Chapter 12: Renal transplantation in adults

Summary

- This chapter reports on data returned from 40 units of which 17 are renal transplant centres.
- Data on 60% of all transplant patients in the UK and 69% from England and Wales are reported to the UK Renal Registry.
- 26% of all transplant patients on the Registry database are managed by non-transplant centres.
- The proportion of new transplant patients with a primary renal diagnosis of diabetic nephropathy has progressively increased from 7.5% in 1999 to 9.6% in 2002.
- Variation exists between centres with respect to access to transplantation. There are a number of possible explanations for these differences which need to be examined further.
- 2.3% of all prevalent transplants failed during 2001 (excluding death with a functioning transplant).
- The annual death rate of patients with established renal transplants for England and Wales is 2.4% (excluding patients with failed grafts returning to dialysis).
- The quality of transplant function differs significantly between centres, as does the haemoglobin level.
- Differences in modifiable risk factors for cardiovascular disease also exist and control of these factors is often poor. In most centres there has been a progressive reduction in median serum cholesterol levels since 1998. In 2002, 51.4% of all transplant patients had a cholesterol level of less than 5.0 mmol/L. Cholesterol levels rise during the first year after transplantation and overall are similar to the distribution of cholesterol in patients treated by peritoneal dialysis. Cholesterol levels are lower in diabetic compared with non-diabetic transplant patients.
- Blood pressure control falls far short of Renal Association standards. Reporting of blood pressure is poor from some centres, who will need to explore ways of storing blood pressure records electronically to facilitate audit.
- There is a need to provide more complete transplant information by merging data from UK Transplant and the UK Renal Registry.

Introduction

In 2002, there were 25 centres in England and Wales performing renal transplantation in adults. However, a greater number of renal units contribute to the management and follow up of patients after transplantation. This chapter reports on data returned from 40 units, of which 17 perform renal transplantation. Two units do not follow up their patients who are transplanted and one follows only 7 patients. The others all follow more than 25 transplantees.

Other data on renal transplantation are available from www.uktransplant.org.uk. In the year April 2001-2002, UK Transplant reported a total of 1245 cadaver donor transplants and 438 live donor transplants; this was a fall of 2.0% over the previous year. There were 4963 patients on the transplant waiting list on 31st March 2002, a figure which had increased by 2.4% over the previous year. Subsequently the number of transplants performed has increased by 1.5% and the waiting list has increased by a further 2.2%. UK Transplant figures include paediatric patients. The paediatric renal replacement therapy population accounted for 119 of these transplants, 65% of which were living donors.

In this chapter, emphasis is placed on access to transplantation, quality of

transplant function (expressed as estimated GFR using abbreviated MDRD formula), patient survival, haemoglobin and potentially modifiable cardiovascular risk factors such as blood pressure and cholesterol. For the first time, information on social deprivation and the ethnic distribution of transplant recipients is provided.

Data comparison between centres managing a small number of transplant patients should be made with caution.

Transplants performed 2002

In 2002, 935 renal transplants were performed in patients from centres contributing to the Renal Registry. This represents 62% of all renal transplants performed in England and Wales and 56% of all renal transplants performed in the UK in that year. The median age of the new transplant recipients was 46.8 years, 61.3% were male and 38.7% female. Table 12.1 shows the change in median age of new adult transplant recipients in England and Wales since 1998.

Since 1999, data on an increasing proportion of new and prevalent transplant patients have been included in the UK Renal Registry (Table 12.2).

Table 12.3 shows the primary renal diagnosis in newly transplanted patients and in the established transplant population. The proportion of new transplants whose primary renal diagnosis was diabetic nephropathy has progressively increased through 1999, 2000, 2001 from 7.8%, to 9.0% to 9.6% in 2002.

Patients with established renal transplants

In 2002 there were 10372 prevalent transplant patients in participating centres. Table 12.4 shows the number of prevalent transplant patients at each centre. Overall, 74% of all transplant patients reported to the Registry are managed by centres performing renal transplantation.

The transfer of patients from the transplant centre back to the referring unit occurs at variable times after transplantation ranging from 7 days to 1 year or longer. Therefore, a more meaningful way of presenting this data is as the transplant prevalence rate (p.m.p.) according to the resident area populations organised by postcode. The data in Table 12.5 has been presented using postcode links to the ‘old’ Health Authorities (HAs) as there has been insufficient time to remap these data to Local Authorities and PCTs in current use. HAs that are known to have incomplete coverage have been removed. The two transplant units in Birmingham and Manchester, which are not currently submitting data to the Registry, account for much of the incomplete data for the HAs in these regions.

The transplant prevalence rate of 271 p.m.p in England is in keeping with the 2002 national survey in Chapter 3 of this years report. The falling proportion of renal replacement therapy patients with a functioning transplant shown in Table 12.6 is due to the increasing number of patients starting dialysis who are aged over 65 years and therefore less likely to be suitable for transplantation, together with falling cadaveric donation rates.

Table 12.1. Median age of new transplant recipients in Registry units in England and Wales since 1999

	Median age	Number
1998	42.9	496
1999	41.6	517
2000	45.4	646
2001	43.7	830
2002	46.8	935

Table 12.2. Number of new and prevalent transplant patients in UK units reporting to the Renal Registry

	New transplants UK (inc children)	Prevalent transplants UK	New transplants Renal Registry E&W	Prevalent transplants Renal Registry E&W
1999	1581	Not available	517	5433
2000	1671	Not available	646	6689
2001	1691	Not available	830	8688
2002	1658	17135	935	10372

Table 12.3. Primary diagnosis of transplant patients in the UK

	New transplants in 2002		**Established transplants 1/1/02**	
	%	**No**	**%**	**No**
Aetiology unc. /Glomer. NP	16.4	153	22	2282
Glomerulonephritis	23.4	219	19	1971
Pyelonephritis	12.7	119	16	1660
Diabetes	9.6	90	7	726
Renal Vascular disease/Hypert.	6.3	59	7	726
Polycystic Kidney	13.1	122	11	1141
Not sent	4.4	41	3	311
Other	14.1	132	15	1556

Table 12.4. Number of prevalent transplant patients according to registry centre.

Treatment Centre	Prevalent Transplant Patients
Bangr	0
Bradf	100
Bristl	561
Camb	392
Carls	85
Carsh	339
Clwyd	26
Covnt	262
Crdff	615
Extr	222
Glouc	51
Guys	706
H&Cx	406
Heart	185
Hull	192
Ipswi	87
Kings	237
Leic	460
LGI	164
Livrpl	632
Newc	465
Notts	380
Oxfrd	859
Plym	221
Ports	613
Prstn	191
Redng	7
SCleve	280
Sheff	410
Stevn	147
Sthend	29
StJms	484
Sund	129
Swnse	105
Truro	63
Wirrl	0
Wolve	84
Words	94
Wrex	47
York	34
Eng	9571
Wales	793
E&W	10372

Centres that perform renal transplantation are shown in bold type

Table 12.5. Transplant prevalence rate per million population (p.m.p) according to resident Health Authority of transplant patient

Region	HA Text	Population	Transp prev p.m.p	% transp	No patients with transp
Y01	Bradford	483,300	283	43	137
Y01	Calderdale and Kirklees	583,800	324	52	189
Y01	County Durham and Darlington	607,800	326	56	198
Y01	East Riding and Hull	574,500	216	40	124
Y01	Gateshead and South Tyneside	353,500	362	60	128
Y01	Leeds	727,400	268	46	195
Y01	Newcastle & North Tyneside	470,100	357	62	168
Y01	North Cumbria	319,300	279	53	89
Y01	North Yorkshire	742,400	229	43	170
Y01	Northumberland	309,600	365	60	113
Y01	Sunderland	292,300	349	63	102
Y01	Tees	556,300	325	58	181
Y01	Wakefield	318,800	248	48	79
Y02	Barnsley	228,100	307	46	70
Y02	Doncaster	290,500	220	37	64
Y02	Leicestershire	928,700	305	45	283
Y02	Lincolnshire	623,100	238	44	148
Y02	North Derbyshire	370,200	213	43	79
Y02	North Nottinghamshire	388,900	255	43	99
Y02	Nottingham	642,700	249	39	160
Y02	Rotherham	254,400	240	36	61
Y02	Sheffield	531,100	217	37	115
Y02	South Humber	308,600	230	39	71
Y07	Coventry	304,300	276	38	84
Y07	Warwickshire	506,700	326	50	165
Y08	Liverpool	461,500	247	40	114
Y08	Morecambe Bay	310,300	126	34	39
Y08	Sefton	287,700	205	39	59
Y08	St Helens and Knowsley	333,000	255	45	85
Y08	Wirral	327,100	263	43	86
Y09	Bedfordshire	556,600	228	41	127
Y09	Cambridgeshire	468,000	321	42	150
Y09	Suffolk	671,100	182	48	122
Y10	Bexley, Bromley and Greenwich	730,000	275	47	201
Y10	Ealing, Hammersmith & Hounslow	617,200	262	28	162
Y10	Lambeth, Southwark and Lewisham	745,200	309	39	230
Y11	Berkshire	800,200	295	52	236
Y11	Buckinghamshire	681,900	301	54	205
Y11	East Surrey	419,900	262	57	110
Y11	I o Wight, Portsmouth, SE Hampshire	671,700	331	58	222
Y11	North and Mid Hampshire	556,900	223	55	124
Y11	Northamptonshire	615,800	268	48	165
Y11	Oxfordshire	616,700	318	55	196
Y11	Southampton & SWest Hampshire	542,300	278	59	151
Y11	West Surrey	640,600	204	47	131
Y12	Avon	999,300	346	53	346
Y12	Cornwall and Isles of Scilly	490,400	281	41	138
Y12	Gloucestershire	557,300	248	46	138
Y12	North and East Devon	479,300	246	45	118
Y12	Somerset	489,300	260	45	127
Y12	South and West Devon	589,100	290	48	171
Y12	Wiltshire	605,500	256	55	155
W00	Gwent	557,200	377	52	210
W00	Bro Taf	739,600	339	50	251
W00	Dyfed Powys	479,400	215	39	103
W00	North Wales	657,500	259	37	170
W00	Morgannwg	499,700	326	46	163
	England	29,528,000	267		7,823
	Wales	2,933,400	306		897
	England & Wales	32,461,400	271		8,720

Figure 12.1 shows the age distribution of the prevalent transplant patients compared with that for the dialysis population from which they were drawn. The median age of the transplant patients was 49.6 years compared with 62.7 years for the dialysis population. 14% of the total prevalent transplant population and 45% of the prevalent dialysis population were over 65 years old.

