

The National Organ Retrieval Service and Usage of Organs

Key messages

- National Organ Retrieval Service teams attended 801 possible DBD donors and 832 possible DCD donors; 98% of these DBD donors and 74% of these DCD donors attended, proceeded to donation
- Overall, 53% of organs offered from those donors that did proceed were transplanted, but individually, these rates were 83% for kidneys, 61% for livers, 25% for pancreases, 32% for hearts, 14% for lungs and 14% for bowels
- Overall, 83% of organs retrieved were transplanted, but individually, these rates were 87% for kidneys, 79% for livers, 51% for pancreases, 97% for hearts, 86% for lungs and 96% for bowels
- The number of deceased donors per million of population was 20.8, however 6% of actual donors resulted in no organ transplants, compared with 4% 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 2021-2022 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 2021 – 31 March 2022

NORS team	DBD				DCD			
	Proceeding ²	Non-proceeding	% non-proc	No. attended	Proceeding ²	Non-proceeding	% non-proc	No. attended
Abdominal								
Birmingham ¹	90	0	0	90	69	21	23	90
Cambridge	86	2	2	88	99	28	22	127
Cardiff ¹	30	1	3	31	20	5	20	25
Edinburgh	67	1	1	68	46	23	33	69
King's	138	5	3	143	89	30	25	119
Leeds ¹	88	1	1	89	57	29	34	86
Manchester ¹	73	1	1	74	58	32	36	90
Newcastle	64	1	2	65	48	18	27	66
Oxford ¹	65	2	3	67	74	21	22	95
Royal Free ¹	83	2	2	85	51	14	22	65
Abdominal total	784	16	2	800	611	221	27	832
Cardiothoracic¹								
Birmingham	44	23	34	67	2	8	80	10
Glasgow	22	19	46	41	2	2	50	4
Harefield	33	28	46	61	31	29	48	60
Manchester	37	27	42	64	8	8	50	16
Newcastle	25	14	36	39	3	-	-	3
Papworth	32	28	47	60	26	24	48	50
Cardiothoracic total	193	139	42	332	72	71	50	143
Total donors attended	785	16	2	801	612	220	26	832

¹ Part-time teams

² 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 2021-2022, 6% of actual donors resulted in no organ transplants, more than the previous year (4%). Note that the COVID-19 pandemic affected the number of offered, retrieved and transplanted organs in 2021-2022.

Table 4.2 Consented, offered, actual and utilised deceased donors in the UK, 1 April 2021 - 31 March 2022						
	DBD (pmp)		DCD (pmp)		Total (pmp)	
Consented donors ¹	875	(13.0)	1021	(15.2)	1896	(28.3)
Offered donors ²	833	(12.4)	924	(13.8)	1757	(26.2)
<i>Kidneys offered</i>	1628		1800		3428	
<i>Livers offered</i>	798		840		1638	
<i>Pancreases offered</i>	476		329		805	
<i>Bowels offered</i>	204		0		204	
<i>Hearts offered</i>	453		162		615	
<i>Lungs offered</i>	990		758		1748	
Actual donors ³	785	(11.7)	612	(9.1)	1397	(20.8)
Utilised donors ⁴	753	(11.2)	557	(8.3)	1310	(19.5)

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

There were 1,397 actual deceased organ donors in 2021-2022, 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 785 DBD and 612 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 1,397 deceased donors in the UK, 1 April 2021 - 31 March 2022

Organ	Organs offered for transplantation ¹	Organs retrieved for transplantation		Organs transplanted			Organs used for research (from actual organ donors)
		N	% of offered	N	% of retrieved	% of offered	
DBD donor organs							
Kidney	1538	1448	94	1303	90	85	77
Liver	755	707	94	607	86	80	54
Pancreas	451	241	53	130	54	29	59
Bowel	192	28	15	27	96	14	0
Heart	430	137	32	136	99	32	0
Lung	938	185	20	164	89	17	12
Total	4304	2746	64	2367	86	55	202
DCD donor organs							
Kidney	1215	1182	97	990	84	81	118
Liver	561	310	55	194	63	35	54
Pancreas	236	93	39	41	44	17	20
Heart	131	48	37	44	92	34	1
Lung	540	59	11	46	78	9	7
Total	2683	1692	63	1315	78	49	200
Deceased donor organs							
Kidney	2753	2630	96	2293	87	83	195
Liver	1316	1017	77	801	79	61	108
Pancreas	687	334	49	171	51	25	79
Bowel	192	28	15	27	96	14	0
Heart	561	185	33	180	97	32	1
Lung	1478	244	17	210	86	14	19
Total	6987	4438	64	3682	83	53	402

