

# The National Organ Retrieval Service and Usage of Organs

## Key messages

- National Organ Retrieval Service teams attended 789 possible DBD donors and 898 possible DCD donors; 98% of these DBD donors and 73% of these DCD donors attended, proceeded to donation
- Overall, 54% of organs offered from those donors that did proceed were transplanted, but individually, these rates were 85% for kidneys, 62% for livers, 24% for pancreases, 35% for hearts, 15% for lungs and 10% for bowels
- Overall, 83% of organs retrieved were transplanted, but individually, these rates were 88% for kidneys, 79% for livers, 47% for pancreases, 98% for hearts, 91% for lungs and 96% for bowels
- The number of deceased donors per million of population was 21.3, however 5% of actual donors resulted in no organ transplants, the same as the previous year

## 4.1 The National Organ Retrieval Service (NORS)

There are 16 NORS teams in total, ten abdominal and six cardiothoracic. On 6 January 2020, the abdominal aspect of the service increased capacity to eight abdominal NORS teams available to retrieve organs from deceased donors in the UK for transplantation, at any given time. Prior to this change there were seven abdominal teams available. Three cardiothoracic NORS teams are available at any given time, an arrangement that has been in place since April 2016.

NORS teams are mobilised using a sequence. The first and second teams in the sequence are defined for each UK hospital (largely based on travel times but adjusted to give a more even workload across NORS teams), while subsequent teams in the sequence are ordered based on travel time and availability, known as 'closest available'.

If a team is first in sequence for a particular donor hospital, they are required to attend possible donors at that hospital within an agreed timescale if at least one organ has been accepted for transplantation. If the team is already retrieving when they are called to attend, then a second team is called in to retrieve and so on.

The number of possible DBD and DCD donors that were attended by each of the teams in 2022-2023 is shown in **Table 4.1**. The geographical distribution of donors and the on-call arrangements lead to variation in these numbers across teams. The figures are broken down by whether the possible donor proceeded to organ donation (proceeding donors) or not. Non-proceeding donors are more common in the pool of potential DCD donors as prolonged time to death after treatment withdrawal can result in unsuitability of organs for transplantation. A small number of possible donors may be attended by local kidney transplant teams. This is typically for DCD donors when only the kidneys have been accepted for transplantation and the teams are appropriately reimbursed if they are willing and able to retrieve.

**Table 4.1 Number of proceeding and non-proceeding donors attended by each NORS team in the UK, 1 April 2022 – 31 March 2023**

NORS team	DBD				DCD			
	Proceeding <sup>2</sup>	Non-proceeding	% non-proc	No. attended	Proceeding <sup>2</sup>	Non-proceeding	% non-proc	No. attended
<b>Abdominal</b>								
Birmingham <sup>1</sup>	92	3	3	95	79	22	22	101
Cambridge	78	4	5	82	107	45	30	152
Cardiff <sup>1</sup>	22	-	-	22	32	6	16	38
Edinburgh	60	2	3	62	70	21	23	91
King's	136	3	2	139	82	25	23	107
Leeds <sup>1</sup>	68	-	-	68	64	29	31	93
Manchester <sup>1</sup>	79	1	1	80	58	27	32	85
Newcastle	73	1	1	74	48	24	33	72
Oxford <sup>1</sup>	80	3	4	83	56	24	30	80
Royal Free <sup>1</sup>	80	1	1	81	60	17	22	77
<b>Abdominal total</b>	<b>768</b>	<b>18</b>	<b>2</b>	<b>786</b>	<b>656</b>	<b>240</b>	<b>27</b>	<b>896</b>
<b>Cardiothoracic<sup>1</sup></b>								
Birmingham	42	34	45	76	7	10	59	17
Glasgow	20	10	33	30	11	8	42	19
Harefield	43	28	39	71	26	24	48	50
Manchester	30	26	46	56	5	6	55	11
Newcastle	27	20	43	47	2	9	82	11
Papworth	29	26	47	55	36	32	47	68
<b>Cardiothoracic total</b>	<b>191</b>	<b>144</b>	<b>43</b>	<b>335</b>	<b>87</b>	<b>89</b>	<b>51</b>	<b>176</b>
<b>Total donors attended</b>	<b>771</b>	<b>18</b>	<b>2</b>	<b>789</b>	<b>657</b>	<b>241</b>	<b>27</b>	<b>898</b>

