

NHS BLOOD AND TRANSPLANT

NATIONAL RETRIEVAL GROUP

IMPACT OF ZONAL TO CLOSEST NORS TEAM FIRST

INTRODUCTION

- 1 Following discussion of the Annual NORS report at the July 2017 National Retrieval Group meeting, it was agreed that Statistics and Clinical Studies would present a summary of the impact of the change in the retrieval team attendance sequence. Prior to 4th April 2016, teams were asked to attend a donor based on a zonal allocation system. Following the NORS Review it was recommended that teams should be asked to attend a donor if they were the closest NORS team. This change in attendance sequence was implemented on 4th April 2016.

RESULTS

- 2 In 2013/14 there were 2,294 donor attendances (1,725 abdominal and 569 cardiothoracic). The number of donor attendances have not increased notably since then, with 2,305 in 2016/17.
- 3 Comparing activity in 2016/17 to previous years shows:
 - i) The range in the proportion of donors attended by an abdominal team has increased from 2013/14 to 2016/17. In contrast, the range in the proportion of donors attended by a cardiothoracic team has decreased.
 - ii) The percentage share of donors (based on closest team) has decreased for the Cambridge and Oxford/Royal Free abdominal teams. However an increase can be seen for the King's College and Leeds/Manchester abdominal teams. This jump in donor share for King's College is not reflected in actual activity, with Cambridge attending a higher proportion of donors than their share.
 - iii) The percentage share of donors (based on closest team) has decreased for the Harefield and Newcastle cardiothoracic teams. However an increase can be seen for Glasgow which fluctuates over the years. Harefield have seen an increase in donor share but the actual share of donors they attend has decreased. Harefield remain one of the busiest teams, while Glasgow remain the least busy team and attend a smaller share of donors than they are first on call for.
 - iv) There has been an increase in total retrieval time for all cardiothoracic teams, and also the Edinburgh and Newcastle abdominal teams.
 - v) Travel time for almost all cardiothoracic teams has increased in 2016/17. The Newcastle abdominal team has seen a slight increase, whereas Cardiff travel time has decreased in the latest year.
 - vi) The location of donors has not changed largely over time, however the number of donors attended by an abdominal team in Scotland has increased in the last year.
- 4 The imbalance in activity between teams has changed over the years, but this is not solely due to the change in the retrieval team attendance sequence.

ACTION

- 5 Members of NRG are asked to review this report and feedback any comments or make any recommendations appropriate.

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APPENDIX

- Table 1** shows the number and percentage of donors attended for each retrieval team in 2016/17. The percentage of donors attended in 2016/17 has changed for each team compared to 2013/14. This can be due to many factors including a change in the location and density of donors over time. The King's College abdominal, Birmingham and Papworth cardiothoracic teams have seen an increase of more than 3% in their percentage of donors attended. In contrast, the Harefield cardiothoracic team have seen a decrease.
- The range in the proportion of donors attended by an abdominal team has increased from 5.6-15.5% up to 3.7-18.4%, from 2013/14 to 2016/17. In contrast, the range in the proportion of donors attended by a cardiothoracic team has decreased from 5.7-28.7% down to 8.5-23.7%.

Table 1 Number of donor attendances (proceeding and non-proceeding) per retrieval team, 1 April 2016 - 31 March 2017, by donor type (DBD/DCD)							
Attending retrieval team	DBD		DCD		Total	% of all donors attended	(% attended in 2013/14)
	N	%	N	%			
Abdominal							
Birmingham ¹	103	50.5	101	49.5	204	11.6	(12.9)
Cambridge	95	42.0	131	58.0	226	12.9	(14.8)
Cardiff ¹	25	38.5	40	61.5	65	3.7	(5.6)
Edinburgh	83	51.6	78	48.4	161	9.2	(8.3)
King's College	158	49.1	164	50.9	322	18.4	(15.2)
Leeds ²	69	49.3	71	50.7	140	8.0	(15.5)⁵
Manchester ²	64	38.8	101	61.2	165	9.4	
Newcastle	104	52.0	96	48.0	200	11.4	10.8
Oxford ³	79	50.0	79	50.0	158	9.0	8.4
Royal Free ³	61	54.5	51	45.5	112	6.4	8.6
Abdominal total	841	48.0	912	52.0	1753	100.0	(100.0)
Cardiothoracic⁴							
Birmingham	76	73.8	27	26.2	103	18.7	(14.6)
Glasgow	36	76.6	11	23.4	47	8.5	(5.7)
Harefield	93	76.2	29	23.8	122	22.1	(28.7)
Manchester	64	76.2	20	23.8	84	15.2	(15.7)
Newcastle	55	84.6	10	15.4	65	11.8	(14.6)
Papworth	87	66.4	44	33.6	131	23.7	(20.7)
Cardiothoracic total	411	74.5	141	25.5	552	100.0	(100.0)

^{1,2,3,4} Share on-call responsibilities.