¹ Includes organs offered outside of organ specific criteria

Suitability Criteria:

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

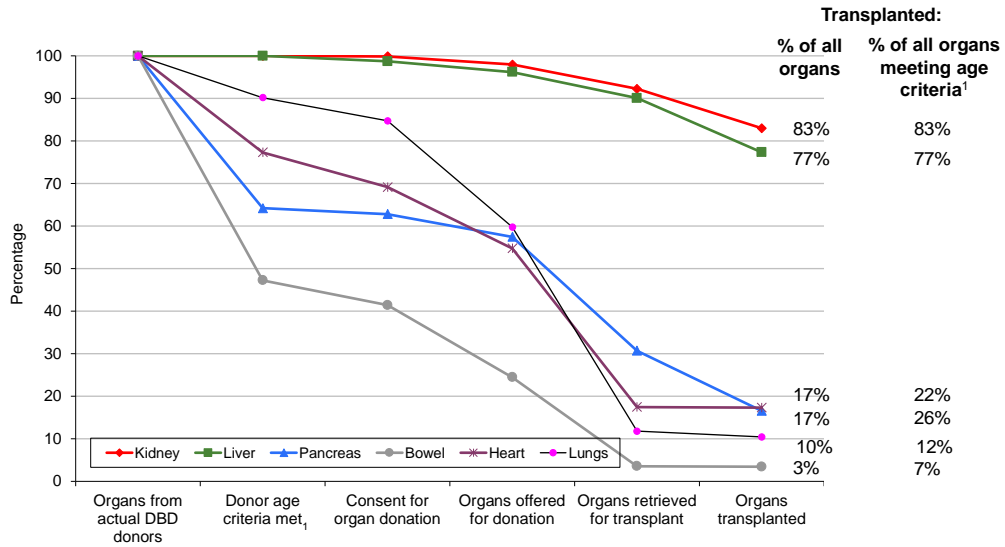
Bowel: donors aged < 60 years or weighing < 90kg

Heart: donors aged < 65 years (DBD) or aged < 55 years (DCD) or did not die due to myocardial infarction (DBD)

Lung: donors aged < 70 years

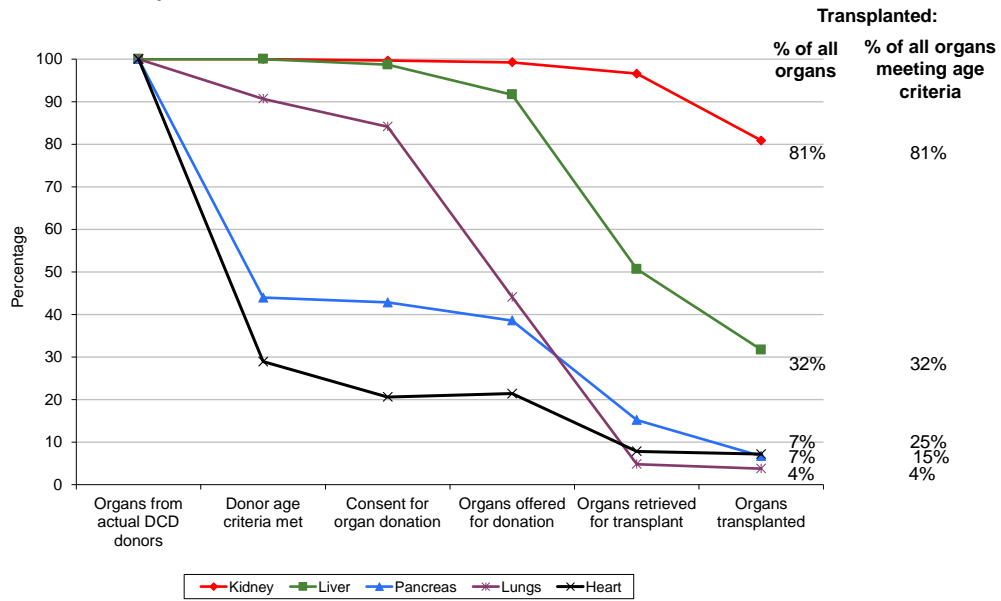
Figures 4.1 and 4.2 show line graphs of the pathway for all donor organs through to transplantation. The charts start at 100% for each organ, representing all organs from the 785 DBD and 612 DCD donors. The proportion of these organs where any national donor age criteria are met is then shown, followed 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 612 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 2021 – 31 March 2022