<sup>1</sup> Part-time teams

<sup>2</sup> For abdominal, at least one abdominal organ retrieved. For cardiothoracic, at least one cardiothoracic organ retrieved

For more detailed information regarding the National Organ Retrieval Service and individual team activity, an annual NORS report is available here: <https://www.odt.nhs.uk/statistics-and-reports/annual-national-organ-retrieval-service-report/>

## 4.2 Retrieval and usage of organs

The number of 'consented' donors ('authorised' donors in Scotland) and 'offered' donors (where at least one organ was offered for transplant) are shown in **Table 4.2**. Note that organs are not always offered from 'consented' donors, e.g. because the donor's condition deteriorates, or it is discovered the donor is unsuitable for organ donation. The number of organs offered from 'offered' donors is also shown. Each year a number of actual organ donors result in no transplants. Donors resulting in at least one transplant are termed 'utilised' donors and the number of actual and utilised donors is shown in **Table 4.2**. The number of donors per million of population (pmp) is also shown. In 2022-2023, 6% of actual donors resulted in no organ transplants, the same as the previous year.

<b>Table 4.2 Consented, offered, actual and utilised deceased donors in the UK, 1 April 2022 - 31 March 2023</b>						
	<b>DBD (pmp)</b>		<b>DCD (pmp)</b>		<b>Total (pmp)</b>	
Consented donors <sup>1</sup>	834	(12.4)	1068	(15.9)	1902	(28.4)
Offered donors <sup>2</sup>	803	(12.0)	978	(14.6)	1781	(26.6)
<i>Kidneys offered</i>	1556		1912		3468	
<i>Livers offered</i>	778		912		1690	
<i>Pancreases offered</i>	491		323		814	
<i>Bowels offered</i>	243		1		244	
<i>Hearts offered</i>	458		184		642	
<i>Lungs offered</i>	880		742		1622	
Actual donors <sup>3</sup>	772	(11.5)	657	(9.8)	1429	(21.3)
Utilised donors <sup>4</sup>	753	(11.2)	600	(9.0)	1353	(20.2)

<sup>1</sup> Consented donors defined as patients where consent for at least one organ was given  
<sup>2</sup> Offered donors defined as donors where one or more organs were offered for transplantation  
<sup>3</sup> Actual donors defined as donors where one or more organs were retrieved  
<sup>4</sup> Utilised donors defined as donors where one or more organs were retrieved and transplanted

There were 1,429 actual deceased organ donors in 2022-2023, but not all organs from these donors were offered for transplantation. **Table 4.3** shows the number of organs offered, retrieved and transplanted from the 772 DBD and 657 DCD actual donors. The number of organs from these donors that were subsequently used for research purposes is also shown. The number of organs offered for transplantation excludes those where the donor did not meet the nationally agreed age criteria for suitability for donation of that specific organ. There are no nationally agreed age criteria for kidney and liver donation.

**Table 4.3 Donation and transplantation of organs from 1,429 deceased donors in the UK, 1 April 2022 - 31 March 2023**

Organ	Organs meeting initial suitability criteria and offered for transplantation	Organs retrieved for transplantation		Organs transplanted			Organs used for research (from actual organ donors)
		N	% of offered	N	% of retrieved	% of offered	
<b>DBD donor organs</b>							
Kidney	1502	1428	95	1308	92	87	74
Liver	750	700	93	601	86	80	53
Pancreas	478	247	52	122	49	26	62
Bowel	237	25	11	24	96	10	0
Heart	444	153	34	152	99	34	0
Lung	858	132	15	125	95	15	6
<b>Total</b>	<b>4269</b>	<b>2685</b>	<b>63</b>	<b>2332</b>	<b>87</b>	<b>55</b>	<b>195</b>
<b>DCD donor organs</b>							
Kidney	1295	1267	98	1067	84	82	112
Liver	617	374	61	249	67	40	59
Pancreas	239	110	46	47	43	20	27
Heart	140	58	41	55	95	39	2
Lung	506	86	17	73	85	14	10
<b>Total</b>	<b>2798</b>	<b>1895</b>	<b>68</b>	<b>1491</b>	<b>79</b>	<b>53</b>	<b>210</b>
<b>Deceased donor organs</b>							
Kidney	2797	2695	96	2375	88	85	186
Liver	1367	1074	79	850	79	62	112
Pancreas	717	357	50	169	47	24	89
Bowel	238	25	11	24	96	10	0
Heart	584	211	36	207	98	35	2
Lung	1364	218	16	198	91	15	16
<b>Total</b>	<b>7067</b>	<b>4580</b>	<b>65</b>	<b>3823</b>	<b>83</b>	<b>54</b>	<b>405</b>