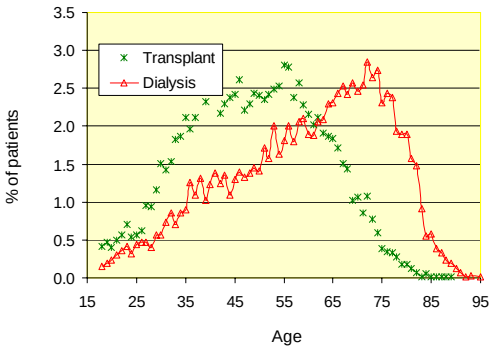

Figure 12.1. Age histogram of dialysis and transplant patients

Figure 12.2 shows the proportion of prevalent patients at each participating centre aged less than 65 years receiving renal replacement therapy by RRT modality at the end of 2002. This age cut off has been chosen as most patients receiving a renal transplant for the first time are aged 65 years or under. Overall for England and Wales, 57% of the prevalent RRT patients under 65 years are transplanted patients. If all patients receiving RRT are included (i.e. those aged over 65 years as well), this proportion falls to 46%.

Figure 12.3 shows the proportion of prevalent dialysis patients at each participating centre under 65 years old that has *ever* had a renal transplant. These figures are an underestimate, as some patients had no information regarding previous transplantation when transferring in on dialysis from a non-Registry unit and are treated as unknown. In spite of this, there are apparent wide variations (7.6-47.4%) between patients' access to transplantation in different centres.

As stated earlier, a proportion of patients originating from non-transplant units may be followed up at the main transplant centre after transplantation (particularly those in clinical trials) and may account for some of the observed differences. Differences may also exist between transplant centres in the selection criteria used for accepting patients onto the waiting list. The demographics of the local population are also important. Renal units in areas with an elderly population will have a larger proportion of elderly dialysis patients with co-morbidity, who are unfit for transplant. In addition, patients in older units are likely to have had a longer opportunity for transplantation than in newer units and older units are consequently more likely to have a larger proportion of transplanted patients. Another possible explanation for these variations is the difference in the proportion of prevalent dialysis patients made up by ethnic minorities (harder to match both blood group and HLA type and thus transplant) in each centre. It is hoped in the future to produce figures for access to transplantation which are standardised for age and gender.

Amongst all transplanted patients in 2002, the ethnic origin was recorded as Caucasian in 85.6%, as African-Caribbean in 4.9%, as Indo-Asian in 7.7%, as Chinese in 0.2% and as other in 1.6%. Figure 12.4 shows the proportion of patients in each ethnic group under 65 years old that have ever received a renal transplant.

Table 12.6. Annual proportion of RRT patients with functioning transplant, recipient median age and % aged>65

Year	% all RRT with functioning transplant	Median age of transplant recipients	% transplant recipients >65 yrs old
1997	51.0	-	-
1998	49.9	42	-
1999	47.3	43	5%
2000	46.9	-	-
2001	46.6	49.0	13.2%
2002	46.0	49.6	14.0%

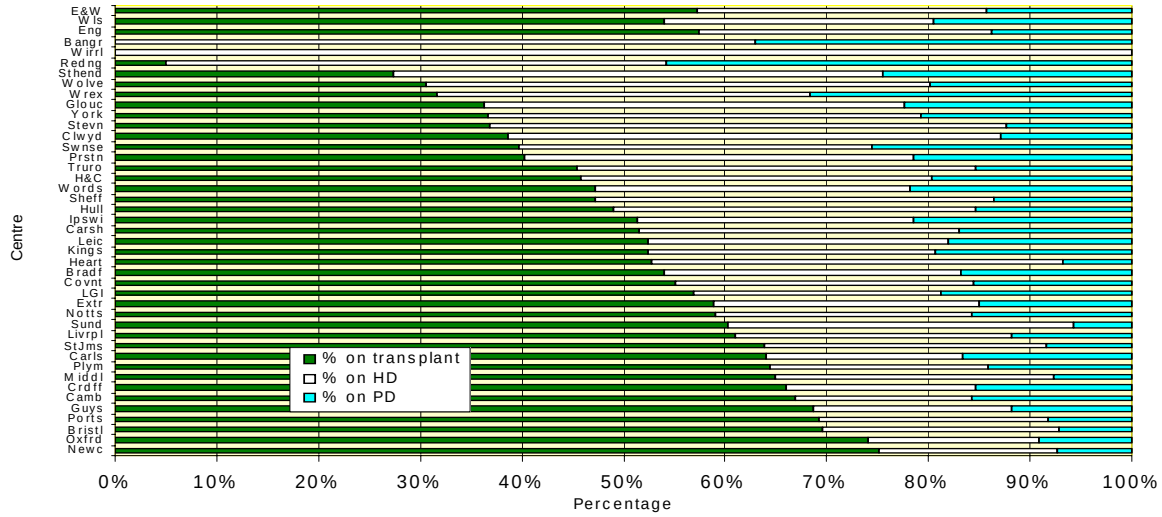

Figure 12.2. Treatment modality of all prevalent patients < 65 years old

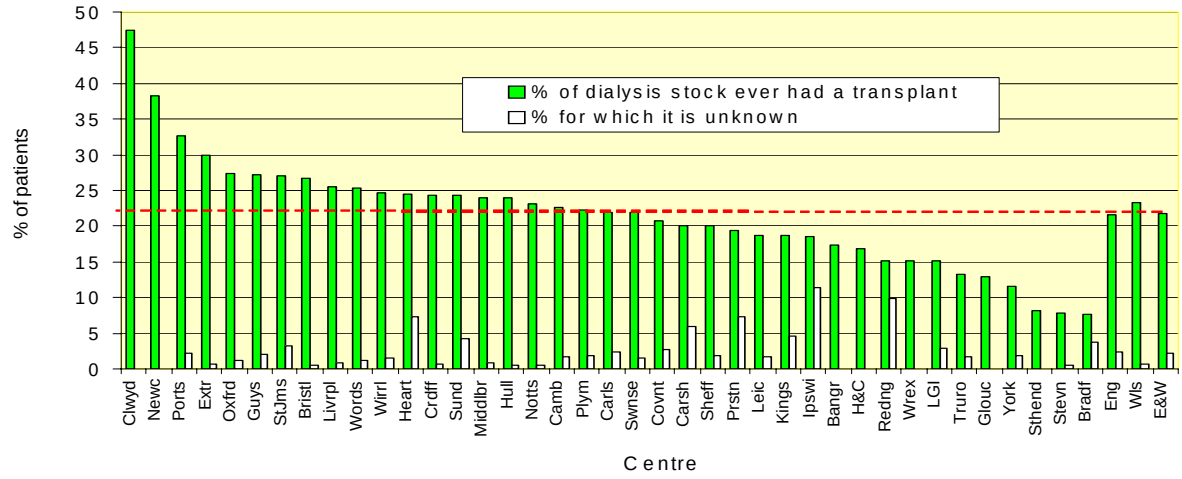

Figure 12.3. % of prevalent dialysis patients aged <65 years who have ever received a transplant

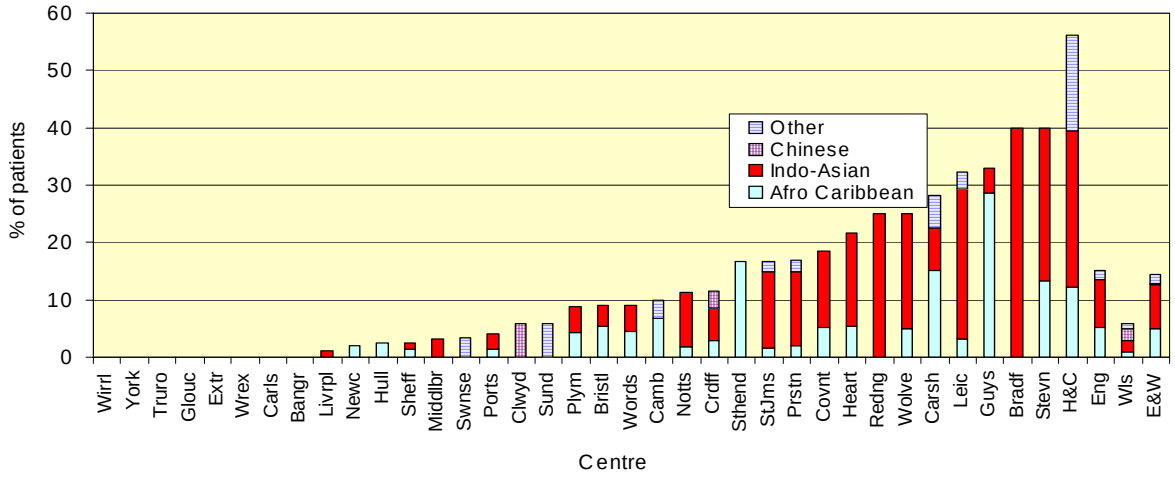

Figure 12.4. Proportion of patients <65 years ever received a transplant, by ethnicity

Transplantation in patients with diabetes mellitus

Figure 12.5 shows the proportion of all patients in each registry centre with a functioning renal transplant on 31/12/02 whose primary renal failure diagnosis was diabetes mellitus. Overall in England and Wales, 7.2% of all prevalent transplant patients have diabetes mellitus as the cause of end-stage renal failure. This proportion has increased annually from 5.8% in 1997. The median age of prevalent transplant patients in England and Wales with a primary diagnosis of diabetes mellitus was 49 years compared with 46.8 years for the whole group of prevalent transplant patients.

