 1 and Group 2 recipients, respectively

⁴ Includes 11 and 3 living liver lobe transplants, 1 and 0 altruistic donor transplants, and 1 and 0 domino transplants in NHS Group 1 and Group 2 recipients, respectively

⁵ Includes 16 and 4 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

8.2 Transplant list

During 2018-2019, 1,227 patients joined the liver transplant list. Outcomes for patients on the list at 1 April 2018 and those joining the list during the year are shown in **Table 8.2**. There have been 138 (11%) new registrations that were super-urgent.

Table 8.2 Liver transplant list and new registrations in the UK, 1 April 2018 - 31 March 2019						
Outcome of patient at 31 March 2019	Active and suspended patients at 1 April 2018		New registrations in 2018-2019¹		TOTAL	
	N	%	N	%	N	%
	Remained active/suspended	116	26	372	30	488
Transplanted	239	54	764	62	1003	60
Removed	75	17	56	5	131	8
Died ²	12	3	35	3	47	3
TOTAL	442		1227		1669	

¹ Includes re-registrations for second or subsequent patients
² Includes patients removed due to deteriorating condition

Table 8.3 shows the active transplant list in the UK at 31 March 2019 and 2018 by country/ former Strategic Health Authority of patient's residence. At 31 March 2019, the overall rate was 6.5 pmp and ranged from 3.4 to 10.8 pmp across the Strategic Health Authorities.

Table 8.3 Active liver transplant list at 31 March, by country/ Strategic Health Authority of patient residence				
Country/ Strategic Health Authority of residence	Liver transplant list (pmp)			
	2019		2018	
North East	13	(4.9)	6	(2.3)
North West	38	(5.2)	29	(4.0)
Yorkshire and The Humber	27	(5.0)	29	(5.3)
North of England	78	(5.1)	64	(4.2)
East Midlands	32	(6.7)	21	(4.4)
West Midlands	63	(10.8)	41	(7.0)
East of England	36	(5.8)	31	(5.0)
Midlands and East	131	(7.8)	93	(5.5)
London	59	(6.7)	44	(5.0)
South East Coast	16	(3.4)	26	(5.5)
South Central	20	(4.6)	23	(5.3)
South West	42	(7.6)	29	(5.2)
South of England	78	(5.3)	78	(5.3)
England	346	(6.2)	279	(5.0)
Isle of Man	0	(0.0)	0	(0.0)
Channel Islands	1	(6.3)	1	(6.3)
Wales	19	(6.1)	14	(4.5)
Scotland	37	(6.8)	36	(6.6)
Northern Ireland	20	(10.7)	23	(12.3)
TOTAL¹	432	(6.5)	359	(5.4)

¹Includes patients in 2019 (2018) resident in: UK unknown 1 (0)
Republic of Ireland - 4 (1); Overseas - 4 (5)

An indication of longer term outcomes for patients listed for a liver transplant is summarised in **Figure 8.2**. This shows the proportion of patients transplanted or still waiting six months, one year and two years after joining the transplant list. It also shows the proportion removed from the transplant list and those dying while on the transplant list (which includes those patients removed due to condition deteriorated). At one year post-registration, 73% of patients had received a liver transplant while 10% of patients had died whilst waiting or had been removed due to their condition deteriorating. 4% had been removed for other reasons such as the patient's condition improving, as a result of non-compliance or at the request of the patient or family.