Suitability Criteria:

Pancreas: donors with a BMI  $\leq 40$  or aged  $\leq 60$  years (DBD) or aged  $\leq 55$  years (DCD)

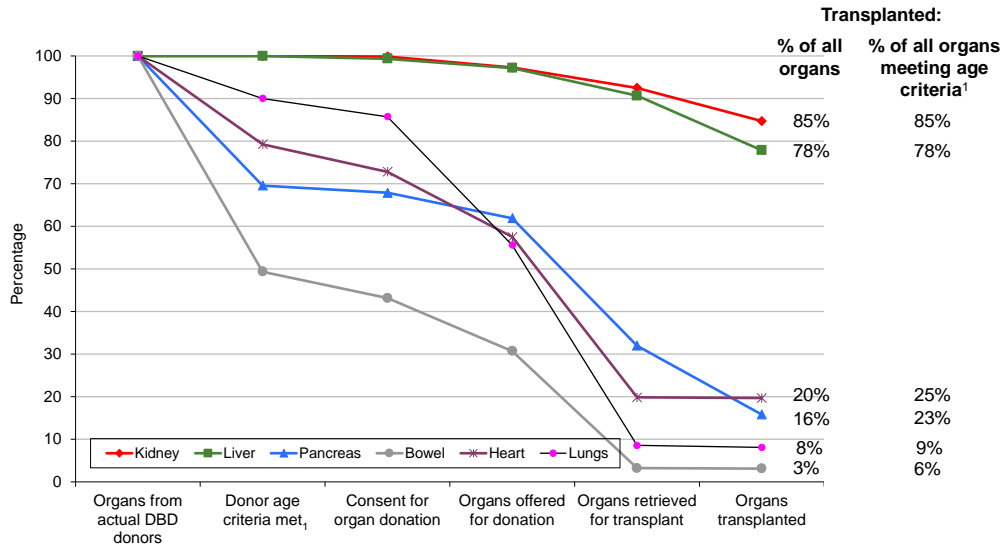
Bowel: donors aged  $< 60$  years or weighting  $< 90\text{kg}$

Heart: donors aged  $< 65$  years (DBD) or aged  $< 55$  years (DCD) or died due to myocardial infarction (DBD)

Lung: donors aged  $< 70$  years

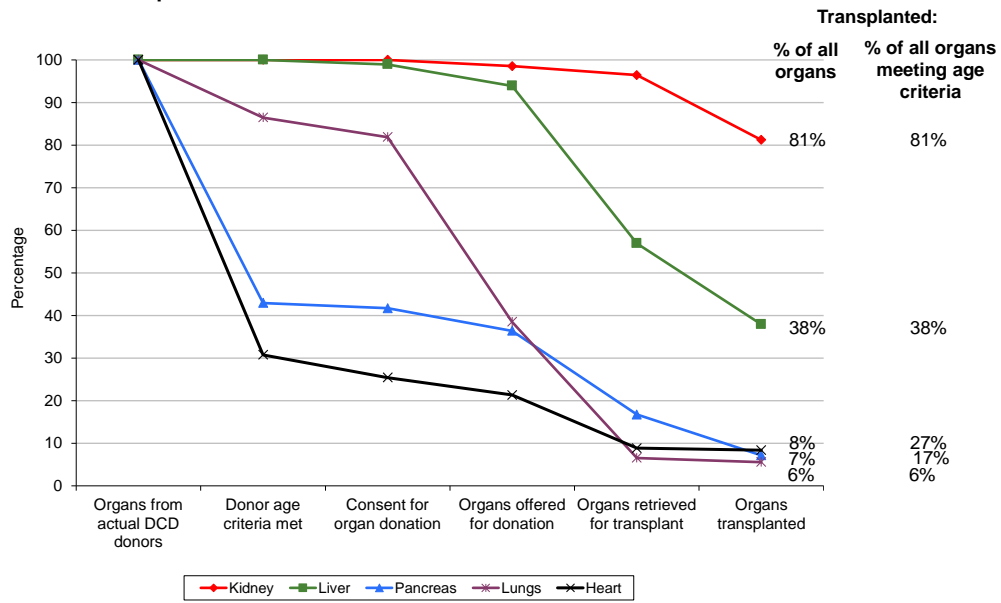
**Figures 4.1 and 4.2** show line graphs of the pathway for all donor organs through to transplantation. The charts start at 100% for each organ, representing all organs from the 772 DBD and 657 DCD donors. The proportion of these organs where any national donor age criteria are met is then shown, followed by the proportion with consent, the proportion offered, the proportion retrieved and finally the proportion transplanted. For example, **Figure 4.2** shows that 81% of the kidneys from the 657 DCD donors were transplanted. Transplantation rates for kidneys and livers are generally high, while for other organs, even after allowing for the agreed age criteria, the rates are generally low.