The percentage of diabetic ERF patients under 65 years old with a transplant was examined by centre to explore whether there was a difference between centres in their approach to transplanting patients with this diagnosis (Figure 12.6).

There is a very wide variation (6.5-64.9%) between centres in the proportion of diabetic patients under 65 years old with end-stage renal failure that have a transplant (37.6% overall mean for England & Wales). To explore further a possible difference in access to transplantation for diabetic patients between centres, the proportion of transplanted diabetic patients and transplanted non-diabetic patients under 65 was expressed as a ratio for each centre (Figure 12.7). This age limit was used in an effort to make the populations more comparable, as most patients receiving a transplant are under 65 and diabetic patients on RRT have a lower median age than other patients.

The ratio was wide ranging from 0.86 down to 0.14. Because differences in the overall proportion of ERF patients with diabetes under 65 years may partially account for this variability, these percentages are also shown for each centre. Inspection of Figure 12.7 shows that a significant difference still exists between centres with either a high or low prevalence of diabetic ERF patients. Differences in the percentage of the cohort originating from ethnic minorities (and thus likely to experience difficulty in blood group and HLA matching) are unlikely to account for all the observed differences.

ERF patients with diabetes mellitus are less likely to receive a transplant than other ERF patients due to a number of possible factors, including co-morbidity and ethnicity. However, other differences between centres must also exist to account for the observed variation in the proportion of patients with diabetes mellitus transplanted.

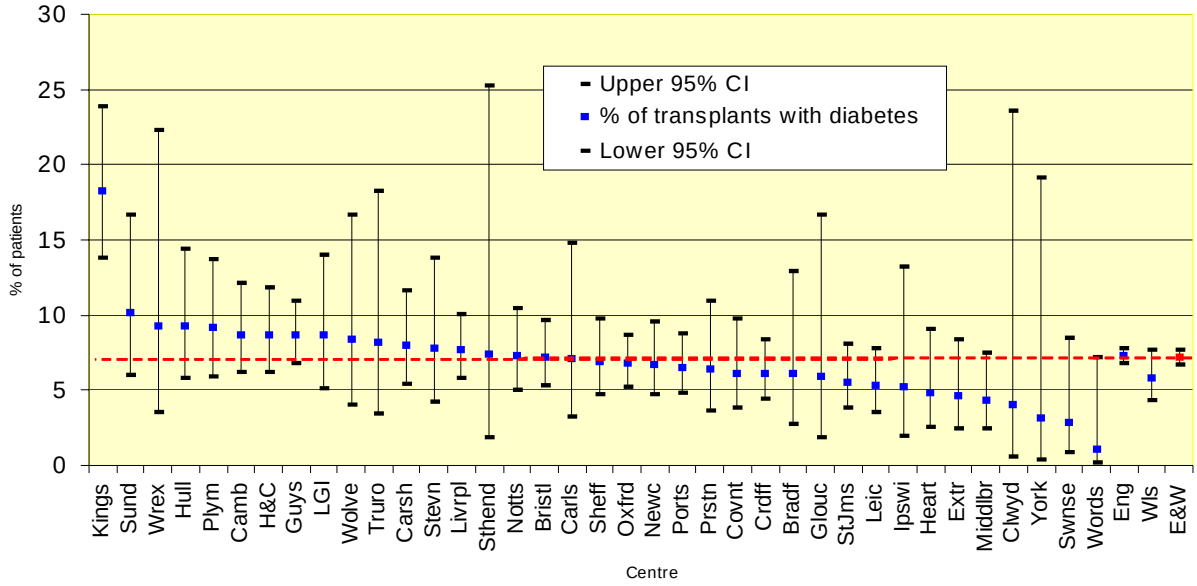

Figure 12.5. Percentage of current transplant patients with diabetes mellitus, by centre

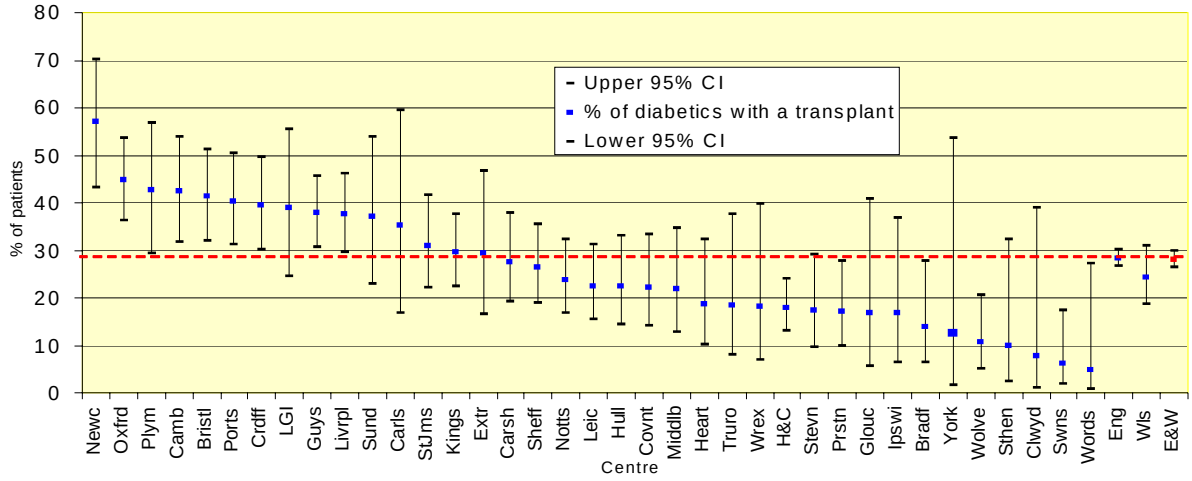

Figure 12.6. Percentage of diabetic ERF patients with a transplant, by centre

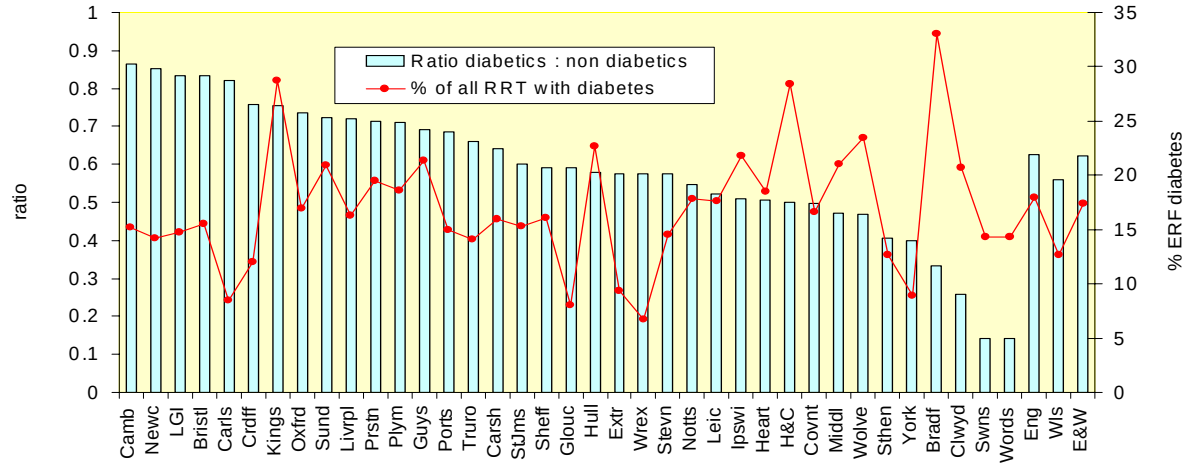

Figure 12.7. Ratio of patients with a transplant under 65, diabetics: non-diabetics and proportion of all ERF patients under 65 with a primary diagnosis of diabetic nephropathy

Social Deprivation

Social deprivation was examined and scored using the Townsend score which was derived from the patient's postcode. The Townsend score is a composite measure of deprivation based on total unemployment rate, no car households, overcrowded households and not owner occupier households based on the electoral ward as at the 2001 Census. The higher the Townsend index, the greater is the deprivation (see Chapter 17).

Analysing the incident cohort, patients who received a transplant within the first 90 days of starting renal replacement therapy (including those with a pre-emptive transplant) were the least socially deprived (Townsend score -1) compared with those on PD (Townsend score -0.33) and HD (Townsend score 0.3) at day 90.

Analysing the prevalent cohort by median Townsend index, renal replacement therapy modality and age (Figure 12.8), in nearly every age band the Townsend index for transplanted patients is lower than for patients treated by peritoneal dialysis or haemodialysis. In addition, for each modality, the index falls with increasing age. The observed differences may be accounted

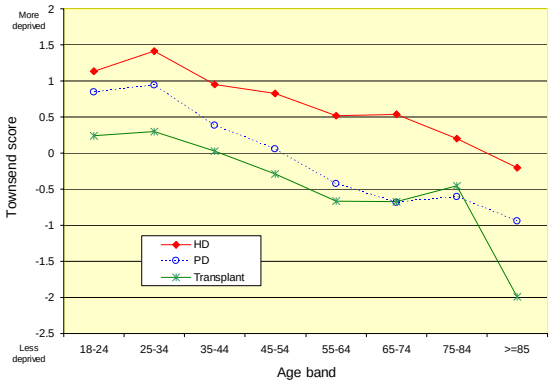

Figure 12.8. Townsend score by different RRT modalities and age

for by a number of factors including differences in co-morbidity and ethnicity, which are different in different social groups (see Chapter 17 for further discussion).

