

Every statistic is a person.



Cover photograph: Caroline and John Fowler's daughter Aimee, now aged two, shared a donated liver in the first operation of its kind to be performed in Leeds in December 2000. "The transplant has made such a difference to all our lives. Aimee has gone from strength to strength and is now full of life. We will be eternally grateful for the generosity of her donor."
(Photograph courtesy of Matt Griggs, IPN)

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Executive Summary

UK Transplant is the Special Health Authority with responsibility for increasing the number of people whose lives are saved or transformed through organ and cornea transplantation. Transplantation is one of the success stories of modern medicine and UK Transplant is leading the way in tackling the shortage of donor organs. This Transplant Activity Report looks at donor, transplant and waiting list activity in the UK from 1 January to 31 December 2001.

The report confirms that whilst the previous decade's decline in donor numbers has been stabilised and more transplants took place, waiting lists continue to grow and there remains a shortage of organs and corneas. The Authority's annual report details the arrangements which were put in place during 2001 to deliver long-term solutions to the shortage of donor organs and corneas.

The main findings of this report are as follows:

Organ and Cornea Donation

- 777 cadaveric solid organ donors were recorded for the second year running, halting the decline of the previous decade.
- 735 of these donors were heartbeating and 42 non-heartbeating.
- Donor rate per million of population (pmp) was 13.1 across the UK, one of the lowest in Europe.
- Donor rates varied by retrieval area from 5.6 pmp to 19.9 pmp.
- At 19.9 pmp Northern Ireland recorded the highest rate in the UK.
- The number of living donors increased by 2% to 381.
- 3,272 corneas were donated which was a decrease of 18%.
- 64 organs were imported from the Republic of Ireland and other European countries, 16 were exported.

Waiting List

- 6,842 people were registered on the UK active and suspended combined solid organ waiting lists, an increase of 1% on the previous year.
- 4,934 patients were registered on the active waiting list for a kidney transplant, an increase of 1% on the previous year.
- The active and suspended liver waiting list increased by 3%.
- The active and suspended cardiothoracic waiting list fell by 9%.

Transplant Activity

- 2,717 solid organ transplants were undertaken, an increase of 0.3% on the previous year.
- Cadaveric kidney transplants increased by 2%.
- Living donor kidney transplants increased by 3%.
- The total number of cardiothoracic transplants (heart, heart/lung and lung) dropped by 11%; this decrease was largely due to an 18% drop in cadaveric and a 23% drop in domino heart transplants.
- Liver transplants increased by 2%.
- Cornea transplants decreased by 10% to 2,050.

Transplant Outcome

One year transplant survival estimates for routine first cadaveric transplants performed in 1998 and 1999 were:

- 88% (95% Confidence interval (CI) 86-89%) for kidney transplants.
- 80% (95% CI: 76-83%) for heart transplants.
- 69% (95% CI: 60-78%) for heart/lung transplants.
- 76% (95% CI: 69-82%) for lung transplants.
- 80% (95% CI: 78-93%) for liver transplants.

NHS Organ Donor Register (ODR)

- At the year end 9,025,636 people had registered on the organ donor register as potential donors.
- 87% indicated a willingness to donate all organs and tissue.
- 36% of registrants came via the Driver Vehicle Licensing Authority, 29% through GP registration and 15% through Boots Advantage Card.

About this Report

This Transplant Activity Report for 2001 relates throughout to the UK. All figures quoted are as reported to UK Transplant for the National Transplant Database (NTxD), maintained on behalf of the transplant community and National Health Service (NHS), or for the NHS Organ Donor Register, maintained on behalf of the UK Health Departments.

The UK definition of a solid organ donor is any donor from whom at least one solid organ has been retrieved with the intention to transplant. Organs retrieved solely for research purposes have not been counted in this Activity Report.

Donation and transplant rates in this Report are presented per million population (pmp): population figures used throughout this Report are given in *Appendix III*.

Please note that organ donation has been recorded to reflect the number of organs retrieved. For example, if both lungs were retrieved, two lungs are recorded even if they were both used in one transplant. Similarly if one liver is donated, one liver is recorded even if it results in two transplants. All pancreatic transplants refer to the whole organ.

Where specified, living and non-heartbeating donations are recorded separately. All percentages quoted are rounded to the nearest whole number. Unless otherwise specified waiting list figures include active and suspended patients.

In some cases, figures for 2000 and earlier years differ from those quoted in *Transplant Activity 2000*. This is due to a continuous programme of data validation undertaken by UK Transplant that may, in some instances, result in changes to the data held on the NTxD. For example, the number of active or suspended patients given for 1 January 2001 ([Tables 3.5](#), [4.5](#) and [5.3](#)) is slightly lower than published in *Transplant Activity 2000*. This is because some patients registered as active or suspended on 31 December 2000 had received transplants or had died shortly before the end of the year, but this was not notified to the NTxD until the following year.

Table 1.1
ACTIVITY SUMMARY FOR 2001

	TOTAL				
Cadaveric solid organ donors (735 heartbeating + 42 non-heartbeating + 9 other European countries)	786				
	Kidney & pancreas ⁵	Heart	Heart/ lung	Lung	Liver
Cadaveric donors ¹	740	200	-	126	661
Cadaveric organs donated ¹	1530 ²	200	-	243	661
Cadaveric transplants ³	1391	161	33	92	675
Living donor transplants	358	10	0	1	9
					378

¹ Excludes donors from other European countries

² Includes 65 pancreas donations

³ Excludes other European countries and ROI transplants from organs donated in the UK

⁴ Includes combined transplants: 7 kidney & liver, 4 kidney & heart, 1 heart & liver, 1 liver & heart/lung

⁵ Includes 39 non-heartbeating donors who provided 77 organs for 56 transplants

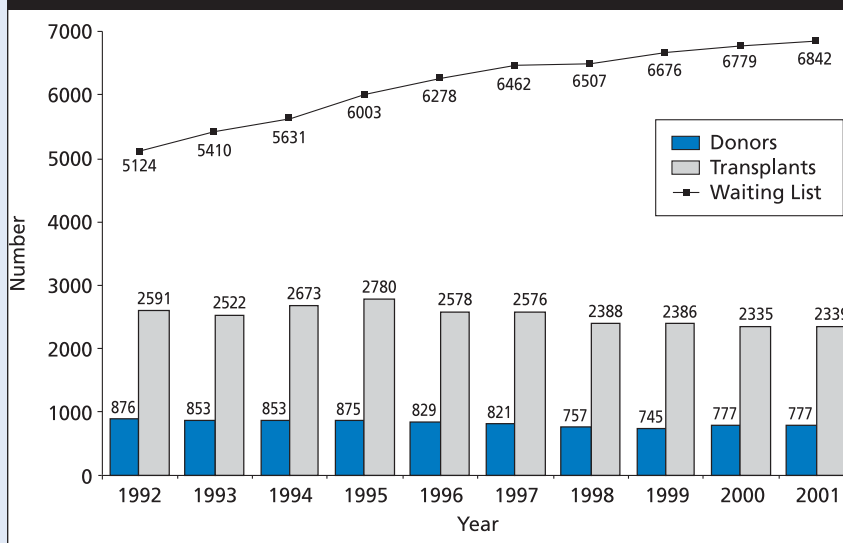
Waiting lists at 31 December 2001

Active list	4942 ⁶	105	72	241	158	5518
Temporarily suspended	1310 ⁷	8	2	2	2	1324
TOTAL	6252	113	74	243	160	6842

⁶ Includes 88 kidney & pancreas and 8 pancreas patients

⁷ Includes 28 kidney & pancreas and 21 pancreas patients

Figure 1.1
NUMBER OF CADAVERIC DONORS AND TRANSPLANTS IN THE UK 1992-2001
AND PATIENTS ON THE ACTIVE AND SUSPENDED WAITING LISTS AT 31 DECEMBER



1

Introduction and Overview

There were 777 cadaveric solid organ donors reported from the UK in 2001, the same as in 2000. Of these 777 donors 42 were non-heartbeating donors: 35 kidney, 4 kidney and liver and 3 liver only donors. There were 2,634 cadaveric solid organs provided for transplant and living donors provided a further 379 organs for transplant.

The total number of solid organ transplants was 2,717: 2,339 transplants through cadaveric donations, four more than in 2000 and 378 transplants through living donations, 16 more than in 2000.

At the end of 2001, 6,842 patients were registered on a solid organ transplant waiting list in the UK. 1,324 (19%) of patients on the waiting list were temporarily suspended from the active national transplant waiting list.

Table 1.1 summarises the donors, transplants and waiting list by organ for 2001. Donor numbers, transplant activity and year end waiting lists for 1992-2001 are shown in **Figure 1.1**.

Table 1.2
ORGAN DONATION AND TRANSPLANT ACTIVITY PER MILLION POPULATION (PMP) IN EUROPE, 2001

	Eurotransplant¹	France	Italy	Spain	Scandia Transplant²	UK³	ROI³
Cadaveric donors	1701	1066	988	1335	331	777	68
pmp	14.3	17.8	17.1	32.5	13.8	13.1	18.2
Cadaveric kidney transplants	3077	1921	1447	1893	599	1385	122
pmp	25.9	32.0	25.0	46.1	25.0	23.4	32.6
Living donor kidney transplants	610	101	99	31	249	358	2
pmp	5.1	1.7	1.7	0.8	10.4	6.1	0.5
Liver transplants	1316	859	831	1004	217	684	35
pmp	11.1	14.3	14.4	24.4	9.0	11.6	9.4
Heart + heart/lung transplants	600	342	316	341	98	204	11
pmp	5.0	5.7	5.5	8.3	4.1	3.4	2.9
Lung transplants	269	117	62	143	67	93	-
pmp	2.3	1.9	1.1	3.5	2.8	1.6	-

¹ Eurotransplant includes Germany, Austria, Belgium, Luxembourg, The Netherlands and Slovenia

² Scandia Transplant includes Denmark, Norway, Finland and Sweden

³ Figures taken from National Transplant Database, February 2002. All others are provisional figures from Organización Nacional de Trasplantes (ONT)

Note: definitions of a cadaveric solid organ donor vary between countries

Donation and transplant rates for the UK compared with the Republic of Ireland (ROI) and other European countries are shown in [Table 1.2](#).

The definition of a cadaveric solid organ donor varies between countries.

Waiting Lists

[Table 1.3](#) shows the numbers of patients waiting for a transplant at 31 December 2000 and 2001. The total number rose by 63 patients (1%) with increased liver and renal waiting lists but a decreased cardiothoracic waiting list.

Table 1.3
ACTIVE AND SUSPENDED WAITING LISTS AT 31 DECEMBER 2000 AND 2001

	2000	2001	% Change
Heart	156	113	-28
Lung(s)	205	243	+19
Heart/lung	109	74	-32
All cardiothoracic patients	470	430	-9
All liver patients	155	160	+3
Kidney	6028	6107	+1
Kidney & pancreas	98	116	+18
Pancreas	28	29	+4
All renal patients	6154	6252	+2
ALL ORGANS	6779	6842	+1

Table 1.4
TRANSPLANTS PERFORMED, 1 JANUARY 2000 - 31 DECEMBER 2001

Organ	2000	2001	% Change
Cadaveric heartbeating kidney ¹	1276	1277	+0.1
Cadaveric non-heartbeating kidney	48	56	+17
Living donor kidney	346	358	+3
Cadaveric heart	191	156	-18
Domino heart	13	10	-23
Heart/lung	33	32	-3
Single lung	38	35	-8
Double lung	59	57	-3
Living lung lobe	1	1	-
Liver	578	586	+1
Domino liver	0	1	-
Liver lobe	74	80	+8
Living liver lobe	13	8	-
Kidney & heart	0	4	-
Kidney & liver	5	7 ²	-
Kidney & pancreas	32	41	+28
Heart & liver	0	1	-
Liver & heart/lung	0	1	-
Liver & pancreas	1	0	-
Pancreas	0	6	-
Total kidney transplants	1707	1743	+2
Total cardiothoracic transplants	335	297	-11
Total liver transplants	671³	684⁴	+2
TOTAL TRANSPLANTS (Solid Organs)	2708	2717	+0.3

¹ Includes en bloc kidney transplants (7 in 2001) and double kidney transplants (1 in 2001)

² Includes 1 kidney & liver lobe transplant

³ Includes 3 liver & small intestine transplants

⁴ Includes 1 liver & small intestine and 1 liver, kidney & small intestine transplant

- % not reported when fewer than 10 transplants in either year

Table 1.5
EXCHANGES BETWEEN UK AND ROI AND OTHER EUROPEAN COUNTRIES (OEC) 1 JANUARY - 31 DECEMBER 2001

Organ	Retrieved from UK, transplanted in ROI and OEC			Transplanted in UK, retrieved from ROI and OEC		
	ROI	OEC	TOTAL	ROI	OEC	TOTAL
Kidney	0	0	0	6	0	6
Heart	0	5	5	7	3	10
Lung	0	0	0	20	2	22
Liver	6	5	11	22	4	26
TOTAL	6	10	16	55	9	64¹

¹ One additional organ from an other European country was not transplanted

Transplants

Table 1.4 shows a total of 2,717 transplants were performed in the UK in 2001 compared with 2,708 in 2000. All multiple organ transplants are identified separately and include 32 heart/lung, 41 kidney and pancreas and 13 other multiple organ transplants.

There was a 2% rise in kidney transplants in 2001, mostly from non-heartbeating and living donors. Overall, the number of cardiothoracic transplants fell by 11%, mainly due to a drop in cadaveric and domino heart transplants. One living lung transplant was carried out in both 2000 and 2001. There was a 1% rise in the number of cadaveric whole liver transplants and there was also one domino liver transplant in 2001. Domino liver transplants occur when a patient with familial amyloid polyneuropathy receives a new liver, but their own liver is still suitable for transplant into another recipient. The number of liver lobe transplants increased by 8%.

Table 1.5 reports the exchange of organs between the UK and ROI and other European countries. Suitable recipients were not identified for a small number of retrieved organs from the UK; these were offered to the ROI and other European countries. Additionally, surplus organs from the ROI and other European countries were transplanted in the UK. During 2001, 16 organs were exported and 64 organs were imported and transplanted. A further one organ from an other European country was not transplanted due to clinical reasons.

2

Donors

Cadaveric solid organ donors

In 2001, 777 cadaveric solid organ donors gave 2,634 solid organs in the UK compared with 777 donors and 2,672 organs in 2000. [Tables 2.1](#) and [2.2](#) report organ donors and the number of organs retrieved for transplant, respectively, for each country of the UK and other European countries. The number of heartbeating and non-heartbeating donors by hospital are documented in *Appendices 1A* and *1B*, respectively.

England was the only country to provide non-heartbeating kidney donors. 82% of UK donors gave a kidney and at least one other solid organ. On average in the UK, 3.4 organs were retrieved per donor in 2001, with Scotland having the highest rate of 3.5 organs per donor.

Solid organ donor rates per million population (pmp) for the years 1999-2001 are given by country in [Table 2.3](#). Northern Ireland achieved the highest rate in 2001, with 19.9 donors pmp. The overall rate of 13.4 donors pmp in 2001 was the same as for 2000.

Table 2.1
CADAVERIC SOLID ORGAN DONORS, 1 JANUARY- 31 DECEMBER 2001

Donor type	Country of donation					TOTAL
	England	Wales	Scotland	Northern Ireland	Other European countries	
Kidney only heartbeating	54	5	5	4	1	69
Kidney only non-heartbeating	35	0	0	0	0	35
Kidney & thoracic	11	0	0	0	0	11
Kidney & liver	287 ¹	25	34	19	0	365
Kidney, thoracic & liver	164	9	15	9	0	197
Thoracic only	1	0	0	1	4	6
Thoracic & liver	5	0	0	0	4	9
Liver only	27 ²	1	1	0	0	29
Liver & pancreas	1	0	0	0	0	1
Kidney, liver & pancreas	18	0	5	0	0	23
Kidney, thoracic, liver & pancreas	36	0	5	0	0	41
TOTAL 2001	639	40	65	33	9	786
TOTAL 2000	653	41	62	21	9	786
% change for 2001	-2%	-2%	+5%	+57%	-	-

¹ Includes 4 non-heartbeating donors
² Includes 3 non-heartbeating donors

Table 2.2
CADAVERIC ORGANS RETRIEVED FOR TRANSPLANT, 1 JANUARY- 31 DECEMBER 2001

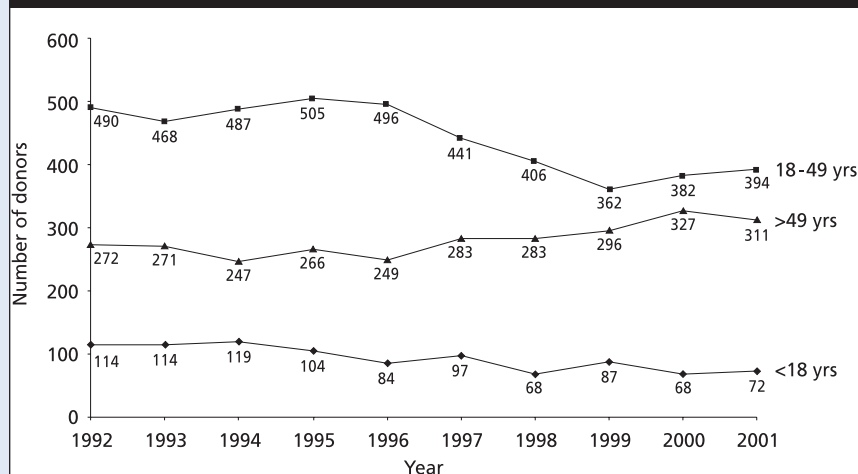
Organ type	Country of donation					TOTAL
	England	Wales	Scotland	Northern Ireland	Other European countries	
Kidney	1201 ¹	76	125	63	1	1466
Heart	172	8	12	8	3	203
Lungs	204	6	23	10	2	245
Liver	538 ²	35	60	28	4	665
Pancreas	55	0	10	0	0	65
TOTAL	2170	125	230	109	10	2644

¹ Includes 77 non-heartbeating kidneys
² Includes 7 non-heartbeating livers

Table 2.3
CADAVERIC SOLID ORGAN DONOR RATES PER MILLION POPULATION (PMP), 1 JANUARY 1999- 31 DECEMBER 2001, BY COUNTRY OF DONATION

Country of donation	Number of donors (pmp)					
	1999		2000		2001	
England	617	(12.5)	653	(13.2)	639	(12.9)
Wales	33	(11.3)	41	(14.0)	40	(13.7)
Scotland	75	(14.7)	62	(12.1)	65	(12.7)
Northern Ireland	20	(12.0)	21	(12.7)	33	(19.9)
TOTAL	745	(12.6)	777	(13.4)	777	(13.4)

Figure 2.1
AGE OF CADAVERIC SOLID ORGAN DONORS IN THE UK, 1992-2001



The age distribution of donors has changed significantly over the last ten years. **Figure 2.1** shows the number of donors per year (1992-2001) in three age groups. In 1992, 56% of donors were aged between 18 and 49 years compared with 51% in 2001. The proportion of paediatric donors has also dropped from 13% in 1992 to 9% in 2001. The mean donor age has increased from 39 years (standard deviation (s.d.) 17.3) in 1992 to 43 years (s.d. 16.7) in 2001 ($p < 0.0001$). The number of donors aged five and under has fallen by nine from 22 in 1992 to 13 in 2001. Of donors in 1992, 5% were aged 65 and over compared with 8% of donors in 2001. Donors aged 50 years and older represent an increasing proportion of the donor pool: 31% in 1992 compared with 40% in 2001.

Figure 2.2
CAUSE OF DEATH OF CADAVERIC SOLID ORGAN DONORS IN THE UK, 1999-2001

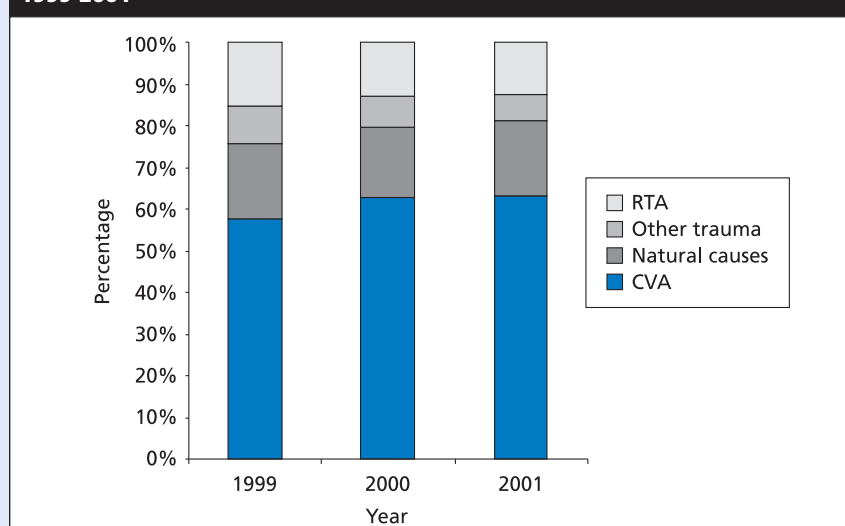


Figure 2.2 shows that there has been little change in donor cause of death over the last three years. The proportion of donors dying after cerebral vascular accident (CVA) has remained the same in 2001 as 2000 at 63%, which is slightly higher than in 1999. The proportion resulting from road traffic accidents (RTA) dropped from 13% in 2000 to 12% in 2001.

Figure 2.3 shows no significant variation in the blood group distribution of donors over the last three years from that of the national population generally.

The ethnic origin of cadaveric solid organ donors in 2000 and 2001 are shown in **Figure 2.4**. In 2001, 97.5% of donors were reported as white. The proportion of Asian donors dropped from 1.5% in 2000 to 0.9% in 2001; however, the proportion of black donors rose from 0.4% to 0.8%. Overall, the proportion of ethnic minority donors rose from 2.1% to 2.5%. The ethnic origin of donors has been routinely reported since 1 January 2000.

Living solid organ donors

Table 2.4 shows the number of organs donated for transplant from living donors in 2001, by country of donation. Wales, Scotland and Northern Ireland were limited to living donor kidney transplants, whereas in England, domino heart, lung lobe, domino liver and liver lobe transplants were also performed.

The number of kidneys donated in England from living donors increased by 7% from 286 in 2000 to 307 in 2001. In Scotland, Wales and Northern Ireland the number of kidney donations dropped by six, one and two, respectively, from 2000 to 2001. Domino heart donations also dropped by two. There was one domino liver donation and eight liver lobe donations in 2001, a reduction of four organs. In 2001, two living lung donors contributed to a single living lung transplant, the same picture as in 2000.