**Figure 4.1 Donation and transplantation rates of organs from DBD organ donors in the UK, 1 April 2022 – 31 March 2023**



<sup>1</sup> Hearts – in addition to age criteria, donors who died due to myocardial infarction are excluded  
 Bowels – in addition to age criteria, donors who weigh >=90kg are excluded

**Figure 4.2 Donation and transplantation rates of organs from DCD organ donors in the UK, 1 April 2022 – 31 March 2023**



Reasons for organs not being offered for transplantation, being offered but not accepted and being retrieved but not subsequently transplanted are shown in **Table 4.4** and **Table 4.5** for abdominal organs from DBD and DCD donors, respectively. **Table 4.6** shows the same information for cardiothoracic organs. Reasons for the medical unsuitability of an organ include infections, tumours, anatomy and disease. Non-medical reasons include donor size and donor instability. Clinical unsuitability of an organ encompasses poor perfusion, prolonged ischaemia, past history of the donor and, in the case of pancreases for islet usage, insufficiency of viable islet yield. Reasons reported under 'other' primarily include recipient related issues (such as no suitable recipients), but may also include logistical reasons and un-coded reasons reported of a miscellaneous nature. Note that reasons associated with the COVID-19 pandemic may also be included under either medical unsuitability or 'other'.

These tables also show the number of organs from UK donors that were transplanted overseas. These organs were not accepted for transplantation by any UK transplant centre, but were accepted for suitable recipients identified elsewhere, usually in Europe. In 2022-2023 only a small number of livers, hearts and lungs were exported for transplantation outside the UK. Organs from outside the UK are occasionally imported for transplant. Further information on the import and export of organs can be found in **Appendix IV**.

The percentage of organs retrieved that were not transplanted are shown in **Figure 4.3**, **Figure 4.4**, **Figure 4.5**, **Figure 4.6** and **Figure 4.7** for kidneys, livers, pancreases, hearts, and lungs respectively. The rates are shown over the last decade. Some organs are found not to be suitable for transplantation after they have been retrieved and this 'non-utilisation rate' is generally increasing over time for each organ, reflecting the ageing donor population. Many organs retrieved but found not to be suitable for transplantation are instead used for research (with appropriate consent).

**Table 4.4 Reasons for non-retrieval and non-use of abdominal organs from DBD donors in the UK, 1 April 2022 - 31 March 2023**

	Kidney	Liver	Pancreas	Bowel
<b>All actual DBD organ donors</b>	<b>772</b>	<b>772</b>	<b>772</b>	<b>772</b>
Donors from whom organs not offered for donation	20	22	294	533
<b>Reasons for organs not being offered<sup>1</sup></b>				
Family permission refused	0	1	7	38
Permission refused by coroner	0	4	4	4
Permission refused other	1	0	2	6
Donor unsuitable - medical	0	0	0	2
Donor unsuitable - non-medical	2	0	20	10
Donor unsuitable - age	0	0	204	4
Organ unsuitable - clinical	10	13	46	29
Poor function	6	1	1	6
Donor age >=60 or donor weight >=90kg	-	-	-	388
Other	1	3	10	46
<b>Organs offered for donation</b>	<b>1502</b>	<b>750</b>	<b>478</b>	<b>237</b>
<b>Organs not retrieved (% of organs offered for donation)</b>	<b>74 (5)</b>	<b>50 (7)</b>	<b>231 (48)</b>	<b>212 (89)</b>
Donor unsuitable - medical	7	5	14	16
Donor unsuitable - non-medical	0	1	28	24
Donor unsuitable - age	16	0	25	24
Organ unsuitable - clinical	36	27	113	67
Poor function	10	4	17	11
Other	5	13	34	70
<b>Organs retrieved (% of organs offered for donation)</b>	<b>1428 (95)</b>	<b>700 (93)</b>	<b>247 (52)</b>	<b>25 (11)</b>
Organs transplanted in the UK	1308	601	122	24
Organs transplanted overseas	0	2	0	0
Organs not transplanted	120	99	125	1
<b>Reasons for organ not being transplanted</b>				
Donor unsuitable - medical	39	11	19	0
Donor unsuitable - non-medical	0	3	0	0
Donor unsuitable - age	1	0	1	0
Organ unsuitable - clinical	34	43	64	0
Poor function	2	10	2	0
Other	44	32	39	1
<b>TOTAL ORGANS RETRIEVED, NOT TRANSPLANTED (Number used for research)</b>	<b>120 (71)</b>	<b>99 (53)</b>	<b>125 (62)</b>	<b>1 (0)</b>