¹ 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 2021 – 31 March 2022



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 2021-2022 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. Note that the COVID-19 pandemic will have affected the 2021-2022 non-utilisation rate. 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 2021 - 31 March 2022

	Kidney	Liver	Pancreas	Bowel
All actual DBD organ donors	785	785	785	785
Donors from whom organs not offered for donation	16	30	334	592
Reasons for organs not being offered¹				
Family permission refused	0	4	7	39
Permission refused by coroner	1	4	3	3
Permission refused other	0	2	1	4
Donor unsuitable - medical	0	0	0	2
Donor unsuitable - non-medical	3	0	18	58
Donor unsuitable - age	0	0	243	28
Organ unsuitable - clinical	8	17	41	19
Poor function	3	2	4	2
Donor age >=60 or donor weight >=90kg	-	-	-	413
Other	1	1	17	24
Organs offered for donation	1538	755	451	192
Organs not retrieved (% of organs offered for donation)	90 (6)	48 (6)	210 (47)	164 (85)
Donor unsuitable - medical	0	4	7	14
Donor unsuitable - non-medical	0	3	26	30
Donor unsuitable - age	5	0	26	20
Organ unsuitable - clinical	57	29	85	54
Poor function	22	6	21	9
Other	6	6	45	37
Organs retrieved (% of organs offered for donation)	1448 (94)	707 (94)	241 (53)	28 (15)
Organs transplanted in the UK	1303	607	130	27
Organs transplanted overseas	0	6	0	0
Organs not transplanted	145	100	111	1
Reasons for organ not being transplanted				
Donor unsuitable - medical	36	22	12	0
Donor unsuitable - non-medical	0	7	0	0
Donor unsuitable - age	2	-	2	0
Organ unsuitable - clinical	31	40	62	0
Poor function	10	10	1	0
Other	66	21	34	1
TOTAL ORGANS RETRIEVED, NOT TRANSPLANTED (Number used for research)	145 (77)	100 (54)	111 (59)	1 (0)

¹ 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 2021 - 31 March 2022

	Kidney	Liver	Pancreas
All actual DCD organ donors	612	612	612
Donors from whom organs not offered for donation	5	51	376
Reasons for organs not being offered¹			
Family permission refused	0	4	5
Permission refused by coroner	2	4	2
Donor unsuitable - medical	0	0	0
Donor unsuitable - non-medical	0	1	22
Donor unsuitable - age	1	5	300
Organ unsuitable - clinical	1	29	28
Poor function	0	6	2
Other	1	2	17
Organs offered for donation	1215	561	236
Organs not retrieved (% of organs offered for donation)	33 (3)	251 (45)	143 (61)
Donor unsuitable - medical	6	7	4
Donor unsuitable - non-medical	0	10	16
Donor unsuitable - age	3	64	37
Organ unsuitable - clinical	21	104	56
Poor function	2	20	1
Other	1	46	29
Organs retrieved (% of organs offered for donation)	1182 (97)	310 (55)	93 (39)
Organs transplanted in the UK	990	194	41
Organs transplanted overseas	0	0	0
Organs not transplanted	192	116	52
Reasons for organ not being transplanted			
Donor unsuitable - medical	58	9	7
Donor unsuitable - non-medical	0	6	0
Donor unsuitable - age	1	2	2
Organ unsuitable - clinical	55	48	27
Poor function	4	15	0
Other	73	36	16
TOTAL ORGANS RETRIEVED, NOT TRANSPLANTED (Number used for research)	192 (118)	116 (54)	52 (20)