Figure 2.3
CADAVERIC SOLID ORGAN DONORS IN THE UK, 1999-2001 AND NATIONAL POPULATION, BY BLOOD GROUP

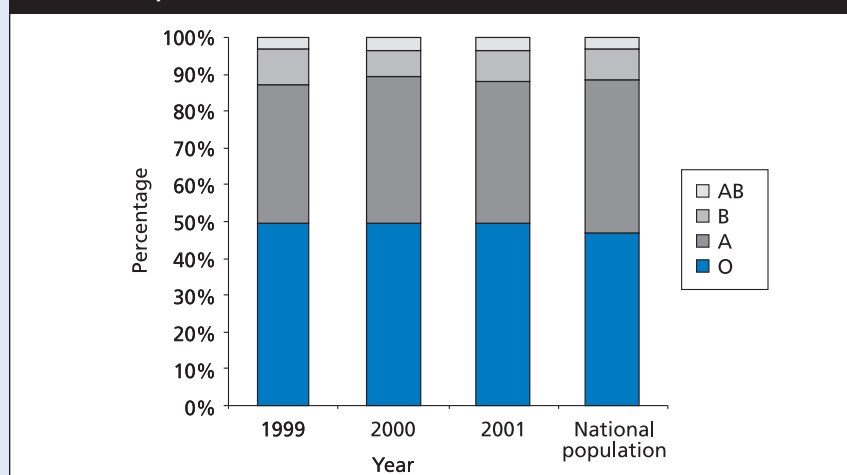


Figure 2.4
CADAVERIC SOLID ORGAN DONORS, 1 JANUARY 2000 - 31 DECEMBER 2001, BY ETHNIC ORIGIN

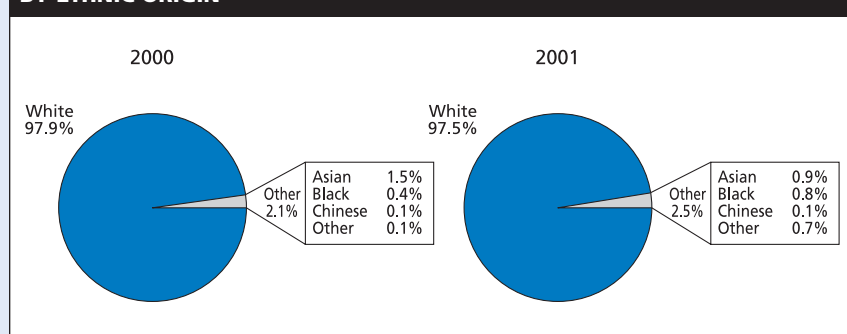
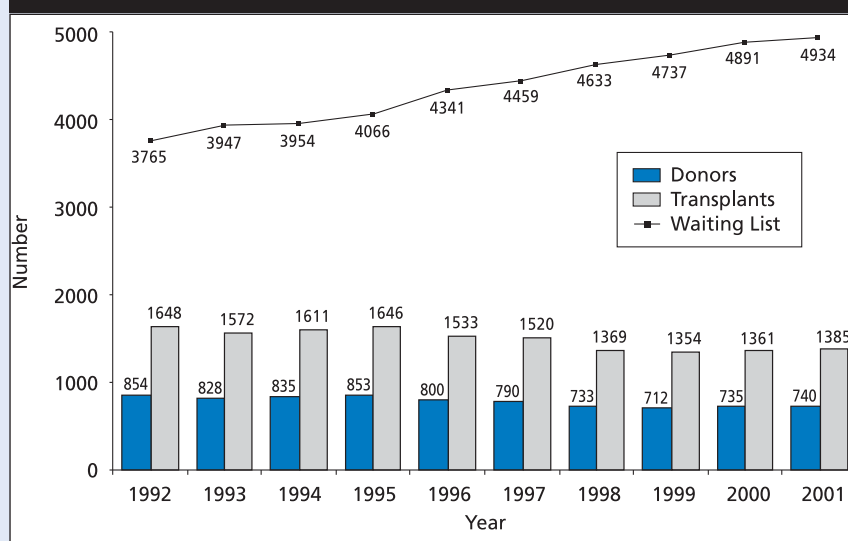


Table 2.4
ORGANS DONATED FOR TRANSPLANT FROM LIVING DONORS, 1 JANUARY - 31 DECEMBER 2001

Organ	Country of donation				TOTAL
	England	Wales	Scotland	Northern Ireland	
Kidney	307	13	35	4	359
Heart	11	0	0	0	11
Lung(s)	2 ¹	0	0	0	2
Liver	9	0	0	0	9
TOTAL	329	13	35	4	381

¹ Used in 1 transplant

Figure 3.1
CADAVERIC KIDNEY PROGRAMME IN THE UK, 1992-2001
NUMBER OF DONORS, TRANSPLANTS AND PATIENTS ON THE ACTIVE
WAITING LIST AT 31 DECEMBER



3

Kidney and Pancreas Activity

Overview

A summary of activity for cadaveric heartbeating and non-heartbeating kidney donor transplants and the transplant waiting list from 1992-2001 is shown in **Figure 3.1**. The total number of cadaveric kidney donors increased in 2001 to 740 from 735 in 2000 and the number of transplants rose to 1,385 from 1,361 in 2000. The number of non-heartbeating kidney donors remained at 39, although the number of transplants increased to 56 in 2001 from 48 in 2000, indicating more efficient use of kidneys from these donors.

The number of patients registered on the active waiting list for a kidney or kidney and pancreas transplant increased by 31% over the nine years between 1992 and 2001.

Living donor kidney transplants increased by 4% to 358 in 2001, representing 21% of the total kidney transplant programme. **Table 3.1** and **Figure 3.2** show the number of cadaveric and living donor kidney transplants carried out in 2001 at each centre/alliance. Seven centres/alliances performed non-heartbeating kidney transplants. The heartbeating transplants include four kidney and heart, seven kidney and liver, 41 kidney and pancreas and seven en bloc kidney transplants. In addition, six pancreas only transplants were carried out: three at Liverpool, two in North Thames and one at Edinburgh. Centres performing more than four kidney and pancreas transplants in the year were North Thames (7), South Thames (11), Manchester (8) and Edinburgh (5).

The number of patients registered on the active kidney or kidney and pancreas waiting list at 31 December 2001 are also given in **Table 3.1**. The number of patients waiting for a kidney transplant represents 83.4 patients per million population.

Many kidney transplant centres have joined other neighbouring centres to form an alliance to maintain a combined waiting list for the allocation of locally retained donor kidneys. At 31 December 2001, 84% of the waiting list comprised patients at an alliance centre; 88% of cadaveric heartbeating, 77% of cadaveric non-heartbeating and 83% of living donor kidney transplants were carried out by centres in an alliance. In 2001, Newcastle joined Leeds, Liverpool and Manchester to form the North of England Alliance; Plymouth joined the South, West and Wales Alliance in April 2001 and Portsmouth asked to be

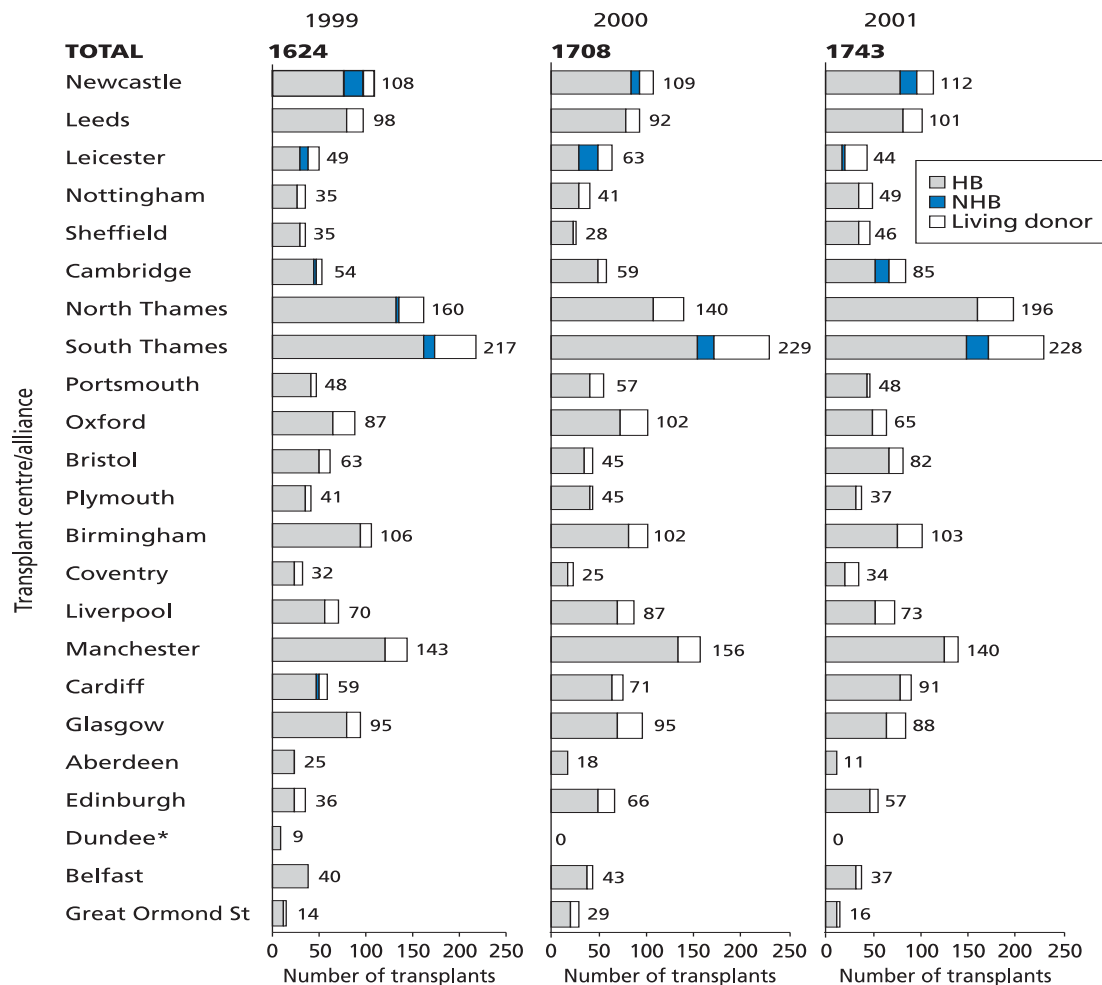
TABLE 3.1
KIDNEY DONORS AND TRANSPLANTS, 1 JANUARY- 31 DECEMBER 2001 AND
WAITING LIST PATIENTS AT 31 DECEMBER 2001, BY CENTRE/ALLIANCE

Centre/alliance	Cadaveric kidney donors		Cadaveric transplants		Living donor transplants (% of total)	Active waiting list
	HB	NHB	HB	NHB		
North Thames	85	0	160	1	35 (18)	787
South Thames	81	12	149	21	58 (25)	290
Leeds	32	0	83	0	18 (18)	341
Liverpool	34	0	54	0	19 (26)	217
Manchester	49	0	126	0	14 (10)	404
Newcastle	51	17	80	16	16 (14)	146
North of England	166	17	343	16	67 (16)	1108
Aberdeen	11	0	11	0	0 (0)	61
Belfast	32	0	33	0	4 (11)	175
Edinburgh	27	0	46	0	11 (19)	150
Glasgow	26	0	63	1	24 (27)	244
Scotland/N Ireland	96	0	153	1	39 (20)	630
Leicester	11	2	19	3	22 (50)	155
Nottingham	13	0	36	0	13 (27)	161
Sheffield	22	0	35	0	11 (24)	224
Trent	46	2	90	3	46 (33)	540
Bristol	23	0	67	1	14 (17)	204
Cardiff	31	0	78	0	13 (14)	192
Oxford	30	0	50	0	15 (23)	185
Plymouth	26	0	33	0	4 (11)	108
Portsmouth	31	0	43	0	5 (10)	102
South, West & Wales	141	0	271	1	51 (16)	791
Cambridge	25	8	53	13	19 (22)	200
Birmingham	47	0	76	0	27 (26)	480
Coventry	14	0	22	0	12 (35)	91
Great Ormond St	0	0	12	0	4 (25)	17
TOTAL	701	39	1329	56	358 (21)	4934

Note: HB = heartbeating, NHB = non-heartbeating

Figure 3.2

CADAVERIC AND LIVING DONOR KIDNEY TRANSPLANTS PERFORMED IN THE UK, 1 JANUARY 1999 - 31 DECEMBER 2001, BY TRANSPLANT CENTRE/ALLIANCE



suspended from this alliance with effect from July 2001. There are four other alliances:

North Thames
South Thames
Scotland and Northern Ireland
Trent

At the end of 2001, three adult transplant centres remained independent of any alliance: Cambridge, Birmingham and Coventry. Each alliance has its own allocation scheme run centrally through UK Transplant for kidneys not allocated through the national scheme. Three of the six alliances use allocation systems based on the national scheme.

Donor and organ supply

Of the 735 cadaveric heartbeating solid organ donors in the UK in 2001, 701 (95%) donated kidney(s). From these donors, 1,388 kidneys were retrieved, 1,331 (96%) of which were transplanted. [Table 3.2](#) shows this activity by retrieval centre/alliance.

The overall heartbeating solid organ donor rate per million population (pmp) is 12.4, with retrieval centre/alliance variation ranging from 5.6 to 19.9. The kidney retrieval rate pmp for the UK is 23.5 and varies from 10.3 to 38.0 pmp. Organ usage rates of at least 95% were observed in 13 (62%) centres.

[Table 3.3](#) shows the same information for non-heartbeating solid organ donors. The non-heartbeating programme at Leicester was temporarily suspended during the year.

Appendix II shows the number of donors and organs retrieved by designated kidney retrieval area for heartbeating and non-heartbeating donors and population figures used throughout this report are shown in *Appendix IIIA*.

Centres within a kidney transplant alliance have a combined waiting list but, with the exception of those in the North and South Thames alliances, have separate retrieval arrangements. Most centres are therefore identified separately throughout this report. Kidney exchange activity by kidney retrieval centre/alliance for donors in 2001 is shown in *Appendix IV*.

Table 3.2
KIDNEY DONATION AND RETRIEVAL RATES FOR HEARTBEATING DONORS, 1 JANUARY - 31 DECEMBER 2001, BY RETRIEVAL CENTRE/ALLIANCE

Retrieval centre/alliance	Total solid organ donors (pmp)		Kidneys retrieved (pmp)		Kidneys used (%)	
Newcastle	55	(18.7)	101	(34.4)	97	(96)
Leeds	37	(9.8)	63	(16.8)	61	(97)
Leicester	12	(5.6)	22	(10.3)	22	(100)
Nottingham	13	(9.4)	26	(18.7)	26	(100)
Sheffield	22	(11.7)	44	(23.4)	41	(93)
Cambridge	25	(10.5)	50	(20.9)	48	(96)
North Thames	91 ¹	(12.7)	169	(23.5)	167	(99)
South Thames	84	(12.5)	161	(23.9)	149	(93)
Portsmouth	32	(14.0)	62	(27.1)	62	(100)
Oxford	31	(10.4)	60	(20.1)	57	(95)
Bristol	23	(11.7)	46	(23.5)	44	(96)
Plymouth	26	(14.6)	52	(29.2)	48	(92)
Birmingham	48	(10.6)	93	(20.6)	85	(91)
Coventry	14	(17.5)	28	(35.0)	26	(93)
Liverpool	37	(11.2)	67	(20.3)	62	(93)
Manchester	55	(13.6)	96	(23.7)	95	(99)
Cardiff	32	(14.1)	60	(26.4)	59	(98)
Glasgow	26	(9.6)	51	(18.8)	51	(100)
Aberdeen	12	(15.4)	22	(28.2)	20	(91)
Edinburgh	27	(16.9)	52	(32.5)	48	(92)
Belfast	33	(19.9)	63	(38.0)	63	(100)
TOTAL	735	(12.4)	1388	(23.5)	1331	(96)

¹ Includes 1 solid organ donor from Great Ormond Street

Table 3.3
KIDNEY DONATION AND RETRIEVAL RATES FOR NON-HEARTBEATING DONORS, 1 JANUARY - 31 DECEMBER 2001, BY RETRIEVAL CENTRE/ALLIANCE

Retrieval centre/alliance	Non-heartbeating kidney donors (pmp)		Kidneys retrieved (pmp)		Kidneys used (%)	
Newcastle	17	(5.8)	34	(11.6)	16	(47)
Leicester	2	(0.9)	4	(1.9)	3	(75)
Cambridge	8	(3.3)	15	(6.3)	14	(93)
South Thames	12	(1.8)	24	(3.6)	23	(96)
TOTAL	39	(0.7)	77	(1.3)	56	(73)

Table 3.4
KIDNEY ONLY HEARTBEATING DONORS, 1 JANUARY 2000 - 31 DECEMBER
2001, BY RETRIEVAL CENTRE/ALLIANCE

Retrieval centre/alliance	Total solid organ donors		Kidney only donors	
	2000 ¹	2001 ²	2000	2001
Newcastle	62	55	8	5
Leeds	40	37	4	2
Leicester	12	12	0	0
Nottingham	21	13	1	1
Sheffield	21	22	1	0
Cambridge	21	25	0	0
North Thames	63	91 ³	2	14
South Thames	98	84	4	5
Portsmouth	31	32	3	2
Oxford	43	31	2	2
Bristol	13	23	2	1
Plymouth	26	26	2	0
Birmingham	39	48	5	2
Coventry	20	14	3	5
Liverpool	48	37	5	9
Manchester	72	55	3	7
Cardiff	25	32	2	4
Glasgow	25	26	4	1
Aberdeen	10	12	1	2
Edinburgh	26	27	1	2
Belfast	21	33	3	4
TOTAL	737	735	56	68

¹ 41 cases assigned to the centre that normally retrieves kidneys when no kidney was donated

² 34 cases assigned to the centre that normally retrieves kidneys when no kidney was donated

³ Includes 1 donor retrieved by Great Ormond St

The number of kidney only heartbeating donors and the number of those for whom other solid organs were not offered for transplant in 2000 and 2001, for each kidney retrieval centre, are shown in [Table 3.4](#). The proportion of kidney only donors rose to 9% in 2001 from 8% in 2000.

Waiting list

The number of patients registered on the kidney or kidney and pancreas waiting list increased by 1% in the year: on 31 December 2001, 4,934 patients were registered active, compared with 4,891 at the end of 2000. The number of patients waiting for a kidney transplant represents 83.4 patients pmp.

Of the 4,934 waiting list patients at the end of 2001, 88 also required a pancreas (69 in 2000). Additionally, eight patients were registered for a pancreas only transplant (17 in 2000). At the end of 2001, 86 paediatric (aged <18 years) patients were registered, representing 2% of the waiting list. Of patients on the waiting list, 26% were registered for a retransplant at 31 December 2001 (27% in 2000).

Figure 3.3 shows the number of patients on the waiting list at individual centres for 2000 and 2001. The changes from 2000 to 2001 varied across centres from -23% to +30%.

The blood group of waiting list patients compared with heartbeating kidney donors is shown in Figure 3.4. A greater proportion of patients awaiting a transplant are blood group B compared with kidney donors: 17% compared with 8%, respectively. The blood group distribution of kidney donors is similar to that of the general population for North West Europe (O: 47%, A: 41.5%, B: 8.5%, AB: 3%).

Figure 3.3
UK ACTIVE KIDNEY WAITING LIST BY CENTRE/ALLIANCE AT 31 DECEMBER 2000 AND 2001

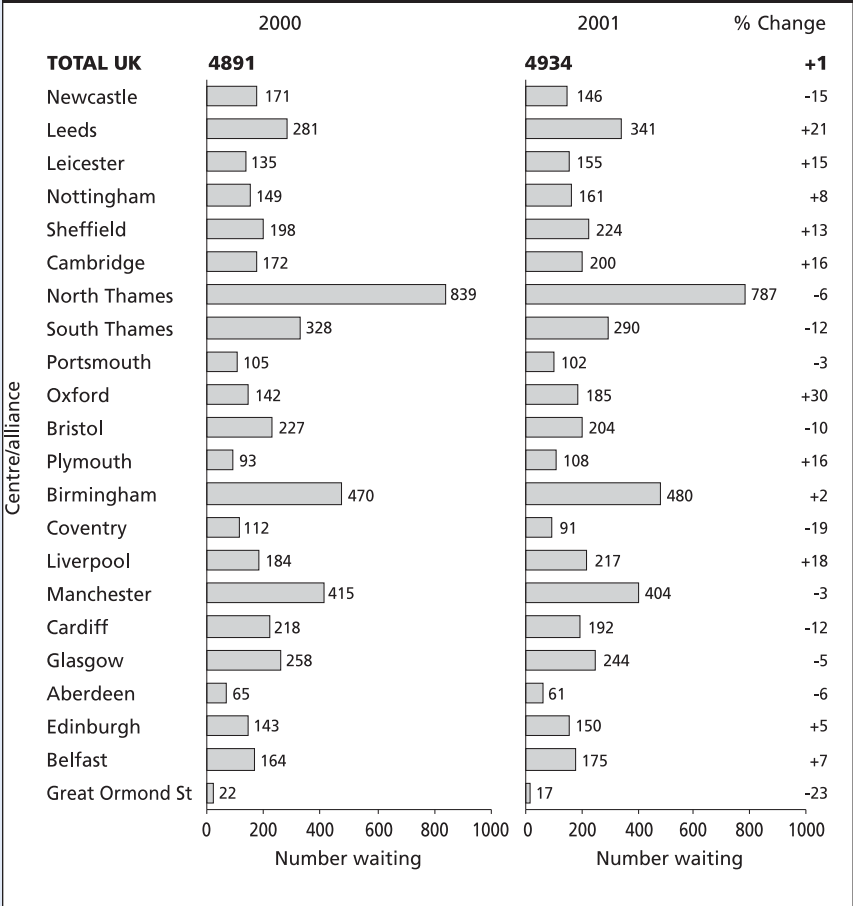


Figure 3.4
CADAVERIC HEARTBEATING KIDNEY DONORS IN 2001 AND ACTIVE KIDNEY WAITING LIST IN THE UK AT 31 DECEMBER 2001, BY BLOOD GROUP

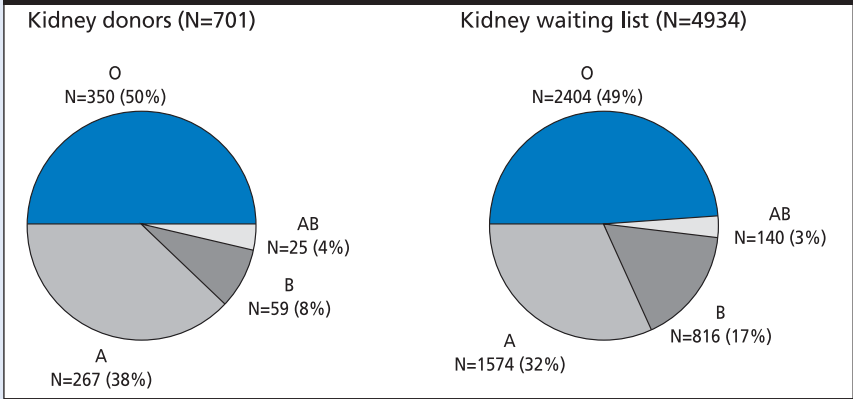


Table 3.5
KIDNEY WAITING LIST AND NEW REGISTRATIONS,
1 JANUARY - 31 DECEMBER 2001

Outcome of waiting patient at 31 December 2001	Active and suspended patients at 1 January 2001		New active registrations in 2001 ¹		TOTAL	
	N	%	N	%	N	%
TOTAL	6052		2371		8423	
Remained active/suspended	4320	71	1921	81	6241	74
Transplanted	1236	21	396	17	1632	19
Removed	293	5	27	1	320	4
Died	203	3	27	1	230	3

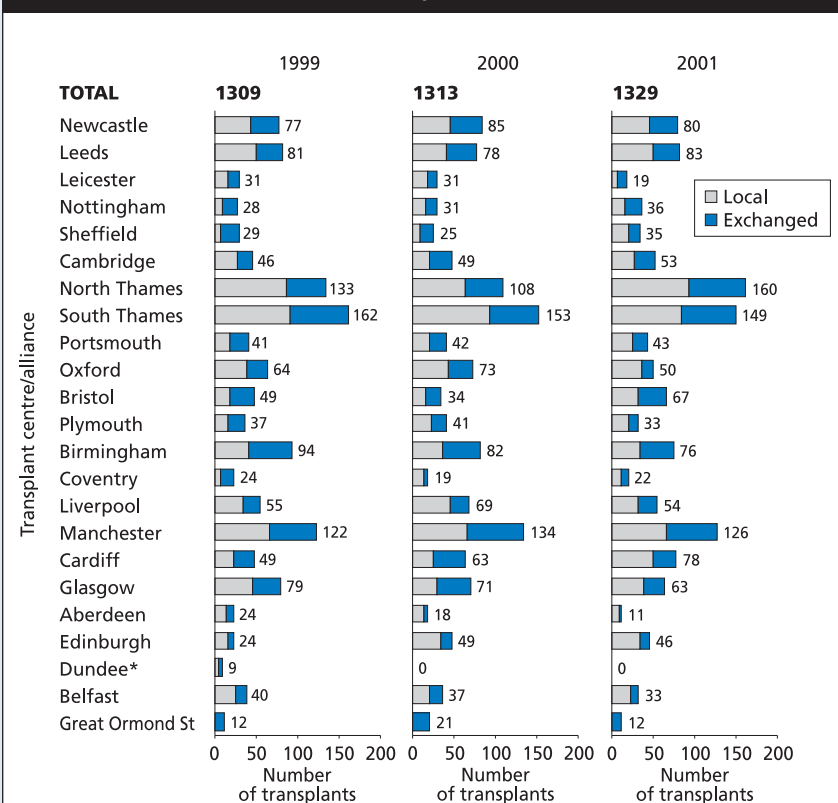
¹ Includes re-registrations for second or subsequent transplants

The outcome of patients registered on the UK kidney waiting list at the beginning of 2001 or during the year is shown in [Table 3.5](#). Overall, 21% of patients on the waiting list received a transplant during 2001.