Failed transplants

Among prevalent transplant patients, 2.3% of transplants failed during 2002, excluding patients who died with a functioning graft. The overall failure rate is dropping and was about 3% in 1998.

Survival of patients with established renal transplants

Table 12.7 shows the Kaplan-Meier one-year patient survival for established transplant patients (transplanted for at least 6 months) alive on 1/1/2002. Data censored for return to dialysis and including death after return to dialysis within 2002 are shown.

Quality of transplant function

This analysis considered transplant patients on 31/12/2002 whose transplant had been functioning for at least one year. The most recent serum creatinine within 6 months was used in the analysis. There was no relationship between primary diagnosis and graft function as judged by estimated GFR using the abbreviated MDRD equation.

Figure 12.9 shows the median estimated GFR of prevalent transplant recipients for each centre. There are no statistically significant differences in median GFR values between centres.

Figures 12.10 and 12.11 show the percentage of established transplant patients at each unit with a calculated GFR of greater than 30 mls/min and 60 mls/min (MDRD) respectively. The differences between units are significant but unexplained; they may include differences in degree of HLA matching, immunosuppressive drug regimens and attitude to use of marginal donors.

Table 12.7. Survival during 2002 of established transplant patients alive 1.1.2002

	Transplant censored at dialysis			Transplant including dialysis returns		
	England	**Wales**	**E&W**	**England**	**Wales**	**E&W**
No. of patients	8503	782	9285	8503	782	9285
No of deaths	193	22	215	211	24	235
Death rate (95% CI)	2.3 (2.0-2.7)	2.9 (1.8-4.4)	2.4 (2.1-2.7)	2.5 (2.2-2.9)	3.1 (2.0-4.7)	2.6 (2.3-2.9)
K-M 1 yr survival (95% CI)	97.7 (97.4-98)	97.1 (96.0-98.3)	97.6 (97.3-98.0)	97.5 (97.2-97.8)	96.9 (95.7-98.1)	97.5 (97.1-97.8)

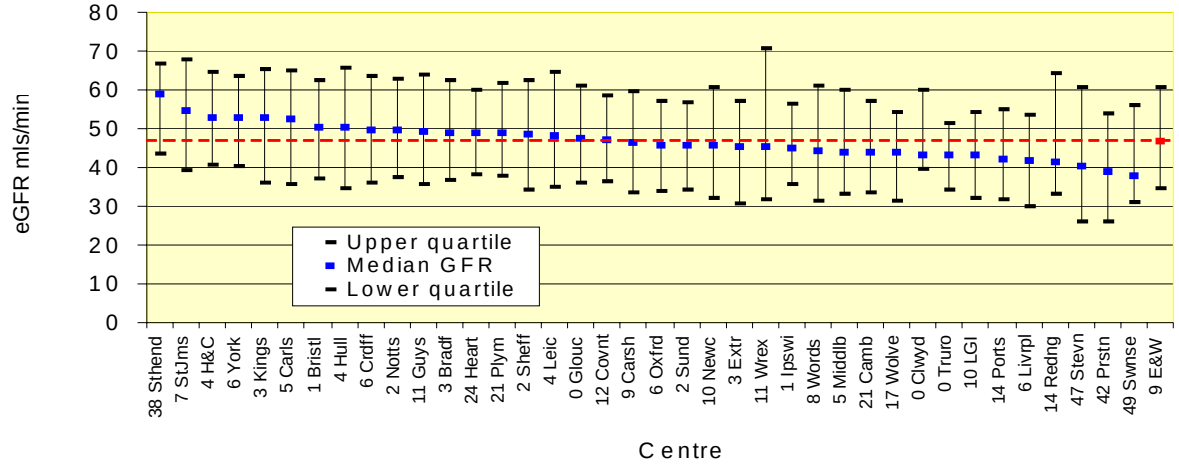

Figure 12.9. Median GFR of prevalent transplant patients, by centre

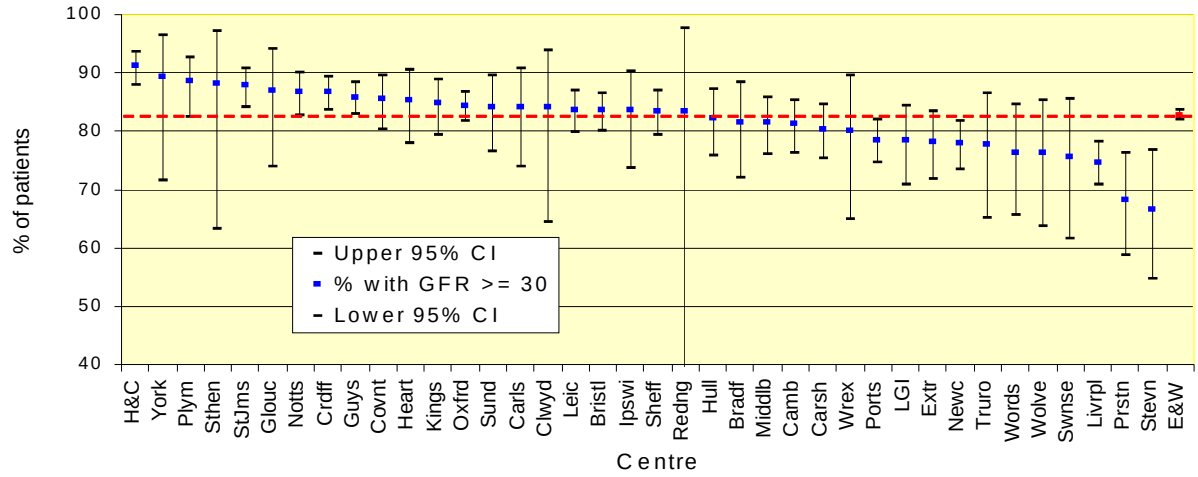

Figure 12.10. Percentage of established transplant patients with eGFR >30 mls/min (MDRD)

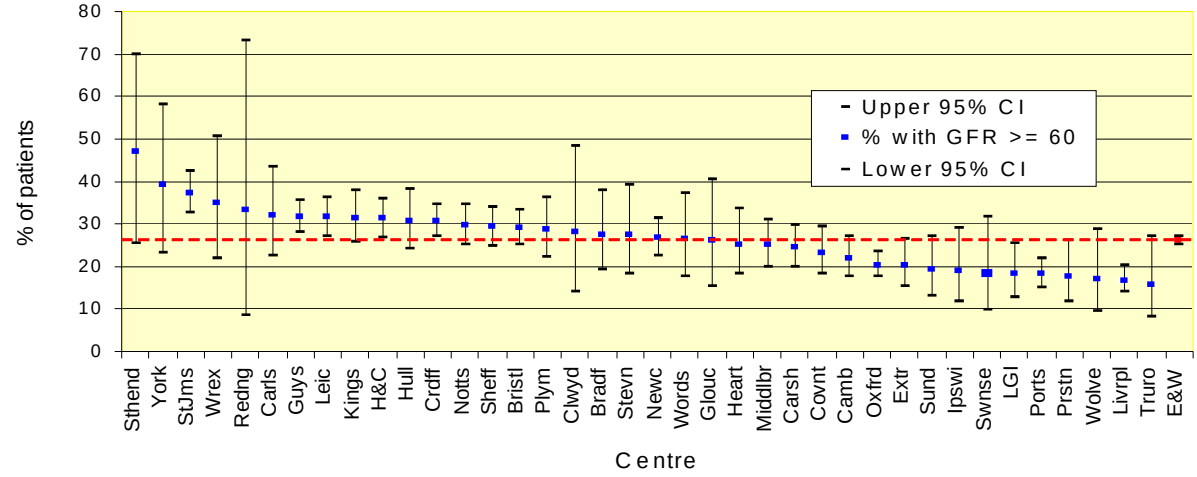

Figure 12.11. Percentage of established transplant patients with eGFR >60 mls/min (MDRD)

Haemoglobin in transplanted patients

There are no recommended haemoglobin standards for renal transplant patients although patients with failing transplants (eGFR < 30 mls/ min) should fall into the same category as patients with chronic kidney disease and the Renal Association Standard (Hb > 10g/dl) should be applied for these patients. Figure 12.12 shows the median haemoglobin for all prevalent transplant patients at least 6 months after transplantation according to Registry centre.

Figure 12.13 shows the percentage of transplant patients in each unit with a haemoglobin concentration less than 10g/dL. Overall, 5.4% of all transplant patients (at least 6 months after transplantation) have a haemoglobin level below 10g/dL. The variation of 1.8-15% between centres with Hb <10g/dL is unexplained. Possible reasons include quality of graft function (see below), type of immunosuppression (i.e. use of azathioprine and mycophenolate mofetil) and use of erythropoietin when there are failing grafts.

Figure 12.14 shows the median haemoglobin at each centre according to level of renal transplant function (calculated GFR greater or less than 30mls/ min). Centres with 10 or fewer patients in each group have been excluded. Not surprisingly, the median haemoglobin was lower in patients with a GFR below 30 mls/min compared with those whose GFR was above this value (11.5 vs 13.1 g/dL; $p < 0.001$).

As expected haemoglobin was lower in women and in patients with a lower GFR (Table 12.8).