⁵ In 2013/14 Leeds and Manchester worked as a joint retrieval team

- 3 **Figure 1a** shows the percentage of donors attended by the abdominal team that attended the donor.
- 4 **Figure 1b** shows the percentage share of donors by abdominal team where they are the first on call. The change from zones to closest team first has a clear impact for some teams, following its implementation in 2016/17. The percentage share of donors (based on closest team) has decreased for the Cambridge and Oxford/Royal Free abdominal teams. However an increase can be seen for the King's College and Leeds/Manchester abdominal teams. This jump in donor share for King's College is not reflected in actual activity in **Figure 1**, with Cambridge attending more donors than their share.
- 5 **Figure 1c** assumes that in 2016/17 teams are allocated zonally, as they were from 2012/13 to 2015/16. This shows that Leeds/Manchester still have a high share of donors in 2016/17, which may be due to more donors in their zone. Cambridge, Oxford/Royal Free and King's College do not experience as large a change in donor share as they do under closest team first.

Figure 1a Percentage share of donors attended by an abdominal team between 1 April 2012 and 31 March 2017, by attending team

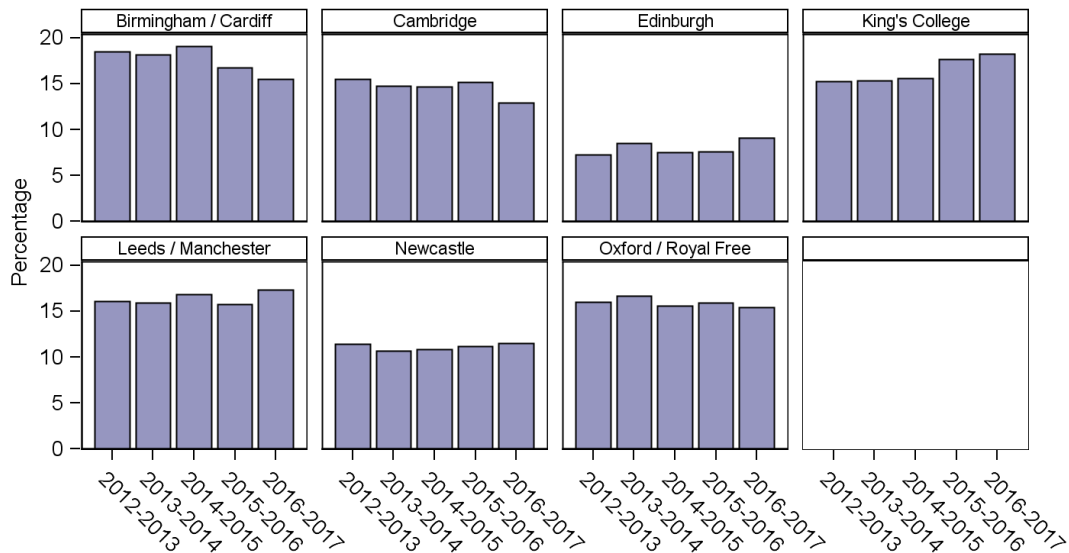


Figure 1b Percentage share of donors attended by an abdominal team between 1 April 2012 and 31 March 2017, by first on call team