Transplant activity

There were 1,329 cadaveric heartbeating kidney transplants in the UK in 2001, 1% more than in 2000. **Figure 3.5** shows transplant activity by transplant centre/alliance for the years 1999 to 2001. Kidneys transplanted by the retrieving centre or by a centre within the same alliance at that time are classified as "local". Overall, 58% of transplants were performed locally.

Figure 3.5
CADAVERIC HEARTBEATING KIDNEY TRANSPLANTS PERFORMED IN THE UK,
1 JANUARY 1999 - 31 DECEMBER 2001, BY TRANSPLANT CENTRE/ALLIANCE



* Dundee closed as a transplant centre in November 1999

Figure 3.6 shows the age distribution of transplant recipients compared with patients on the active kidney waiting list. The waiting list population is generally older than the transplant population: 44% of patients waiting were aged 50 or more compared with 38% of transplant recipients (39% in 2000). Paediatric patients represented 2% of the waiting list and 8% of the transplants (7% in 2000).

Donor and recipient age groups for cadaveric heartbeating kidney transplants in 2001 are shown in **Table 3.6**. 1,227 patients aged 18 or over received a transplant: 397 (32%) from a donor in the same age group, 445 (36%) from a donor in a younger age group and 385 (32%) from a donor in an older age group. 60% of 102 paediatric recipients (under 18 years) received a kidney from a paediatric donor compared with 57% in 2000.

In 2001, 11% of paediatric and 16% of adult transplant recipients had previously received a transplant, lower retransplant rates than in 2000: 14% and 18%, respectively.

Table 3.7 compares donor and recipient blood groups for cadaveric heartbeating kidney transplants. Donor and recipient were of identical blood group in 95% of cases. Of blood group O kidneys, 9% were used for non-O group recipients. Of the 70 blood group compatible transplants, 14 (20%) were for children and a further 16 (23%) were for highly sensitised patients.

Figure 3.6
AGE AT TRANSPLANT FOR 1329 CADAVERIC HEARTBEATING KIDNEY RECIPIENTS IN THE UK, 1 JANUARY-31 DECEMBER 2001, COMPARED WITH PATIENTS ON THE ACTIVE KIDNEY WAITING LIST

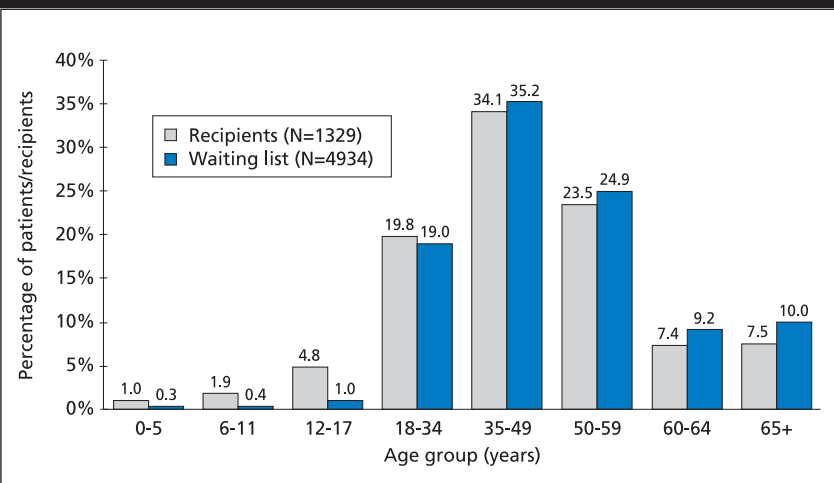


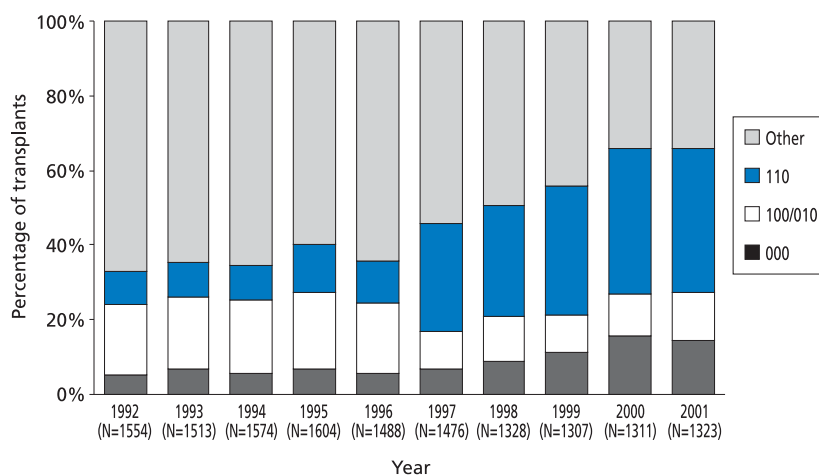
Table 3.6
DONOR AND RECIPIENT AGE AT TRANSPLANT IN 1329 CADAVERIC HEARTBEATING KIDNEY TRANSPLANTS PERFORMED, 1 JANUARY-31 DECEMBER 2001

Donor age (years)	Recipient age (years)								TOTAL
	0-5	6-11	12-17	18-34	35-49	50-59	60-64	65+	
0-5	0	0	3	4	3	2	1	0	13
6-11	2	3	8	9	3	5	0	0	30
12-17	10	10	25	9	12	4	2	3	75
18-34	1	7	12	88	106	45	15	20	294
35-49	0	5	16	81	163	88	20	31	404
50-59	0	0	0	54	116	120	34	19	343
60-64	0	0	0	9	24	26	9	10	78
65+	0	0	0	9	26	22	18	17	92
TOTAL	13	25	64	263	453	312	99	100	1329

Table 3.7
DONOR AND RECIPIENT BLOOD GROUP IN 1329 CADAVERIC HEARTBEATING KIDNEY TRANSPLANTS PERFORMED, 1 JANUARY-31 DECEMBER 2001

Donor blood group	Recipient blood group				TOTAL
	O	A	B	AB	
O	609	16	39	3	667
A	-	493	-	10	503
B	-	-	111	2	113
AB	-	-	-	46	46
TOTAL	609	509	150	61	1329

Figure 3.7
HLA MATCHING OF CADAVERIC HEARTBEATING KIDNEY TRANSPLANTS PERFORMED IN THE UK, 1 JANUARY 1992 - 31 DECEMBER 2001

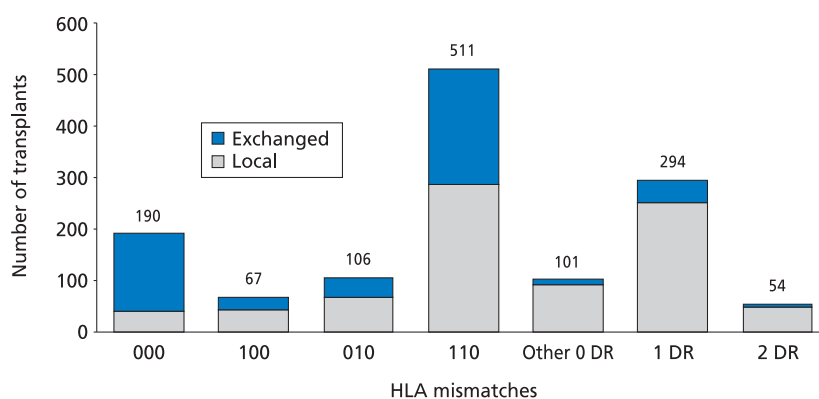


HLA matching

The recent improvement in HLA matching is clearly evident in **Figure 3.7**. The proportion of 000 mismatched grafts has increased from 5% in 1992 to 14% in 2001. In 2001, 13% of grafts were 100/010 mismatched compared with 11% in 2000. The proportion of non-favourably matched grafts remained at 34% in 2001.

The majority of 000 HLA-A, -B, -DR mismatched kidney grafts used organs from outside the local centre/alliance (70%) - **Figure 3.8**. For favourable matches (100, 010 and 110 HLA-A, -B, -DR), 51% of grafts used organs imported from outside the centre/alliance (57% in 2000). This lower level of exchange reflects the increased availability of local favourably matched donors within alliances, where the potential for identifying a favourably matched patient is much greater. Most non-favourably matched kidney transplants used locally retrieved organs, but 14% of such transplants used imported kidneys.

Figure 3.8
HLA MISMATCHES AT THE A, B AND DR LOCI IN 1323¹ CADAVERIC HEARTBEATING KIDNEY TRANSPLANTS PERFORMED IN THE UK, 1 JANUARY - 31 DECEMBER 2001



¹ Mismatches unknown for 6 kidney transplants performed

Table 3.8

HLA MISMATCHES IN ADULT (18 YEARS AND OVER) AND PAEDIATRIC CADAVERIC HEARTBEATING KIDNEY TRANSPLANTS PERFORMED, 1 JANUARY 2000 - 31 DECEMBER 2001

		HLA-A, -B, -DR mismatches						Other			Total non-favourable	TOTAL
Year		000	100	010	110	Total favourable (100 + 010 + 110)		0 DR	1 DR	2 DR		
Adults	2000	N	193	50	84	478	612	99	268	44	411	1216¹
		%	16	4	7	39	50	8	22	4	34	
	2001	N	181	57	100	475	632	98	259	51	408	1221²
		%	15	5	8	39	52	8	21	4	33	
Paediatrics	2000	N	9	5	9	34	48	7	29	2	38	95
		%	9	5	9	36	51	7	31	2	40	
	2001	N	9	10	6	36	52	3	35	3	41	102
		%	9	10	6	35	51	3	34	3	40	

¹ HLA-A, -B, -DR type not reported for 2 kidney & liver transplant recipients

² HLA-A, -B, -DR type not reported for 4 kidney & liver transplant recipients and 2 kidney & heart transplant recipients

Table 3.8 shows HLA matching levels for adult and paediatric cadaveric heartbeating kidney transplants separately.

The proportion of adult transplants in each HLA-A, -B, -DR mismatch category in 2001 was similar to that in 2000. The proportion of 000 mismatched grafts for children remained at 9%, while the proportion of 100 mismatched grafts increased from 5% to 10%. However, the overall proportion of paediatric favourably matched grafts remained at 51%.

The significant improvements in HLA matching, for both adult and paediatric transplants, over recent years are primarily due to changes made to the National Kidney Allocation Scheme. Favourable matching was introduced in January 1997 and since July 1998 two kidneys from a donor are exported for 000 mismatched patients when no such patient is on the local waiting list. In July 2000 two changes were made to the allocation scheme. Firstly, children were given greater access to well-matched adult donor kidneys: favourably matched children anywhere in the country now receive priority over local favourably matched adults for the second kidney from an adult donor. Secondly, some priority was given to

Table 3.9

ETHNICITY OF CADAVERIC HEARTBEATING KIDNEY DONORS AND RECIPIENTS, 1 JANUARY - 31 DECEMBER 2001 AND WAITING LIST PATIENTS AT 31 DECEMBER 2001

Ethnic origin	Donors		Transplant recipients		Active waiting list patients	
	N	%	N	%	N	%
White	677	97.3	1118	86.4	3742	78.1
Asian	7	1.0	120	9.3	645	13.5
Black	6	0.9	37	2.9	318	6.6
Chinese	1	0.1	10	0.8	36	0.8
Other	5	0.7	9	0.7	52	1.1
Not reported	5	-	35	-	141	-
TOTAL	701		1329		4934	

Figure 3.9
ONE YEAR TRANSPLANT SURVIVAL AFTER FIRST CADAVERIC
HEARTBEATING KIDNEY ONLY TRANSPLANT IN THE UK,
1 JANUARY 1994 - 31 DECEMBER 1999

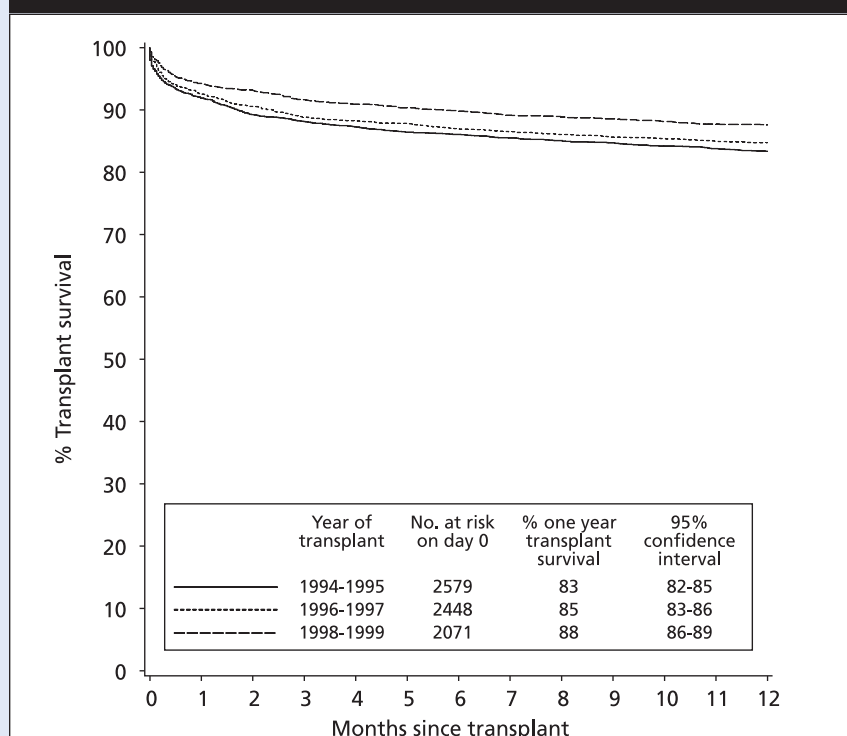


Table 3.10
TRANSPLANT SURVIVAL AFTER FIRST CADAVERIC KIDNEY ONLY
TRANSPLANT IN THE UK, 1 JANUARY 1994 - 31 DECEMBER 1999

Transplant survival time	Year of transplant	Number analysed	Transplant survival estimate (%)	95% CI	% follow-up
One year	1998-1999	2071	88	86-89	96
Three years	1996-1997	2448	78	76-79	94
Five years	1994-1995	2579	69	67-71	93

HLA-DR homozygous patients when the donor was similarly homozygous. This second change was made to redress the imbalance in waiting times and HLA matching for HLA-DR homozygous and heterozygous patients. Both changes have resulted in significant improvements in HLA matching for the respective groups.

Table 3.9 shows the ethnic origin of cadaveric heartbeating kidney donors, transplant recipients and waiting list patients. Only 1% of donors were Asian compared with 13.5% of the waiting list patients.

Transplant survival

One year Kaplan-Meier transplant survival is illustrated in **Figure 3.9** for first cadaveric heartbeating kidney only transplants in the UK for 1994-1995, 1996-1997 and 1998-1999. A statistically significant improvement in outcome can be seen (Log-rank test, $p=0.0002$). Follow-up information was available for at least 96% in each cohort.

For transplant survival analysis, the outcome event is the earlier of a return to chronic renal dialysis or death of the recipient. This differs from graft survival, for which death with a functioning graft is treated not as an outcome event but as a censored graft survival time.

Transplant survival estimates at one year, three years and five years, for the three different cohorts are given in **Table 3.10**. The proportion of transplants still functioning are 88%, 78% and 69%, respectively. Follow-up rates indicate the proportion of transplants for which outcome was known at the relative time post-transplant.

Non-heartbeating donor transplants

Non-heartbeating donor kidney transplants increased by 17% to 56 in 2001. **Figure 3.10** shows the donor and recipient age groups. 27% of recipients were aged 60 and over compared with 11% of donors. There were no paediatric recipients of non-heartbeating kidneys. 29% of recipients received an organ from a donor in the same age category, 29% received an organ from a younger donor and 42% from an older donor. In 50 (89%) cases the donor and recipient had identical blood groups.

The majority of non-heartbeating donor kidneys were used for non-favourably matched grafts (82%) as shown in **Figure 3.11**. Only three grafts used organs from outside the local centre/alliance.

Figure 3.10
AGE AT TRANSPLANT FOR 56 CADAVERIC NON-HEARTBEATING KIDNEY RECIPIENTS IN THE UK, 1 JANUARY-31 DECEMBER 2001, COMPARED WITH DONOR AGE

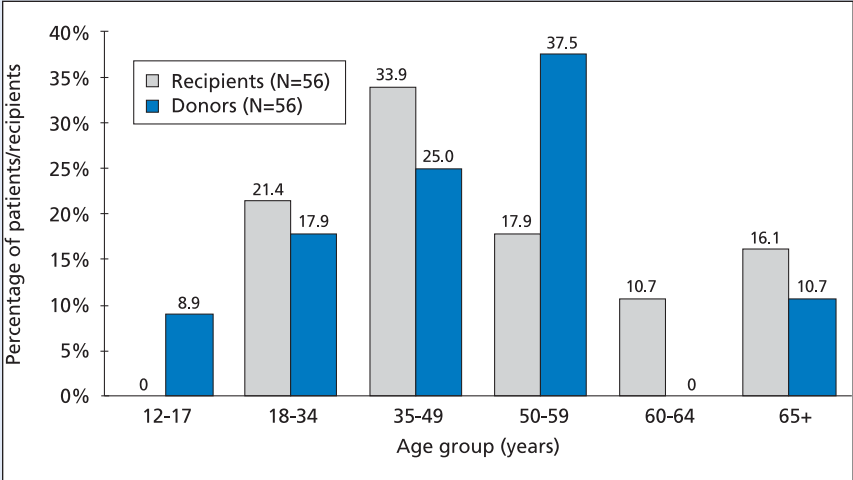


Figure 3.11
HLA MISMATCHES AT THE A, B AND DR LOCI IN 56 CADAVERIC NON-HEARTBEATING KIDNEY TRANSPLANTS PERFORMED IN THE UK, 1 JANUARY-31 DECEMBER 2001

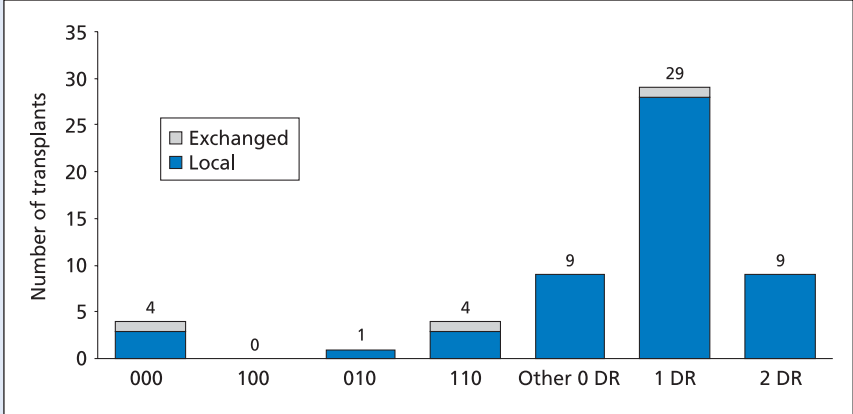
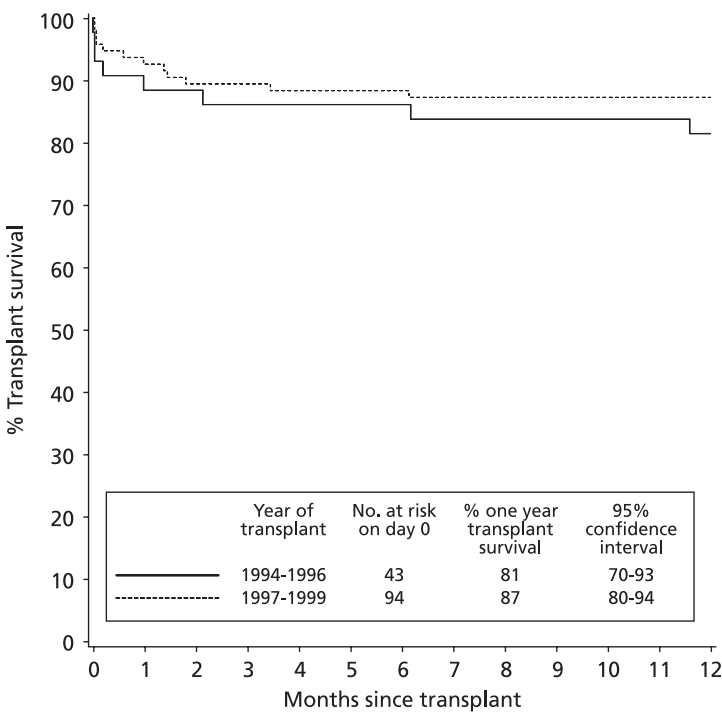
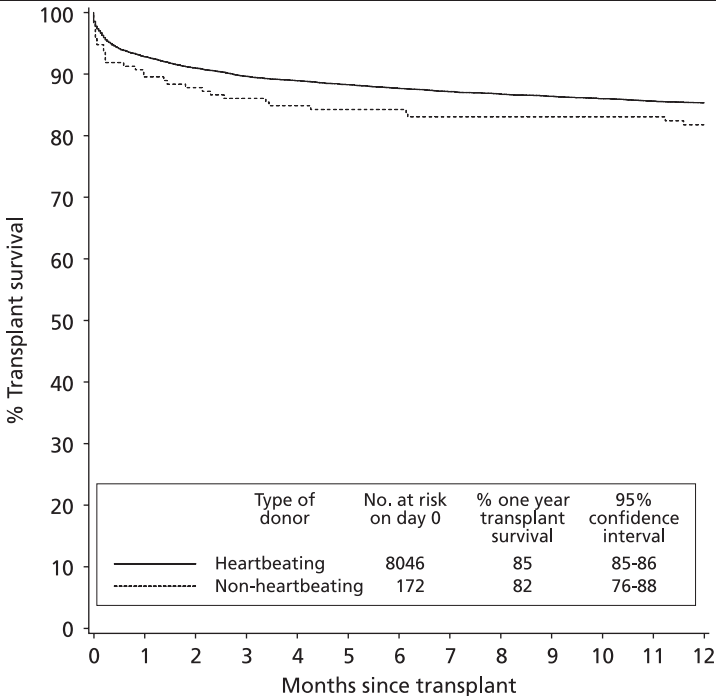


Figure 3.12
ONE YEAR TRANSPLANT SURVIVAL AFTER FIRST CADAVERIC
NON-HEARTBEATING KIDNEY ONLY TRANSPLANT IN THE UK,
1 JANUARY 1994 - 31 DECEMBER 1999



One year Kaplan-Meier transplant survival is shown in **Figure 3.12** for first cadaveric non-heartbeating kidney only transplants in the UK for 1994-1996 and 1997-1999. An improvement can be seen in outcome over the years, but this was not statistically significant (Log-rank test, $p=0.37$). Follow-up was available for 96% of the grafts in each year group. A comparison of transplant survival for cadaveric heartbeating and non-heartbeating transplants is illustrated in **Figure 3.13** (Log-rank test, $p=0.17$). In order to increase the number of non-heartbeating transplants, 2000 data were included in the analysis.