Serum cholesterol

No recommendations have been made in either the Renal Association or British Transplant Society standards documents regarding a target cholesterol level in renal transplant recipients. However, for primary prevention in dialysis patients, the Renal Association Standards 3rd edition recommends that ;

> ***patients with a 10-year risk of coronary disease calculated as 30% should receive treatment with a HMG-CoA reductase inhibitor ("statin") to achieve a total cholesterol of <5 mmol/L, or a 30% reduction from baseline or a fasting LDL-cholesterol of <3mmol/L (whichever is the greatest reduction).***

This analysis included all transplant patients on 31/12/2002 whose grafts had been functioning for at least one year. The most recent serum cholesterol over a 12-month period was used. Results were available from 6501 patients. At least one serum cholesterol value had

Table 12.8. Relationship between haemoglobin, GFR and gender in transplant patients

		Haemoglobin							
Gender	GFR mls/ min	Mean Hb	Std dev	5th centile	Lower quartile	Median Hb	Upper quartile	95th centile	No. with data
Male	<30	11.7	1.7	9.0	10.4	11.6	12.8	14.6	664
Male	>30	13.5	1.7	10.7	12.4	13.5	14.7	16.2	3475
Female	<30	11.4	1.6	8.9	10.4	11.3	12.4	14.0	582
Female	>30	12.5	1.5	10.1	11.5	12.5	13.5	14.9	2026

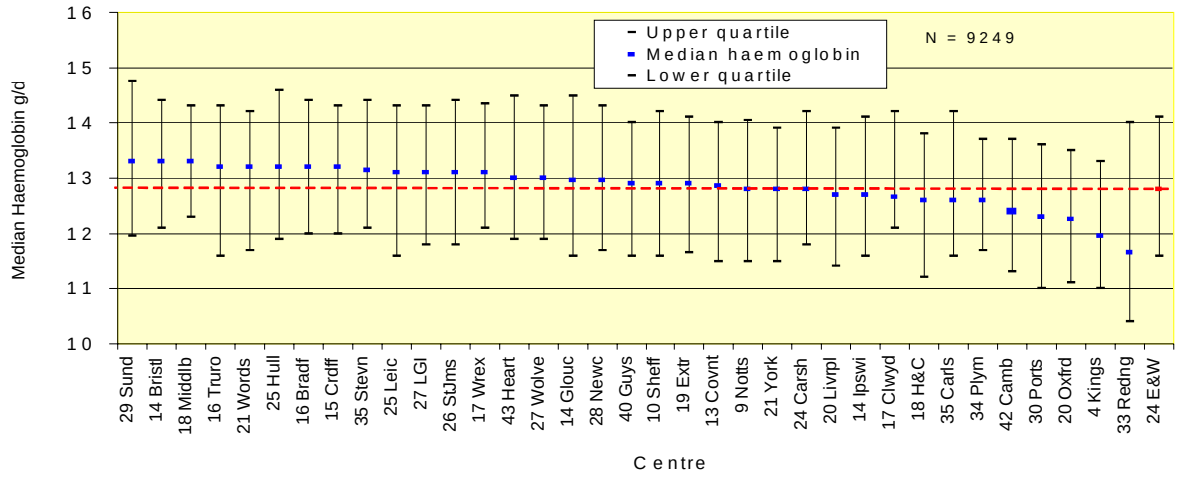

Figure 12.12. Median Hb of transplant patients >6 months post-transplant by centre

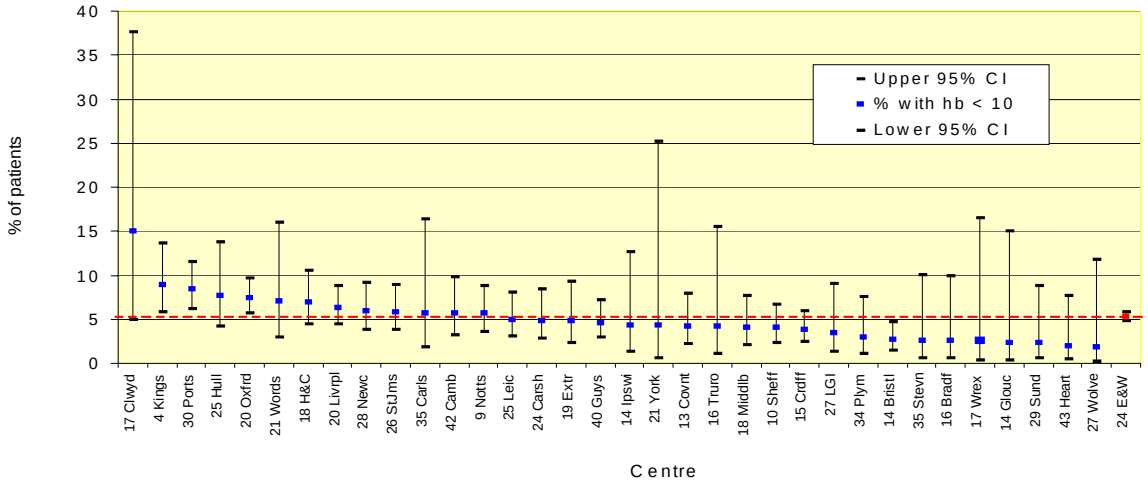

Figure 12.13. Percentage of transplant patients with haemoglobin <10g/dL by centre

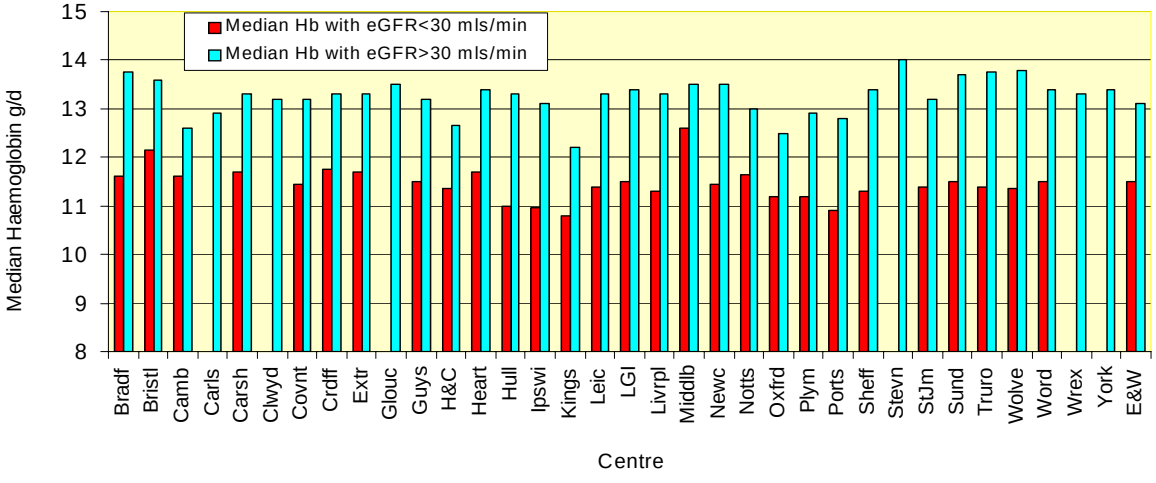

Figure 12.14. Median Hb of transplant patients by centre according to GFR (< or > 30mls/min)

been recorded in only 63% of the prevalent transplant cohort over that year.

The median serum cholesterol of prevalent transplant by centre is shown in figure 12.15. The percentage of missing data (cholesterol measured within the year) is shown before each centres name. Overall for England and Wales, the median cholesterol level was 5.0 mmol/L (range 4.5-5.5 mmol/L) equating to 50% of patients with a cholesterol < 5 mmol/L (range 80 – 18%).

The distribution of cholesterol levels amongst transplanted patients is similar to that of patients treated with peritoneal dialysis. When compared to patients on haemodialysis however, the cholesterol distribution curve for transplanted patients is shifted to the right i.e. serum cholesterol is lower in haemodialysis patients (Figure 12.16).

Interestingly, the distribution curve of serum cholesterol values among diabetic renal transplant patients is shifted to the left compared with non-diabetic transplant patients (Figure 12.17). More aggressive use of HMG-CoA reductase inhibitors amongst this patient group at high risk of cardiovascular disease may account for this observation.

Figure 12.18 shows the serial cholesterol for patients one year before and one year after a change in RRT modality from dialy-

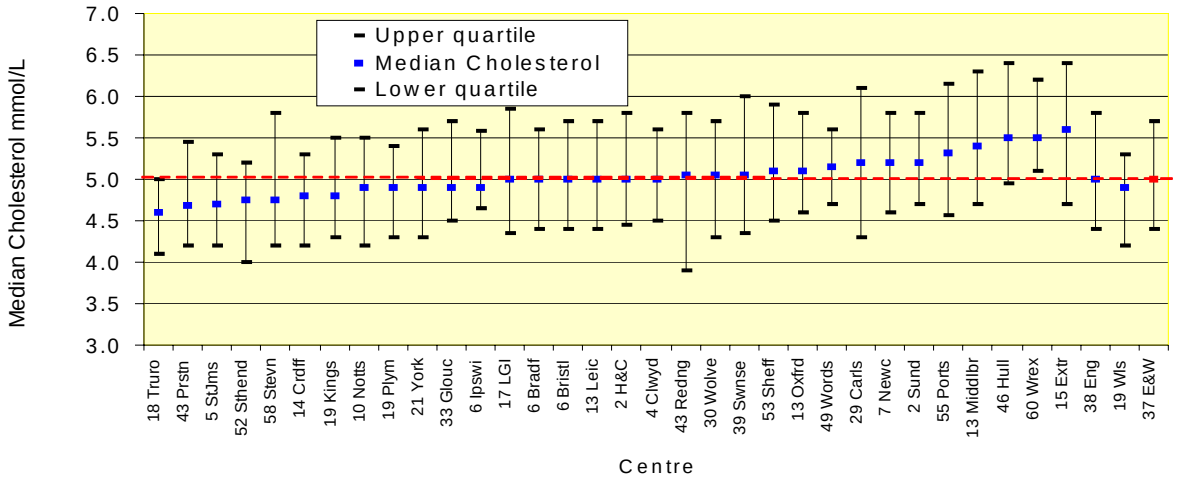

Figure 12.15. Median serum cholesterol transplant patients – by centre

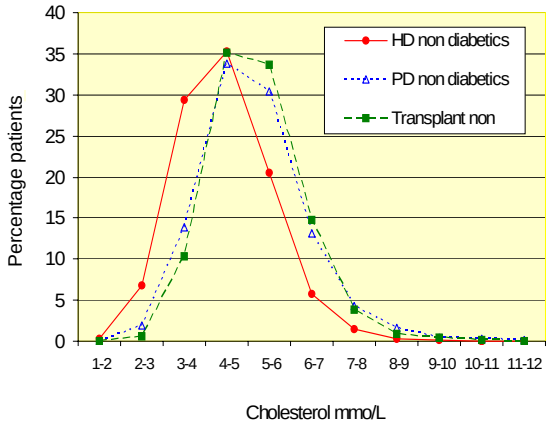

Figure 12.16. Cholesterol distribution curves according to RRT modality

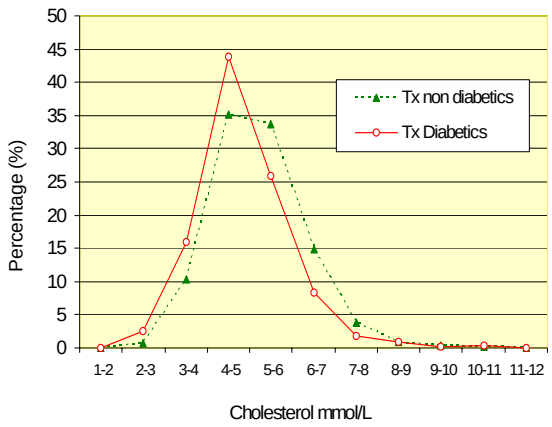

Figure 12.17. Cholesterol distribution curves according to diabetic status in transplant patients

