Chapter 4: New Adult Patients Starting Renal Replacement Therapy in England and Wales

Summary

- The Registry data are compatible with the annual acceptance rate of 101 adult new patients p.m.p. for RRT in England and Wales, as reported by the National Renal Review.

- The Registry identified 3583 new patients starting RRT in 2002, from 72% of the population of England and Wales.

- For the first time, using data from the National Census, standardised acceptance ratios, standardised for age and gender of the population served, for acceptance for RRT in different local authority areas were calculated.

- Crude annual acceptance rates varied from 52 p.m.p. in Calderdale to 165 p.m.p.in Wolverhampton. Standardised acceptance ratios varied from 0.58 in Calderdale to 1.88 in Lewisham.

- Standardised acceptance ratios correlate significantly with both social deprivation and with ethnicity.

- Areas submitting data since 1998 show a 6.4% rise in the acceptance rate over this period, with wide variations between different areas.

- Diabetic nephropathy was the cause of ERF in 19.8% of new patients in 2002, a proportion which is slowly rising each year.

- Of the 2002 patient cohort, the established modality at 90 days was haemodialysis in 68.8%: only 2.7 % had received a transplant.

- At 3 years, of patients first established on HD, 42% remain on HD, 3.4% had changed to PD, 13% had been transplanted, and 38% had died. For established PD patients, 28% remain on PD, 23% converted to HD, 21% were transplanted and 25% had died.

Introduction

Whilst the UK Renal Registry does not have complete coverage of the UK, any assessment of the incidence and characteristics of new patients starting renal replacement therapy in the whole UK must be an extrapolation from data from the units participating in the Registry, which has inherent potential errors. For this reason, for data relating to the whole UK, the results reported from the National Renal Review in Chapter 3 should be used. However, for comparison between renal units, and between local areas fully covered by the Renal Registry, the data from the Registry are fully valid . Such analyses are reported in detail in this chapter.

The National Renal Review contains summary data from Scotland and Northern Ireland. No further data from these countries for 2002 were made available to the UK Renal Registry, so this chapter refers entirely to England and Wales.

Paediatric data are not included in this chapter.

Adult patients accepted for Renal Replacement Therapy in England and Wales, 2002

35 of the 52 renal units in England, and all 5 units in Wales, returned data on new patients accepted for Renal Replacement Therapy in 2002. The estimated catchment population for the units was 37.5 million (Table 4.1), representing 72% of the population of England and Wales. These units recorded 3583 new patients.

The proportion of the population aged over 65 years was similar in the covered population compared with the general population of England and Wales (16.1 and 16.0% respectively).

The proportion from an ethnic minority group was lower in the covered population (4.9%) compared with 6.5% in the total population. This is because the areas not reporting to the Registry include parts of London and Manchester where there are high ethnic minority populations. If an attempt is made to calculate the acceptance rate of new patients for the whole UK from the Registry data, the difference in ethnic mix between the populations served by the Registry and the whole population of the UK will inevitably lead to an underestimate, as the incidence of renal failure is high in the ethnic minority populations.

Estimates of renal unit catchment populations are unreliable; in general there is usually a slight overestimate of catchment populations.

One estimate of acceptance rate might be obtained by studying the areas of England and Wales from which all patients needing renal replacement therapy are treated by renal units reporting to the Registry. It is estimated that a total population of 30,319,815 of the population of England and Wales (51,923,966) lived in areas completely covered by the Registry. This is 58% of the population of England and Wales. There were 2792 cases accepted from this population. However, 4.9% of patients did not have a valid postcode and were thus not included in such calculations. It would thus be necessary to inflate any estimate of acceptance rate by this method by 4.9%. There is also the possibility that some local authority areas for which Registry coverage was not quite complete were included. The last argument particularly applies to London and surrounding areas as not all renal units are covered by the Registry (e.g. note Hammersmith has a lower than expected rate).

Calculating the acceptance rate in England and Wales using Renal Units' data together with estimates of their catchment populations gives a crude acceptance rate of 95.9 patients per million population per annum. Calculating the figure from the local authority areas fully covered by the Registry gives a figure of 96.6 patients per million per annum. Taking into account the above potential errors, together with a small inflation for under representation of ethnic minorities in the Registry units one would calculate the take on rate to be around 100 patients per million per annum, as was found in the National Renal Review (see Chapter 3).