Figure 3.13
ONE YEAR TRANSPLANT SURVIVAL AFTER FIRST CADAVERIC KIDNEY ONLY
TRANSPLANT IN THE UK, 1 JANUARY 1994 - 31 DECEMBER 2000



Note: 2000 data were included in this analysis

Living donor transplants

The number of living donor kidney transplants increased by 29% between 1999 and 2000 and by 3% between 2000 and 2001. For 2000 and 2001, the number of related and unrelated transplants performed by each transplant centre/alliance is shown in [Table 3.11](#). There has been an increase of 36% in the number of living unrelated transplants.

One year Kaplan-Meier transplant survival is illustrated in [Figure 3.14](#) for living donor kidney transplants in the UK for 1990-1993, 1994-1996 and 1997-1999. A statistically significant improvement in one year outcome is shown (Log-rank test, $p=0.01$). Follow-up information was available for 93%, 95% and 95% of the living donor kidney transplants in the years 1990-1993, 1994-1996 and 1997-1999, respectively.

Table 3.11
LIVING DONOR KIDNEY TRANSPLANTS, 1 JANUARY 2000 - 31 DECEMBER 2001, BY TRANSPLANT CENTRE/ALLIANCE

Transplant centre/alliance	2000			2001		
	Related donor	Unrelated donor	TOTAL	Related donor	Unrelated donor	TOTAL
Newcastle	13	2	15	11	5	16
Leeds	12	2	14	13	5	18
Leicester	12	0	12	18	4	22
Nottingham	7	3	10	10	3	13
Sheffield	0	3	3	7	4	11
Cambridge	7	3	10	11	8	19
North Thames	29	3	32	27	8	35
South Thames	42	16	58	43	15	58
Portsmouth	11	4	15	2	3	5
Oxford	21	8	29	10	5	15
Bristol	10	1	11	7	7	14
Plymouth	1	3	4	3	1	4
Birmingham	12	8	20	19	8	27
Coventry	4	2	6	7	5	12
Liverpool	17	1	18	17	2	19
Manchester	21	0	21	14	0	14
Cardiff	13	1	14	12	1	13
Glasgow	19	5	24	18	6	24
Aberdeen	0	0	0	0	0	0
Edinburgh	12	5	17	6	5	11
Belfast	6	0	6	4	0	4
Great Ormond St	8	0	8	4	0	4
TOTAL	277	70	347	263	95	358

Figure 3.14
ONE YEAR TRANSPLANT SURVIVAL AFTER LIVING DONOR KIDNEY TRANSPLANT IN THE UK, 1 JANUARY 1990 - 31 DECEMBER 1999

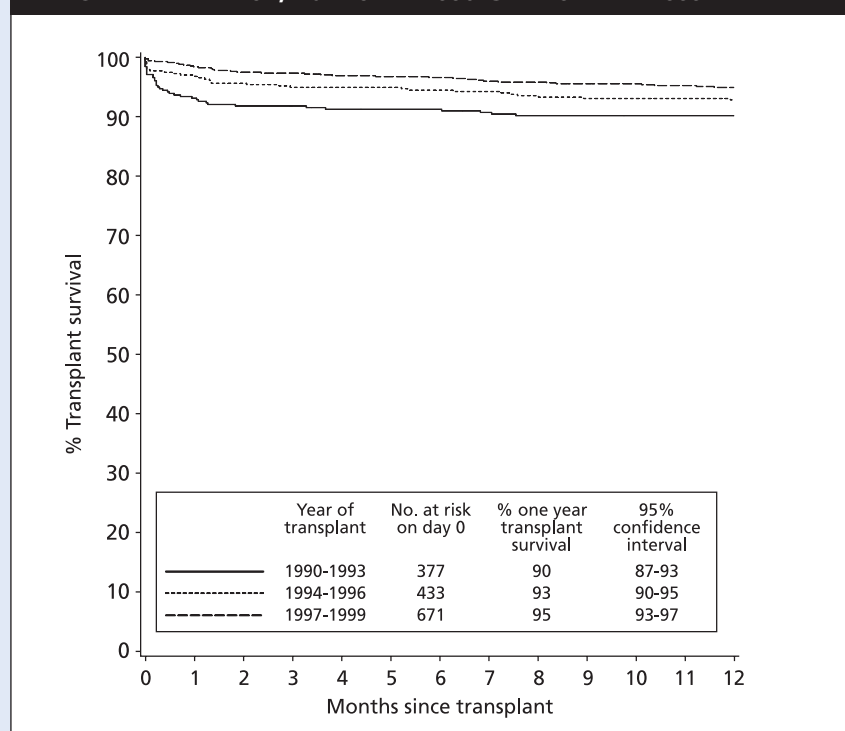


Figure 4.1
CADAVERIC HEART, HEART/LUNG AND LUNG PROGRAMME IN THE UK,
1992-2001. NUMBER OF DONORS, TRANSPLANTS AND PATIENTS ON THE
ACTIVE WAITING LIST AT 31 DECEMBER

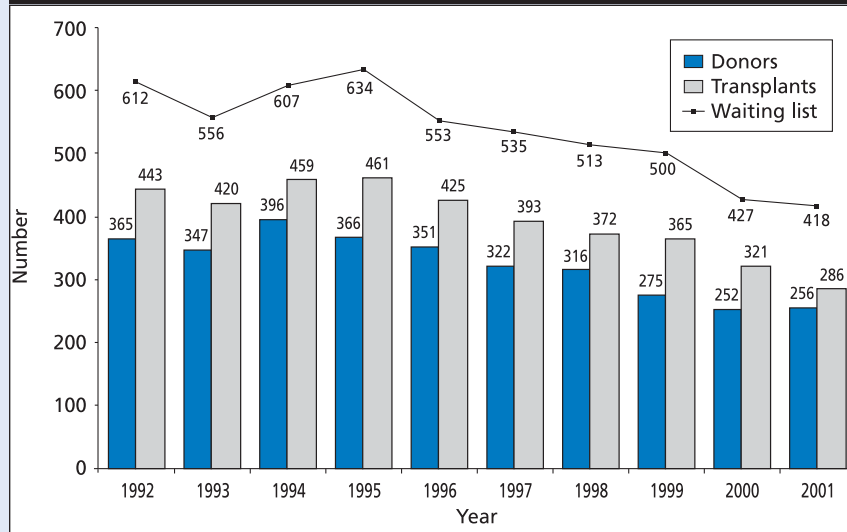


Table 4.1
CARDIOTHORACIC ORGAN DONORS, 1 JANUARY - 31 DECEMBER 2001,
BY RETRIEVAL CENTRE

Retrieval centre	Type of donor					Total Cardiothoracic Donors
	Cadaveric heart only	Domino heart	Heart & lung	Lung(s) only	Living lung	
Newcastle	20	0	14	12	0	46 ¹
Sheffield	14	0	7	5	0	26
Papworth	25	5	15	11	0	56
Harefield	36	5	25	14	2	82
Great Ormond St	3	1	0	0	0	4
Birmingham	16	0	3	3	0	22
Manchester	12	0	4	7	0	23
Glasgow ²	3	0	1	0	0	4
Other European countries	1	0	1	3	0	5
TOTAL	130	11	70	56³	2	269³

¹ Newcastle additionally retrieved from 9 cadaveric donors in the ROI: 1 heart only, 4 heart & lung and 4 lung only donors

² Glasgow recommenced retrieval in September 2001

³ Includes 1 donor retrieved by King's College

4

Cardiothoracic Activity

Overview

The UK cardiothoracic transplant activity, donor numbers and active waiting list are shown in **Figure 4.1**. Transplant levels decreased by 11% and donor levels increased by 2% compared with 2000. The active cardiothoracic waiting list at 31 December 2001 was slightly lower than in 2000 and continues a decline that began in 1995.

Newcastle continued to cover Glasgow's retrievals, transplants and waiting list until 3 September 2001, when Glasgow recommenced retrieval and heart transplantation. Papworth and Harefield also continued to share responsibility for St George's retrievals and transplants.

Cardiothoracic organ donors by retrieval centre (as opposed to geographical zone) are detailed in **Table 4.1**. 52% of donors donated only the heart, 26% heart and lungs and 22% lungs only.

Table 4.2**CARDIOTHORACIC TRANSPLANTS, 1 JANUARY - 31 DECEMBER 2001 AND WAITING LIST PATIENTS AT 31 DECEMBER 2001, BY CENTRE**

Centre	Transplants					Total Transplants	Active and suspended waiting lists			Total Waiting List
	Cadaveric heart	Domino heart	Heart/lung	Lung(s)	Living lung		Heart lung	Heart/lung	Lung	
Newcastle	31	1	2	24	0	58	42	8	113	163
Sheffield	6	0	0	7	0	13	5	0	6	11
Papworth	32 ¹	2	14 ³	27	0	75	11	15	33	59
Harefield	29 ²	5	14	19	1	68	23	40	41	104
Great Ormond St	18	2	1	2	0	23	8	2	0	10
Birmingham	18	0	2	3	0	23	9	7	19	35
Manchester	22	0	0	10	0	32	6	2	31	39
Glasgow	5	0	0	0	0	5⁴	9	0	0	9
TOTAL	161	10	33	92	1	297	113	74	243	430

¹ Includes 3 heart & kidney transplants² Includes 1 heart & kidney and 1 heart & liver transplant³ Includes 1 heart/lung & liver transplant⁴ Glasgow recommenced transplanting hearts in September 2001

Table 4.2 shows transplant activity and active and suspended waiting list sizes for each centre. 297 transplants were carried out in 2001. 54% of cardiothoracic transplants were cadaveric heart only grafts.

At 31 December 2001, 430 patients were registered on the active or suspended waiting lists for a cardiothoracic organ transplant: 26% for a heart, 57% for a lung and the remaining 17% for a heart/lung.

Donor and organ supply

Table 4.3 shows the number of cadaveric heartbeating solid organ donors identified in each cardiothoracic zone, the number that donated cardiothoracic organs and the number of organs retrieved. The numbers in this table reflect the number of organs retrieved from within each zone (by any centre) rather than the number of retrievals made by that centre. Retrieved organs have been recorded as the actual number of solid organs retrieved. Non-heartbeating solid organ donors have been excluded as their cardiothoracic organs would not have been considered for transplantation.

Table 4.3**CADAVERIC CARDIOTHORACIC ORGAN DONATION AND RETRIEVAL RATES, 1 JANUARY - 31 DECEMBER 2001, BY DONATION ZONE**

Donation zone	Number of donors (pmp)		Number of organs retrieved (used)		Total retrieved (used)	Organs retrieved (pmp)
	Solid organ ¹	Cardiothoracic	Hearts	Lungs		
Newcastle	103 (13.7)	30 (4.0)	25 (25)	29 (28)	54 (53)	(7.2)
Sheffield	58 (13.6)	27 (6.3)	21 (19)	25 (15)	46 (34)	(10.8)
Papworth	96 (10.3)	36 (3.8)	31 (31)	34 (34)	65 (65)	(6.9)
Harefield	159 (12.8)	60 (4.8)	47 (45)	66 (58)	113 (103)	(9.1)
St George's	87 (12.7)	39 (5.7)	30 (30)	38 (35)	68 (65)	(10.0)
Birmingham	84 (11.8)	22 (3.1)	19 (18)	11 (8)	30 (26)	(4.2)
Manchester	83 (12.7)	22 (3.4)	15 (14)	17 (15)	32 (29)	(4.9)
Glasgow	65 (12.7)	20 (3.9)	12 (9)	23 (10)	35 (19)	(6.8)
TOTAL	735 (12.4)	256 (4.3)	200 (191)	243 (203)	443 (394)	(7.5)

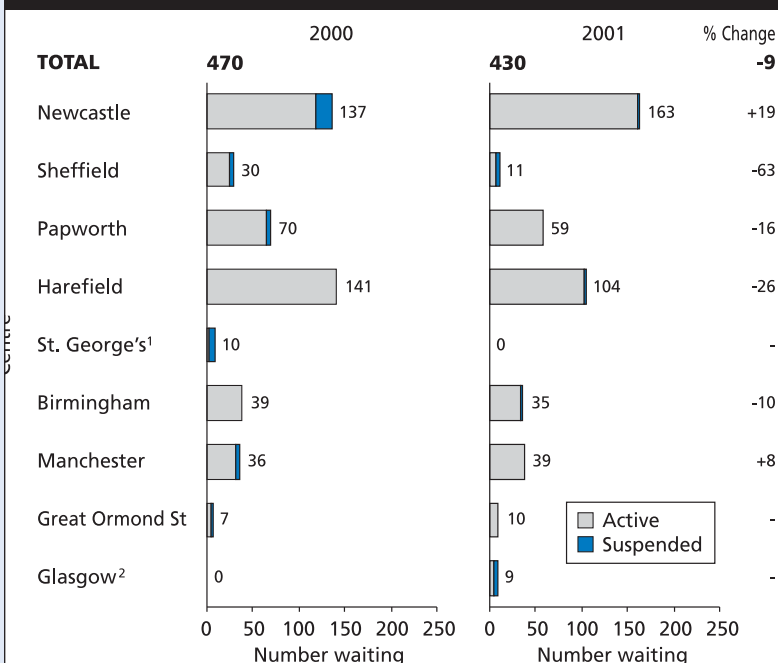
¹ Excludes 42 non-heartbeating donors

Table 4.4
ETHNICITY OF CARDIOTHORACIC DONORS AND RECIPIENTS,
1 JANUARY - 31 DECEMBER 2001 AND WAITING LIST PATIENTS AT
31 DECEMBER 2001

Ethnic origin	Donors		Transplant recipients		Active and suspended waiting list patients	
	N	%	N	%	N	%
White	245	95.3	271	92.5	402	93.7
Asian	4	1.6	10	3.4	21	4.9
Black	5	1.9	7	2.4	3	0.7
Chinese	0	0	1	0.3	0	0
Other	3	1.2	4	1.4	3	0.7
Not reported	12	-	4	-	1	-
TOTAL	269		297		430	

Of the 735 heartbeating donors, 35% donated cardiothoracic organs. The overall cardiothoracic organ donor rate remained 4.3 per million population (pmp) in 2001 and varied across the donation zones from 3.1 pmp to 6.3 pmp. The overall organ retrieval rate was 7.5 pmp (8.8 pmp in 2000). 84% of retrieved lungs and 96% of retrieved hearts were used in transplants.

Figure 4.2
ACTIVE AND SUSPENDED CARDIOTHORACIC WAITING LIST BY CENTRE IN
THE UK AT 31 DECEMBER 2000 AND 2001



¹ St George's patients assessed after October 2000 were transferred to either Papworth or Harefield

² Glasgow patients registered at Newcastle between May 2000 and September 2001

- % not reported when fewer than 10 patients in either year

The ethnic origin of cardiothoracic donors, transplant recipients and waiting list patients is shown in [Table 4.4](#). While 1.6% of donors in 2001 were Asian, 4.9% of the waiting list patients at 31 December 2001 were Asian.

Waiting list

The total waiting list for the UK fell by 9% to 430. This fall is partially attributable to an improvement in reporting arrangements. **Figure 4.2** shows the number of patients waiting at each centre at 31 December 2000 and 2001. Changes in waiting lists between 2000 and 2001 varied at each centre from -63% to +19%. Only 3% of the waiting list were temporarily suspended at the end of 2001 compared with 9% for 2000.

The blood group distribution of patients awaiting a cardiothoracic transplant at the end of 2001 is similar to that of cardiothoracic donors during the year - **Figure 4.3**. The proportion of patients of blood group B are over-represented on the heart and heart/lung waiting lists compared with cardiothoracic donors during the year.

Table 4.5 shows the outcome of patients registered on each cardiothoracic waiting list during the year. Of the 903 patients on the waiting list for a cardiothoracic organ in 2001, 48% were still waiting at the end of the year and 30% had received a transplant.

Figure 4.3
CARDIOTHORACIC DONORS IN 2001 AND ACTIVE AND SUSPENDED WAITING LISTS AT 31 DECEMBER IN THE UK, BY BLOOD GROUP

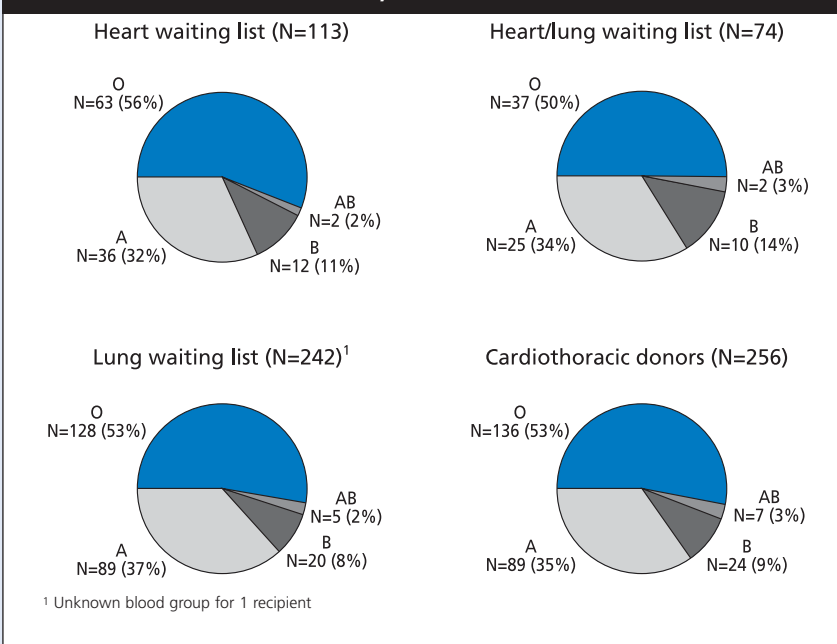


Table 4.5
CARDIOTHORACIC WAITING LISTS AND NEW REGISTRATIONS, 1 JANUARY - 31 DECEMBER 2001

Outcome of waiting patient at 31 December 2001	Active and suspended patients at 1 January 2001		New registrations in 2001 ¹		TOTAL	
	N	%	N	%	N	%
Heart waiting list						
TOTAL	158		198		356	
Remained active/suspended	51	32	68	34	119	33
Transplanted	41	26	107	54	148	42
Removed	54	34	9	5	63	18
Died	12	8	14	7	26	7
Lung waiting list						
TOTAL	206		173		379	
Remained active/suspended	118	57	128	74	246	65
Transplanted	50	24	29	17	79	21
Removed	16	8	3	2	19	5
Died	22	11	13	8	35	9
Heart/lung waiting list						
TOTAL	107		61		168	
Remained active/suspended	41	38	30	49	71	42
Transplanted ²	27	25	17	28	44	26
Removed	21	20	2	3	23	14
Died	8	17	12	20	30	18

¹ Includes re-registrations for second or subsequent transplants

² Heart, lung or heart/lung

Table 4.6
HEART, HEART/LUNG (H/L) AND LUNG TRANSPLANT ACTIVITY, 1 JANUARY 1999 - 31 DECEMBER 2001,
BY TRANSPLANT CENTRE

Transplant centre	1999				2000				2001			
	Heart	H/L	Lung	TOTAL	Heart	H/L	Lung	TOTAL	Heart	H/L	Lung	TOTAL
Newcastle	36	5	28	69	38	3	31	72	32	2	24	58
Sheffield	10	1	2	13	19	0	4	23	6	0	7	13
Papworth	36	23	27	86	43	17	21	81	34	14	27	75
Harefield	42	13	16	71	41	7	21	69	34	14	19	67
Great Ormond St	13	7	4	24	13	4	1	18	20	1	2	23
St George's ¹	24	0	10	34	8	0	2	10	-	-	-	-
Birmingham	18	1	6	25	15	1	5	21	18	2	3	23
Manchester	17	0	15	32	24	1	12	37	22	0	10	32
Glasgow ²	34	-	-	34	3	-	-	3	5	-	-	5
TOTAL	230	50	108	388	204	33	97	334	171	33	92	296

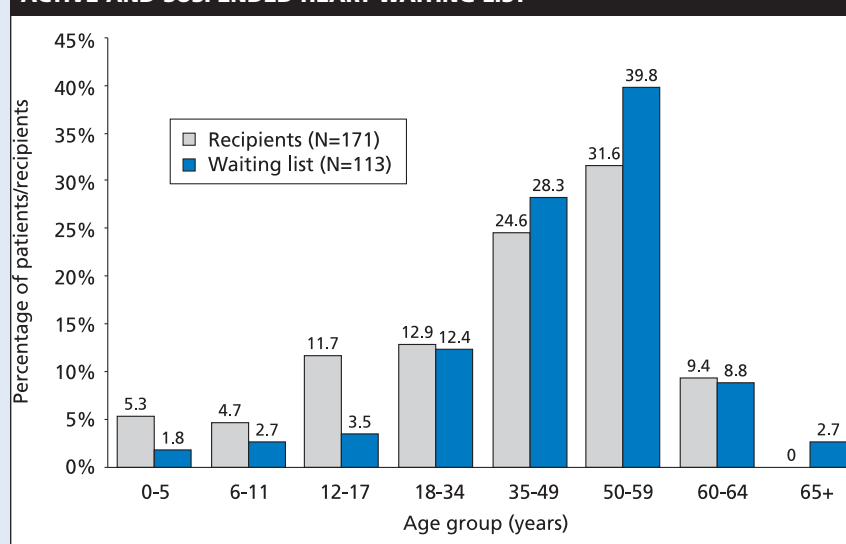
¹ St George's stopped transplanting in October 2000

² Glasgow stopped transplanting from May 2000 to September 2001

- Not applicable

Note: 4 living donor lung transplants were additionally carried out: 2 in 1999 (1 Harefield, 1 Newcastle), 1 in 2000 (Harefield) and 1 in 2001 (Harefield)

Figure 4.4
AGE AT TRANSPLANT FOR 171 HEART RECIPIENTS IN THE UK,
1 JANUARY- 31 DECEMBER 2001, COMPARED WITH PATIENTS ON THE
ACTIVE AND SUSPENDED HEART WAITING LIST



Transplant activity

In 2001, there were 297 cardiothoracic transplants including one living donor lung transplant.

