NHS BLOOD AND TRANSPLANT

Deceased Donor Transplant Projections for 2019/20-2023/24 in the UK

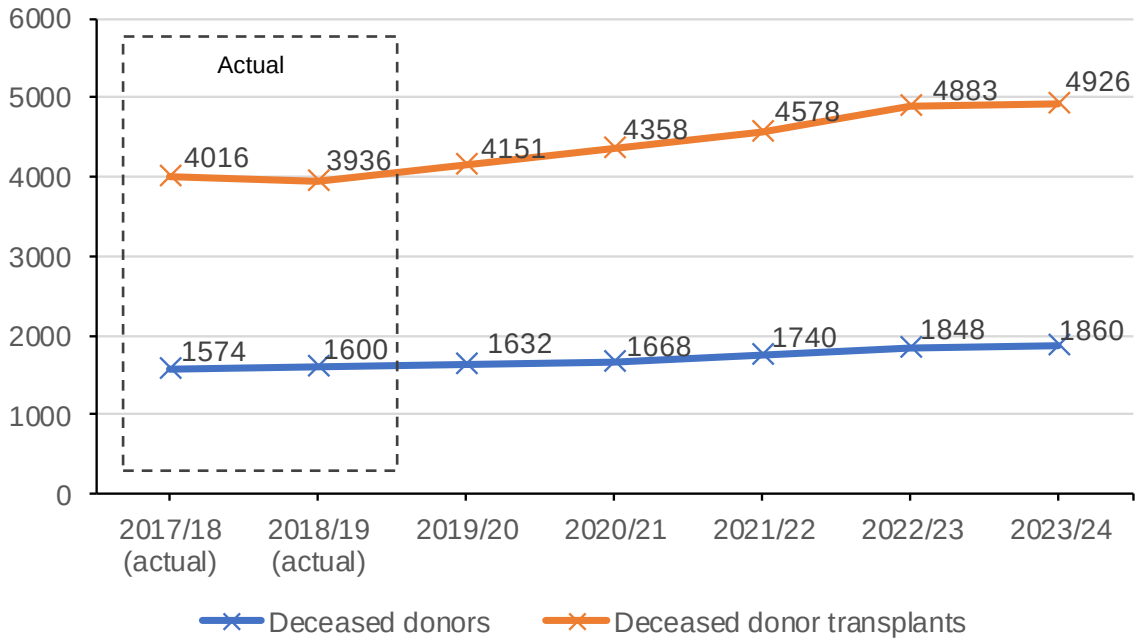
1. Summary

This paper presents deceased donor and transplant projections for the UK for the next 5 financial years taking into account historic trends in organ utilisation, initiatives to increase organ utilisation, and the expected impact of introducing opt-out legislation. The impact of opt-out legislation on transplant numbers is measured against a baseline year of 2017/18, in which there were 4,016 transplants across the UK. These projections should be thought of as a likely scenario based on available evidence, but it should be borne in mind that the reality might look quite different.

Table 1 Summary of UK deceased donor and transplant projections

	2019/20	2020/21	2021/22	2022/23	2023/24
Deceased donor projections	1,632	1,668	1,740	1,848	1,860
Deceased donor transplant projections	4,151	4,358	4,578	4,883	4,926
Transplants expected without organ utilisation initiatives	4,057	4,145	4,327	4,595	4,625
Difference in transplants from baseline (2017/18)	41	129	311	579	609
Difference in transplants from baseline (2017/18) with organ utilisation initiatives	135	342	562	867	910

Figure 1 UK deceased donor and transplant projections, 2019/20-2023/24



Key messages:

1) By 2022/23 we project that we will see 579 additional transplants performed across the UK compared with the baseline year as a result of opt-out legislation (2017/18 is the baseline year when there were 4,016 transplants).
2) If organ utilisation initiatives are funded, combined with the effect of opt-out, by 2022/23 we project that we will see 867 additional transplants performed across the UK compared with the baseline year.

2. Donor Projections

Estimates of the number of UK deceased donors have been projected for the next 5 financial years. These projections account for the introduction of opt-out legislation and assume an 80% consent rate for organ donation by 2022/23 across the UK. The increase in deceased donors as a result of opt-out is expected to come in gradually and reach full effect in 2022/23, then level off in 2023/24. The proportion of donors that are expected to be DBD is 60%, which is the average observed over the last 5 financial years and there is no strong evidence that this would change under opt-out. The breakdown by donor nation (according to donor hospital) assumes the following split: 86% in England, 6% in Scotland, 5% in Wales and 3% in Northern Ireland.