Table 4.1. Number of new patients accepted by individual renal units

		No. of new patients				
Centre	**Estimated catchment population**	**1998**	**1999**	**2000**	**2001**	**2002**
Bangor	0.18					29
Bradford	0.60				61	60
Bristol	1.50	122	119	151	151	125
Cambridge	1.42				84	75
Cardiff	1.30	137	138	137	142	142
Carlisle	0.36	40	26	27	25	29
Carshalton	1.67	141	108	117	120	173
Clwyd	0.15					19
Coventry	0.85	87	92	89	103	97
Exeter	0.75	74	82	71	99	82
Gloucester	0.55	49	59	46	49	57
Guys	1.73			122	109	140
Hammers /ChX	1.3					174
Heartlands	0.60	71	71	77	85	59
Hull	0.84	73	65	81	75	105
Ipswich	0.33					21
Kings	1.01					117
Leeds GI	0.90			68	74	63
Leicester	1.73	181	161	177	182	151
Liverpool	1.35				182	150
Middlesbrough	1.00	109	92	90	82	112
Newcastle	1.31					105
Nottingham	1.16	129	128	113	121	87
Oxford	1.80	146	139	144	168	160
Plymouth	0.55	71	67	63	63	86
Portsmouth	2.00				144	143
Preston	1.56	79	105	118	135	113
Reading	0.60			54	71	43
Sheffield	1.75	129	134	136	152	156
Stevenage	1.25	116	105		125	97
Southend	0.35		43	39	35	35
St James, Leeds	1.30	71	79	89	87	80
Sunderland	0.34	41	45	46	35	56
Swansea	0.70		23	61	110	111
Truro	0.36				35	58
Wirral	0.53					40
Wolverhampton	0.49		75	77	76	99
Wordsley	0.42	46	43	40	34	25
Wrexham	0.42		51	58	36	42
York	0.34			40	36	67

Geographical variation in acceptance rates in England and Wales

Introduction

Geographical equity of acceptance onto renal replacement therapy (RRT) is an important goal of renal service provision. However different areas will have different needs for RRT depending on demographic composition, particularly their age and ethnic minority composition. Comparison of crude acceptance rates onto RRT by geographical area alone can be misleading without taking account of such factors. This section outlines a new analysis of 2002 acceptance data, which uses age and gender standardisation to compare RRT rates, and relates these to the ethnic minority and social deprivation profiles. The total population used for the standardisation is the combination of all areas for which the Registry had complete coverage in 2002. This analysis is restricted to England and Wales.

Methods

Patients

All new cases accepted onto RRT in 2002 recorded by the Registry were included. Each patient's postcode was matched to a 2001 Census output area. In 2002 172/3501 (4.9%) of postcodes had no match; there was no obvious clustering by renal unit.

Geography: Unitary Authorities, Counties and other areas

Postcodes were assigned to 2001 Census Output Areas (OAs) using a look-up table (available from census.gov) and SPSS software.

OAs are the smallest geographical unit to which postcode data can be aggregated. They were aggregated to a higher level geography of Unitary Authorities and Local Authority Districts (both Metropolitan and non-Metropolitan) in order to create a manageable number of areas (see Appendix D for a description of UK administrative geography).

For the final analysis, contiguous 'county' areas were derived by merging Unitary Authorities (UAs) with a bordering county. For example, Southampton UA was merged with Hampshire County, Rutland UA with Leicestershire County, and Bristol UA with Somerset County (for a complete list of data merges see Appendix D). The final areas used were Metropolitan counties, Greater London districts, Welsh areas and county areas – these different types of area were called 'LA areas'.

Lists of areas (English Counties as at 31/12/2000; English UAs as at 31/12/2000; Welsh UAs as at 31/12/2000 and English districts as at 31/12/2000) were taken from http://www.statistics.gov.uk/geography/geographic_area_listings/administrative.asp .

Population

The populations for Unitary Authorities and Districts were taken from http://www.statistics.gov.uk/census2001/population_data.asp .

Coverage: the covered population

The Renal Registry identified all areas in England and Wales for which they estimated to have complete coverage. Analysis was restricted to these areas. See Appendix D for a complete list of covered areas.

Calculation of acceptance rates

Crude rate

The crude rate of acceptance onto RRT was calculated for each LA area for the year 2002

$$\frac{observed\_cases}{population} \times 1000000$$

per million population (p.m.p.)