Heart transplants

Heart transplant activity by transplant centre for the last three years is shown in [Table 4.6](#). Of the 171 heart transplants in 2001, 28 (16%) were for patients registered on the urgent heart waiting list. Of these, 8 (29%) were carried out at Newcastle, 8 (29%) at Great Ormond Street, 5 (18%) at Papworth with other centres carrying out three or less.

Recipient age at transplant for the 161 cadaveric and 10 domino heart transplants in 2001 compared with age of patients waiting for a heart transplant at 31 December 2001 is shown in [Figure 4.4](#). In 2001, 41% of heart transplants were performed in recipients aged 50 or over compared with 51% of patients on the end of year waiting list. These proportions are smaller than in 2000, when 49% of recipients and 64% of waiting list patients were aged 50 or over.

Table 4.7 shows donor and recipient age at the time of heart transplant in 2001. 31% of recipients received an organ from a donor in the same age group, 49% from a donor in a younger age group and 21% from a donor in an older age group. Using the paediatric age definitions applied for allocation (<15 years for donors, <16 years for recipients) 13 (76%) of the 17 paediatric donor hearts were transplanted in paediatric recipients. Of the 154 adult donor hearts, 16 (10%) were transplanted in paediatric recipients.

Donor and recipient blood groups for the 171 heart transplants are shown in **Table 4.8**. The proportion of group A transplant recipients was 47% (42% in 2000). Only 69% of the 95 donor group O hearts were used in group O heart transplant recipients: 22% were used in group A recipients and 6% in group B recipients. The blood group A donor used in a group B heart transplant recipient was for a child aged less than one year.

Heart/lung transplants

Heart/lung transplant activity by transplant centre for the last three years is shown in **Table 4.6**.

Recipient age at transplant for heart/lung transplants in 2001 compared with age of patients waiting for a heart/lung transplant at 31 December 2001, is shown in **Figure 4.5**. Of the 33 heart/lung transplants in 2001, 82% were performed in recipients aged between 18 and 49 years, while at 31 December 2001 85% of patients waiting for a heart/lung were aged between 18 and 49 years.

Table 4.7
DONOR AND RECIPIENT AGE IN 171 HEART TRANSPLANTS PERFORMED, 1 JANUARY - 31 DECEMBER 2001

Donor age (years)	Recipient age (years)							TOTAL
	0-5	6-11	12-17	18-34	35-49	50-59	60-64	
0-5	6	0	0	0	0	0	0	6
6-11	1	3	0	0	1	0	0	5
12-17	1	1	6	3	1	3	0	15
18-34	1	4	7	11	18	22	5	68
35-49	0	0	7	7	19	21	6	60
50-59	0	0	0	1	3	7	3	14
60-64	0	0	0	0	0	1	1	2
65+	0	0	0	0	0	0	1	1
TOTAL	9	8	20	22	42	54	16	171

TABLE 4.8
DONOR AND RECIPIENT BLOOD GROUP IN 171 HEART TRANSPLANTS PERFORMED, 1 JANUARY - 31 DECEMBER 2001

Donor blood group	Recipient blood group				TOTAL
	O	A	B	AB	
O	66	21	6	2	95
A	-	59	1	1	61
B	-	-	11	1	12
AB	-	-	-	3	3
TOTAL	66	80	18	7	171

Figure 4.5
AGE AT TRANSPLANT FOR 33 HEART/LUNG RECIPIENTS IN THE UK, 1 JANUARY - 31 DECEMBER 2001, COMPARED WITH PATIENTS ON THE ACTIVE AND SUSPENDED HEART/LUNG WAITING LIST

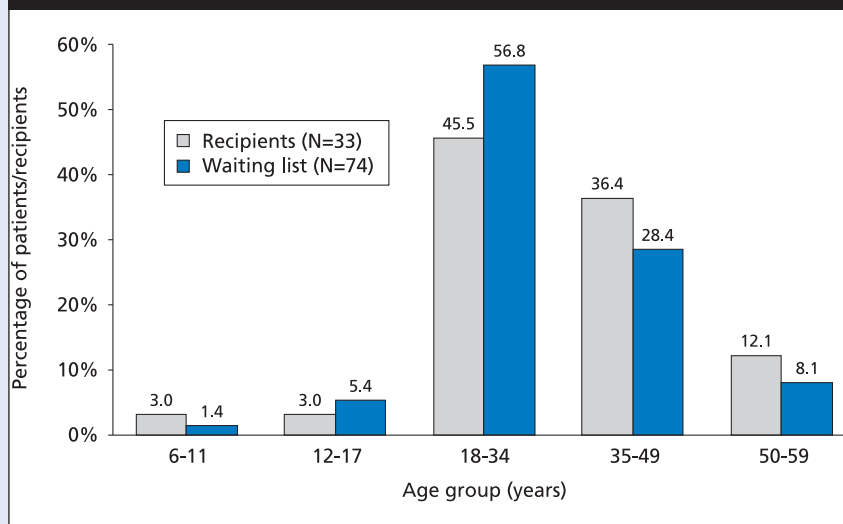


Table 4.9
DONOR AND RECIPIENT AGE IN 33 HEART/LUNG TRANSPLANTS PERFORMED,
1 JANUARY - 31 DECEMBER 2001

Donor age (years)	Recipient age (years)					TOTAL
	6-11	12-17	18-34	35-49	50-59	
0-5	1	0	0	0	0	1
6-11	0	0	0	0	0	0
12-17	0	1	0	0	0	1
18-34	0	0	10	2	3	15
35-49	0	0	4	7	1	12
50-59	0	0	1	3	0	4
TOTAL	1	1	15	12	4	33

Table 4.9 shows donor and recipient age at the time of heart/lung transplant. Only two transplants were carried out in children. 82% of donors were aged between 18 and 49 years, the same proportion as for recipients.

Table 4.10
DONOR AND RECIPIENT BLOOD GROUP IN 33 HEART/LUNG TRANSPLANTS PERFORMED, 1 JANUARY - 31 DECEMBER 2001

Donor blood group	Recipient blood group				TOTAL
	O	A	B	AB	
O	9	6	1	1	17
A	-	10	-	1	11
B	-	-	3	-	3
AB	-	-	-	2	2
TOTAL	9	16	4	4	33

Donor and recipient blood groups for the 33 heart/lung transplants are shown in **Table 4.10**. 17 (52%) donors were blood group O: 53% were used in group O recipients and 35% in group A recipients.

Lung transplants

Lung transplant activity by transplant centre for the last three years is shown in **Table 4.6**.

Recipient age at transplant for the 93 lung transplants in 2001, compared with age of patients waiting for a lung transplant at 31 December 2001, is shown in **Figure 4.6**. 44% of patients waiting were aged 50 or over compared with 56% of transplant recipients.

Figure 4.6
AGE AT TRANSPLANT FOR 93 LUNG RECIPIENTS IN THE UK,
1 JANUARY - 31 DECEMBER 2001, COMPARED WITH PATIENTS ON THE
ACTIVE AND SUSPENDED LUNG WAITING LIST

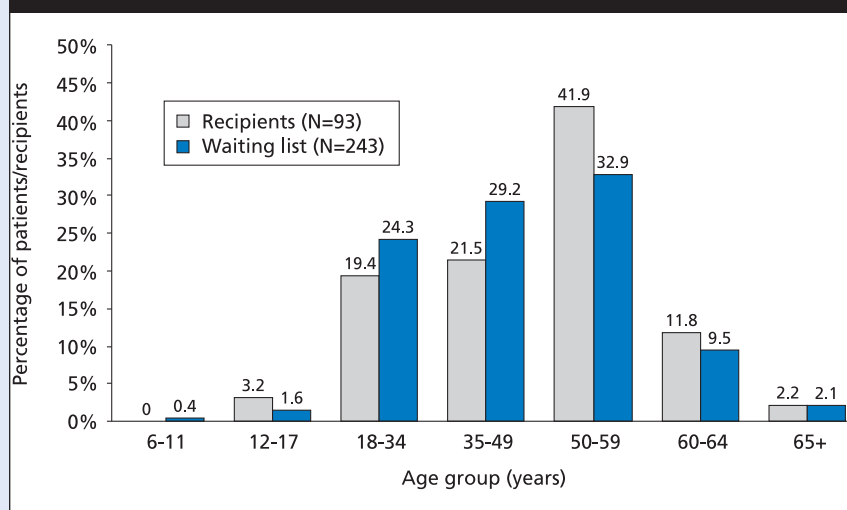


Table 4.11 shows donor and recipient age at the time of lung transplant. 32% of recipients received lung(s) from donors in the same age category, 57% from younger donors and 11% from older donors. Using the paediatric age definitions applied for allocation (<15 years for donors, <16 years for recipients), 1 (25%) of four paediatric donor organs was transplanted in a paediatric recipient. The table includes both donors for the one living lung transplant recipient. The recipient was aged 27 and received a lobe from a partner and a parent (aged 28 and 47 years, respectively).

Donor and recipient blood groups for the 93 lung transplants are shown in **Table 4.12**. 52 (57%) donors were blood group O: 81% were used in group O patients and 12% in group A patients. 13% of recipients received a lung or lungs from a compatible blood group donor.

Transplant survival

One year Kaplan-Meier transplant survival is illustrated in **Figure 4.7** for first heart only transplants in the UK for 1994-1995, 1996-1997 and 1998-1999. One year outcome has improved since the first time period and remained similar for the last two periods (Log-rank test, $p=0.1$). The proportion of follow-up available for the latest cohort is lower than for the earlier two cohorts: 94% compared with 100%, respectively.

Table 4.11
DONOR AND RECIPIENT AGE IN 93 LUNG TRANSPLANTS PERFORMED,
1 JANUARY - 31 DECEMBER 2001

Donor age (years)	Recipient age (years)						TOTAL
	12-17	18-34	35-49	50-59	60-64	65+	
6-11	1	0	0	0	0	0	1
12-17	1	2	2	2	0	0	7
18-34	1	12	9	10	7	0	39
35-49	0	5	7	15	2	2	31
50-59	0	0	2	10	2	0	14
60-64	0	0	0	2	0	0	2
TOTAL	3	19	20	39	11	2	94¹

¹ Including both donors for the 1 living lung transplant

Table 4.12
DONOR AND RECIPIENT BLOOD GROUP IN 93 LUNG TRANSPLANTS
PERFORMED, 1 JANUARY - 31 DECEMBER 2001

Donor blood group	Recipient blood group				TOTAL
	O	A	B	AB	
O	42	6	4	-	52
A	-	24	-	1	25
B	-	-	12	1	13
AB	-	-	-	1	1
TOTAL	42	30	16	3	91¹

¹ Blood group unknown for both donors for the 1 living lung transplant and for 1 recipient

Figure 4.7
ONE YEAR TRANSPLANT SURVIVAL AFTER FIRST HEART ONLY TRANSPLANT,
1 JANUARY 1994 - 31 DECEMBER 1999

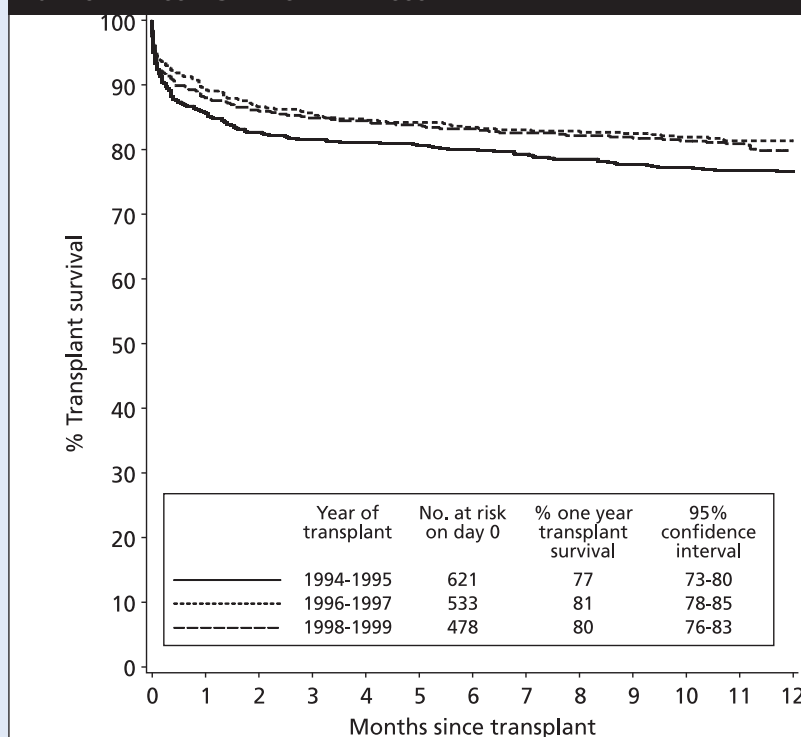


Figure 4.8
ONE YEAR TRANSPLANT SURVIVAL AFTER FIRST HEART/LUNG TRANSPLANT,
1 JANUARY 1994 - 31 DECEMBER 1999

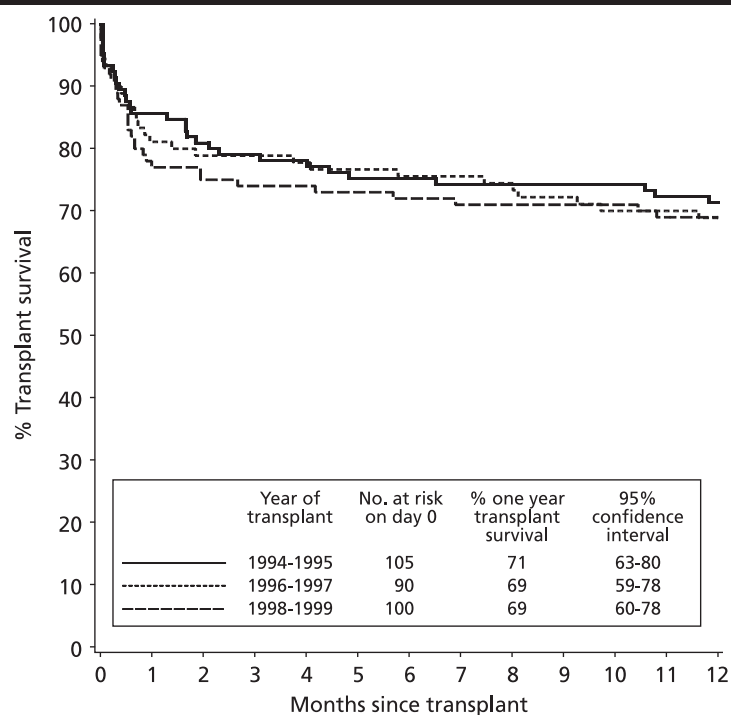
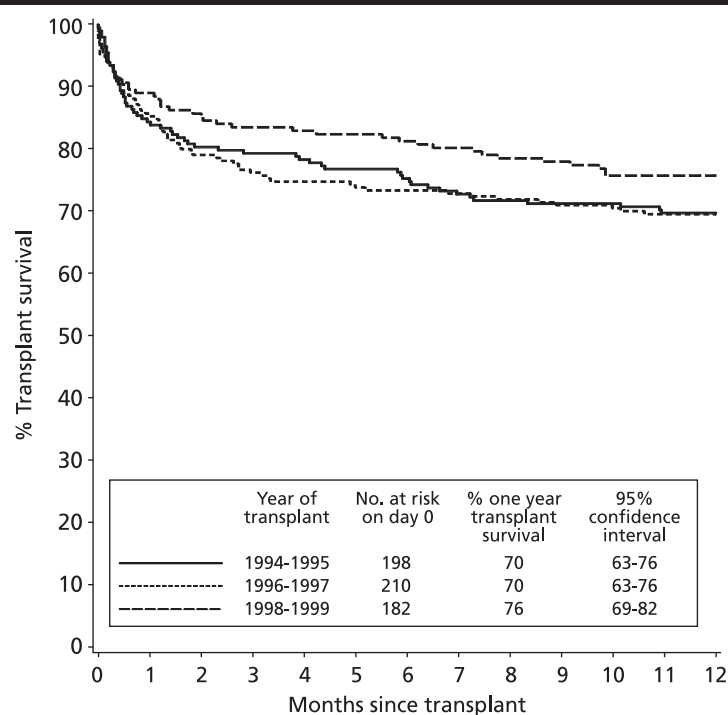


Figure 4.8 similarly illustrates one year transplant survival for heart/lung transplants. The survival curves do not differ significantly (Log-rank test, $p=0.9$).

Figure 4.9 shows an improvement in lung transplant survival for the latest cohort of transplants, although this was not significant (Log-rank test, $p=0.3$).

Figure 4.9
ONE YEAR TRANSPLANT SURVIVAL AFTER FIRST CADAVERIC LUNG ONLY
TRANSPLANT, 1 JANUARY 1994 - 31 DECEMBER 1999



Transplant survival estimates for one year, three years and five years, for the three different cohorts, are presented in [Table 4.13](#) for heart, heart/lung and lung transplants. Numbers of transplants analysed and the follow-up rates are also given. The follow-up rates indicate the proportion of transplants in those years for which outcome was known at one, three and five years post-transplant, respectively.

Table 4.13
TRANSPLANT SURVIVAL AFTER FIRST HEART, HEART/LUNG AND LUNG ONLY
TRANSPLANT IN THE UK, 1 JANUARY 1994 - 31 DECEMBER 1999

Transplant survival time	Year of transplant	Number analysed	Transplant survival estimate (%)	95% CI	% follow-up
Heart					
One year	1998-1999	478	80	76-83	94
Three years	1996-1997	533	76	73-80	94
Five years	1994-1995	621	63	60-67	95
Heart/lung					
One year	1998-1999	100	69	60-78	98
Three years	1996-1997	90	59	49-69	96
Five years	1994-1995	105	47	37-56	95
Lung					
One year	1998-1999	182	76	69-82	94
Three years	1996-1997	210	57	50-63	94
Five years	1994-1995	198	42	35-49	96

Figure 5.1
CADAVERIC LIVER PROGRAMME IN THE UK, 1992-2001
NUMBER OF DONORS, TRANSPLANTS AND PATIENTS ON THE ACTIVE
WAITING LIST AT 31 DECEMBER

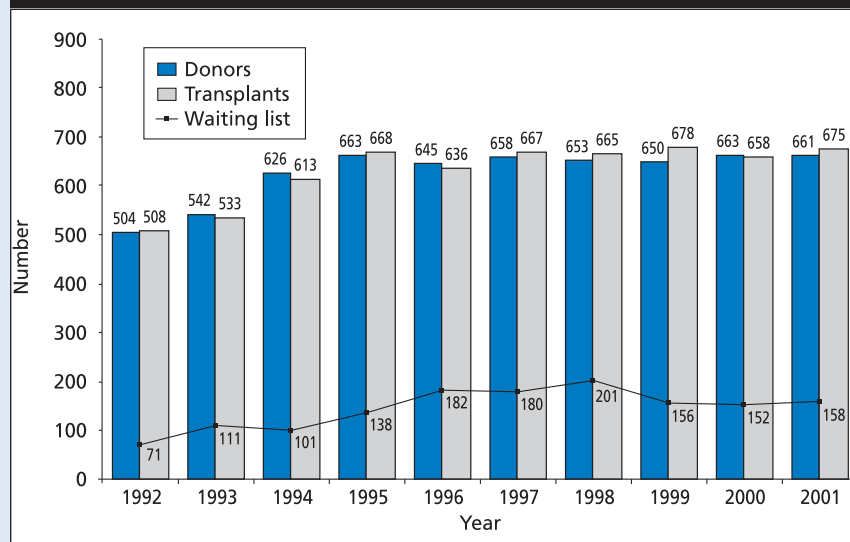


Table 5.1
CADAVERIC AND LIVING LIVER DONORS AND TRANSPLANTS¹,
1 JANUARY - 31 DECEMBER 2001 AND WAITING LIST PATIENTS,
31 DECEMBER 2001, BY CENTRE

Donation zone/ transplant centre	Cadaveric donors	Cadaveric transplants	Living donor transplants	Active and suspended waiting list
Newcastle	51	38	0	6
Leeds	97	120	0	18
Cambridge	75	66	0	9
The Royal Free	61	52	0	13
King's College	175	193	9	52
Birmingham	139	150	0	46
Edinburgh	60	54	0	16
TOTAL	661^{2,3}	675⁴	9	160

¹ Whole liver and lobe

² Includes 7 non-heartbeating donors (King's College)

³ Includes 3 UK donors retrieved by Dublin

⁴ Includes 1 liver & heart/lung transplant (Papworth) and 1 liver & heart transplant (Harefield) and 5 non-heartbeating transplants (4 at King's College, 1 at Birmingham)

5

Liver Activity

Overview

The number of cadaveric liver donors and transplants in the UK has remained relatively constant since 1995 - **Figure 5.1**. The number of patients actively waiting for a transplant increased steadily until 1998, followed by decreases in both 1999 and 2000. However, the end of 2001 saw an increase of 4% from 2000.

The number of cadaveric donors (heartbeating and non-heartbeating), cadaveric and living donor transplants and patients on the waiting list (active or suspended), by centre, is shown in **Table 5.1**. 661 (85%) of the 777 solid organ donors in 2001 donated their liver for transplant. Additionally, there were eight living liver lobe donors and one domino liver donor. There were 675 cadaveric transplants in 2001 and 160 patients were on the waiting list at 31 December 2001.

New liver donation zones, based on number of donors rather than populations, were introduced on 16 October 2001. The number of donors by hospital is documented in *Appendices IA and IB*. Population figures used throughout this Report are given in *Appendix IIIB*.

Donor and organ supply

In the UK, the liver retrieval rate in 2001 was 11.2 livers per million population (pmp) with the zonal rate varying between centres from 10.1 pmp to 15.1 pmp - [Table 5.2](#).

95% of livers retrieved were transplanted in 2001 compared with 94% in 2000. The number of donors is equivalent to the number of livers retrieved. There were seven non-heartbeating liver donors in 2001 including four liver and kidney donors.

Waiting list

Figure 5.2 shows the number of patients on the waiting list at individual centres for 2000 and 2001. The changes at individual centres varied considerably, although the number of patients is small. The total waiting list for the UK rose by five patients (3%).