Table 2 Deceased donor projections

	2017/18 (actual)	2018/19 (actual)	2019/20	2020/21	2021/22	2022/23	2023/24
UK deceased donor projections	1,574	1,600	1,632	1,668	1,740	1,848	1,860
Assumed consent rate	66%	67%	70%	72%	75%	80%	80%
Projected increase on previous year (%)		1.7%	2.0%	2.2%	4.3%	6.2%	0.6%
ONS population predictions	66.1	66.5	66.9	67.3	67.6	68.0	68.3
Donors pmp	23.8	24.1	24.4	24.8	25.7	27.2	27.2
DBD donors	955	961	979	1,001	1,044	1,109	1,116
DCD donors	619	639	653	667	696	739	744
Donors in England	1358	1371	1398	1430	1497	1597	1606
Donors in Wales	74	87	89	90	91	92	93
Donors in Scotland	102	98	100	102	106	112	114
Donors in Northern Ireland	40	44	45	46	46	47	47

3. Transplant Projections

Table 3 provides a breakdown of the deceased donor transplant projections by donor type and nation of transplant centre. Organ utilisation was lower in 2018/19 compared with 2017/18; in particular there were fewer transplants per DBD donor. Going forward, the number of transplants per DBD is expected to increase back to 2.9 in the next few years and the number of transplants per DCD is expected to increase more markedly because of organ utilisation initiatives which affect DCD more than DBD. See **Section 4** for the list of assumptions on which these numbers are based, including the list of organ utilisation initiatives that have been taken into account.

Table 4 provides a breakdown of the transplant projections by nation of transplant centre and organ type. **Table 5** provides a breakdown of the transplants expected due to organ utilisation initiatives and the numbers expected without organ utilisation initiatives, by nation of transplant centre.

Table 3 Deceased donor transplant projections

	2017/18 (actual)	2018/19 (actual)	2019/20	2020/21	2021/22	2022/23	2023/24
Deceased donor transplants	4,016	3,936	4,151	4,358	4,578	4,883	4,926
Transplants pmp	60.8	59.2	62.0	64.8	67.7	71.8	72.1
Transplants per donor	2.6	2.5	2.5	2.6	2.6	2.6	2.6
DBD transplants	2,756	2,651	2,786	2,886	3,011	3,186	3,209
Transplants per DBD	2.9	2.8	2.8	2.9	2.9	2.9	2.9
DCD transplants	1,260	1,285	1,365	1,472	1,567	1,697	1,717
Transplants per DCD	2.0	2.0	2.1	2.2	2.3	2.3	2.3
Transplants in England	3,546	3,489	3,672	3,857	4,051	4,320	4,359
Transplants in Wales	54	86	74	78	82	87	88
Transplants in Scotland	350	313	348	364	383	408	412
Transplants in Northern Ireland	66	48	57	59	63	67	67

Table 4 Transplant projections by nation of transplant centre and organ

Year	Nation	Liver	Pancreas	Heart	Lung	Kidney	Other*	Total
2019/20	England	886	183	184	196	2,185	38	3,672
2019/20	Wales	0	8	0	0	66	0	74
2019/20	Scotland	112	30	11	0	195	0	348
2019/20	Northern Ireland	0	0	0	0	57	0	57
2019/20	***UK Total***	***998***	***221***	***195***	***196***	***2,503***	***38***	***4,151***
2020/21	England	925	191	217	205	2,281	39	3,857
2020/21	Wales	0	9	0	0	69	0	78
2020/21	Scotland	117	31	14	0	203	0	364
2020/21	Northern Ireland	0	0	0	0	59	0	59
2020/21	***UK Total***	***1,041***	***230***	***230***	***205***	***2,613***	***39***	***4,358***
2021/22	England	975	199	226	213	2,398	41	4,051
2021/22	Wales	0	9	0	0	73	0	82
2021/22	Scotland	123	32	14	0	214	0	383
2021/22	Northern Ireland	0	0	0	0	63	0	63
2021/22	***UK Total***	***1,098***	***239***	***240***	***213***	***2,747***	***41***	***4,578***
2022/23	England	1,037	211	239	226	2,565	43	4,320
2022/23	Wales	0	9	0	0	78	0	87
2022/23	Scotland	131	34	15	0	228	0	408
2022/23	Northern Ireland	0	0	0	0	67	0	67
2022/23	***UK Total***	***1,167***	***254***	***254***	***226***	***2,938***	***43***	***4,883***
2023/24	England	1,047	212	241	227	2,589	43	4,359
2023/24	Wales	0	9	0	0	78	0	88
2023/24	Scotland	132	34	15	0	231	0	412
2023/24	Northern Ireland	0	0	0	0	67	0	67
2023/24	***UK Total***	***1,179***	***255***	***256***	***227***	***2,965***	***44***	***4,926***

* includes intestinal transplants and multi-organ transplants not including simultaneous kidney-pancreas which are included in the pancreas figures, or combined heart-lung which are included in the lung figures

Table 5 Transplant projections broken down by those expected due to organ utilisation initiatives and those expected without organ utilisation initiatives, by nation of transplant centre