Standardised acceptance rate ratio (SARR)

The age/gender standardised rate ratio of acceptance onto RRT was calculated for each LA area for the year 2002

$$\frac{observed\_cases}{\exp ected\_cases} \times 100$$

Observed cases (O_i) were calculated by summing all cases in all age and gender bands for each LA area. Expected cases (E_i) for each LA area were calculated by: for each age/gender band the observed rate over all LA areas (the standard population) was applied to the population of that age/gender band to determine the expected number of referrals. The expected cases in each age/gender band were summed to give an expected number of cases in each LA area. 95% confidence limits were calculated for each area.

A figure of 1 indicates that the LA area's acceptance rate was as expected if the age/gender rates found in the total covered population applied to the LA area's population structure; a level above 1 indicates that the observed rate is greater than expected given the LA area's population structure, if the lower confidence limit was above 1 this is statistically significant at the 5% level. The converse applies to standardised rate ratios under one.

LA area level social deprivation

For each LA area the Townsend social deprivation score was calculated. This is a measure of material deprivation available for all output areas in England and Wales using 2001 Census data.

Variables in the Townsend score are: the proportion of households without a car or van; the proportion of households living in overcrowded accommodation; the proportion of households which are owner occupied; and the proportion of the population who are unemployed. The unemployment and overcrowding variables are log transformed, and all four variables are then standardised to give Z-scores. The Townsend score for each OA is calculated by summing the four Z-scores.

To calculate Townsend scores for LA areas the raw census data for each OA in the LA area are summed to the new area boundaries. The four variables are then recalculated for the new area populations.

The range of scores runs from negative to positive with a high score indicating higher social deprivation. LA area social deprivation scores were correlated with LA acceptance rates and with the proportion of the population from ethnic minorities for each LA area.

The acceptance rate by quintile of social deprivation was calculated for the combination of populations covered by the Registry and with < 3% from ethnic minorities to reduce the confounding effect of ethnicity on the association between social deprivation and acceptance rate.

Results

Age and Gender

The rates of acceptance increased with age and were higher in men (Table 4.2 and Figure 4.1). The rates in the over 75s reflect the balance between the higher rates of ERF and the effect of referral/acceptance for RRT in the elderly. The different pattern in men and women over 75 is of interest and requires further analysis.

Standardised acceptance ratios

The standardised acceptance ratios for local authorities with complete coverage by the registry are shown in Table 4.3

Table 4.2. Age/gender specific acceptance rates in the covered population

		N (covered population)	N (cases in covered population)	Crude rate per million covered population
15-29	Women	2,811,437	50	18
	Men	2,823,347	60	21
30-44	Women	3,437,675	155	45
	Men	3,339,093	225	67
45-59	Women	2,917,298	233	80
	Men	2,875,081	348	121
60-74	Women	2,140,803	398	186
	Men	1,948,888	652	335
75+	Women	1,458,578	249	171
	Men	847,500	422	498
All		**30319815**	**2792**	**92**

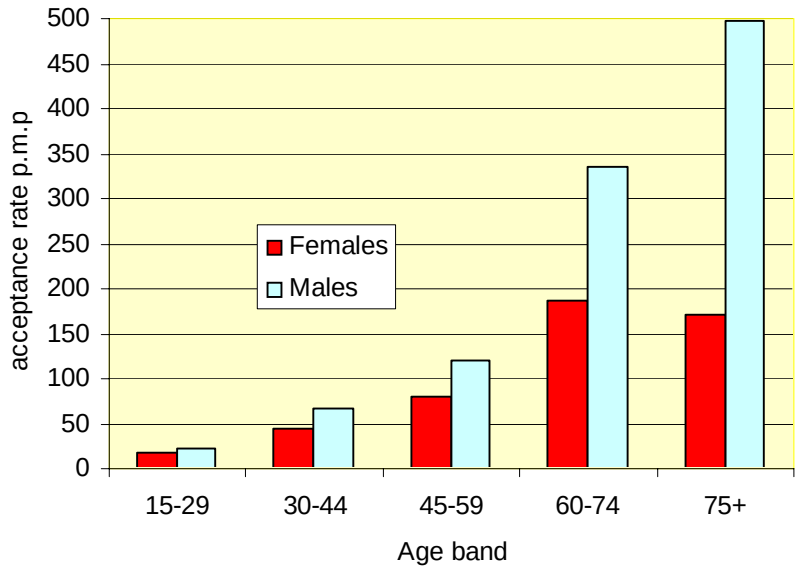

Figure 4.1. Acceptance rate p.m.p by age band and gender

Table 4.3. Adult acceptance rates, social deprivation and ethnicity for LA areas with full coverage