sis to transplantation. The rise in cholesterol following transplantation is unexplained but may be related to use of immunosuppressive drugs (corticosteroids and calcineurin inhibitors), the lifting of dietary restrictions, the appetite stimulated by the initial relatively high steroid doses, or the discontinuation of HMG-CoA reductase inhibitors at the time of transplantation. Explanations for the observed fall in cholesterol in the last quartile after transplantation are again speculative but may relate to a reduction in immunosuppressive drug dose, especially steroids, and/or recommencement of HMG-CoA reductase inhibitors.

The consecutive annual median serum cholesterol by centre since 1998 is shown in Figure 12.19. For most centres a progressive fall in cholesterol is observed. Overall for England and Wales, the median cholesterol level has fallen annually from 5.7 mmol/L in 1998 to 5.0 mmol/L in 2002.

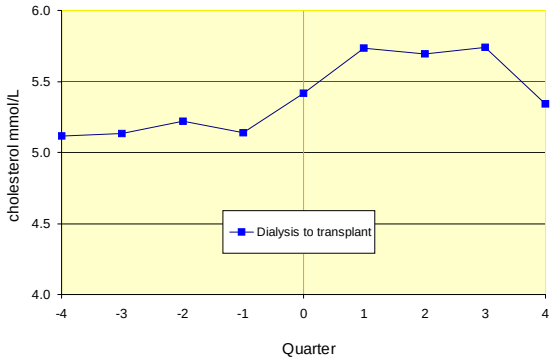

Figure 12.18. Cholesterol levels one year before and after a change in modality from dialysis to transplantation

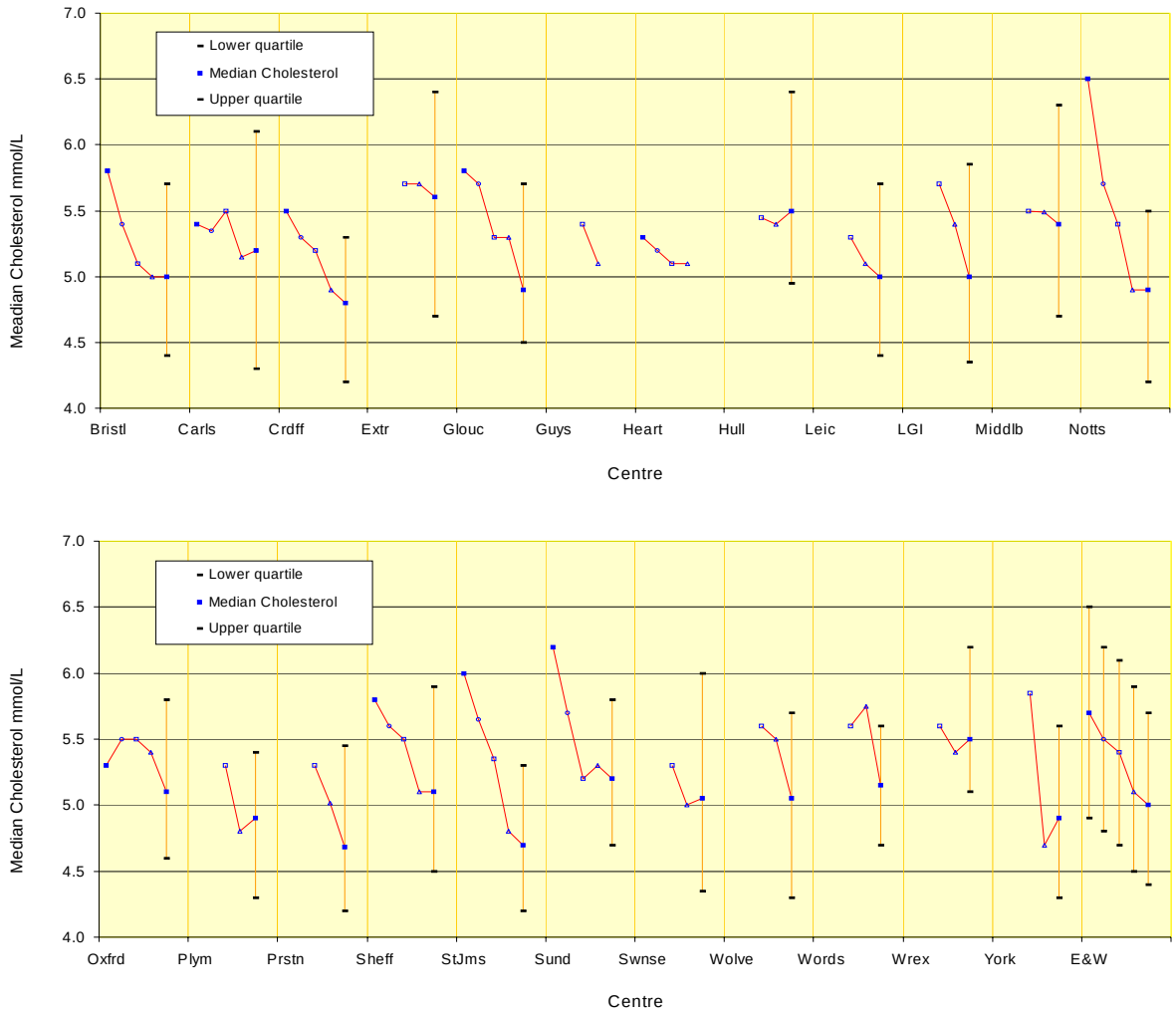

Figure 12.19. Median serum cholesterol, mmol/L, in transplant patients by centre 1998-2002

Figure 12.20 shows the percentage of prevalent transplant patients for each registry centre with a serum cholesterol level below 5.0 mmol/L. Significant differences between units are observed and may be accounted for by differences in HMG-CoA reductase inhibitor use and immunosuppressive drug regimes.

Figure 12.21 shows the annual percentage of patients with a serum cholesterol below 5.0 mmol/L for each centre since 1998. Although there are differences between centres, in most cases within centres there is overall a progressive improvement in cholesterol levels. The marked improvement observed in some centres suggests a change in policy over this time with a more active approach to cholesterol lowering.