<sup>1</sup> Includes donors whose organ may have been offered but are outside of organ specific criteria



**Table 4.5 Reasons for non-retrieval and non-use of abdominal organs from DCD donors in the UK, 1 April 2022 - 31 March 2023**

	Kidney	Liver	Pancreas
<b>All actual DCD organ donors</b>	<b>657</b>	<b>657</b>	<b>657</b>
Donors from whom organs not offered for donation	9	40	418
<b>Reasons for organs not being offered<sup>1</sup></b>			
Family permission refused	0	3	4
Permission refused by coroner	0	3	2
Permission refused other	0	1	2
Donor unsuitable - medical	0	0	1
Donor unsuitable - non-medical	0	3	20
Donor unsuitable - age	0	4	329
Organ unsuitable - clinical	6	22	46
Poor function	3	4	2
Other	0	0	12
<b>Organs offered for donation</b>	<b>1295</b>	<b>617</b>	<b>239</b>
<b>Organs not retrieved (% of organs offered for donation)</b>	<b>28 (2)</b>	<b>243 (39)</b>	<b>129 (54)</b>
Donor unsuitable - medical	4	2	3
Donor unsuitable - non-medical	0	13	16
Donor unsuitable - age	1	64	24
Organ unsuitable - clinical	15	111	57
Poor function	7	16	7
Other	1	37	22
<b>Organs retrieved (% of organs offered for donation)</b>	<b>1267 (98)</b>	<b>374 (61)</b>	<b>110 (46)</b>
Organs transplanted in the UK	1067	249	47
Organs transplanted overseas	0	0	0
Organs not transplanted	200	125	63
<b>Reasons for organ not being transplanted</b>			
Donor unsuitable - medical	64	12	8
Donor unsuitable - non-medical	0	5	0
Donor unsuitable - age	4	6	1
Organ unsuitable - clinical	65	50	35
Poor function	4	18	0
Other	63	34	19
<b>TOTAL ORGANS RETRIEVED, NOT TRANSPLANTED (Number used for research)</b>	<b>200 (112)</b>	<b>125 (59)</b>	<b>63 (27)</b>