County name	2002 crude rate per 1,000,000 population	2002 age/ gender standardised rate-ratio	95% CI lower	95% CI upper	Townsend deprivation score	% of the population from an ethnic minority[1]
Barnsley	110.1	**1.18**	0.79	1.76	-.43	.39
Bedfordshire	72.4	**0.86**	0.63	1.17	-2.26	11.28
Bexley	119.1	**1.31**	0.89	1.93	-2.68	6.24
Bradford	115.5	**1.39**	1.06	1.81	.46	19.83
Bromley	91.4	**0.98**	0.67	1.43	-2.72	5.47
Buckinghamshire	68.5	**0.81**	0.61	1.08	-3.80	5.95
Calderdale	52.0	**0.58**	0.31	1.07	-.43	5.92
Cambridgeshire	67.7	**0.77**	0.58	1.02	-3.16	3.29
Cornwall & I of Scilly	163.6	**1.54**	1.24	1.91	-2.37	.34
Coventry	139.6	**1.60**	1.19	2.17	.37	13.07
Croydon	121.0	**1.49**	1.09	2.03	.60	24.64
Cumbria	86.1	**0.85**	0.63	1.16	-2.30	.24
Devon	99.5	**0.96**	0.79	1.16	-2.48	.38
Doncaster	87.2	**0.93**	0.63	1.38	-.82	1.44
Durham (county)	104.2	**1.12**	0.94	1.34	.06	1.28
Ealing	126.3	**1.64**	1.19	2.26	2.20	33.33
Gateshead	115.1	**1.19**	0.78	1.81	1.81	.83
Gloucestershire	93.8	**0.99**	0.79	1.25	-4.31	1.43
Greenwich	125.9	**1.61**	1.10	2.34	4.71	17.86
Hammersmith	60.5	**0.83**	0.45	1.54	6.52	15.57
Hampshire	72.0	**0.78**	0.65	0.92	-3.44	1.65
Hertfordshire	54.2	**0.61**	0.47	0.79	-3.70	4.14
Kirklees	97.8	**1.13**	0.82	1.55	-.71	12.70
Knowsley	86.4	**1.01**	0.58	1.73	2.99	.44
Lambeth	109.0	**1.60**	1.11	2.30	7.77	30.33
Lancashire	74.2	**0.80**	0.66	0.97	-2.12	5.55
Leeds	74.1	**0.85**	0.65	1.11	.42	5.96
Leicestershire	86.6	**0.97**	0.78	1.21	-2.30	12.67
Lewisham	136.6	**1.88**	1.34	2.62	5.36	27.20
Lincolnshire	74.2	**0.74**	0.59	0.93	-2.66	.75
Liverpool	88.7	**1.02**	0.75	1.40	4.44	2.32
Newcastle upon	88.6	**1.01**	0.67	1.51	3.26	4.75
Northamptonshire	99.7	**1.12**	0.85	1.47	-3.09	3.19
Northumberland	78.1	**0.78**	0.52	1.17	-1.36	.42
Nottinghamshire	74.8	**0.82**	0.65	1.02	-.76	3.93
Oxfordshire	76.0	**0.87**	0.65	1.16	-3.94	2.56
Rotherham	64.5	**0.70**	0.43	1.15	-.75	2.39
Sefton	106.0	**1.07**	0.75	1.53	-1.03	.58
Sheffield	91.6	**1.01**	0.76	1.34	1.14	6.34
Solihull	70.2	**0.73**	0.43	1.23	-3.56	3.49
Somerset & Avon	84.9	**0.88**	0.73	1.06	-2.86	1.97
Southwark	130.7	**1.84**	1.30	2.60	8.65	29.96
St. Helens	96.1	**1.05**	0.65	1.69	-.50	.48
Sunderland	99.7	**1.10**	0.76	1.60	1.81	1.13
Sutton	116.9	**1.38**	0.90	2.11	-2.24	7.29
Tyneside - North	99.1	**1.02**	0.65	1.59	.19	.94
Tyneside - South	91.6	**0.94**	0.56	1.59	3.53	1.75
Wakefield	76.2	**0.84**	0.56	1.25	-.85	1.54
Walsall	114.4	**1.24**	0.86	1.78	.33	11.83
Warwickshire	100.8	**1.06**	0.81	1.40	-3.88	3.15
Wiltshire	62.0	**0.68**	0.49	0.93	-4.18	1.24
Wirral	83.3	**0.86**	0.59	1.26	-1.12	.59
Wolverhampton	164.9	**1.77**	1.29	2.42	1.98	18.91
Yorkshire - East	108.3	**1.14**	0.92	1.42	-.79	.86
Yorkshire - North	129.9	**1.30**	1.03	1.63	-4.07	.29
North Wales	117.6	**1.19**	0.95	1.48	-2.04	.33
Dyfed Powys	100.4	**0.96**	0.73	1.28	-2.64	.33
Morgannwg	121.3	**1.24**	0.96	1.61	-1.64	.68
Gwent	110.9	**0.99**	0.75	1.30	-1.46	.96
Bro Taf	92.3	**1.25**	1.00	1.55	-1.44	2.26