Nation		2017/18 (actual)	2018/19 (actual)	2019/20	2020/21	2021/22	2022/23	2023/24
England	Total	3,546	3,489	3,672	3,857	4,051	4,320	4,359
	Due to organ utilisation initiatives			83	188	222	255	267
	Without organ utilisation initiatives			3,589	3,669	3,829	4,066	4,092
Wales	Total	54	86	74	78	82	87	88
	Due to organ utilisation initiatives			2	4	4	5	5
	Without organ utilisation initiatives			73	74	77	82	83
Scotland	Total	350	313	348	364	383	408	412
	Due to organ utilisation initiatives			8	18	21	24	25
	Without organ utilisation initiatives			340	346	362	384	387
Northern Ireland	Total	66	48	57	59	63	67	67
	Due to organ utilisation initiatives			1	3	3	4	4
	Without organ utilisation initiatives			56	57	59	63	63
UK	**Total**	**4,016**	**3,936**	**4,151**	**4,358**	**4,578**	**4,883**	**4,926**
	Due to organ utilisation initiatives			**93**	**213**	**251**	**288**	**301**
	Without organ utilisation initiatives			**4,057**	**4,145**	**4,327**	**4,595**	**4,625**

4. Assumptions

1) 60% of projected donors will be DBD (average observed over the last 5 financial years and there is no strong evidence that this would change under opt-out).

2) The conversion from projected donors to transplants is based on the utilisation rates observed during the last three financial years, 2016/17-2018/19, with weighting towards the more recent years, for example:

	2016/17	2017/18	2018/19	Weighted
No. DBDs	829	955	961	
No. DBD kidney transplants	1263	1432	1426	
Utilisation rate	1.52	1.50	1.48	1.50

Where 1.50=((1.48x3)+(1.50x2)+(1.52x1))/6
The DBD donor projections are then multiplied by 1.50 to get the number of DBD kidney transplants

3) In addition to (2) we expect the following organ utilisation initiatives to have an impact on the number of transplants:
    a. Liver NRP (Normothermic Regional Perfusion): based on data observed from Cambridge and Edinburgh, NRP leads to a 1.27 increase in the liver transplant rate and we assume that the impact will be phased in across SNOD regions not currently using NRP from 1 April 2019 (regions already using NRP assume no change) based on the current distribution of DCD liver donors across regions. There is also expected to be a small impact on DBD liver transplant numbers and DCD kidney transplant numbers.
    b. Hepatitis C virus donors: assumed 50% usage of organs from HCV donors projected in 2019/20, increased thereafter.
    c. DCD hearts: assumed that DCD heart utilisation will double from 4.1% to 8% from 2020/21 due to availability of cheaper machines. Assumed 2019/20 rates same as current.
    d. EVNP (Ex-Vivo Normothermic Perfusion) trial: minimal impact on DCD kidney utilisation.
    e. Scouting: no effect of scouting was taken into consideration as there is currently no guarantee that scouting will be performed more widely than at present.
    f. New allocation schemes: new schemes that are in development (kidney and pancreas) are not expected to increase utilisation.

4) Transplant centre specific projections (SEE SUPPORTING SPREADSHEET) of different organ transplants were calculated and for these we considered whether the factors above may differentially influence individual transplant programmes over the next 5 years. We concluded that there was insufficient evidence to do anything other than assume an equal impact of all these changes across relevant transplant centres[1]. Therefore, the breakdown by centres is based solely on the breakdown that has been observed during 2016/17-2018/19, with weighting towards the more recent year (except for liver which only used the breakdown observed in 2018/19 since before then allocation was considerably different). To obtain projections by transplant nation (see the Appendix) these centre specific projections were summed within the nation in which the centre is located.

Sally Rushton, Lisa Mumford, Statistics and Clinical Studies
Joanne Allen, Performance and Business Manager, ODT

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[1] See Appendix for rationale

APPENDIX – Rationale for using historic breakdown observed across transplant centres for centre specific projections

- Organ allocation arrangements in the UK are UK-wide and so increases in donors in certain parts of the UK relative to others, as a result of opt-out, are likely to benefit the whole of the UK. For cardiothoracic organ allocation there is still a regional (zonal) element of allocation, but the only UK cardiothoracic organ transplant centre not in England is the Glasgow transplant centre. This centre does not transplant lungs and transplants fewer than 20 hearts per year, so there was no real justification to adjust the transplant rates differently here than in other centres.
- NRP will impact liver transplantation and will be phased in across different NORS teams but because allocation is national, we do not expect this to affect some transplant centres more than others.
- Hepatitis C virus donors – although funding not agreed for all nations, the impact is relatively small and so any adjustment in centre specific projections would be minimal.
- Changes to organ allocation schemes – apart from pancreas and kidney allocation scheme changes due in 2019/20, no other future changes are confirmed and recent changes in liver offering have already been taken into account in the baseline period. The pancreas changes are relatively minor and not expected to impact activity levels. The kidney allocation changes are likely to lead to different patient priorities for some types of donor, but there is no evidence that this will impact some transplant centres more than others.
- DCD hearts – it is likely that cheaper machines will be available in 2020/21 to facilitate this and there will be a move towards national allocation.