Table 5.2
CADAVERIC LIVER RETRIEVAL RATES, 1 JANUARY - 31 DECEMBER 2001,
BY DONATION ZONE

Donation zone	Number of donors (pmp)		Number of livers retrieved ² (used ³)	
	Solid organ ¹	Liver ²		
Newcastle	74 (22.8)	49 (15.1)	49	(45)
Leeds	104 (11.8)	93 (10.6)	93	(89)
Cambridge	96 (11.9)	81 (10.1)	81	(77)
The Royal Free	76 (13.5)	59 (10.5)	59	(58)
King's College	191 (13.2)	174 (12.1)	174	(164)
Birmingham	171 (12.3)	145 (10.5)	145	(141)
Edinburgh	65 (12.7)	60 (11.7)	60	(57)
TOTAL	777 (13.1)	661 (11.2)	661	(631)

¹ Includes 42 non-heartbeating donors

² Includes 7 non-heartbeating liver donors

³ Includes 5 non-heartbeating liver donors

Figure 5.2
ACTIVE AND SUSPENDED LIVER WAITING LIST BY CENTRE IN THE UK
AT 31 DECEMBER 2000 AND 2001

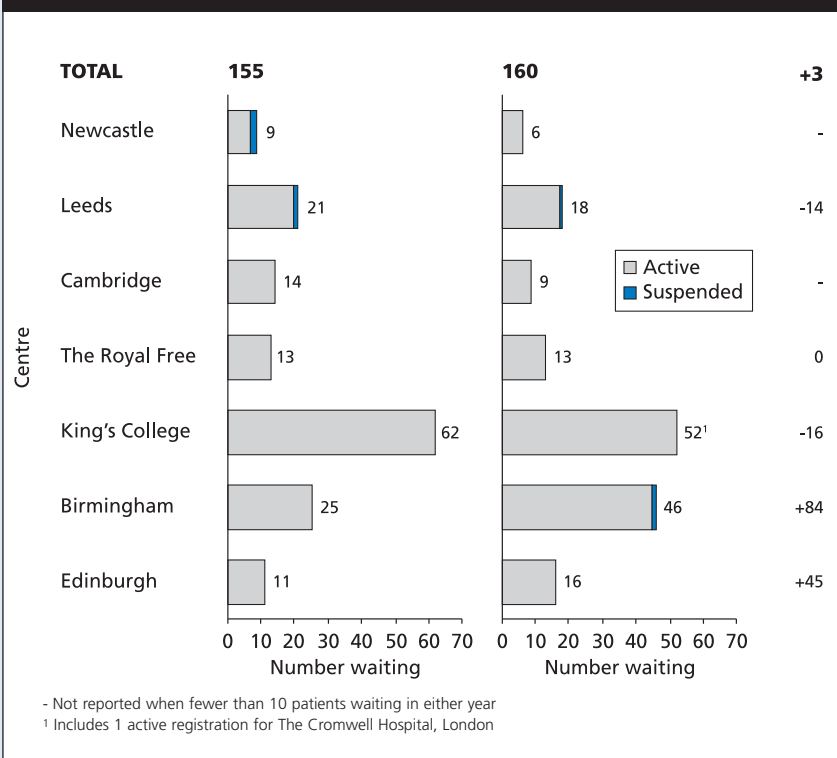
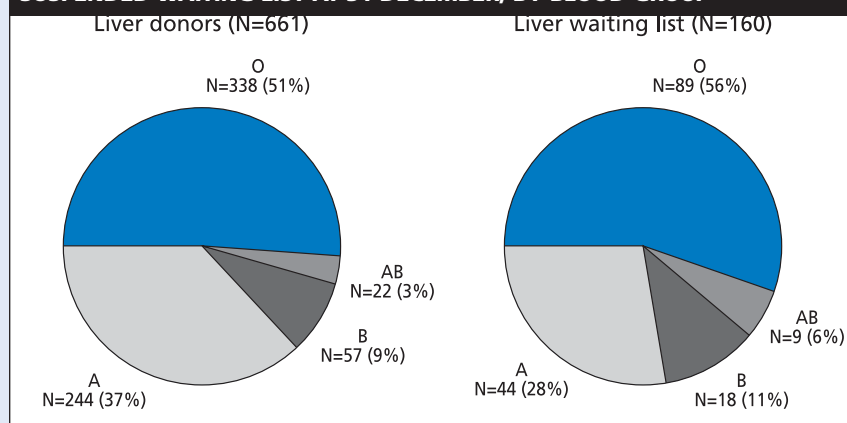


Figure 5.3
CADAVERIC LIVER DONORS IN THE UK IN 2001 AND ACTIVE AND SUSPENDED WAITING LIST AT 31 DECEMBER, BY BLOOD GROUP



The blood group distribution of patients awaiting a liver transplant at 31 December 2001 and liver donors during the year are presented in **Figure 5.3**. The proportion of blood group A liver donors is greater than that of patients waiting: 37% compared with 28%, respectively.

Of the 954 patients waiting on the list in 2001, 70% were transplanted and 17% were still waiting at 31 December 2001 (**Table 5.3**).

Table 5.3
LIVER WAITING LIST AND NEW REGISTRATIONS,
1 JANUARY - 31 DECEMBER 2001

Outcome of waiting patient at 31 December 2001	Active and suspended patients at 1 January 2001		New registrations in 2001 ¹		TOTAL	
	N	%	N	%	N	%
TOTAL	153		801		954	
Remained active/suspended	13	9	153	19	166	17
Transplanted	120	78	545	68	665	70
Removed	13	9	50	6	63	7
Died	7	5	53	7	60	6

¹ Includes re-registrations for second or subsequent transplants

Transplant Activity

684 liver transplants were performed in 2001 - 594 whole liver (including six liver and kidney, one liver and heart and one liver, heart and lung), 81 cadaveric liver lobe and nine living transplants. Of the 81 cadaveric liver lobe transplants, 62 were split liver transplants and 19 were reduced liver transplants (including one kidney and liver lobe). 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. Eight of the nine living donor transplants were reduced, one was a domino liver transplant.

Transplant activity by centre for the years 1999-2001 is shown in **Figure 5.4**.

Recipient age at transplant for the 684 liver transplants carried out in 2001, compared with age of patients waiting for a liver transplant at 31 December 2001, is shown in **Figure 5.5**. The transplant population is generally older than the waiting list population: 47% of transplant recipients were aged 50 or over compared with 44% of patients waiting.

Figure 5.4
LIVER TRANSPLANTS PERFORMED IN THE UK,
1 JANUARY 1999 - 31 DECEMBER 2001, BY TRANSPLANT CENTRE¹

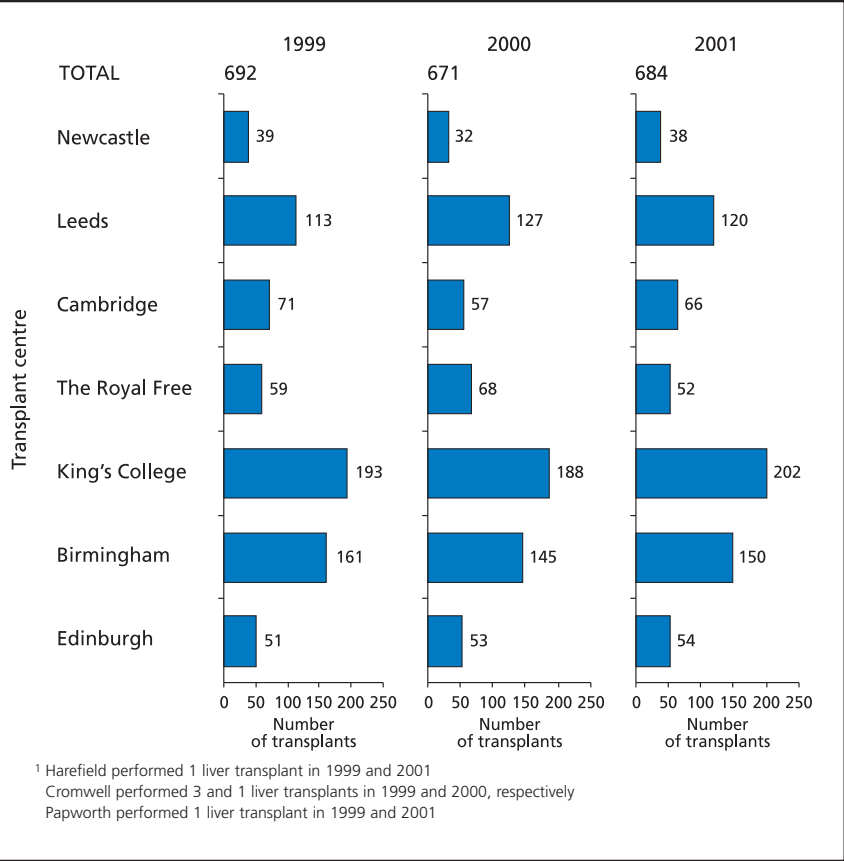


Figure 5.5
AGE AT TRANSPLANT FOR 684 LIVER RECIPIENTS IN THE UK,
1 JANUARY - 31 DECEMBER 2001, COMPARED WITH PATIENTS ON THE ACTIVE
AND SUSPENDED LIVER WAITING LIST

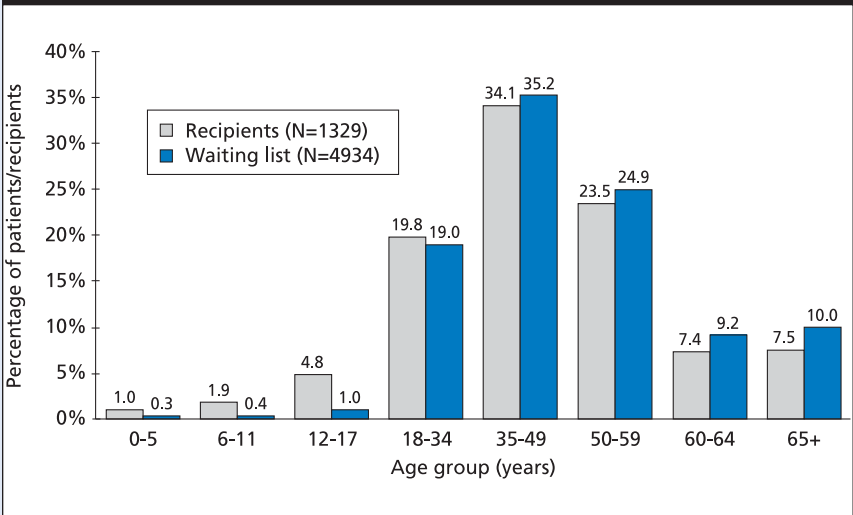


Table 5.4
DONOR AND RECIPIENT AGE IN 684 LIVER TRANSPLANTS PERFORMED,
1 JANUARY - 31 DECEMBER 2001

Donor age (years)	Recipient age (years)								TOTAL
	0-5	6-11	12-17	18-34	35-49	50-59	60-64	65+	
0-5	11	0	0	0	1	0	0	0	12
6-11	4	3	2	2	1	0	1	0	13
12-17	11	6	4	4	8	7	3	2	45
18-34	15	4	5	20	49	51	22	6	172
35-49	7	3	6	23	67	53	28	11	198
50-59	2	1	2	14	52	52	24	11	158
60-64	1	0	2	5	10	10	8	4	40
65+	0	0	1	5	11	16	4	9	46
TOTAL	51	17	22	73	199	189	90	43	684

Table 5.5
DONOR AND RECIPIENT BLOOD GROUP IN 684 LIVER TRANSPLANTS
PERFORMED, 1 JANUARY - 31 DECEMBER 2001

Donor blood group	Recipient blood group				TOTAL
	O	A	B	AB	
O	295	36	17	4	352
A	-	236	-	10	246
B	-	-	66	3	69
AB	-	-	-	17	17
TOTAL	295	272	83	34	684

Table 5.6
ETHNICITY OF LIVER DONORS AND RECIPIENTS, 1 JANUARY - 31 DECEMBER
2001 AND WAITING LIST PATIENTS AT 31 DECEMBER 2001

Ethnic origin	Donors		Transplant recipients		Active and suspended waiting list patients	
	N	%	N	%	N	%
White	640	97.6	560	81.9	132	83.0
Asian	4	0.6	53	7.7	13	8.2
Black	6	0.9	18	2.6	3	1.9
Chinese	1	0.2	5	0.7	3	1.9
Other	5	0.8	48	7.0	8	5.0
Not reported	14	-	0	-	1	-
TOTAL	670		684		160	

Donor and recipient age at time of transplant is shown in [Table 5.4](#).

Using the paediatric age definitions applied for liver allocation (<16 years for donors, <17 years for recipients), 38 (70%) of 54 paediatric donor livers were used in paediatric recipients. Of the 46 livers from adult donors that were used in paediatric recipients, 13 were kept as a whole liver, 9 were reduced and 24 were split.

Donor and recipient blood groups for 684 liver transplants are shown in [Table 5.5](#). 90% of transplants used blood group identical donors and 84% of group O donor livers were used in group O recipients. Of the 70 non-identical blood group transplants, 47 (67%) were in super-urgent recipients.

In 2001, 67 (10%) transplant recipients had received a previous liver transplant, compared with a re-graft rate of 9% in 2000.

Of all livers used in 2001, 61% were retrieved by the centre that performed the transplant (60% in 2000).

During 2001, 114 (17%) transplants were for patients on the super-urgent waiting list compared with 101 (15%) in 2000. Of these, 37 were carried out at King's College, 20 at Birmingham and 19 at Leeds. 28% of Edinburgh's liver transplant patients were recorded as super-urgent, while for The Royal Free the proportion was 24%. For all other centres the proportion was less than 20%.

The ethnic origin of liver donors, transplant recipients and waiting list patients is shown in [Table 5.6](#). The proportion of Asian patients on the waiting list is much greater

than that of donors in 2001, 8.2% compared with less than 0.6%. Consequently, white patients are under-represented on the waiting list in comparison with the number of donors who were white (83% and 97.6%, respectively).

Liver lobe transplants

Table 5.7 shows the number of liver lobe transplants for each centre for 2000 and 2001. Split liver transplants accounted for 70% of liver lobe transplant activity. In 2001, 76% of liver lobe transplants were carried out at either King's College or Birmingham. 20% of liver transplants at King's College were single lobe transplants, as were 18% at Birmingham.

Small intestine transplantation

Six patients were registered on the small intestine transplant waiting list at some time in 2001, all at Birmingham. Of these patients, four were transplanted, one was removed from the waiting list and one was still waiting at 31 December 2001. Of the four transplanted patients, two received a small intestine only, one received a liver and small intestine and one received a liver lobe, small intestine and kidney.

Transplant survival

One year transplant survival is illustrated in Figure 5.6 for routine first cadaveric liver only transplants in the UK for 1994-1995, 1996-1997 and 1998-1999. One year outcome has improved since the first time period and remained the same for the last two periods (Log-rank test, $p=0.17$).

Table 5.7
LIVER LOBE TRANSPLANTS PERFORMED, 1 JANUARY 2000 - 31 DECEMBER 2001

Transplant centre	2000			2001		
	Reduced liver	Split liver	TOTAL	Reduced liver	Split liver	TOTAL
Leeds	0	4	4	4	13	17
Cambridge	0	0	0	0	1	1
The Royal Free	1	2	3 ¹	0	2	2
King's College	24	20	44 ³	13	28	41 ²
Birmingham	9	21	30	8	18	26
Edinburgh	3	2	5	1	0	1
The Cromwell Hospital	1	0	1 ¹	0	0	0
TOTAL	38	49	87	26	62	88⁴

¹ Includes 1 living donor transplant

² Includes 8 living donor transplants

³ Includes 11 living donor transplants

⁴ Excludes 1 kidney & liver lobe transplant (Birmingham)

Figure 5.6
ONE YEAR TRANSPLANT SURVIVAL AFTER FIRST ROUTINE CADAVERIC LIVER ONLY TRANSPLANT IN THE UK, 1 JANUARY 1994 - 31 DECEMBER 1999

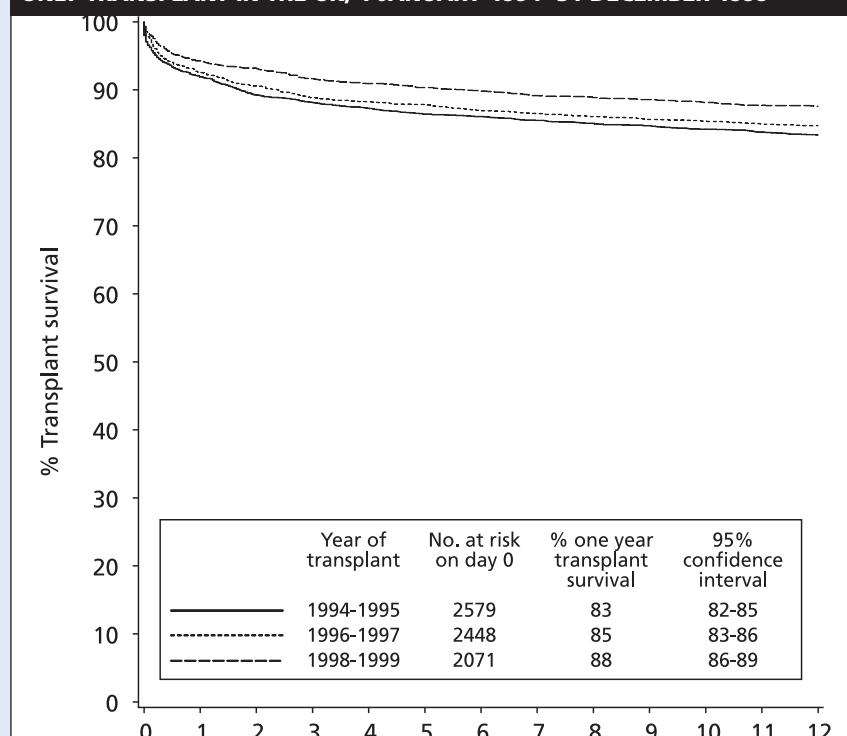


Table 5.8
TRANSPLANT SURVIVAL AFTER FIRST ROUTINE CADAVERIC LIVER ONLY
TRANSPLANT IN THE UK, 1 JANUARY 1994 - 31 DECEMBER 1999

Transplant survival time	Year of transplant	Number analysed	Transplant survival estimate (%)	95% CI	% follow-up
One year	1998-1999	1005	80	78-83	91
Three years	1996-1997	934	73	70-76	90
Five years	1994-1995	905	64	61-67	90

Table 5.8 gives Kaplan-Meier transplant survival estimates for one, three and five years, for the three different cohorts. The estimates drop steadily as the time post-transplant increases. The number of transplants analysed and the follow-up rates are also given. The follow-up rates indicate the proportion of transplants in those years for which outcome was known at the specified period post-transplant.

6 Cornea Donation and Transplants

Overview

Both the number of corneas donated and the number of cornea grafts carried out decreased in 2001, by 18% and 10.5%, respectively (**Figure 6.1**). Additionally, 122 donors donated sclera.

In 2001, there were 1,642 cornea donors of whom 1,397 donated cornea(s) only and 245 donated cornea(s) and solid organ(s) - **Table 6.1**. Compared with 2000, the number of cornea only donors decreased by 337 (19%) and the number of cornea and solid organ donors decreased by 43 (15%). In 2000, corneas were retrieved from 36% of cadaveric heartbeating solid organ donors; this fell to 30.5% in 2001. Of the 42 non-heartbeating solid organ donors in 2001, 21 (50%) also donated corneas.

Table 6.1 shows the number and rate per million population (pmp) of donors by country. In both 2000 and 2001 Wales had the highest cornea donation rate in the UK: 40 cornea donors pmp in 2000 and 39 cornea donors pmp in 2001. The cornea donation rate was unchanged in Northern Ireland, but fell in England, Scotland and Wales.

Donor and tissue supply

Figure 6.1
CORNEA PROGRAMME IN THE UK, 1992-2001
NUMBER OF CORNEAS DONATED AND CORNEAS GRAFTED

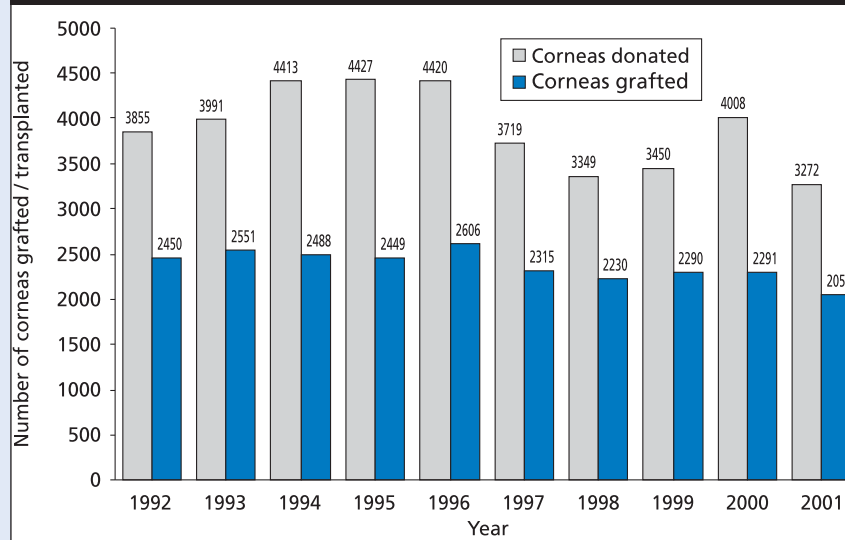


Table 6.1
CORNEA DONATION RATES PER MILLION POPULATION (PMP),
1 JANUARY 2000 - 31 DECEMBER 2001, BY COUNTRY OF DONATION

Country of donation	Donor type				TOTAL (pmp)	
	Cornea only		Solid organ and cornea		2000	2001
	2000	2001	2000	2001		
England	1580	1272	247	201	1827 (36.1)	1473 (29.4)
Wales	73	72	17	16	90 (39.6)	88 (38.8)
Scotland	69	45	21	20	90 (17.6)	65 (12.7)
Northern Ireland	12	8	3	8	15 (9.0)	16 (9.6)
TOTAL	1734	1397	288	245	2022 (34.2)	1642 (27.8)