¹ 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 2021 - 31 March 2022

	Heart (DBD)	Lung (DBD)	Heart (DCD)	Lung (DCD)
All actual organ donors	785	785	612	612
Donors from whom organs not offered for donation	355	316	481	342
Reasons for organs not being offered¹				
Family permission refused	32	22	23	21
Permission refused by coroner	26	18	27	18
Permission refused other	6	3	1	1
Donor unsuitable - medical	2	5	0	5
Donor unsuitable - non-medical	3	0	31	4
Donor unsuitable - age	169	60	309	59
Organ unsuitable - clinical	64	55	51	111
Poor function	42	135	29	117
Other	11	18	10	6
Organs offered for donation	430	938	131	540
Organs not retrieved (% of organs offered for donation)	293 (68)	753 (80)	83 (63)	481 (89)
Reasons for non-retrieval				
Donor unsuitable - medical	10	22	2	22
Donor unsuitable - non-medical	27	40	8	16
Donor unsuitable - age	28	40	1	32
Organ unsuitable - clinical	66	197	17	188
Poor function	105	309	30	107
Other	56	145	23	116
Organs retrieved (% of organs offered for donation)	137 (32)	185 (20)	48 (37)	59 (11)
Organs transplanted in the UK	135	158	44	46
Organs transplanted overseas	1	6	0	0
Organs not transplanted	1	21	4	13
Reasons for organ not being transplanted				
Donor unsuitable - medical	0	0	0	0
Donor unsuitable - non-medical	0	2	0	0
Donor unsuitable - age	1	0	0	2
Organ unsuitable - clinical	0	0	0	0
Poor function	0	5	2	4
Other	0	14	2	7
TOTAL ORGANS RETRIEVED, NOT TRANSPLANTED (Number used for research)	1 (0)	21 (12)	4 (1)	13 (7)

¹ 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 2012 - 31 March 2022

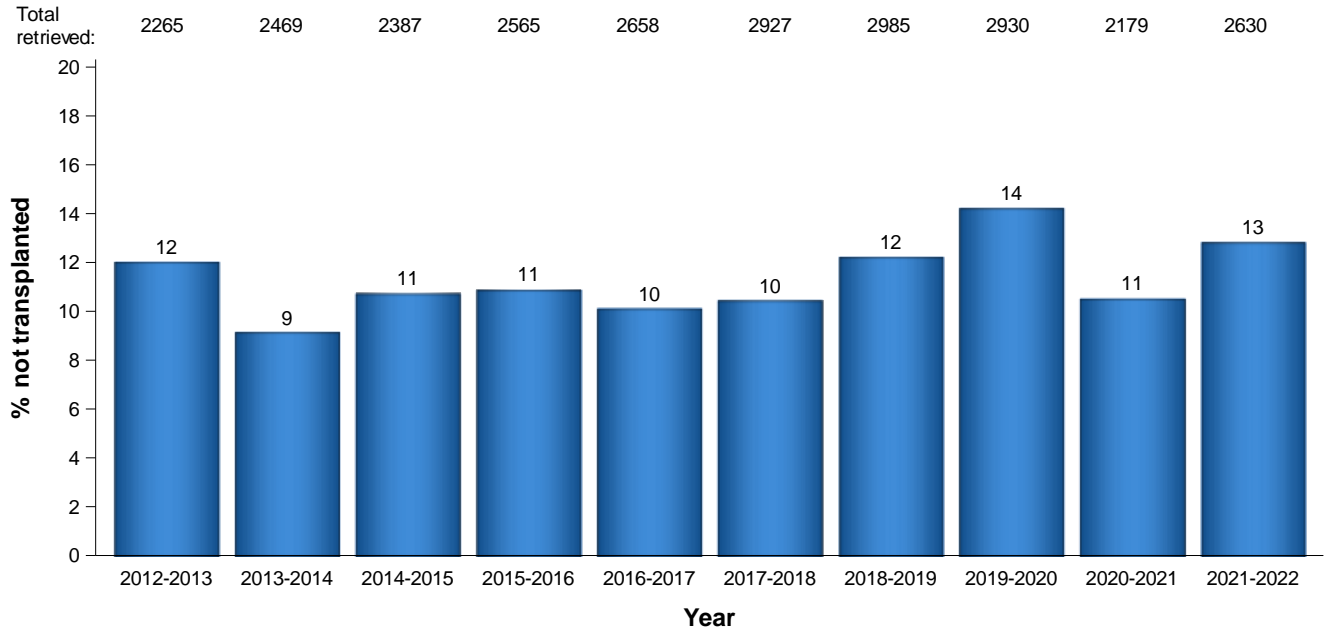


Figure 4.4 Percentage of livers retrieved that were not transplanted from deceased organ donors in the UK, 1 April 2012 - 31 March 2022