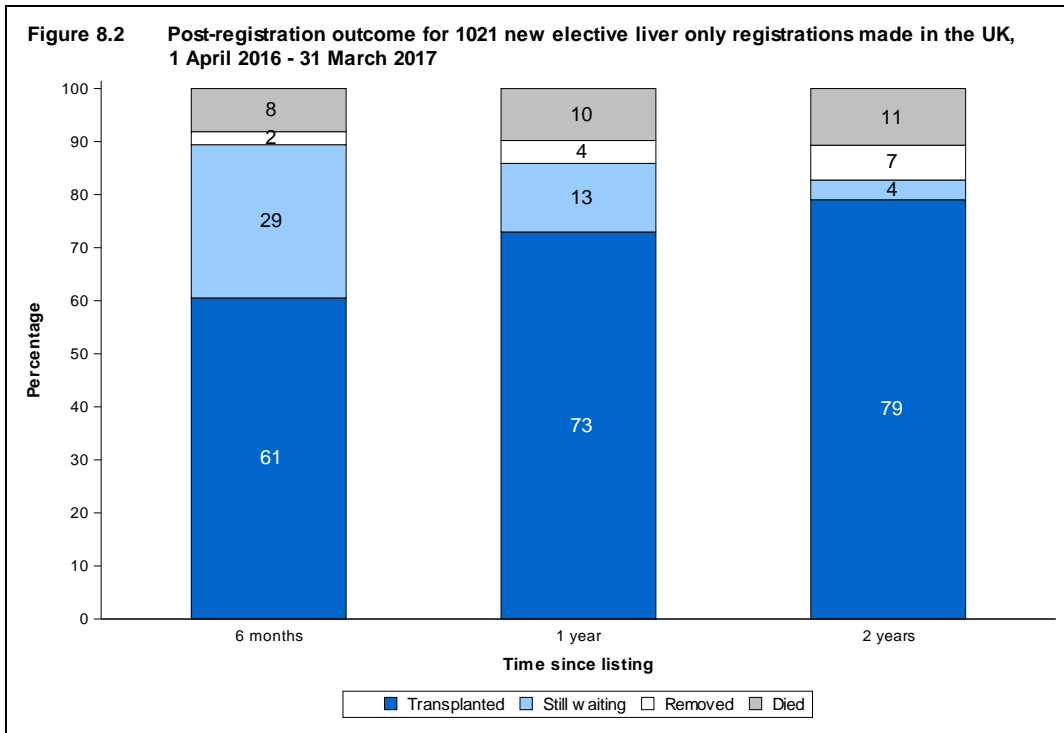


Table 8.4 and **Table 8.5** show the median waiting time to liver transplant for adult and paediatric elective registrations, separately, including a breakdown by blood group and ethnicity for adult elective registrations only. On average, adult patients wait 99 days for a transplant while paediatric patients wait an average of 107 days. Note that these waiting times are not adjusted for other relevant factors which may be influential and which may differ across blood or ethnic groups.

Table 8.4 Median active waiting time to liver transplant in the UK, for elective patients registered 1 April 2015 - 31 March 2018			
Blood group	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
Adult			
O	1282	169	151 - 187
A	1031	58	52 - 64
B	287	167	133 - 201
AB	98	60	36 - 84
TOTAL	2698	99	91 - 107
Paediatric	220	107	84 - 130

Table 8.5 Median active waiting time to liver transplant in the UK, for elective patients registered 1 April 2015 - 31 March 2018			
Ethnicity	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
Adult			
White	2385	97	89 - 105
Asian	178	116	90 - 142
Black	72	129	74 - 184
Other	56	97	63 - 131
TOTAL¹	2698	99	91 - 107
Paediatric	220	107	84 - 130

¹ Includes 7 recipients whose ethnicity was not reported

8.3 Donor and organ supply

On 20 March 2018, the new National Liver Offering Scheme was introduced to offer livers from donors after brain death. This change introduced a national waiting list for all adult liver patients and liver offering for these donors is now made on a patient basis. For donors after circulatory death, the allocation scheme has not changed from centre based offering.

Of the 1,600 organ donors, 1,113 (70%) donated their liver and 948 (85%) of these donated livers were used; see **Table 8.6**. Of livers retrieved from donors after brain death and donors after circulatory death, 89% and 72% were transplanted, respectively. One liver can be used in more than one transplant, see **Table 8.9**.

Table 8.6 Deceased liver donation and retrieval in the UK, 1 April 2018 - 31 March 2019, by allocation zone											
Allocation zone	Number of donors						Number of livers retrieved (used)				
	Solid organ			Liver			DBD		DCD		TOTAL
	DBD	DCD	TOTAL	DBD	DCD	TOTAL	DBD	DCD	TOTAL		
Birmingham	193	156	349	170	68	238	170	(152)	68	(44)	238 (196)
Cambridge	93	74	167	86	38	124	86	(76)	38	(27)	124 (103)
Edinburgh	102	52	154	93	14	107	93	(83)	14	(10)	107 (93)
King's College	222	149	371	203	58	261	203	(180)	58	(42)	261 (222)
Leeds	187	120	307	159	43	202	159	(143)	43	(34)	202 (177)
Newcastle	66	28	94	58	8	66	58	(48)	8	(7)	66 (55)
Royal Free	99	59	158	87	28	115	87	(80)	28	(22)	115 (102)
TOTAL	962	638	1600	856	257	1113	856	(762)	257	(186)	1113 (948)

The rates per million population (pmp) for liver donors are shown in **Table 8.7** by donor country/Strategic Health Authority of residence. No adjustments have been made for potential demographic differences in populations. The overall deceased liver donor rate was 16.9 pmp in 2018-2019 and varied across the Strategic Health Authorities from 15.1 pmp to 24.6 pmp.