Figure 6.2
CAUSE OF DEATH OF CORNEA DONORS, 1 JANUARY 2000 - 31 DECEMBER 2001

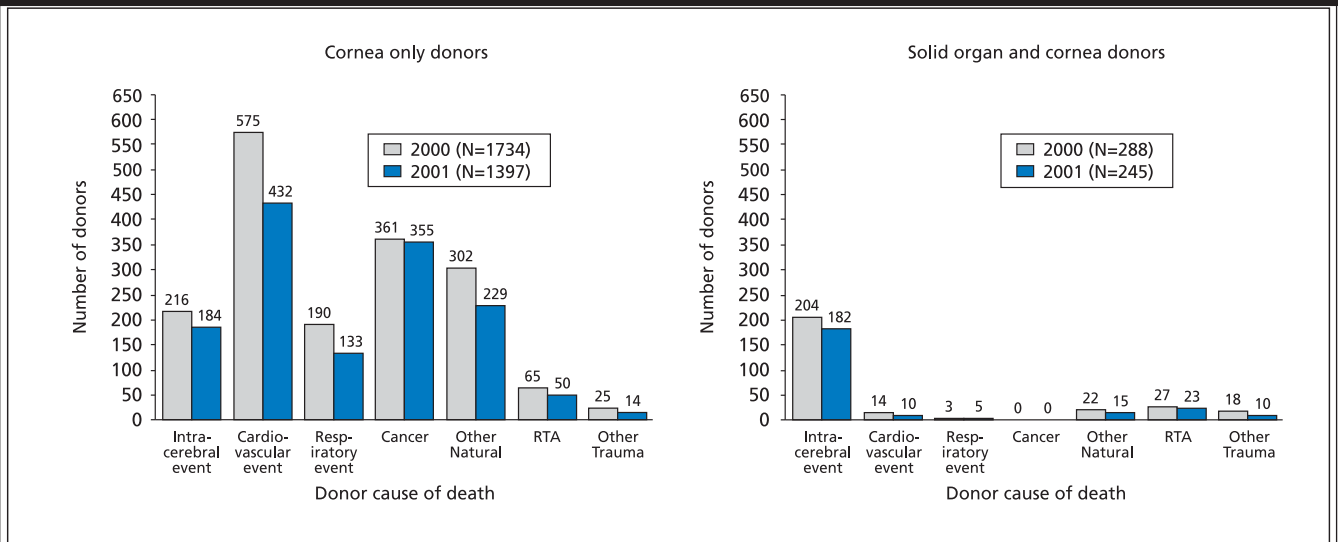


Figure 6.3
AGE OF CORNEA DONORS, 1 JANUARY 2000 - 31 DECEMBER 2001

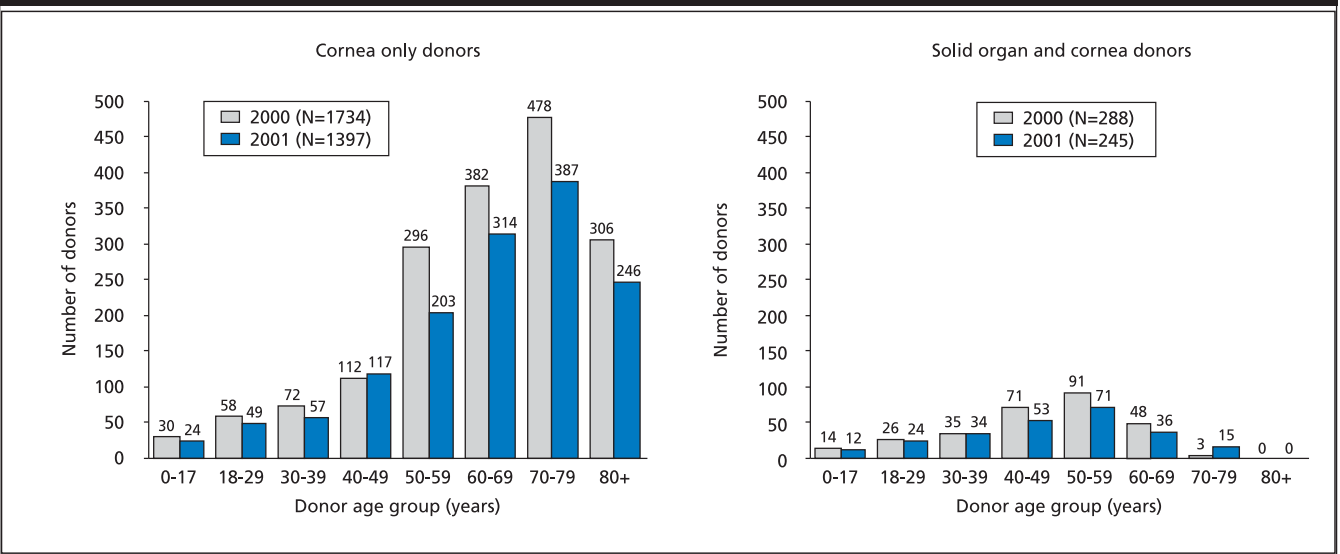


Figure 6.2 shows the cause of death for cornea only and solid organ and cornea donors. The majority of cornea only donors died from natural causes with only 5% suffering trauma in each year. However, the majority of solid organ and cornea donors died from an intracerebral event. The age of cornea only donors is generally older than that of solid organ and cornea donors (Figure 6.3). In 2001, the mean age for cornea only donors was 64 years (standard deviation (s.d.) 17.3) compared with 47 years (s.d. 15.7) for solid organ and cornea donors ($p < 0.0001$). In

2001, 68% of cornea only donors were aged 60 or over, whereas, only 21% of solid organ and cornea donors were aged 60 years or over.

In both 2000 and 2001, 97% of retrieved corneas reported to the National Transplant Database were supplied to the Cornea Transplant Service (CTS) Eye Banks in Bristol and Manchester. [Table 6.2](#) shows those centres that supplied more than 20 corneas in 2001.

CTS Eye Bank Activity

Both the numbers of corneas received and issued by the CTS Eye Banks decreased in 2001 (by 18% and 12.5%, respectively). In 2001, 3,186 corneas were received into the Eye Banks, of which 2,203 (69%) were issued for grafting. The Eye Bank activity levels for the Bristol and Manchester Eye Banks are shown in [Table 6.3](#). The balance comprises corneas unsuitable for transplantation.

The outcome of the corneas received into the CTS Eye Banks is

Table 6.2
CENTRES SUPPLYING MORE THAN 20 CORNEAS TO THE CTS EYE BANKS, 1 JANUARY - 31 DECEMBER 2001

Centre	Corneas supplied
East Grinstead, Queen Victoria Hospital	420
Norwich, West Norwich Hospital	320
Newcastle, Royal Victoria Hospital	213
Liverpool, Royal Liverpool University Hospital	189
Bristol Eye Hospital	177
London, Moorfields Eye Hospital	109
Manchester, Royal Eye Hospital	80
Exeter, Royal Devon & Exeter Hospital (Wonford)	74
St Asaph, H M Stanley Hospital	52
Birmingham and Midlands Eye Centre	48
Nottingham, University Hospital	46
Cardiff, University of Wales Hospital	44
Middlesbrough, North Riding Infirmary	38
Southampton, University Hospital	38
Leeds, St James's University Hospital	36
Oxford, Radcliffe Infirmary	30
Reading, Royal Berkshire Hospital	30
Leeds General Infirmary	30
Sunderland, Eye Infirmary	28
Belfast, Royal Victoria Hospital	28
Cambridge, Addenbrooke's Hospital	28
Newport, Royal Gwent Hospital	26
Yeovil District Hospital	25
Coventry & Warwickshire Hospital	24
Swindon, Princess Margaret Hospital	22
Portsmouth, Queen Alexandra Hospital	22
Edinburgh, Royal Infirmary of Edinburgh	22
Ipswich Hospital	22
Taunton & Somerset Hospital	22
Truro, Royal Cornwall Hospital	22

Table 6.3
CORNEAS RECEIVED INTO THE BRISTOL AND MANCHESTER EYE BANKS, 1 JANUARY 2000 - 31 DECEMBER 2001, BY YEAR

	Total received	Bristol			Total received	Manchester			Total received	TOTAL		
		Number issued ¹ (%)	Balance ²			Number issued ¹ (%)	Balance ²			Number issued ¹ (%)	Balance ²	
2000	2465	1631 (66)	834		1437	910 (63)	527		3902	2541 (65)	1361	
2001	2058	1458 (71)	600		1128	745 (66)	383		3186	2203 (69)	983	

¹ Number issued of those received in each year

² Comprises corneas unsuitable for transplantation

Table 6.4
OUTCOME OF CORNEAS RECEIVED INTO THE BRISTOL AND MANCHESTER EYE BANKS,
1 JANUARY 2000 - 31 DECEMBER 2001, BY YEAR

Outcome of cornea	Bristol				Manchester				TOTAL			
	2000		2001		2000		2001		2000		2001	
	N	%	N	%	N	%	N	%	N	%	N	%
Used												
Penetrating keratoplasty	1417	57	1274	62	802	56	673	60	2219	57	1947	61
Lamellar keratoplasty	34	1	39	2	13	1	12	1	47	1	51	2
Epikeratophakia plano lens	7	<1	1	<1	0	0	0	0	7	<1	1	<1
Epikeratophakia powered	1	<1	1	<1	0	0	0	0	1	<1	1	<1
Lathed lamellar lenticule	28	1	17	1	0	0	0	0	28	1	17	1
Other/not reported	12	<1	9	<1	9	1	11	1	21	1	20	1
Total used	1499	61	1341	65	824	57	696	62	2323	60	2037	64
Not used												
Issued, not used	132	5	117	6	86	6	49	4	218	6	166	5
Unsuitable - endothelium, stromal opacity, other	455	18	234	11	240	17	156	14	695	18	390	12
Medical reason - virology	136	6	173	8	77	5	86	8	213	5	259	8
Medical reason - other	122	5	79	4	53	4	50	4	175	4	129	4
Contaminated	116	5	109	5	79	5	85	8	195	5	194	6
Other/not reported	5	<1	5	<1	78	5	6	1	83	2	11	<1
Total not used	966	39	717	35	613	43	432	38	1579	40	1149	36
TOTAL	2465		2058		1437		1128		3902		3186	

given in [Table 6.4](#). Of corneas supplied to the Eye Banks in 2001, 61% were used for a penetrating graft, 2% were used for lamellar grafts and epikeratophakia and 5% were issued to hospitals, but not used. A further 12% of corneas supplied to the Eye Banks were not suitable for grafting due to endothelial deficiencies, stromal opacity or other reasons and 12% due to medical contraindications. Only 6% of corneas were discarded because of contamination. Finally, <1% of corneas became outdated (were not placed within 28 days), some of which were subsequently used for research ("other" category in [Table 6.4](#)).

Transplant activity

Transplant activity by country for the years 2000 and 2001 is detailed in [Table 6.5](#). The overall transplant rate was 38.7 pmp in 2000: this fell to 34.7 pmp in 2001. The transplant rates were lower in 2001 for each of the countries within the UK. Additionally, there were 111 sclera transplants.

Figure 6.4 shows the recipient age distribution for transplants in 2001. Of all recipients, 54% were aged 60 or over and 40% were aged 70 or over at transplant. The bimodal distribution is characteristic of the cornea transplant population. [Table 6.6](#) demonstrates the degree of age matching achieved for routine unmatched penetrating transplants in 2001. This table excluded 146 tissue matched grafts; these represented 7% of cornea grafts in the year.

Table 6.5
CORNEA TRANSPLANTS PERFORMED PER MILLION POPULATION (PMP),
1 JANUARY 2000 - 31 DECEMBER 2001, BY COUNTRY

Country	Number of transplants (pmp)			
	2000		2001	
England	1964	(38.9)	1799	(35.9)
Wales	98	(43.2)	78	(34.4)
Scotland	165	(32.3)	131	(25.6)
Northern Ireland	61	(36.7)	42	(25.3)
TOTAL	2288	(38.7)	2050	(34.7)

Figure 6.4
RECIPIENT AGE AT TRANSPLANT FOR 2050 CORNEA TRANSPLANTS
PERFORMED, 1 JANUARY - 31 DECEMBER 2001

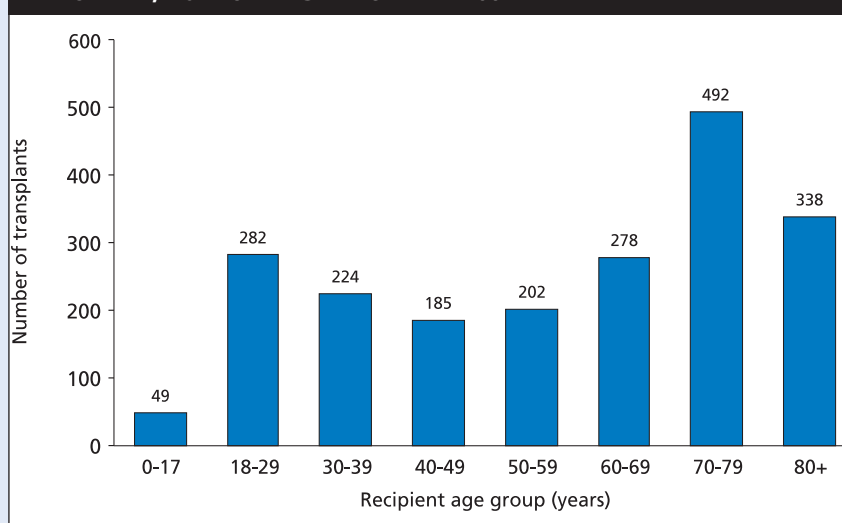


Table 6.6
RECIPIENT AND DONOR AGE IN 1905 ROUTINE UNMATCHED PENETRATING
CORNEA GRAFTS, 1 JANUARY - 31 DECEMBER 2001¹

Recipient age (years)	Donor age (years)								TOTAL
	0-17	18-29	30-39	40-49	50-59	60-69	70-79	80+	
0-17	9	12	10	7	4	3	2	0	47
18-29	24	54	45	88	38	16	8	4	277
30-39	5	7	17	57	97	14	8	5	210
40-49	2	2	7	23	70	53	8	0	165
50-59	0	2	4	14	50	97	17	3	187
60-69	0	1	1	5	36	107	94	8	252
70-79	1	3	4	7	38	109	208	87	457
80+	0	0	1	5	16	46	122	120	310
TOTAL	41	81	89	206	349	445	467	227	1905

¹ Age matching is not a consideration for tissue matched grafts

Figure 7.1
SOURCE OF APPLICATIONS FOR REGISTRATION ON THE NHS ORGAN DONOR REGISTER, 1 JANUARY - 31 DECEMBER 2001

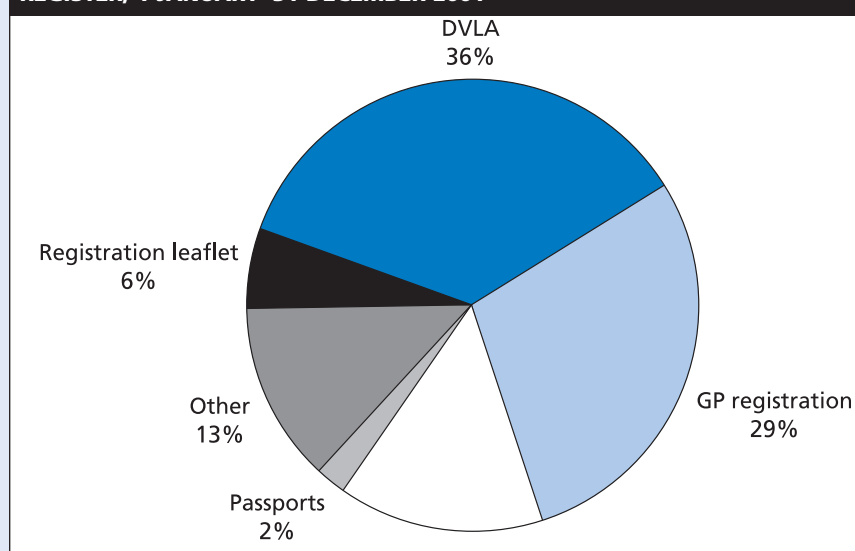


Table 7.1
PREPAREDNESS OF THOSE REGISTERED ON THE NHS ORGAN DONOR REGISTER AT 31 DECEMBER 2001 TO DONATE DIFFERENT ORGANS

Registrants prepared to donate all organs		87%
Of those not prepared to donate all organs ("restricted donors"):		
	% of all	
Not prepared to donate:	"Restricted donors"	Registrants
Kidneys	8	0.7
Pancreas	30	2.7
Heart	28	2.4
Lungs	26	2.3
Liver	16	1.4
Corneas	78	6.8

This information was not available for 4% of the total registered

7

NHS Organ Donor Register

The seventh anniversary of the NHS Organ Donor Register was reached in October 2001 and by the end of the year the Register held 9,025,636 registrations. During 2001 information on the Register was continually reviewed to validate data. There are a number of registration routes: Department of Health registration leaflet readily available in the community; campaigns in both national and regional newspapers and by community groups; leaflets delivered to households (for example with local electoral roll registration); when registering as a patient with a general practitioner (via the Family Health Services Authorities); with driving licence applications and reminders (via the Driver and Vehicle Licensing Agency (DVLA)); from the Passport Agency when applying for a new passport and when applying for a Boots Advantage Card. **Figure 7.1** shows that 29% of registrations in 2001 arrived by means of the Family Health Services Authorities, 36% from the DVLA and 15% through the Boots Advantage Card route.

At the end of 2001, 87% of registrations indicated a willingness to donate all organs and tissue (kidneys, pancreas, heart, lungs, liver and corneas). However, of those who were not willing to donate all organs, the majority (78%) did not wish to donate their corneas. Of the restricted registrations, only 8% (less than 1% of the total Register) did not wish to donate their kidneys. Willingness to donate, by organ type, is shown in **Table 7.1**.

Applications have been received from all parts of the UK. **Figure 7.2** illustrates the proportion of the population registered at the end of 2001 in each of the NHS Regions.

People of all ages are eligible for organ donor registration: the distribution of age at time of registration is shown in **Figure 7.3**. The highest proportion, representing 27% of registrations, are registered in the 21 to 30 years age group. The lowest proportion is the under 11 age group with 2% of registrations.

Of all the registrations on the Organ Donor Register, 46% were male and 54% were female.

Figure 7.2
PROPORTION OF POPULATION REGISTERED ON THE NHS ORGAN DONOR REGISTER BY 31 DECEMBER 2001, BY NHS REGION

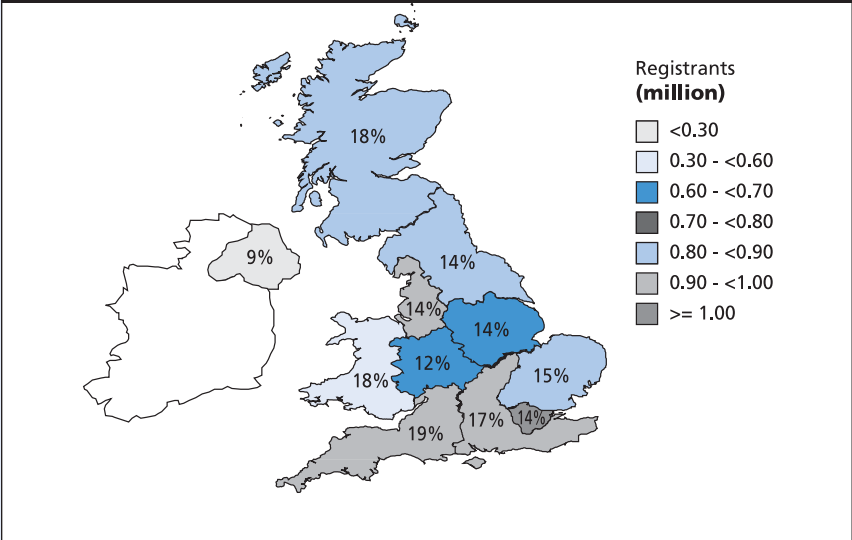
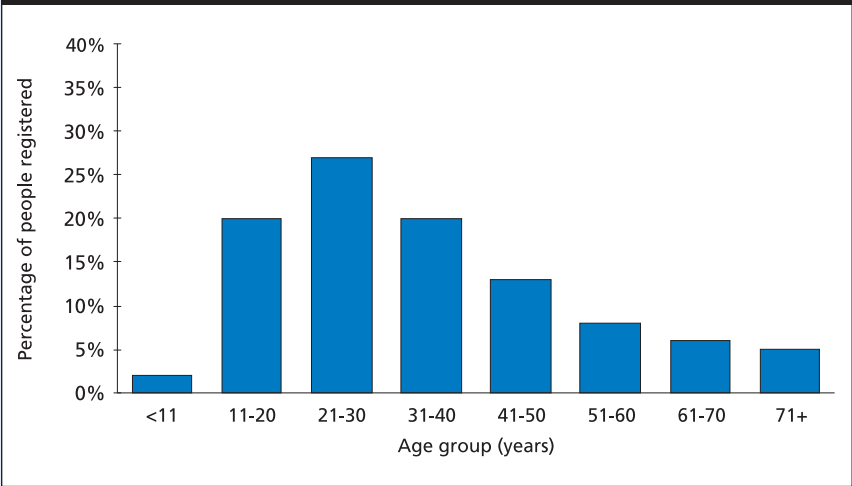


Figure 7.3
AGE OF PEOPLE REGISTERED ON THE NHS ORGAN DONOR REGISTER AT 31 DECEMBER 2001



Appendices

Appendix IA provides details of the 735 cadaveric heartbeating solid organ donors reported in 2001. Details are given for each donating centre and the hospitals have been grouped by current Health Region and country. This Appendix does not reflect regional retrieval rates: for example, in Wales three of the donating hospitals reported are listed under Liverpool for kidney retrievals. *Appendix IB* gives similar information for the 42 cadaveric non-heartbeating solid organ donors. The number of donors per kidney retrieval area is given in *Appendix II*; where the kidneys were not retrieved, donors and organs have been assigned to the retrieval area that would normally have retrieved the kidney. The populations used for kidney, liver and cardiothoracic retrievals per million population (pmp) are given in *Appendices IIIA* and *IIIB*; these populations are based on those given in the *IHSM Health and Social Services Yearbook* for 1999/2000 as data were not complete for all hospitals in the 2001/2002 version.

Numbers of cadaveric heartbeating kidneys retained and exchanged with other centres/alliances are given in *Appendix IV*.