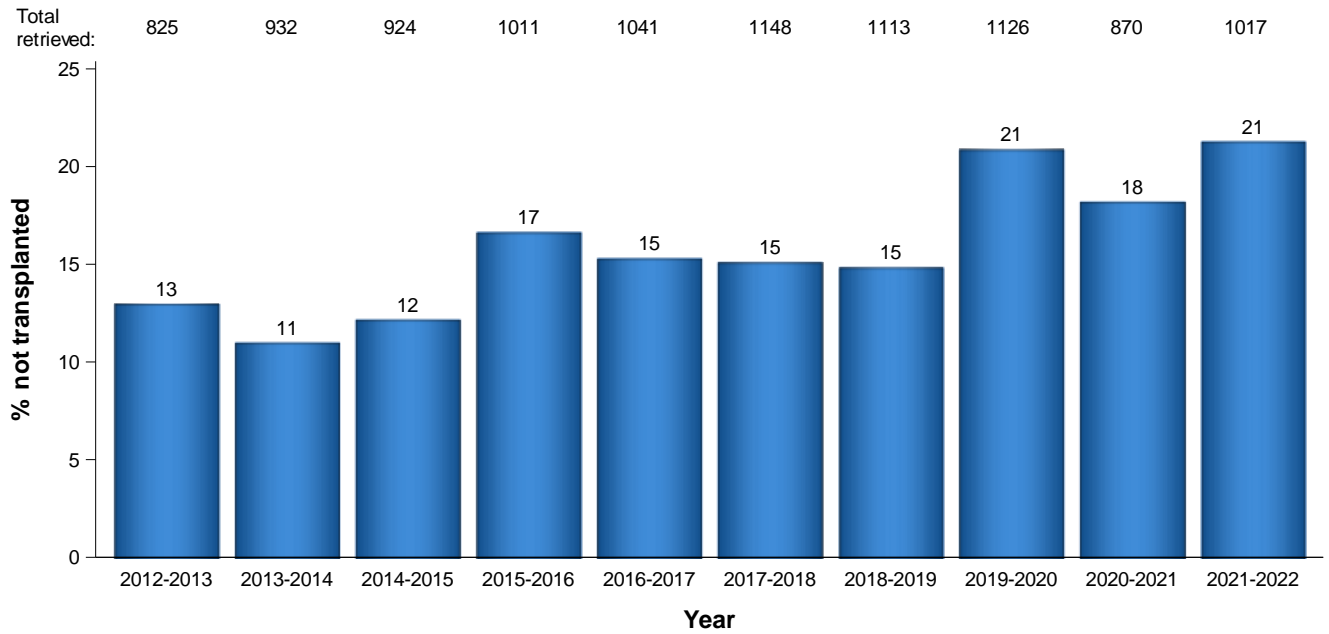
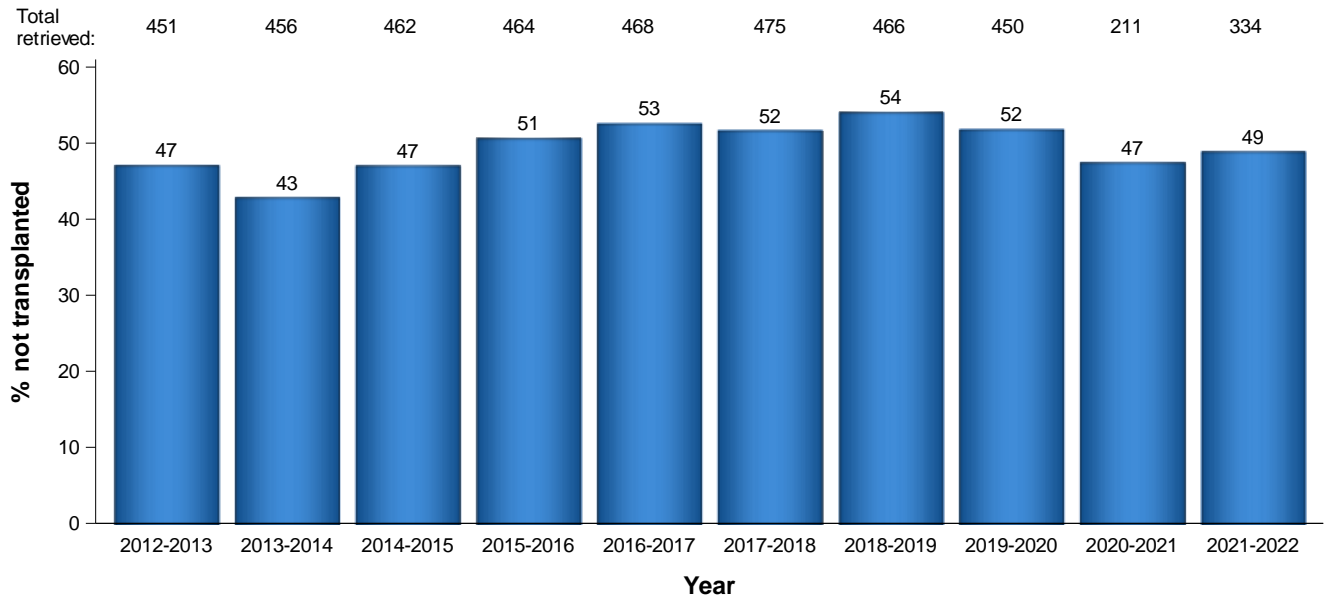