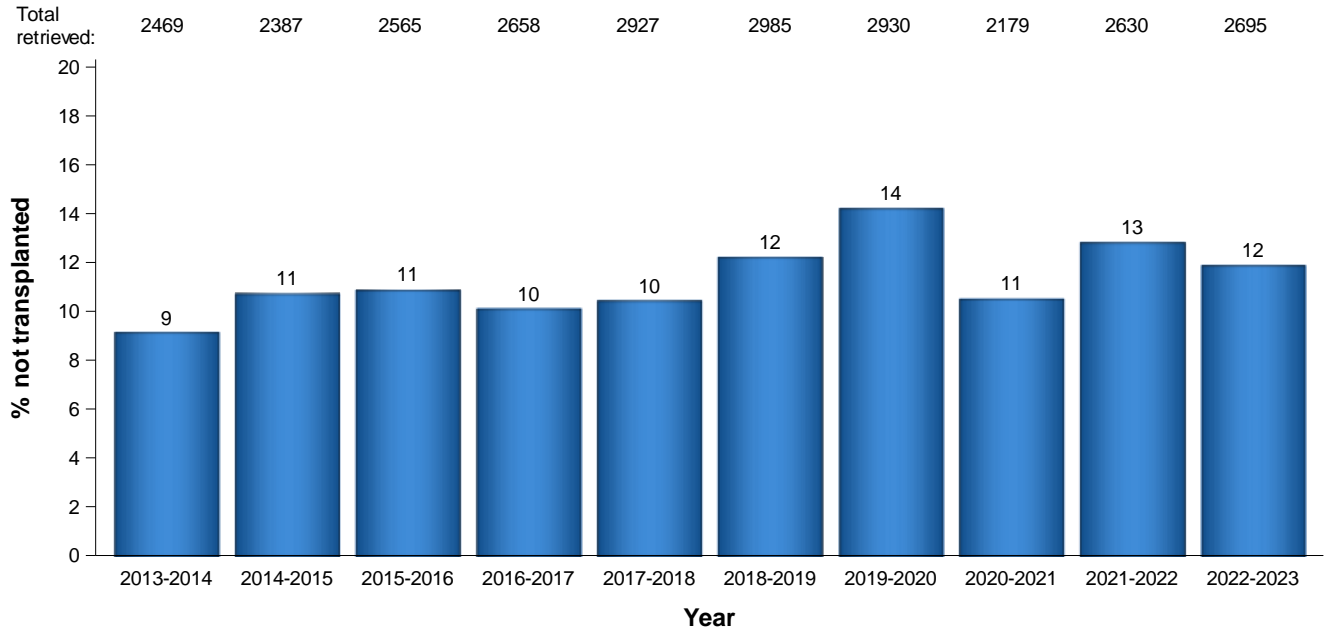
<sup>1</sup> Includes donors whose organ may have been offered but are outside of organ specific criteria

**Table 4.6 Reasons for non-retrieval and non-use of cardiothoracic organs from deceased donors in the UK, 1 April 2022 - 31 March 2023**

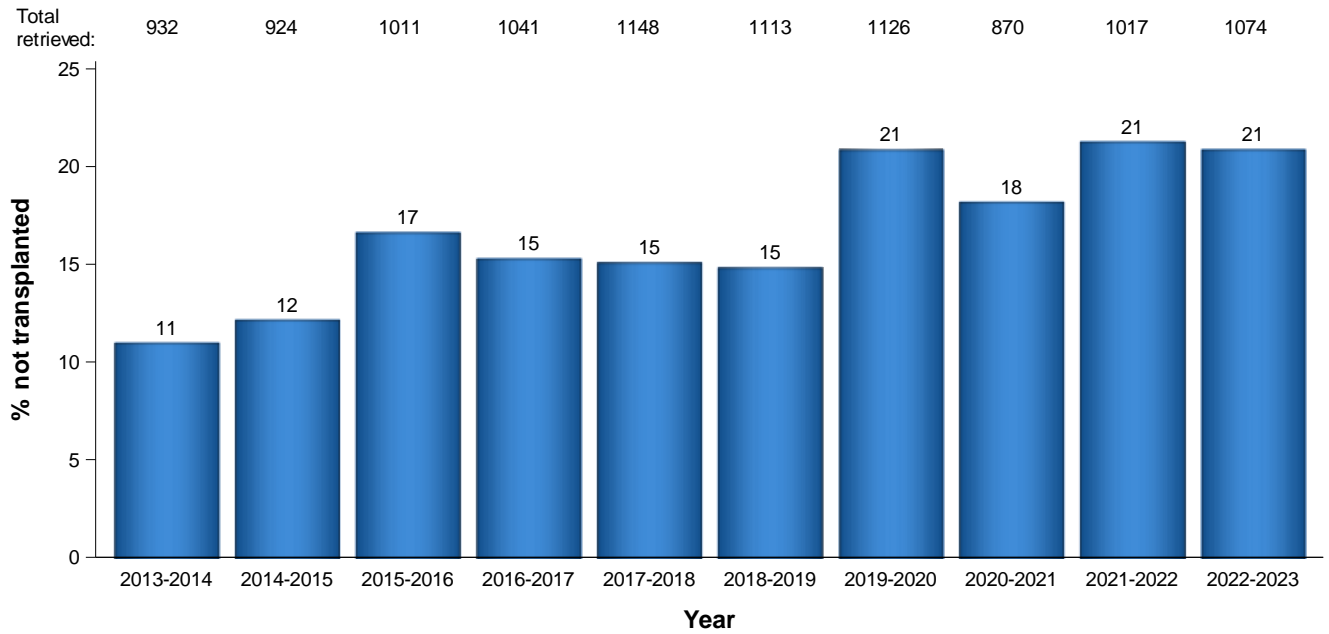
	Heart (DBD)	Lung (DBD)	Heart (DCD)	Lung (DCD)
<b>All actual organ donors</b>	<b>772</b>	<b>772</b>	<b>657</b>	<b>657</b>
Donors from whom organs not offered for donation	328	343	517	404
<b>Reasons for organs not being offered<sup>1</sup></b>				
Family permission refused	17	13	18	16
Permission refused by coroner	29	18	16	12
Permission refused other	4	2	1	2
Donor unsuitable - medical	0	6	1	15
Donor unsuitable - non-medical	0	0	27	0
Donor unsuitable - age	156	48	360	80
Organ unsuitable - clinical	71	79	61	107
Poor function	42	156	31	157
Other	9	21	2	15
<b>Organs offered for donation</b>	<b>444</b>	<b>858</b>	<b>140</b>	<b>506</b>
<b>Organs not retrieved (% of organs offered for donation)</b>	<b>291 (66)</b>	<b>726 (85)</b>	<b>82 (59)</b>	<b>420 (83)</b>
<b>Reasons for non-retrieval</b>				
Donor unsuitable - medical	13	20	4	10
Donor unsuitable - non-medical	29	32	9	12
Donor unsuitable - age	21	46	4	38
Organ unsuitable - clinical	72	128	22	136
Poor function	94	337	23	166
Other	62	163	20	58
<b>Organs retrieved (% of organs offered for donation)</b>	<b>153 (34)</b>	<b>132 (15)</b>	<b>58 (41)</b>	<b>86 (17)</b>
Organs transplanted in the UK	151	115	55	73
Organs transplanted overseas	1	10	0	0
Organs not transplanted	1	7	3	13
<b>Reasons for organ not being transplanted</b>				
Donor unsuitable - medical	0	0	0	0
Donor unsuitable - non-medical	0	2	0	1
Donor unsuitable - age	0	0	0	0
Organ unsuitable - clinical	0	0	0	4
Poor function	0	2	1	6
Other	1	3	2	2
<b>TOTAL ORGANS RETRIEVED, NOT TRANSPLANTED (Number used for research)</b>	<b>1 (0)</b>	<b>7 (6)</b>	<b>3 (2)</b>	<b>13 (10)</b>