[1] Data on numbers self reported as Black or Indo-Asian in the 2001 census as a proportion of the entire population (using the five categories of Black, South Asian, white, other and mixed ethnic origin).

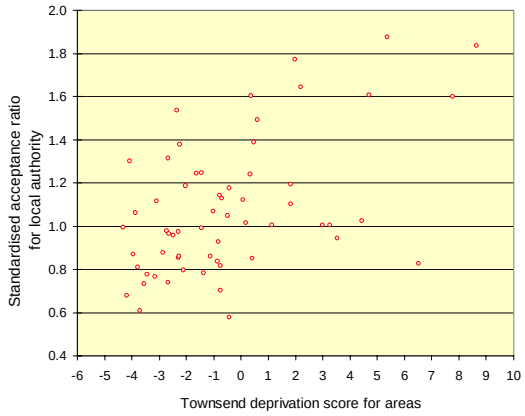

Figure 4.2a. Standardised Acceptance Ratio for local authority and Townsend deprivation score

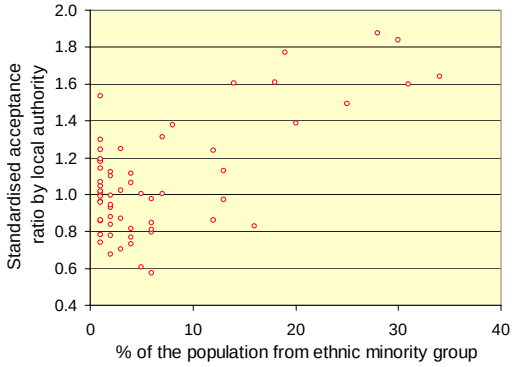

Figure 4.2b. Standardised acceptance ratio by local authority and % of population from ethnic minorities (standardised for age and sex)

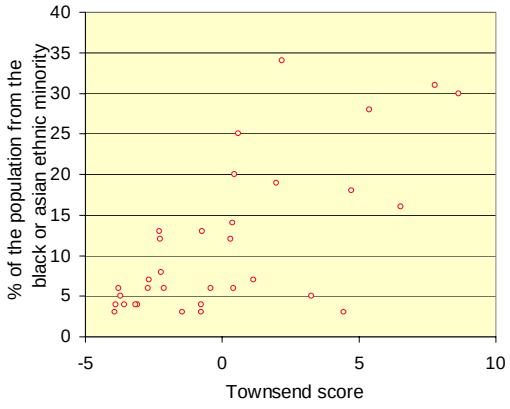

Figure 4.2c. Percentage from ethnic minorities in each Local Authority and Townsend score

Social deprivation

Standardised acceptance ratios are correlated with social deprivation (r^2 = 0.27, $p<0.001$) and with ethnicity (r^2 = 0.45, $p<0.001$) (Figures 4.2a and 4.2b). However, there is a strong relationship between ethnicity and social deprivation (Figure 4.2c, $r^2=0.47$, $p<0.001$). To determine the separate effects on acceptance ratio of social deprivation, ethnic mix, and the reaction between the two, stepwise multiple regression analysis was performed. The results of the correlation matrix are shown in Table 4.4. As the data are not normally distributed, log transformations were used.