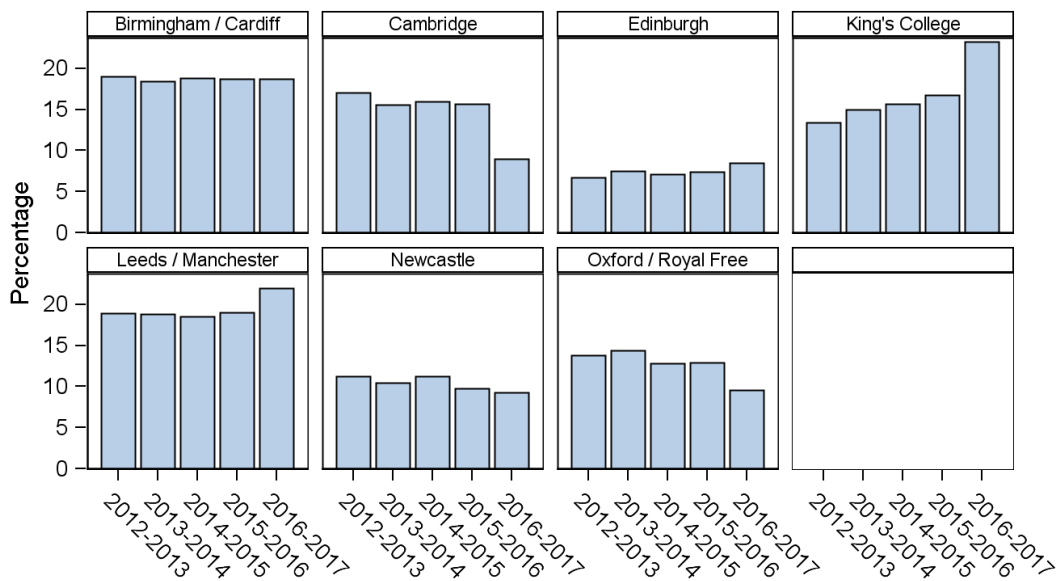
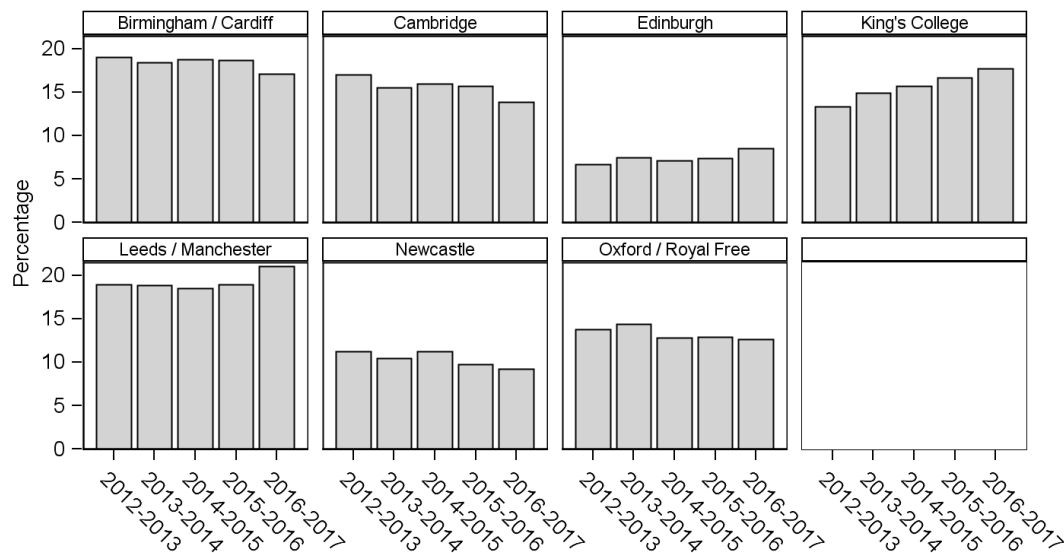


Figure 1c Percentage share of donors attended by an abdominal team between 1 April 2012 and 31 March 2017, by first on call team assuming zonal allocation



- 6 **Figure 2a** shows the percentage of donors attended by the cardiothoracic team that attended the donor.
- 7 **Figure 2b** shows the percentage share of donors by cardiothoracic team where they are first on call. The percentage share of donors (based on closest team) has decreased for Harefield and Newcastle in 2016/17. However an increase can be seen for Glasgow which fluctuates over the years. The share of donors based on the first team on call is reflected in the actual activity in **Figure 1**. However it appears that though Harefield have seen an increase in donor share they have seen a decrease in the actual share of donors they attended. Harefield remain one of the busiest teams, while Glasgow remain the least busy team and attend a smaller share of donors than they are first on call for.
- 8 In **Figure 2c** it is assumed that cardiothoracic teams are allocated zonally in 2016/17, rather than closest team first. This shows that with zonal allocation Harefield would have a higher share of donor attendances, and Papworth would have fewer than with the closest first allocation. Birmingham, Manchester, Newcastle and Glasgow have a similar share of donors based on zonal and closest first allocation.

Figure 2a Percentage share of donors attended by a cardiothoracic team between 1 April 2012 and 31 March 2017, by attending team