<sup>1</sup> Includes donors whose organ may have been offered but are outside of organ specific criteria

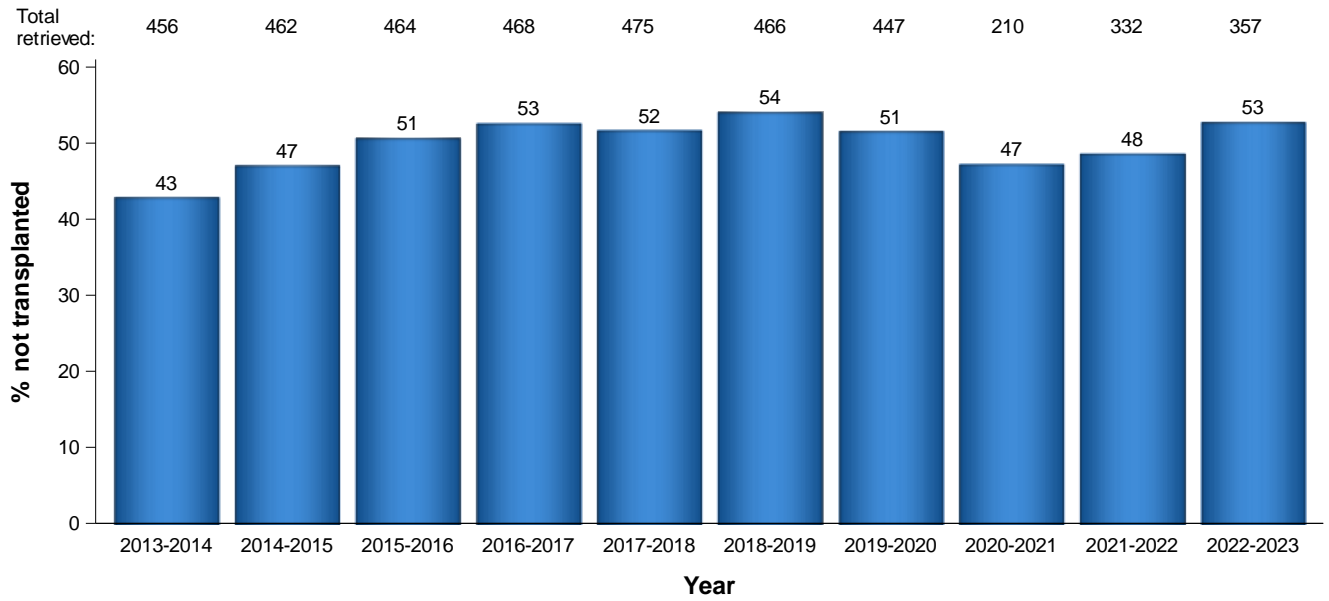
**Figure 4.3 Percentage of kidneys retrieved that were not transplanted from deceased organ donors in the UK, 1 April 2013 - 31 March 2023**