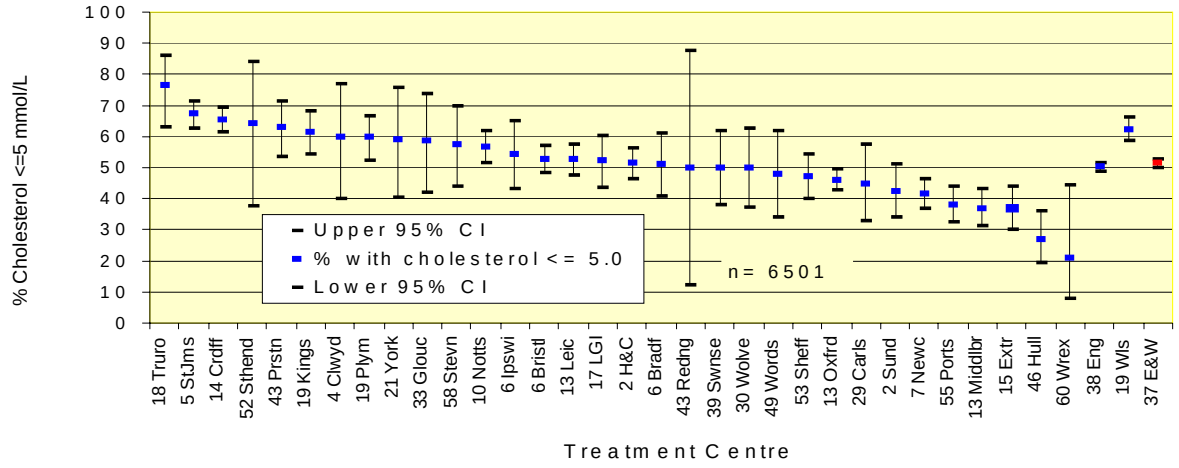

Figure 12.20. Percentage of transplant patients with cholesterol <5.0 mmol/L

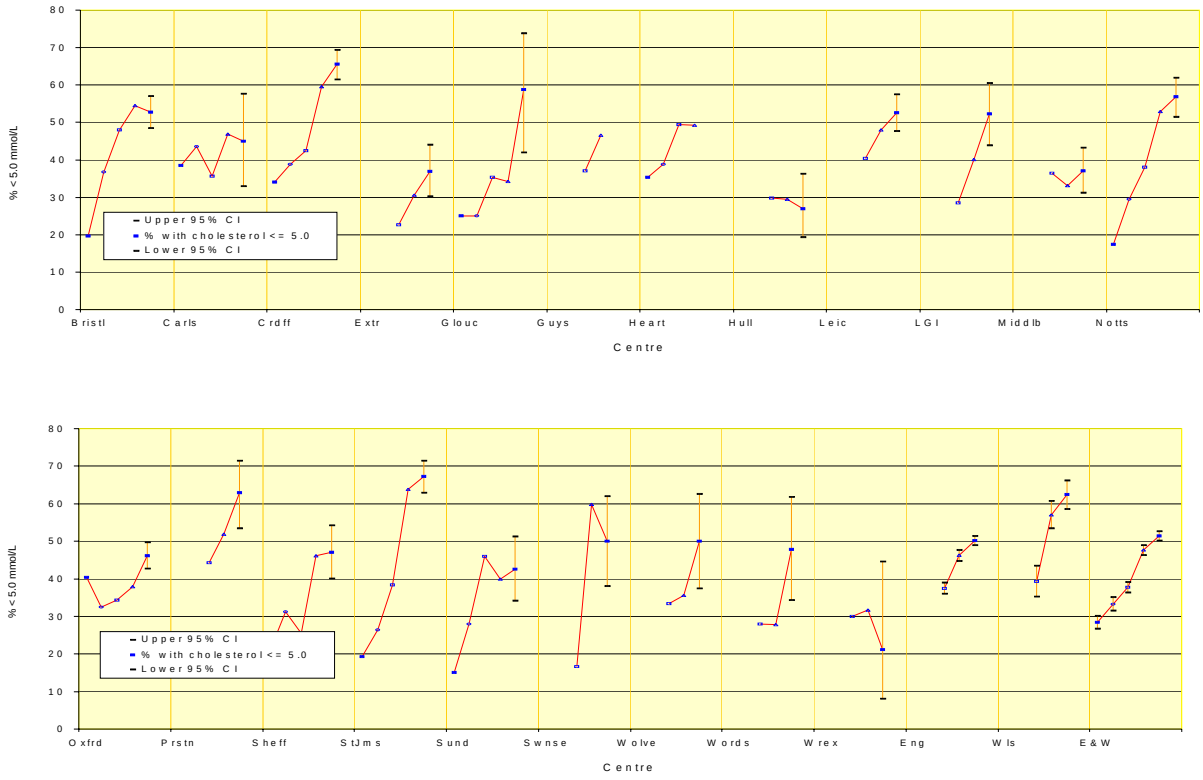

Figure 12.21. Percentage transplant patients with a serum cholesterol ≤ 5.0 mmol/L between 1998-2002 by centre

Blood pressure

The Renal Association Standards 3rd edition and Audit Measures published in August 2002 recommends ;

> ***blood pressure targets for renal transplant recipients of <130 mmHg systolic and <80 mmHg diastolic (strength of recommendation B).***

There are problems due to incomplete data returns. Table 12.9 shows the percentage of renal transplant recipients with blood pressure data returned to the Registry. Although the completeness of blood pressure returns has improved, only a small number of centres have an electronically stored record of blood pressure and centres need to explore ways of capturing this information for audit purposes.

Blood pressure recordings may also be subject to a variety of biases. Healthy patients with infrequent clinic attendance will have infrequent BP assessment. High BP readings may be selectively included or excluded from computer records depending on operator bias. The method and number of BP measurements has not been standardised between units. Figures 12.22 and 12.23 reflect the bias of digit preference when blood pressure is measured by manual devices, with frequent rounding of readings to the nearest ten.

Table 12.9. Completeness of BP returns for transplant patients

Centre	% BP return from last 6 months
Sheff	97
Bradf	97
Clwyd	96
Notts	95
York	94
Crdff	93
StJms	90
Words	84
Covnt	81
Leic	80
Camb	79
Livrpl	78
Wls	76
Kings	72
Bristl	54
Middlbr	52
Truro	45
Oxfrd	24
Extr	20
Redng	14
Stevn	8
Carls	6
Wolve	5
LGI	4
Sthend	3
Guys	3
Sund	2
Heart	2
Glouc	2
Plym	0
Carsh	0
E&W	42

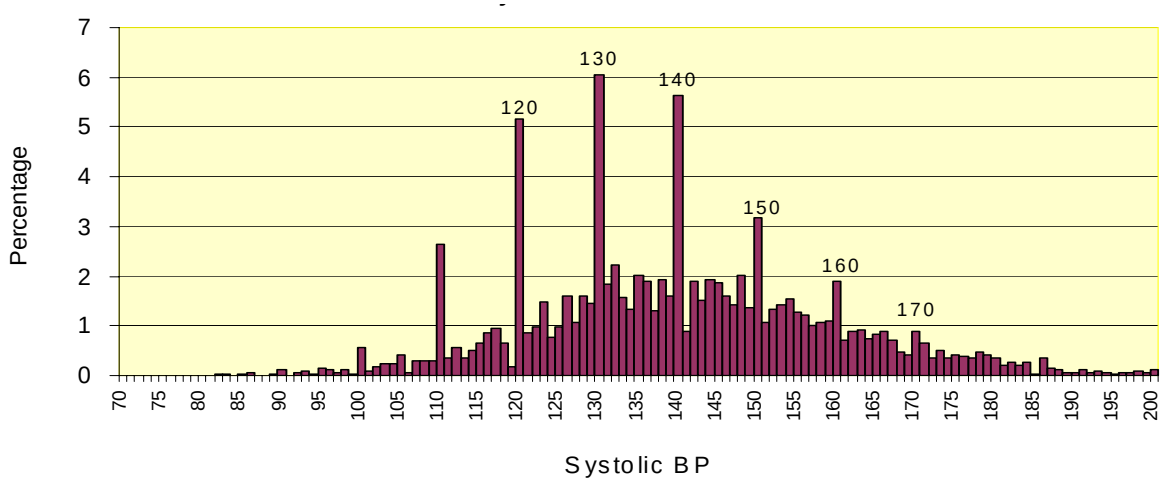

Figure 12.22. Frequency distribution of systolic blood pressure in transplant patients

Figure 12.24 shows that in almost all centres significantly fewer than 50% of patients achieved the Renal Association target blood pressure of less than 130/80. Overall for England and Wales, only 27% of patients reached this target.

Figures 12.25 and 12.26 show the median systolic and diastolic blood pressure for transplant recipients at each centre.

Figure 12.27 shows the percentage of patients at each centre with a systolic blood pressure below 130 mmHg and Figure 12.28 shows the percentage with a diastolic blood pressure below 80 mmHg.

The relationship between systolic, diastolic and mean arterial blood pressure and transplant function as reflected by calculated GFR is shown in Table 12.10. It is not possible to determine whether higher blood pressure causes, or results from, poorer graft function. As the Registry collects further sequential data on these patients, the relationship of blood pressure both before and after transplantation to graft and patient survival will be investigated.

Table 12.10. Relationship between BP and graft function in transplant patients in E&W

eGFR (MDRD)	Median arterial BP	Median Systolic BP	Median Diastolic BP
< 30 mls/min	102.0	143.0	80.0
30-60 mls/min	100.0	140.0	80.0
> 60 mls/min	98.0	137.0	80.0

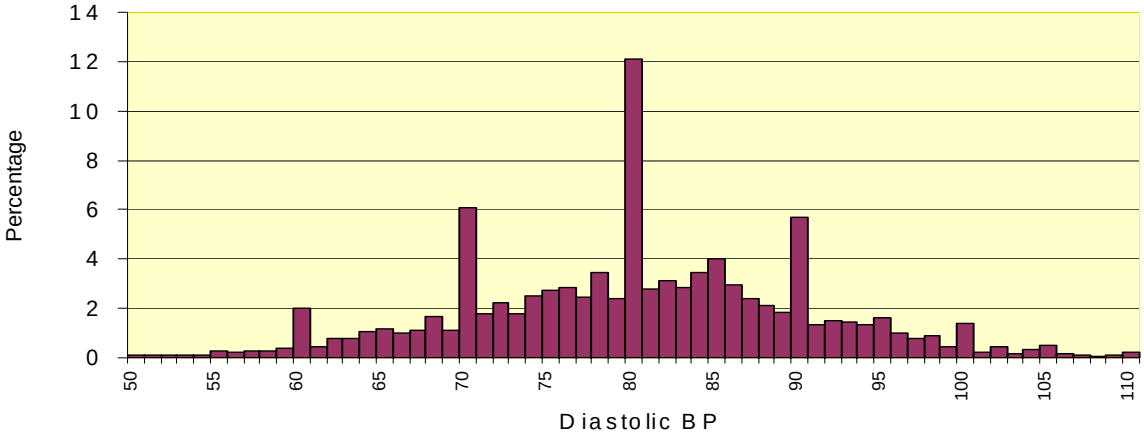

Figure 12.23. Frequency distribution of diastolic blood pressure in transplant patients

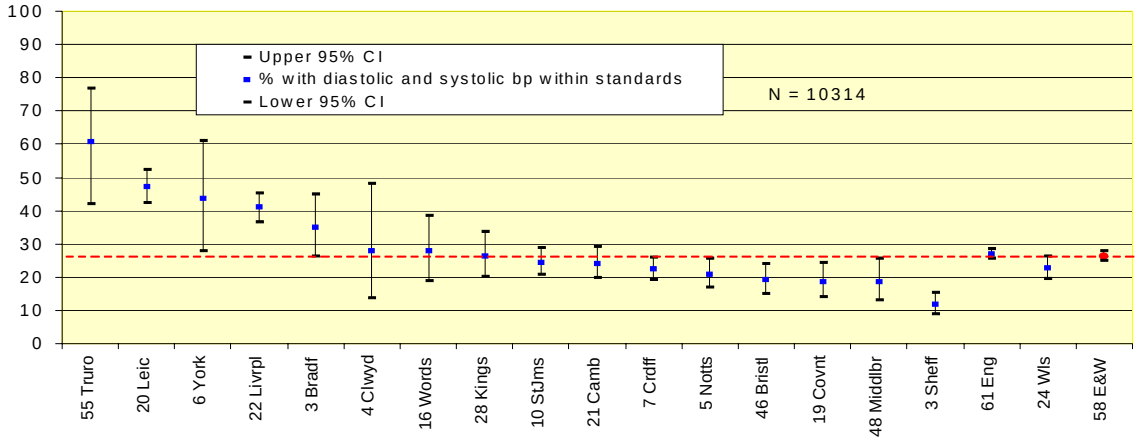

Figure 12.24. Percentage patients with systolic and diastolic BP below 130/80 mmHg