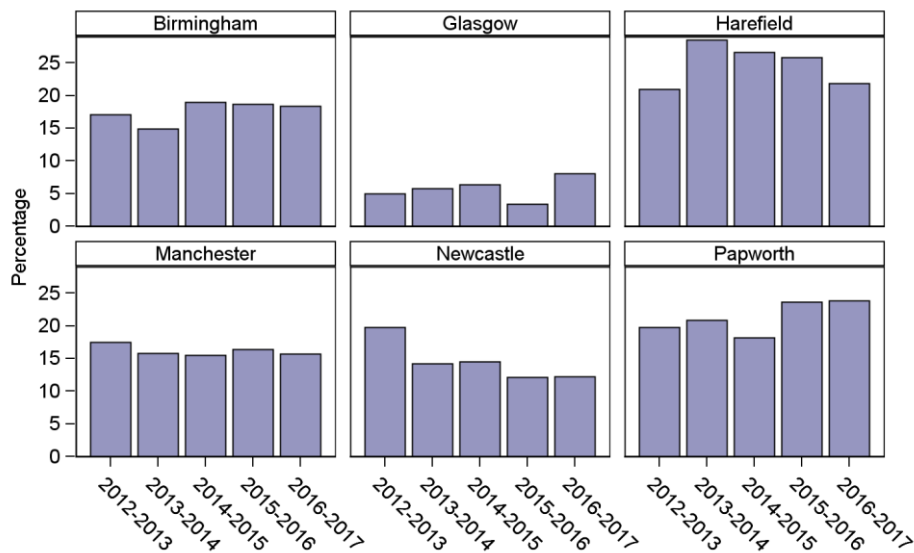


Figure 2b Percentage share of donors attended by a cardiothoracic team between 1 April 2012 and 31 March 2017, by first on call team

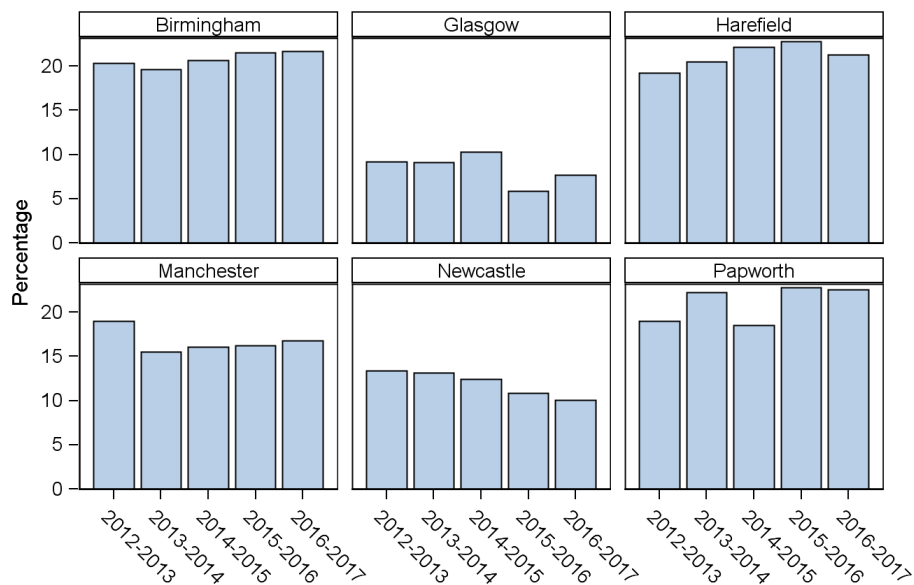
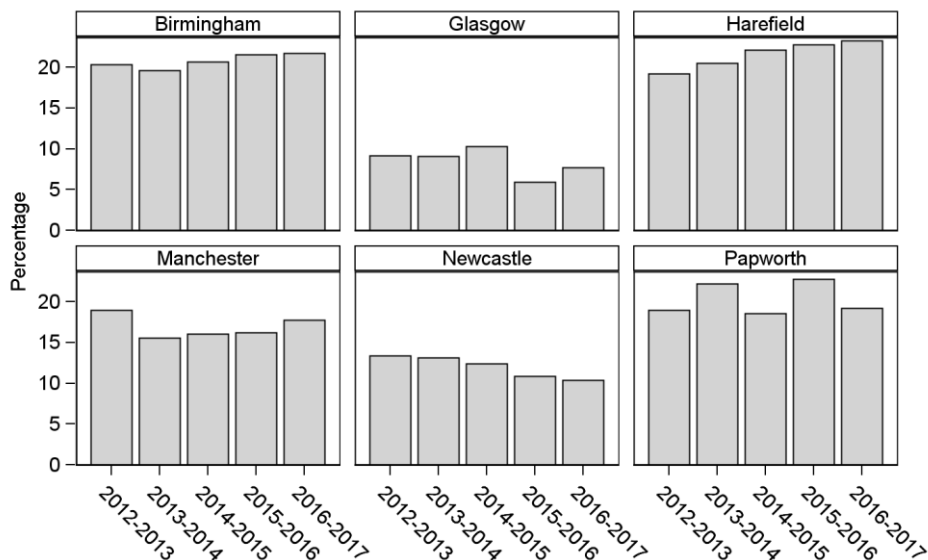


Figure 2c Percentage share of donors attended by a cardiothoracic team between 1 April 2012 and 31 March 2017, by first on call team assuming zonal allocation



- 9 The attendance sequence of the NORS team that attended donors in 2016/17 is shown in **Table 2**. The % where the attending team was not first in the sequence is given, alongside the % from 2015/16 for comparison. In almost half (45%) of Cambridge attendances they are not first in sequence, compared to 24.7% under the zonal system in 2015/16. This explains how the percentage of donors they are first on call for has decreased, but the proportion of donors they actually attend is higher. Newcastle, Oxford and Royal Free abdominal teams are also attending a higher proportion of donors where they are not first in sequence. This is also true for the Birmingham, Glasgow, Manchester and Newcastle cardiothoracic teams.