Appendix IA
CADAVERIC HEARTBEATING SOLID ORGAN DONORS AND DONATED ORGANS, 1 JANUARY- 31 DECEMBER 2001,
BY DONATING CENTRE

Donating centre	All donors	Multi-organ donor	Kidney	Heart	Lung	Liver	Pancreas
Northern and Yorkshire							
Ashington, Wansbeck General Hospital	1	1	2	0	0	1	0
Bishop Auckland General Hospital	1	1	2	0	0	1	0
Bradford Royal Infirmary	1	1	2	0	0	1	0
Calderdale Royal Hospital	1	0	0	0	0	1	0
Carlisle, Cumberland Infirmary	2	1	4	0	0	1	0
Darlington Memorial Hospital	4	3	6	1	4	4	0
Dewsbury and District Hospital	1	0	2	0	0	0	0
Halifax, Royal Halifax Infirmary	1	0	2	0	0	0	0
Harrogate District Hospital	2	2	4	0	0	2	0
Hartlepool General Hospital	2	2	4	1	4	1	0
Huddersfield Royal Infirmary	1	1	2	1	1	1	0
Hull Royal Infirmary	4	4	6	1	0	4	0
Leeds General Infirmary	20	19	38	8	6	20	1
Leeds, St James's University Hospital	2	1	0	0	2	2	0
Middlesbrough General Hospital	11	10	19	3	2	11	0
Middlesbrough, South Cleveland Hospital	1	0	2	0	0	0	0
Newcastle General Hospital	25	20	46	7	6	22	0
Newcastle, Freeman Hospital	2	2	4	1	0	1	0
Stockton-on-Tees, North Tees General Hospital	5	5	10	0	0	5	0
Wakefield, Pinderfields General Hospital	2	2	4	0	0	2	0
Whitehaven, West Cumberland Hospital	1	1	2	1	0	1	0
York District Hospital	1	1	1	0	0	1	0
Trent							
Barnsley District General Hospital	3	3	6	0	2	3	0
Boston, Pilgrim Hospital	1	0	0	0	0	1	0
Chesterfield & North Derbyshire Royal Hospital	1	1	2	0	0	1	0
Derby, Derbyshire Royal Infirmary	2	2	4	0	0	2	0
Doncaster Royal Infirmary	2	2	4	1	2	2	0
Grimsby, Diana Princess of Wales Hospital	1	1	2	0	0	1	0
Leicester Royal Infirmary	4	4	8	1	0	4	0
Lincoln County Hospital	1	1	2	0	0	1	0
Nottingham, University Hospital	9	9	18	7	3	9	0
Rotherham, District General Hospital (Rotherham)	3	3	6	0	2	3	1
Sheffield Children's Hospital	3	3	6	2	0	3	0
Sheffield, Northern General Hospital	3	3	6	0	2	3	0
Sheffield, Royal Hallamshire Hospital	7	7	14	3	8	7	0
Sutton-in-Ashfield, King's Mill Hospital	2	1	4	0	0	1	0
Eastern							
Basildon Hospital	2	1	4	0	0	1	0
Bedford Hospital	2	2	4	1	2	2	0
Bury St Edmunds, West Suffolk Hospital	1	1	2	0	0	1	0
Cambridge, Addenbrooke's Hospital	12	12	24	6	4	12	5
Chelmsford, Broomfield Hospital	3	2	6	0	0	2	0
Great Yarmouth, The James Paget Hospital	2	2	4	1	2	2	0
Hemel Hempstead General Hospital	1	1	2	0	0	1	0
Huntingdon, Hinchingbrooke Hospital	1	1	2	0	0	1	0
Ipswich Hospital	1	1	2	1	2	1	0
Luton and Dunstable Hospital	1	1	2	0	0	1	0
Norwich, Norfolk and Norwich Hospital	2	2	4	0	2	2	0
Norwich, West Norwich Hospital	3	3	6	2	2	3	1
Peterborough District Hospital	2	2	4	1	0	2	0
Southend Hospital	2	2	4	1	2	2	0
Stevenage, Lister Hospital	2	1	4	0	0	1	0
Watford General Hospital	2	2	4	1	0	1	0
Welwyn Garden City, Queen Elizabeth II Hospital	1	1	2	1	2	1	0

Appendix IA continued
CADAVERIC HEARTBEATING SOLID ORGAN DONORS AND DONATED ORGANS, 1 JANUARY - 31 DECEMBER 2001,
BY DONATING CENTRE

Donating centre	All donors	Multi-organ donor	Kidney	Heart	Lung	Liver	Pancreas
London							
Barnet General Hospital	1	1	2	0	0	1	0
Carshalton, St Helier Hospital	1	1	2	0	0	1	1
Chelsea and Westminster Hospital	1	0	0	0	0	1	0
Croydon, Mayday Hospital	1	1	2	0	0	1	0
Enfield, Chase Farm Hospital	2	2	4	1	0	1	0
Great Ormond Street Hospital for Children	3	1	4	1	0	1	0
Hillingdon Hospital	1	1	2	0	0	1	0
Isleworth, West Middlesex University Hospital	2	1	4	1	0	0	0
London, Atkinson Morley's Hospital	10	10	20	5	4	10	1
London, Central Middlesex Hospital	2	1	4	1	2	1	0
London, Charing Cross Hospital	14	11	27	3	4	11	2
London, Cromwell Hospital	2	2	4	1	4	2	0
London, Greenwich District Hospital	3	3	6	2	0	3	2
London, Guy's Hospital	3	3	6	1	0	3	0
London, Hammersmith Hospital	1	1	2	0	0	1	0
London, Homerton Hospital	1	1	2	1	2	1	0
London, King's College Hospital	12	11	24	5	4	11	5
London, Lewisham University Hospital	2	1	2	0	0	2	0
London, London Bridge Hospital	1	0	2	0	0	0	0
London, National Hospital for Neurology and Neurosurgery	8	6	16	3	2	6	2
London, St George's Hospital	2	2	4	0	0	2	0
London, St Mary's Hospital	3	2	4	0	0	3	0
London, St Peter's Hospital	1	0	0	0	0	1	0
London, St Thomas' Hospital	4	4	8	2	2	4	1
London, The London Clinic	1	1	2	0	0	1	0
London, The Middlesex Hospital	1	0	0	0	0	1	0
London, The Royal Free Hospital	7	7	14	2	0	6	0
London, The Royal London Hospital (Whitechapel)	8	7	14	4	4	7	4
London, Whittington Hospital	1	1	2	0	0	1	0
Romford, Oldchurch Hospital	12	11	24	2	6	11	2
Uxbridge, Hillingdon Hospital	5	5	10	1	4	4	0
South East							
Ashford, William Harvey Hospital	3	3	6	0	0	3	1
Aylesbury, Stoke Mandeville Hospital	2	1	4	0	0	1	0
Basingstoke, North Hampshire Hospital	1	1	2	0	2	1	0
Brighton, Royal Sussex County Hospital	5	4	10	1	2	4	0
Camberley, Frimley Park Hospital	5	5	9	1	4	5	1
Canterbury, Kent and Canterbury Hospital	1	1	2	0	2	1	0
Chertsey, St Peter's Hospital	2	2	4	1	4	2	1
Chichester, St Richard's Hospital	4	3	8	1	2	3	1
Crawley Hospital	1	1	2	0	0	1	0
Dartford, Darent Valley Hospital	2	2	4	1	0	2	0
Eastbourne District General Hospital	4	4	8	4	2	4	1
Epsom General Hospital	2	2	4	0	0	2	0
Gillingham, Medway Hospital	6	5	12	3	2	5	2
Guildford, Royal Surrey County Hospital	2	2	4	0	0	2	0
Haywards Heath, Hurstwood Park Neurological Centre	2	2	4	1	2	2	0
Haywards Heath, Princess Royal Hospital (East Wing)	1	1	2	0	0	1	0
High Wycombe, Wycombe Hospital	3	3	6	2	0	3	0
Kettering General Hospital	4	4	8	0	2	3	0
Maidstone Hospital	2	2	4	0	0	2	0
Margate, The Queen Elizabeth the Queen Mother Hospital	3	3	6	2	4	3	1
Milton Keynes General Hospital	2	2	4	1	0	2	0
Newport, St Mary's Hospital (Isle of Wight)	3	3	6	1	0	3	0
Northampton General Hospital	1	1	2	1	0	1	0
Oxford, Radcliffe Infirmary	5	5	10	0	2	5	0
Oxford, The John Radcliffe	9	7	16	7	2	8	1
Portsmouth, Queen Alexandra Hospital	6	4	10	2	2	5	2
Redhill, East Surrey Hospital	1	1	2	0	2	1	0

Appendix IA continued
CADAVERIC HEARTBEATING SOLID ORGAN DONORS AND DONATED ORGANS, 1 JANUARY- 31 DECEMBER 2001,
BY DONATING CENTRE

Donating centre	All donors	Multi-organ donor	Kidney	Heart	Lung	Liver	Pancreas
South East continued							
Slough, Wexham Park Hospital	1	1	2	1	0	1	0
Southampton University Hospitals	15	15	30	5	10	15	2
Tunbridge Wells, Kent and Sussex Hospital	2	0	2	0	0	1	0
Winchester, Royal Hampshire County Hospital	1	1	2	0	0	1	0
Worthing Hospital	1	1	0	0	2	1	0
South West							
Barnstaple, North Devon District Hospital	1	1	2	1	0	1	0
Bath, Royal United Hospital	1	1	2	1	0	1	0
Bournemouth, Royal Bournemouth General Hospital	2	2	4	0	2	2	0
Bristol Royal Hospital for Children	3	3	6	2	2	3	0
Bristol Royal Infirmary	3	3	6	0	0	3	0
Bristol, Frenchay Hospital	8	8	16	6	10	8	0
Bristol, Southmead Hospital	1	1	2	0	0	1	0
Cheltenham General Hospital	3	3	6	1	0	3	0
Exeter, Royal Devon & Exeter Hospital (Wonford)	2	1	4	0	2	1	0
Gloucester, Gloucestershire Royal Hospital	2	2	4	1	2	2	0
Plymouth, Derriford Hospital	17	17	34	1	6	17	0
Poole General Hospital	1	1	2	0	0	1	1
Salisbury District Hospital	2	2	4	1	0	2	1
Swindon, Princess Margaret Hospital	4	4	8	1	0	4	1
Taunton & Somerset Hospital (Musgrove Park Branch)	3	3	6	1	2	3	0
Torquay, Torbay Hospital	1	1	2	0	0	1	0
Truro, Royal Cornwall Hospital (Treliske)	5	5	10	2	4	4	0
Yeovil District Hospital	1	1	2	0	0	1	0
West Midlands							
Birmingham Children's Hospital	1	1	2	0	0	1	0
Birmingham, Queen Elizabeth Hospital	6	6	12	1	0	6	0
Birmingham, Selly Oak Hospital	5	5	10	2	0	5	0
Burton-on-Trent, Queen's Hospital	3	3	6	0	0	3	0
Coventry, Walsgrave Hospital	6	3	12	0	0	3	0
Dudley, Russell's Hall Hospital	5	5	10	2	2	5	0
Hereford, County Hospital (Hereford)	2	1	4	0	0	1	0
Nuneaton, George Eliot Hospital	2	1	4	1	2	1	0
Redditch, Alexandra Hospital	1	1	2	0	0	1	0
Rugby, Hospital of St Cross	1	0	2	0	0	0	0
Shrewsbury, Royal Shrewsbury Hospital	2	2	4	1	0	2	0
Stafford General Hospital	2	2	4	1	0	2	0
Stoke City General Hospital	2	2	4	1	0	2	0
Stoke, North Staffordshire Royal Infirmary	9	8	15	1	5	9	0
Sutton Coldfield, Good Hope Hospital	1	1	2	1	0	1	0
Telford, Princess Royal Hospital	2	2	4	0	0	2	0
Walsall Manor Hospital	2	1	4	1	0	1	0
Warwick, South Warwickshire Hospital	5	5	10	2	0	4	0
West Bromwich, Sandwell General Hospital	3	3	6	0	0	3	0
Wolverhampton, New Cross Hospital	2	2	4	0	0	2	0
North West							
Barrow-in-Furness, Furness General Hospital	1	1	2	1	0	1	1
Blackburn Royal Infirmary	2	1	4	0	0	1	0
Blackpool Victoria Hospital	2	2	4	1	0	2	0
Bolton Royal Infirmary	2	1	4	0	0	1	0
Burnley General Hospital	1	1	2	1	0	1	0
Bury General Hospital	1	0	0	0	0	1	0
Chester, Countess of Chester Hospital	2	2	4	0	0	2	0
Crewe, Leighton Hospital	2	1	4	0	2	1	1
Lancaster, Royal Lancaster Hospital	2	1	4	0	0	1	0
Liverpool, Cardiothoracic Centre Liverpool	1	1	2	0	0	1	0

Appendix IA continued
CADAVERIC HEARTBEATING SOLID ORGAN DONORS AND DONATED ORGANS, 1 JANUARY - 31 DECEMBER 2001,
BY DONATING CENTRE

Donating centre	All donors	Multi-organ donor	Kidney	Heart	Lung	Liver	Pancreas
North West continued							
Liverpool, Royal Liverpool University Hospital	4	2	8	1	0	2	0
Liverpool, University Hospital Aintree	2	2	4	0	1	2	0
Liverpool, Walton Hospital	6	5	10	2	4	6	1
Macclesfield District General Hospital	1	1	2	0	0	1	0
Manchester, North Manchester General Hospital	3	3	6	1	3	3	1
Manchester, Royal Manchester Children's Hospital	2	2	4	0	1	2	1
Manchester, Trafford General Hospital	1	1	1	0	0	1	0
Manchester, Withington Hospital	3	3	6	2	0	3	0
Manchester, Wythenshawe Hospital	1	1	2	1	0	0	0
Ormskirk & District General Hospital	2	1	4	0	0	1	0
Prescot, Whiston Hospital	2	2	4	0	0	2	1
Preston, Royal Preston Hospital	10	10	18	1	2	10	1
Royal Bolton Hospital	2	0	0	0	0	2	0
Salford, Hope Hospital	10	8	18	3	2	9	3
Southport General Infirmary	1	0	1	0	0	0	0
Stockport, Stepping Hill Hospital	3	2	6	0	0	2	1
Warrington Hospital NHS Trust	2	1	4	1	0	1	0
Wigan, Royal Albert Edward Infirmary	9	6	15	0	2	7	0
Wirral, Arrowe Park Hospital	4	0	4	1	0	1	0
TOTAL (England)	597	518	1124	172	204	531	55
Wales							
Abergavenny, Nevill Hall Hospital	2	2	3	0	0	2	0
Bangor, Ysbyty Gwynedd	2	2	4	0	0	2	0
Bodelwyddan, Glan Clwyd District General Hospital	3	3	6	1	0	3	0
Bridgend, Princess of Wales Hospital	1	1	2	0	2	1	0
Cardiff, University Hospital of Wales	12	10	22	3	4	11	0
Carmarthen, West Wales General Hospital	3	2	6	1	0	2	0
Llanelli, Prince Philip Hospital	2	2	4	1	0	2	0
Merthyr Tydfil, Prince Charles Hospital	1	0	1	0	0	0	0
Newport, Royal Gwent Hospital	3	3	6	0	0	3	0
Penarth, Llandough Hospital	1	1	2	0	0	1	0
Pontypridd, East Glamorgan General Hospital	1	1	2	0	0	1	0
Swansea, Morriston Hospital	6	5	12	0	0	5	0
Wrexham, Maelor General Hospital	3	2	6	2	0	2	0
TOTAL (Wales)	40	34	76	8	6	35	0
Scotland							
Aberdeen, Royal Infirmary	7	6	14	0	0	6	2
Airdrie, Monklands District General Hospital	1	1	2	0	0	1	0
Dumfries and Galloway Royal Infirmary	1	1	2	1	0	1	1
Dundee, Ninewells Hospital	5	4	9	1	0	4	0
Dunfermline, Queen Margaret Hospital	3	3	6	0	0	3	0
East Kilbride, Hairmyres Hospital	1	1	2	1	2	1	0
Edinburgh, Royal Hospital for Sick Children (Edinburgh)	1	1	2	1	0	1	0
Edinburgh, Western General Hospital	12	11	24	2	2	11	2
Falkirk and District Royal Infirmary	1	1	2	0	0	1	0
Glasgow Royal Infirmary	1	0	1	0	0	0	0
Glasgow, Royal Hospital for Sick Children	1	1	2	0	0	1	0
Glasgow, Southern General Hospital	10	10	20	2	8	10	1
Glasgow, Stobhill General Hospital	2	2	4	0	0	2	1
Glasgow, Victoria Infirmary	2	2	4	2	2	2	0
Glasgow, Western Infirmary	2	2	4	1	2	2	1
Greenock, Inverclyde Royal Hospital	1	1	2	0	0	1	0
Inverness, Raigmore Hospital	5	3	8	0	0	4	0
Kilmarnock, Crosshouse Hospital	1	1	2	0	2	1	0
Livingstone, St John's Hospital at Howden	2	2	4	1	1	2	2

Appendix IA continued
CADAVERIC HEARTBEATING SOLID ORGAN DONORS AND DONATED ORGANS, 1 JANUARY- 31 DECEMBER 2001,
BY DONATING CENTRE

Donating centre	All donors	Multi-organ donor	Kidney	Heart	Lung	Liver	Pancreas
Scotland continued							
Melrose, Borders General Hospital	4	4	7	0	2	4	0
Stirling Royal Infirmary	1	1	2	0	2	1	0
Wishaw General Hospital	1	1	2	0	0	1	0
TOTAL (Scotland)	65	59	125	12	23	60	10
Northern Ireland							
Antrim Hospital	1	1	2	1	2	1	0
Belfast, Royal Victoria Hospital	21	18	40	4	5	18	0
Belfast, The Ulster Hospital	1	0	2	0	0	0	0
Coleraine Hospital	1	1	2	0	0	1	0
Craigavon Area Hospital	2	1	3	1	2	1	0
Enniskillen, Erne Hospital	2	2	4	0	0	2	0
Londonderry, Altnagelvin Area Hospital	5	5	10	2	1	5	0
TOTAL (Northern Ireland)	33	28	63	8	10	28	0

Appendix IB
CADAVERIC NON-HEARTBEATING SOLID ORGAN DONORS AND DONATED ORGANS, 1 JANUARY- 31 DECEMBER 2001, BY DONATING CENTRE

Donating centre	All donors	Multi-organ donor	Kidney	Liver
Northern and Yorkshire				
Carlisle, Cumberland Infirmary	1	0	2	0
Bishop Auckland General Hospital	1	0	2	0
Gateshead, Queen Elizabeth Hospital	4	0	8	0
Newcastle, General Hospital	10	0	20	0
Newcastle, Freeman Hospital	1	0	2	0
TOTAL	17	0	34	0
Trent				
Leicester Royal Infirmary	1	0	2	0
Grantham & Kesteven General Hospital	1	0	2	0
TOTAL	2	0	4	0
Eastern				
Cambridge, Addenbrooke's Hospital	7	0	13	0
Luton and Dunstable Hospital	1	0	2	0
TOTAL	8	0	15	0
London				
Sidcup, Queen Mary's Hospital	1	0	2	0
London, St Thomas' Hospital	3	0	2	2
London, King's College Hospital	1	0	2	0
London, Guy's Hospital	1	0	0	1
London, Lewisham University Hospital	1	1	2	1
London, St George's Hospital	1	0	2	0
TOTAL	8	1	10	4
South East				
Dartford, Darent Valley Hospital	4	3	8	3
Maidstone Hospital	1	0	2	0
Gillingham, Medway Hospital	1	0	2	0
Redhill, East Surrey Hospital	1	0	2	0
TOTAL	7	3	14	3

Appendix II
NUMBER OF HEARTBEATING DONORS AND ORGANS RETRIEVED, 1 JANUARY - 31 DECEMBER 2001, BY KIDNEY RETRIEVAL AREA

Kidney retrieval area	All donors	pmp	Multi-organ donors	pmp	Kidney	Heart	Lung	Liver	Pancreas
Newcastle	55	18.7	46	15.6	101	14	16	48	0
Leeds	37	9.8	32	8.5	63	10	9	35	1
Leicester	12	5.6	11	5.1	22	2	2	11	0
Nottingham	13	9.4	12	8.6	26	7	3	12	0
Sheffield	22	11.7	22	11.7	44	6	16	22	1
Cambridge	25	10.5	25	10.5	50	11	14	25	6
North Thames	91	12.7	73	10.2	169	25	32	72	10
South Thames	84	12.5	77	11.4	161	29	36	79	17
Portsmouth	32	14.0	29	12.7	62	10	16	30	6
Oxford	31	10.4	28	9.4	60	14	6	29	2
Bristol	23	11.7	22	11.2	46	11	16	22	0
Plymouth	26	14.6	26	14.6	52	3	12	25	1
Birmingham	48	10.6	45	10.0	93	11	7	46	0
Coventry	14	17.5	9	11.3	28	3	2	8	0
Liverpool	37	11.2	25	7.6	67	8	7	27	3
Manchester	55	13.6	43	10.6	96	11	10	47	8
Cardiff	32	14.1	27	11.9	60	5	6	28	0
Glasgow	26	9.6	25	9.2	51	7	18	25	4
Aberdeen	12	15.4	9	11.5	22	0	0	10	2
Edinburgh	27	16.9	25	15.6	52	5	5	25	4
Belfast	33	19.9	28	16.9	63	8	10	28	0
TOTAL	735	12.4	639	10.8	1388	200	243	654	65

Appendix IIIA
RETRIEVAL POPULATIONS FOR KIDNEY CENTRES, 2001/2002 (BASED ON IHSM HEALTH AND SOCIAL SERVICES YEARBOOK FOR 1999/2000¹)

Kidney centre	Retrieval population (million)²	Adjustments³	
Newcastle	2.94		
Leeds	3.76	+0.32	(South Humber HA)
Leicester	2.14	+0.30	(Kettering)
		+0.28	(Peterborough)
Nottingham	1.39		
Sheffield	1.88	-0.32	(South Humber HA)
Cambridge	2.39	-0.28	(Peterborough)
		-0.49	(North & East Herts HA)
		-0.89	(North Essex HA)
		-0.70	(South Essex HA)
		-0.52	(West Herts HA)
North Thames	7.19	+0.27	(Slough)
		+0.49	(North & East Herts HA)
		+0.89	(North Essex HA)
		+0.70	(South Essex HA)
		+0.52	(West Herts HA)
South Thames	6.73	+0.56	(West Sussex HA – Chichester)
		+0.59	(East Kent HA)
		+0.41	(East Surrey HA)
		+0.75	(East Sussex HA)
		+0.96	(West Kent HA)
		+0.63	(West Surrey)
		+0.08	(Jersey HA)
Portsmouth	2.29	+0.30	(Salisbury)
		+0.06	(Guernsey HA)
Oxford	2.99	+0.56	(Gloucestershire HA)
		+0.30	(Swindon)
		-0.30	(Kettering)
		-0.27	(Slough)
		-0.75	(East Sussex HA)
		-0.96	(West Kent HA)
		-0.63	(West Surrey HA)
		-0.41	(East Surrey HA)
		-0.59	(East Kent HA)
		-0.56	(West Sussex HA – Chichester)
Bristol	1.96	-0.56	(Gloucestershire HA)
		-0.60	(Wiltshire HA)
Plymouth	1.78		
Birmingham	4.51		
Coventry	0.80		
Liverpool	3.30	+0.66	(North Wales HA)
		+0.07	(Isle of Man HA)
Manchester	4.05		
Total (England)	50.10		
Cardiff	2.27	-0.66	(North Wales HA)
Total (Wales)	2.27		
Glasgow	2.72		
Aberdeen	0.78		
Edinburgh	1.60		
Total (Scotland)	5.11		
Belfast	1.66		
Total (Northern Ireland)	1.66		
TOTAL (UK)	59.14		

¹ Data from the 2001/2002 IHSM Health and Social Services Yearbook were not complete for all hospitals

² After adjustments have been made

³ Hospitals or Health Authorities in another centre's region. Pro rata adjustments made when retrieval arrangements changed during the year and similarly when a Health Authority is split across centres

Appendix IIIB RETRIEVAL POPULATION FOR LIVER AND CARDIOTHORACIC ZONES 2001/2002 (BASED ON IHSM HEALTH AND SOCIAL SERVICES YEARBOOK FOR 1999/2000¹)

Liver Zone	Retrieval population (million)
Newcastle	3.25
Leeds	8.81
Cambridge	8.05
The Royal Free	5.64
King's College	14.42
Birmingham	13.86
Edinburgh	5.11

Cardiothoracic Zone	Retrieval population (million)
Newcastle	7.51
Sheffield	4.27
Papworth	9.36
Harefield	12.38
St George's	6.83
Birmingham	7.14
Manchester	6.54
Glasgow	5.11

¹ Data from the 2001/2002 IHSM Health and Social Services Yearbook were not complete for all hospitals

Appendix IV CADAVERIC HEARTBEATING KIDNEYS RETAINED AND EXCHANGED WITH OTHER CENTRES/ALLIANCES, 1 JANUARY - 31 DECEMBER 2001

Centre/Alliance	Retained		Given to another centre/alliance		Received from another centre/alliance		Balance
	Used	Not used	Used	Not used	Used	Not used	
Cambridge, Addenbrooke's Hospital	27	1	21	1	26	0	-4
Great Ormond Street	0	0	0	0	12	0	-12
Birmingham, Queen Elizabeth Hospital	36	5	49	3	41	0	11
Coventry, Walsgrave Hospital	12	2	14	0	10	1	3
North Thames	94	2	73	0	66	2	5
South Thames	85	10	64	2	61	0	5
Scotland and Northern Ireland Alliance	107	5	75	1	46	0	30
North of England Alliance	204	11	111	1	143	4	-35
Trent Alliance	45	2	44	1	45	2	-2
South, West and Wales Alliance ¹	166	8	104	2	105	2	-1
TOTAL (UK)	776	46	555	11	555	11	

Figures use year of donation, not year of transplant

¹ Activity in this table has assumed the alliance was in place for the whole year

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