Table 8.7 Liver donor rates in the UK, 1 April 2018 - 31 March 2019, by Country/ Strategic Health Authority						
Country/ Strategic Health Authority	DBD		Deceased donors (pmp) DCD		Total	
	North East	57	(21.6)	8	(3.0)	65
North West	88	(12.1)	23	(3.2)	111	(15.3)
Yorkshire and The Humber	67	(12.3)	17	(3.1)	84	(15.4)
North of England	212	(13.8)	48	(3.1)	260	(16.9)
East Midlands	56	(11.7)	25	(5.2)	81	(17.0)
West Midlands	67	(11.4)	33	(5.6)	100	(17.1)
East of England	75	(12.2)	37	(6.0)	112	(18.2)
Midlands and East	198	(11.8)	95	(5.7)	293	(17.4)
London	103	(11.7)	30	(3.4)	133	(15.1)
South East Coast	72	(15.4)	18	(3.8)	90	(19.2)
South Central	60	(13.7)	19	(4.3)	79	(18.1)
South West	76	(13.7)	16	(2.9)	92	(16.5)
South of England	208	(14.2)	53	(3.6)	261	(17.9)
England	721	(13.0)	226	(4.1)	947	(17.0)
Isle of Man	2	(25.0)	0	(0.0)	2	(25.0)
Channel Islands	1	(6.3)	0	(0.0)	1	(6.3)
Wales	45	(14.4)	19	(6.1)	64	(20.4)
Scotland	65	(12.0)	11	(2.0)	76	(14.0)
Northern Ireland	22	(11.8)	1	(0.5)	23	(12.3)
TOTAL¹	856	(13.0)	257	(3.9)	1113	(16.9)

¹ Includes 10 donors where the hospital postcode was used in place of an unknown donor postcode

8.4 Transplants

The number of liver transplants by recipient country/Strategic Health Authority of residence are shown in **Table 8.8**. No adjustments have been made for potential demographic differences in populations. The deceased donor transplant rate ranged from 9.8 to 20.3 pmp across the Strategic Health Authorities and overall was 14.7 pmp.

Table 8.8 Liver transplant rates per million population (pmp) in the UK, 1 April 2018 - 31 March 2019, by Country/ Strategic Health Authority								
Country/ Strategic Health Authority	Deceased transplants (pmp)						Living transplants (pmp)	
	DBD		DCD		Total			
North East	24	(9.1)	2	(0.8)	26	(9.8)	0	(0.0)
North West	56	(7.7)	19	(2.6)	75	(10.3)	3	(0.4)
Yorkshire and The Humber	57	(10.5)	9	(1.7)	66	(12.1)	3	(0.6)
North of England	137	(8.9)	30	(2.0)	167	(10.9)	6	(0.4)
East Midlands	51	(10.7)	16	(3.4)	67	(14.0)	0	(0.0)
West Midlands	99	(16.9)	20	(3.4)	119	(20.3)	0	(0.0)
East of England	88	(14.3)	25	(4.1)	113	(18.3)	2	(0.3)
Midlands and East	238	(14.2)	61	(3.6)	299	(17.8)	2	(0.1)
London	102	(11.6)	23	(2.6)	125	(14.2)	0	(0.0)
South East Coast	47	(10.0)	15	(3.2)	62	(13.2)	0	(0.0)
South Central	45	(10.3)	14	(3.2)	59	(13.5)	2	(0.5)
South West	52	(9.4)	15	(2.7)	67	(12.1)	1	(0.2)
South of England	144	(9.8)	44	(3.0)	188	(12.9)	3	(0.2)
England	621	(11.2)	158	(2.8)	779	(14.0)	11	(0.2)
Isle of Man	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Channel Islands	2	(12.5)	1	(6.3)	3	(18.8)	0	(0.0)
Wales	28	(8.9)	7	(2.2)	35	(11.2)	0	(0.0)
Scotland	101	(18.6)	13	(2.4)	114	(21.0)	0	(0.0)
Northern Ireland	33	(17.6)	1	(0.5)	34	(18.2)	1	(0.5)
TOTAL¹	790	(12.0)	182	(2.8)	972	(14.7)	12²	(0.2)

¹ Excludes 19 recipients who reside outside the UK (4 DBD, 5 DCD, 10 Living).
² Includes 1 domino donor transplants.