**Figure 4.4 Percentage of livers retrieved that were not transplanted from deceased organ donors in the UK, 1 April 2013 - 31 March 2023**

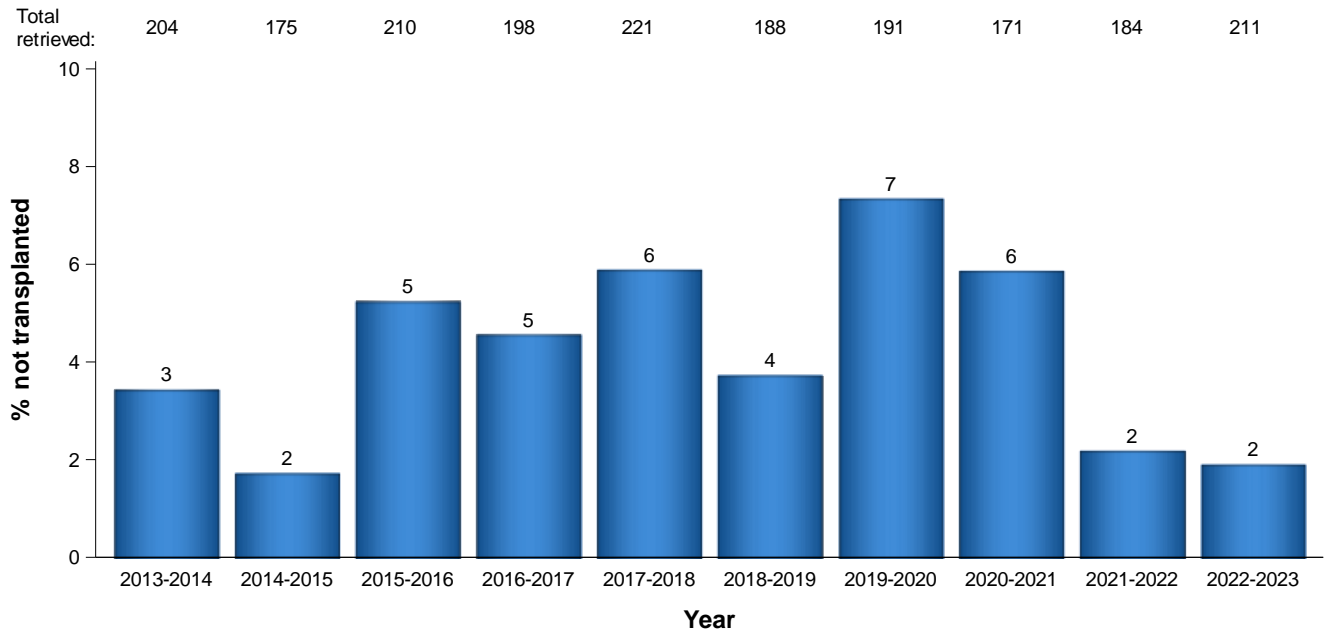


**Figure 4.5 Percentage of pancreases<sup>1</sup> retrieved that were not transplanted from deceased organ donors in the UK, 1 April 2013 - 31 March 2023**



<sup>1</sup>Includes pancreases retrieved for islet transplantation and not transplanted due to the outcome of the islet isolation

**Figure 4.6 Percentage of hearts retrieved that were not transplanted from deceased organ donors in the UK, 1 April 2013 - 31 March 2023**



**Figure 4.7** Percentage of lungs retrieved that were not transplanted from deceased organ donors in the UK, 1 April 2013 - 31 March 2023