Table 2 Number of actual and non-proceeding donors attended by each retrieval team, 1 April 2016 - 31 March 2017, by the position of the donor hospital in the on-call attendance sequence											
Attending retrieval team	First team in seq.	Second team in seq.	Third team in seq.	Fourth team in seq.	Fifth team in seq.	Sixth team in seq.	Seventh team in seq.	Total	% not first in seq.	% not 1st on call (2015/16)	
Abdominal											
Birmingham	144	35	6	13	0	0	0	198	27.3	26.9	
Cambridge	123	25	52	17	5	1	1	224	45.1	24.7	
Cardiff	47	1	3	10	1	0	0	62	24.2	31.8	
Edinburgh	133	12	9	1	0	0	5	160	16.9	13.0	
King's College	257	44	7	2	3	0	0	313	17.9	27.1	
Leeds	112	13	2	1	2	0	0	130	13.8	14.2	
Manchester	137	10	2	3	4	0	0	156	12.2	14.2	
Newcastle	121	35	24	4	0	12	0	196	38.3	27.3	
Oxford	69	63	16	7	0	1	0	156	55.8	38.3	
Royal Free	33	47	21	1	3	3	0	108	69.4	45.2	
Abdominal Total	1176	285	142	59	18	17	6	1703	30.9	26.2	
Cardiothoracic											
Birmingham	77	22	0	0	0	0	0	99	22.2	6.9	
Glasgow	30	3	10	0	0	0	0	43	30.2	4.2	
Harefield	84	16	11	0	0	0	0	111	24.3	28.7	
Manchester	61	20	0	0	0	0	0	81	24.7	15.4	
Newcastle	37	7	13	0	0	0	0	57	35.1	24.3	
Papworth	96	15	2	0	0	0	0	113	15.0	14.3	
Cardiothoracic Total	385	83	36	0	0	0	0	504	23.6	17.6	
Total	1561	368	178	59	18	17	6	2207	29.3	24.0	
Note that 9 paediatric (< 145 cm) cardiothoracic retrievals and 25 paediatric (< 5 years) abdominal retrievals have been excluded from this table due to the special arrangements for paediatric retrieval.											

10 The total length of time that a team is out retrieving is estimated from theatre departure times and travel times. This is presented in **Figure 3a** and **Figure 3b** for abdominal and cardiothoracic team attendances. There has been an increase in retrieval time for all cardiothoracic teams; this is to be expected as the number of teams on call reduced from six to three. An increase can also be seen for the Edinburgh and Newcastle abdominal teams. The median travel time for abdominal teams over the four years was 8 hours, and the same for cardiothoracic teams, as shown by the dashed lines.

Figure 3a Median (IQR) time an abdominal team is out attending a donor from departure to return to base, 1 April 2013 to 31 March 2017