The number of whole, reduced and split liver transplants by urgency status of the transplant (elective, super-urgent) in 2018-2019 is shown in **Table 8.9**. The term 'reduced' is used when only one lobe of the liver is transplanted and the term 'split' applies when both lobes of the liver are transplanted into two different recipients.

Overall, the number of deceased donor liver transplants fell by 3% in 2018-2019. There were 981 deceased donor liver transplants performed in 2018-2019: 873 whole liver, including 12 liver and kidney; 84 split liver, and 24 deceased liver lobe. Split liver transplants accounted for 78% of liver lobe transplant activity.

Table 8.9 Deceased liver transplants performed in the UK, 1 April 2017 - 31 March 2019

Transplant centre	2017 - 2018								2018 - 2019							
	Whole liver		Reduced liver		Split liver		TOTAL		Whole liver		Reduced liver		Split liver		TOTAL	
	E	SU	E	SU	E	SU	E	SU	E	SU	E	SU	E	SU	E	SU
Birmingham	179	21	3	3	21	1	203	25	191	25	4	2	16	2	211	29
Cambridge	102	13	0	0	2	0	104¹	13	104	10	0	0	4	0	108	10
Edinburgh	90	9	0	0	4	0	94	9	94	11	0	0	3	0	97	11
King's College	184	17	1	3	34	3	219	23	176	13	4	10	35	6	215	29
Leeds	131	17	2	0	15	4	148	21	82	18	3	1	14	1	99	20
Newcastle	34	4	0	0	0	0	34	4	24	4	0	0	0	0	24	4
Royal Free	92	17	0	0	6	1	98	18	107	14	0	0	3	0	110	14
TOTAL	812	98	6	6	82	9	900	113	778	95	11	13	75	9	864	117

E=Elective, SU=Super-urgent
 Birmingham, King's College and Leeds transplant paediatric patients
 Super-urgent registration categories were changed on 17 June 2015 to account for development in treatment of patients with acute liver failure
¹ Includes 1 urgent heart/liver transplant and 1 super-urgent lung/liver transplant at Cambridge

The length of time that elapses between a liver being removed from the donor to its transplantation into the recipient is called the cold ischaemia time (CIT). Generally, the shorter this time, the more likely the liver is to work immediately and the better the long-term outcome. In 2018-2019, the median CIT for a DBD donor whole liver only transplant was 8.8 hours (Inter-Quartile (IQ) range 7.1 – 10.3) and for a DCD donor whole liver only transplant was 7.6 hours (IQ range 6.1 – 9.2) and overall was 8.5 hours (IQ range 6.9 – 10.1). Please note some of these data include the use of donor organ maintenance systems, in which cases the CIT reported will be an overestimate of the true cold ischaemia time.

At 31 March 2019 there were approximately 10,500 recipients with a functioning liver transplant (or multi-organ including the liver) being followed-up as reported to the UK Transplant Registry.

8.5 Demographic characteristics

The age group, sex, ethnicity and blood group of liver donors, transplant recipients and transplant list patients are shown in **Table 8.10**.

Table 8.10 Demographic characteristics of deceased liver donors and transplant recipients 1 April 2018 - 31 March 2019, and transplant list patients at 31 March in the UK						
Age group (years)	Donors		Transplant recipients		Active transplant list patients	
	N	(%)	N	(%)	N	(%)
0 - 17	40	(4)	82	(8)	37	(9)
18 - 34	173	(16)	122	(12)	61	(14)
35 - 49	257	(23)	155	(16)	110	(25)
50 - 59	260	(23)	307	(31)	130	(30)
60 - 69	235	(21)	303	(31)	92	(21)
70+	148	(13)	12	(1)	2	(0)
mean (SD)	51	(17)	49	(18)	46	(17)
Male	577	(52)	620	(63)	249	(58)
Female	536	(48)	361	(37)	183	(42)
White	1008	(91)	838	(87)	365	(87)
Asian	44	(4)	48	(5)	35	(8)
Black	17	(2)	27	(3)	11	(3)
Chinese	3	(0)	10	(1)	3	(1)
Other	32	(3)	42	(4)	4	(1)
Not reported	9		16		14	
O	564	(51)	452	(46)	226	(52)
A	425	(38)	376	(38)	145	(34)
B	92	(8)	104	(11)	58	(13)
AB	32	(3)	49	(5)	3	(1)
First graft			885	(90)	378	(88)
Re-graft			96	(10)	54	(13)
TOTAL	1113	(100)	981	(100)	432	(100)