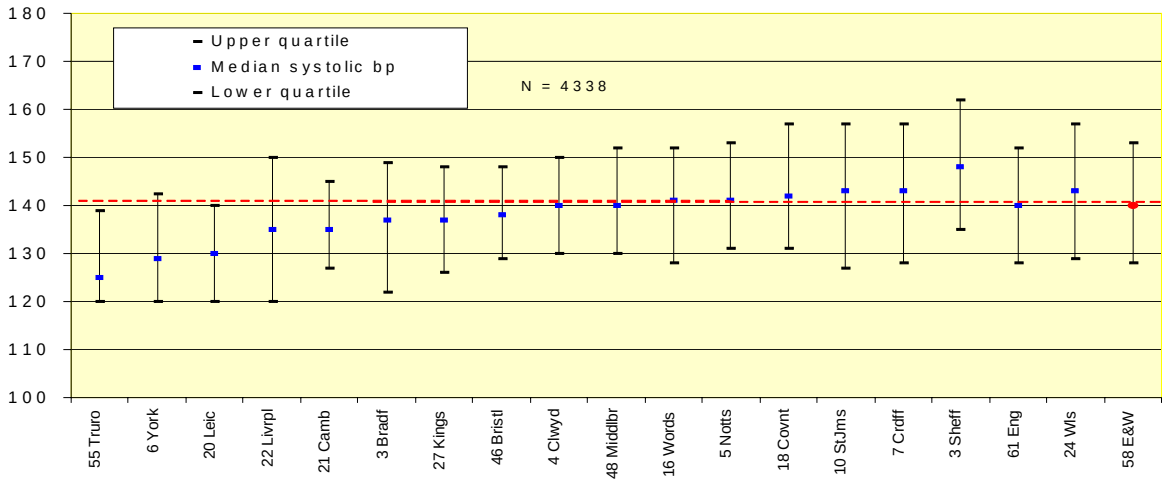

Figure 12.25. Median systolic blood pressure for transplant patients at each centre

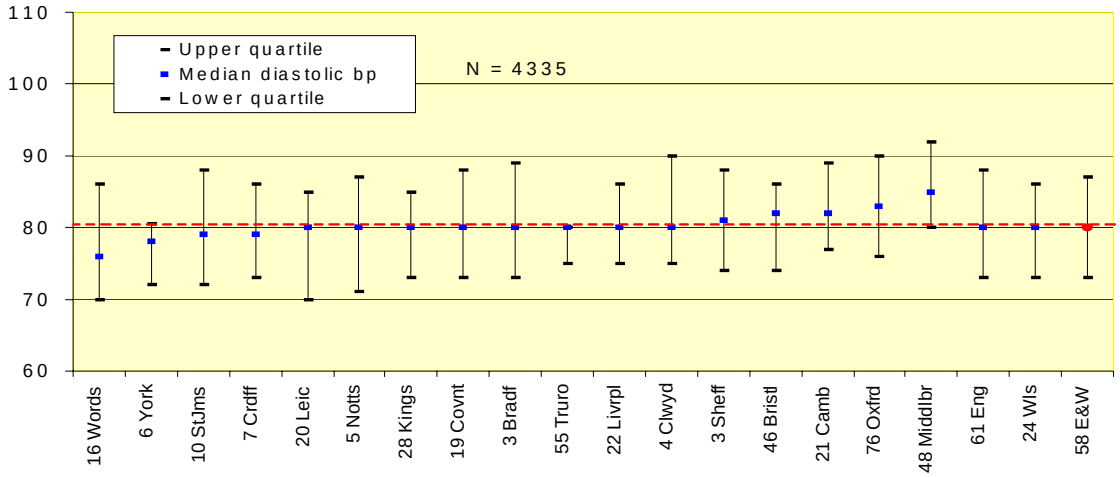

Figure 12.26. Median diastolic blood pressure for transplant patients at each centre

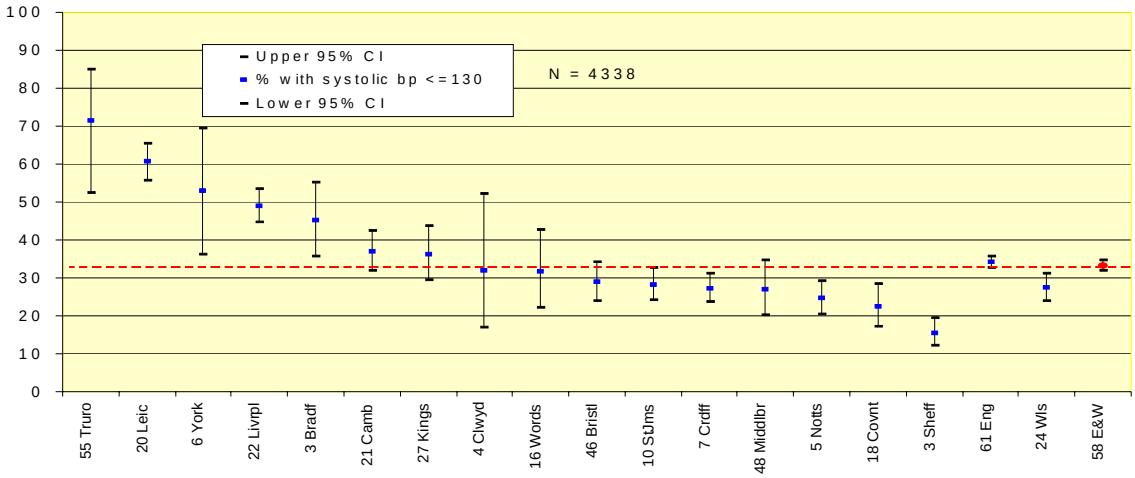

Figure 12.27. Percentage of patients with systolic BP <130 mmHg at each centre

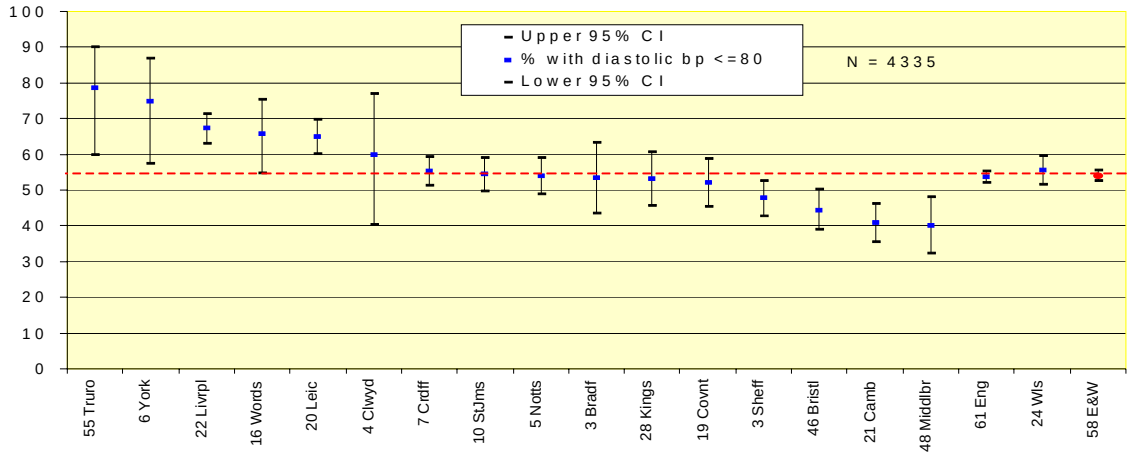

Figure 12.28. Percentage of patients with diastolic BP <80 mmHg at each centre

Conclusion

This chapter reports on data returned from 40units: 37 follow significant numbers of prevalent transplant patients. 17 units perform renal transplantation and follow up 78% of the Registry prevalent transplant cohort. Data on 56% of all renal transplants performed in 2002 in the UK are presented together with data on 62% of the total prevalent renal transplant population for England and Wales.

There has been a progressive decline from 51% in 1997 to 46% in 2002, in the proportion of the prevalent RRT patients with a functioning renal transplant.

Variation exists between centres with respect to access to transplantation for all prevalent patients receiving renal replacement therapy and for patients whose primary diagnosis is diabetes mellitus. However, 9.6% of new transplants performed in 2002 were in patients whose primary renal diagnosis was diabetic nephropathy compared with 7.5% in 2000.

The proportion of patients aged under 65 years from each ethnic group who have ever received a renal transplant is 69% for Caucasian, 57% for Chinese, 52% for Indo-Asians, and 46% for African-Caribbeans.

2.3% of all prevalent transplants failed during 2002.

The annual death rate of patients with established renal transplants for England and Wales is 2.4% (excluding patients dying after returning to dialysis during 2002).

The quality of transplant function differs significantly between centres as does the haemoglobin level. Differences in modifiable risk factors for cardiovascular disease such as serum cholesterol and blood pressure also exist. Overall there has been a progressive reduction in the median serum cholesterol level from 1998 to 2002 with 51.4% of all patients having a cholesterol level <5 mmol/L. Blood pressure control however, falls far short of Renal Association targets for most centres returning blood pressure data.