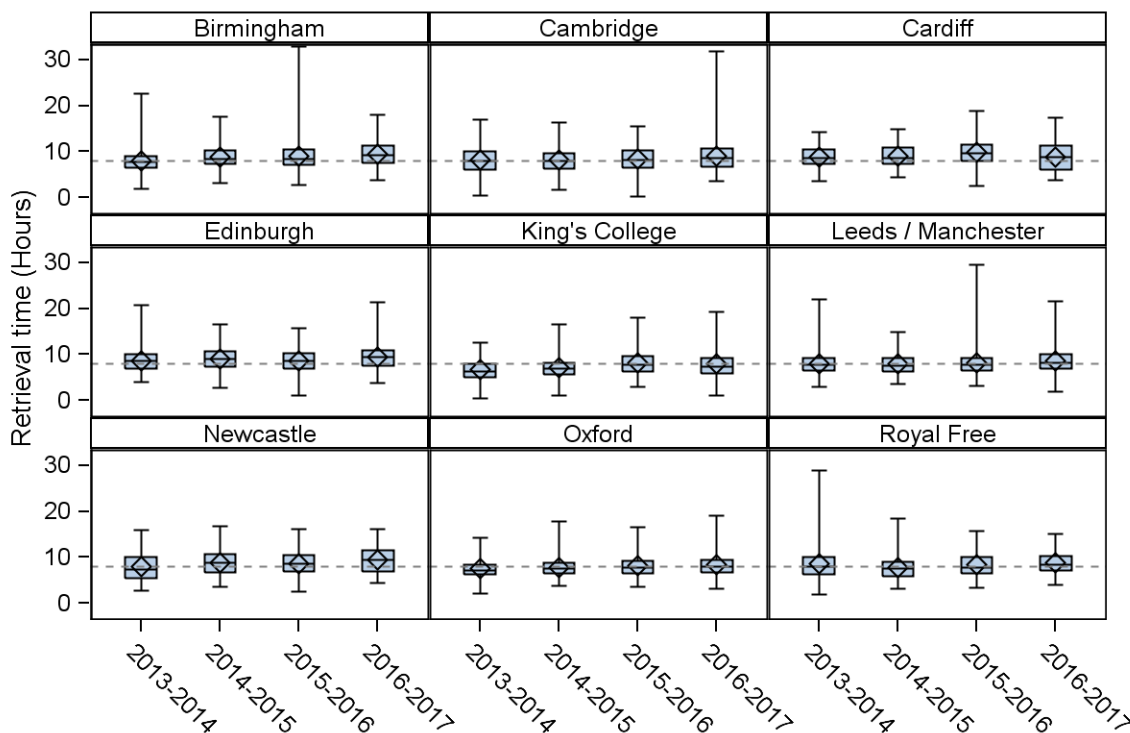
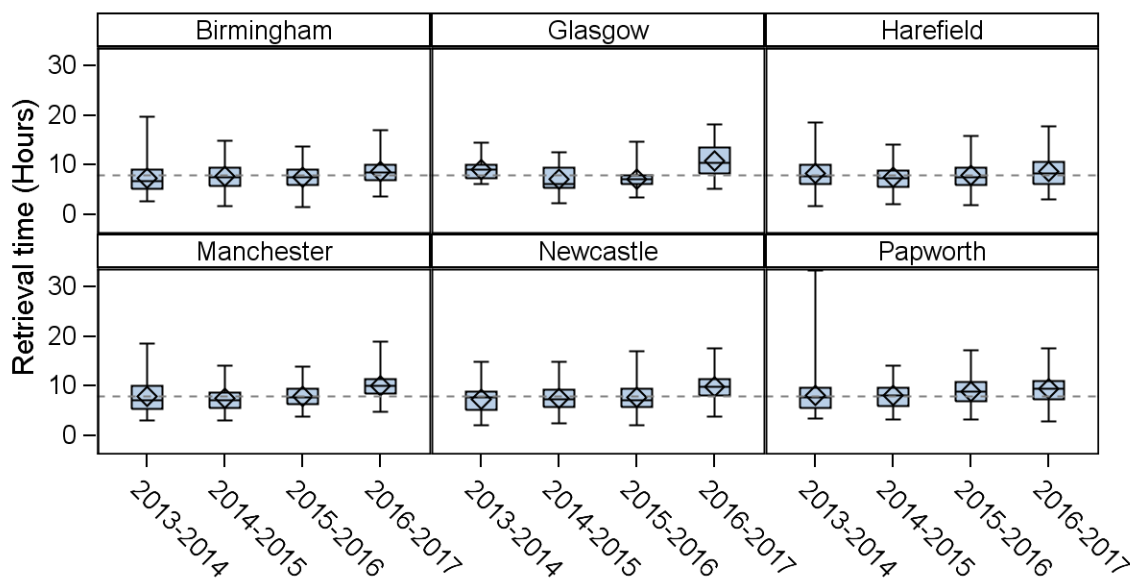


Figure 3b Median (IQR) time a cardiothoracic team is out attending a donor from departure to return to base, 1 April 2013 to 31 March 2017



- 11 The mobilisation time of NORS teams by time of day is shown in **Figure 4a** and **Figure 4b**, for abdominal and cardiothoracic teams, respectively. Mobilisation time is the agreed departure time of teams. Over the last four years there has been a shift in mobilisation time from the early hours to later in the morning. This can be seen for abdominal and cardiothoracic teams.

Figure 4a Heatmaps for time of abdominal team mobilisation, 1 April 2013 to 31 March 2017									
2013/14									
Weekday	Hour								Total
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-0	
Monday	48	28	27	14	8	9	19	41	194
Tuesday	62	43	39	10	10	17	29	58	268
Wednesday	55	59	38	24	11	12	26	64	289
Thursday	61	36	43	20	7	17	28	51	263
Friday	79	36	38	12	5	14	21	48	253
Saturday	56	56	33	20	12	9	28	41	255
Sunday	44	34	24	17	9	6	22	42	198
Total	405	292	242	117	62	84	173	345	1720
2014/15									
Weekday	Hour								Total
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-0	
Monday	42	41	30	14	6	11	20	38	202
Tuesday	47	46	33	22	17	19	22	41	247
Wednesday	59	50	36	16	12	11	22	41	247
Thursday	50	45	53	27	11	13	14	34	247
Friday	62	43	41	24	18	12	23	37	260
Saturday	58	35	45	27	8	13	20	33	239
Sunday	36	30	31	17	9	4	16	36	179
Total	354	290	269	147	81	83	137	260	1621
2015/16									
Weekday	Hour								Total
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-0	
Monday	44	30	37	21	16	6	14	32	200
Tuesday	34	50	41	33	16	13	9	35	231
Wednesday	59	68	47	32	13	18	13	47	297
Thursday	56	53	49	33	16	15	18	36	276
Friday	48	44	49	32	16	12	14	33	248
Saturday	53	41	44	39	17	6	12	29	241
Sunday	40	24	34	31	14	7	19	34	203
Total	334	310	301	221	108	77	99	246	1696
2016/17									
Weekday	Hour								Total
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-0	
Monday	30	32	41	22	29	7	9	18	188
Tuesday	40	38	45	32	23	11	13	33	235
Wednesday	40	38	52	31	37	19	20	32	269
Thursday	44	47	57	36	23	21	14	20	262
Friday	42	54	42	30	23	16	15	29	251
Saturday	54	44	55	49	15	13	18	21	269
Sunday	36	30	46	32	15	13	19	27	218
Total	286	283	338	232	165	100	108	180	1692