This stepwise multiple regression analysis shows that the most dominant factor affecting the acceptance ratio is the interaction between ethnic mix and social deprivation ($p<0.0001$). However ethnic mix also has an effect on acceptance ratio which is independent of social deprivation ($p=0.0003$), but after eliminating the effects of these two factors there is little independent effect of social deprivation.

Discussion

There is substantial variation in the crude LA area acceptance rates from 57 p.m.p (Calderdale) to 187 p.m.p (Lewisham). Relatively small numbers of cases mean that the confidence limits are often quite wide for most areas so that the standardised rate ratios usually include one. However, some areas have significantly high ratios. In some, this is commensurate with their high ethnic minority population and/or deprived population, good examples being Ealing and Wolverhampton. In other areas, the high rate is unexplained e.g. Cornwall. Possibilities here include the artefact of misclassification of ARF as ERF (the Registry has checked that this is not the case in Cornwall) and a true increase in acceptance. High acceptance rates could be due to unexplained high rates of ERF, or to high rates of recognition/referral and acceptance of cases

Table 4.4. Correlation matrix of variables in the stepwise multiple regression analysis of Ethnicity, Social Deprivation and Standardised Acceptance Ratio

Correlation				
	Pearson Correlation Coefficients, N = 60			
	Standardised acceptance ratio	**log_townsend_plus**	**log_ethnic minority**	**interaction**
rate-ratio	1	0.4984	0.40911	0.52928
		<.0001	0.0012	<.0001
log_townsend_plus	0.4984	1	0.39591	0.55134
	<.0001		0.0017	<.0001
log_ethnic minority	0.40911	0.39591	1	0.96495
	0.0012	0.0017		<.0001
interaction	0.52928	0.55134	0.96495	1
	<.0001	<.0001	<.0001	

Dependent variable: standardised acceptance ratio

of ERF along with sufficient dialysis facilities.

Some LA areas have significantly low rate ratios. In some, this is consistent with low ethnic minority numbers and lower social deprivation e.g. Wiltshire. The standardised rates are all relative to an overall acceptance rate that probably does not meet population need for RRT.

The correlation between both an area's ethnic minority population and its social deprivation score and the acceptance rate highlights the impact such factors have on RRT rates. However, ethnic minority status and social deprivation are associated: the individual effect of social deprivation is also demonstrated in an analysis restricted to areas with a low ethnic minority proportion. This analysis is confounded by access to renal services (area of high social deprivation are in urban areas and hence have better access), the effect being to increase the association between social deprivation and acceptance rates.

This overall analysis has shown that it is possible to compare age/gender standardised acceptance rates at a meaningful area level using the latest population denominators. In future years the covered population will increase and hence the number of LAs. One can combine more than one year's acceptance data to increase the precision of the acceptance rate estimate.

Ethnic specific acceptance rates and standardisation of areas by ethnic status will be more difficult because of incomplete ethnic coding of patients, and age/gender breakdown of the Census output areas is not available by ethnic group.

Local changes in acceptance rate

Changes in acceptance by 'old' Health Authorities

The Registry has not yet analysed acceptance rates before 2002 by Local Authorities. The data are therefore presented by old Health Authorities as in previous years to show comparison over time (Table 4.5).

Previous calculations of the UK acceptance rate have been based on 'complete' Health Authorities. For some areas around London it has been difficult to know the extent of cross boundary flows. With the Hammersmith and Kings Renal units submitting data this year, the acceptance rates for some of the London HAs have apparently risen indicating that coverage was incomplete in the previous years.

Analysing these data by complete HAs submitting data since 1998, these HAs show a 6.4% rise in the acceptance rate over this period.

Changes in acceptance by renal unit

The number of patients accepted by each renal unit in England and Wales is shown in Table 4.1. There is variation in the pattern of time trends by unit which may reflect chance fluctuation, completeness of reporting, rising incidence of ERF, changes in referral patterns or catchments and the introduction of conservative care teams.

Ethnicity

There is substantial variation in the completeness of ethnicity data (Table 4.6). No ethnicity data were available for Scotland. In England and Wales 18 units now provide over 90% complete data. In contrast 10 provide less than 30%. Such levels of incompleteness make it difficult to assess reliably the ethnic breakdown in such units.