Figure 4.5 Percentage of pancreases¹ retrieved that were not transplanted from deceased organ donors in the UK, 1 April 2012 - 31 March 2022



¹Includes 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 2012 - 31 March 2022

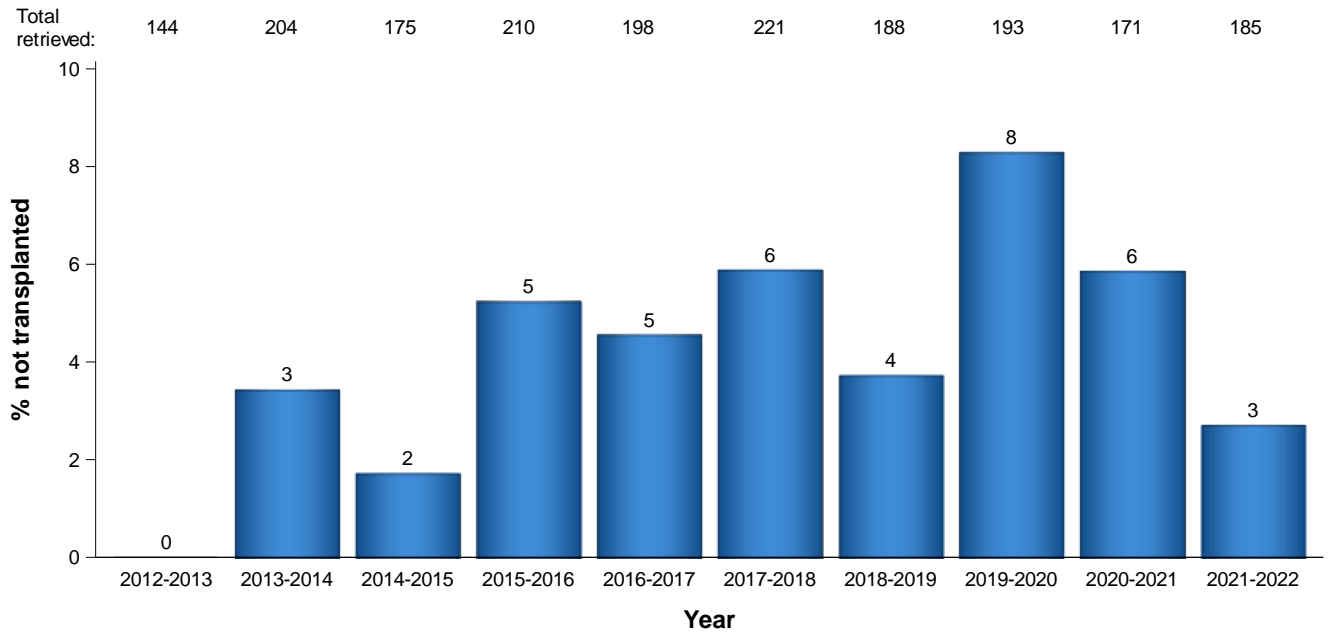


Figure 4.7 Percentage of lungs retrieved that were not transplanted from deceased organ donors in the UK, 1 April 2012 - 31 March 2022