Figure 4b Heatmaps for time of cardiothoracic team mobilisation, 1 April 2013 to 31 March 2017										
2013/14										
Weekday	Hour								Total	
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-0		
Monday	14	10	11	6	5	4	4	9	63	
Tuesday	16	18	17	8	1	8	7	9	84	
Wednesday	20	25	14	10	4	4	5	12	94	
Thursday	14	21	10	13	5	2	7	17	89	
Friday	22	15	11	5	2	6	5	6	72	
Saturday	5	16	13	9	4	5	5	9	66	
Sunday	18	15	9	6	3	1	4	11	67	
Total	109	120	85	57	24	30	37	73	535	
2014/15										
Weekday	Hour								Total	
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-0		
Monday	16	16	12	8	4	5	6	13	80	
Tuesday	14	12	16	9	9	4	5	7	76	
Wednesday	16	13	15	8	6	6	3	4	71	
Thursday	14	12	25	11	6	7	2	9	86	
Friday	19	14	15	7	9	4	2	5	75	
Saturday	9	12	14	14	5	3	3	7	67	
Sunday	6	10	8	7	5	4	3	16	59	
Total	94	89	105	64	44	33	24	61	514	
2015/16										
Weekday	Hour								Total	
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-0		
Monday	14	10	23	8	4	2	8	7	76	
Tuesday	13	17	23	10	13	2	4	8	90	
Wednesday	14	14	19	18	6	6	3	9	89	
Thursday	14	15	18	16	7	6	4	6	86	
Friday	10	15	21	12	6	3	7	5	79	
Saturday	11	11	18	8	5	3	4	10	70	
Sunday	9	4	15	21	6	3	3	8	69	
Total	85	86	137	93	47	25	33	53	559	
2016/17										
Weekday	Hour								Total	
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-0		
Monday	8	11	17	9	13	2	4	7	71	
Tuesday	7	11	13	14	10	4	7	7	73	
Wednesday	11	13	14	16	13	7	7	10	91	
Thursday	9	8	19	11	9	13	4	1	74	
Friday	11	17	12	10	6	8	5	3	72	
Saturday	11	10	24	16	5	3	4	2	75	
Sunday	10	9	14	9	5	4	8	6	65	
Total	67	79	113	85	61	41	39	36	521	

12 Travel time from actual departure at team base to arrival at donor hospital is presented in **Figure 5a** and **Figure 5b**. For abdominal teams the travel time is comparable with previous years; however there has been a decrease for Cardiff in 2016/17. Newcastle has seen a slight increase in travel time in the latest year. For almost all cardiothoracic teams there has been an increase in travel time in 2016/17 compared to previous years. This increase is perhaps more notable for Glasgow and Newcastle who are travelling further following the decrease to three on call teams from six. Harefield have not seen an increase in travel time in 2016/17, which may be due to the reduction in their proportion of donor attendances (**Table 1**) and that for 76% of the donors they attend they are the closest team, compared to 71% in the previous year. The median travel time for abdominal teams over the four years was 1.42 hours, and for cardiothoracic teams was 1.67 hours, as shown by the dashed lines.

Figure 5a Median (IQR) time an abdominal team is out travelling from their base to donor hospital, 1 April 2013 to 31 March 2017

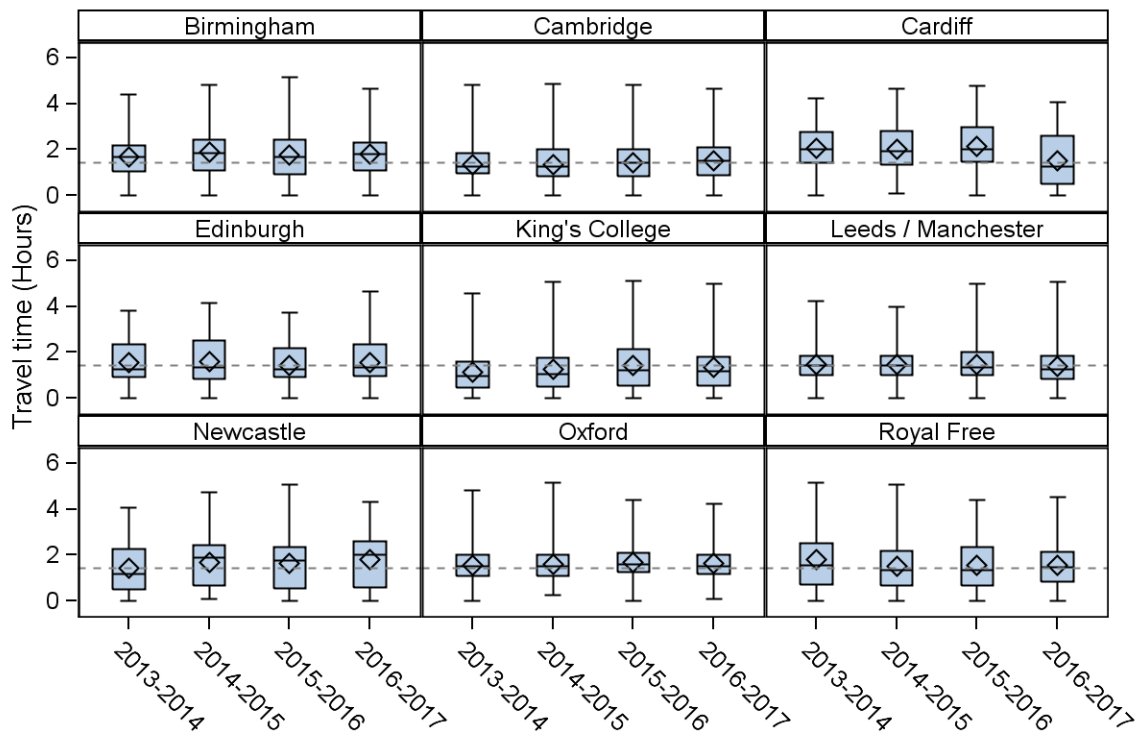
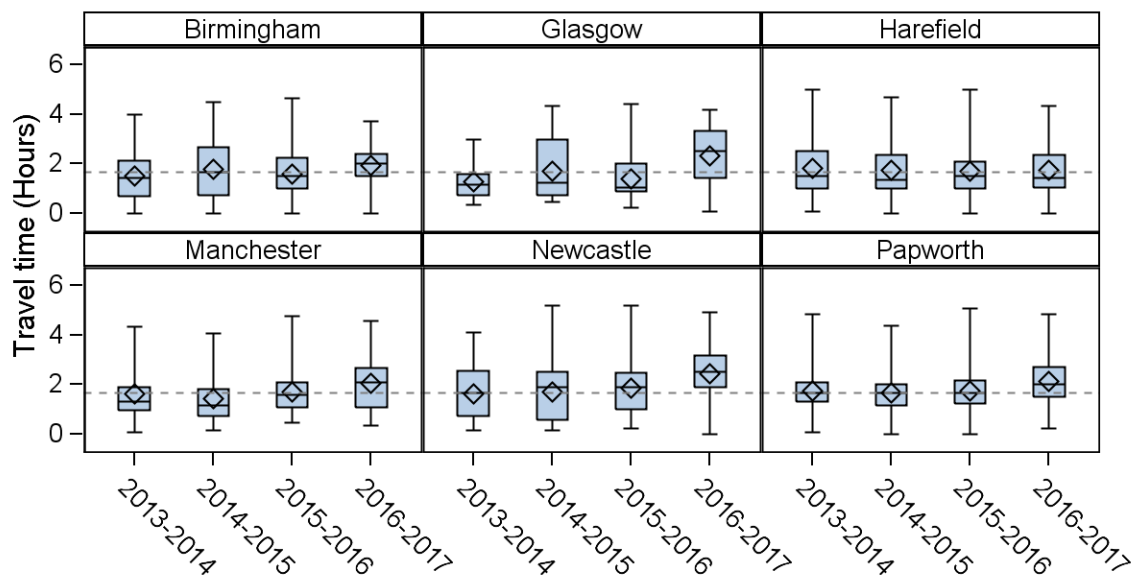


Figure 5b Median (IQR) time a cardiothoracic team is out travelling from their base to donor hospital, 1 April 2013 to 31 March 2017



- 13 **Figure 6a** and **Figure 6b** show the geography of donors attended by abdominal and cardiothoracic NORS teams, in 2013/14 and 2016/17 respectively. The location of donors has not changed largely over time, however the number of donors attended by an abdominal team in Scotland has increased in the last year.