There is a lower proportion of patients from ethnic minority populations in the Registry data than found in the National Renal Review, showing that the Registry units are not totally representative of the whole UK.

Within the units with over 90% returns there is significant variation in the percentages of new patients from the ethnic minorities with high rates of ERF i.e. South Asian and Black, ranging from 0% to 38%.

Table 4.7 demonstrates the younger age of ethnic minorities in most though not all renal units. There is variation in the age differences even in units with a significant ethnic minority population (e.g. compare Heartlands with Preston). It is unclear to what extent this reflects differences in the units' catchment populations, or patterns of ERF or referral pathways. Overall new patients from ethnic minorities are 6 years younger than Whites. Compared with similar data for new patients in 2001 the median age of ethnic minorities has increased by 3 years. This rise in median age over one year cannot be due simply to the ageing of these populations, and indicates increasing acceptance rates in older ages.

Table 4.5. Acceptance rate by 'old' Health Authorities

Region	HA Text	Population	1998 pmp	1999 pmp	2000 pmp	2001 pmp	2002 pmp
Y01	Bradford	483,300			95.8	120.0	113.8
Y01	Calderdale and Kirklees	583,800			80.5	94.2	89.1
Y01	County Durham and Darlington	607,800	100.4	74.0	72.4	75.7	98.7
Y01	East Riding and Hull	574,500	71.4	71.4	88.8	85.3	92.3
Y01	Gateshead and South Tyneside	353,500					101.8
Y01	Leeds	727,400			77.0	92.1	77.0
Y01	Newcastle & North Tyneside	470,100					89.3
Y01	North Cumbria	319,300	125.3	72.0	68.9	78.3	94.0
Y01	North Yorkshire	742,400			92.9	84.9	137.4
Y01	Northumberland	309,600					77.5
Y01	Sunderland	556,300	51.3	85.5	82.1	88.9	95.8
Y01	Tees	318,800	107.9	91.7	82.7	93.5	116.8
Y01	Wakefield	228,100			100.4	84.7	78.4
Y02	Barnsley	290,500	70.1	83.3	61.4	65.8	105.2
Y02	Doncaster	928,700	75.7	82.6	79.2	92.9	89.5
Y02	Leicestershire	623,100	107.7	89.4	91.5	107.7	92.6
Y02	Lincolnshire	370,200	81.8	91.5	88.3	77.0	73.8
Y02	North Derbyshire	388,900	51.3	62.1	59.4	86.4	75.6
Y02	North Nottinghamshire	642,700	115.7	95.1	108.0	90.0	87.4
Y02	Nottingham	254,400	119.8	110.5	96.5	112.0	70.0
Y02	Rotherham	531,100	51.1	62.9	102.2	149.4	78.6
Y02	Sheffield	308,600	88.5	90.4	81.0	90.4	94.1
Y02	South Humber	292,300	103.7	64.8	74.5	55.1	100.5
Y07	Coventry	304,300	111.7	115.0	118.3	154.5	134.7
Y07	Dudley	311,500	80.3	64.2	70.6	54.6	64.2
Y07	Solihull	205,600	82.7	73.0	87.5	111.9	68.1
Y07	Walsall	261,200	11.5	114.9	76.6	111.0	122.5
Y07	Warwickshire	506,700	96.7	116.4	100.7	100.7	100.7
Y07	Wolverhampton	241,600		99.3	157.3	115.9	169.7
Y08	East Lancashire	511,200		68.5	74.3	86.1	99.8
Y08	Liverpool	461,500			121.3	149.5	91.0
Y08	Morecambe Bay	310,300		70.9	99.9	70.9	58.0
Y08	North Cheshire	311,900			60.9	93.0	93.0
Y08	North-West Lancashire	466,300	75.1	68.63	79.3	96.5	75.1
Y08	Sefton	287,700			104.3	93.8	104.3
Y08	St Helens and Knowsley	333,000			96.1	81.1	90.1
Y08	Wirral	327,100				100.9	79.5
Y09	Bedfordshire	556,600	80.8	73.7	72.5	88.0	82.6
Y09	Cambridgeshire	468,000			126.1	100.4	109.0
Y10	Bexley, Bromley and Greenwich	730,000				91.8	111.0
Y10	Croydon	338,200			88.7	79.8	130.1
Y10	Ealing, Hammersmith & Hounslow	617,200				168.5	170.1
Y10	Hillingdon	251,200				96.5	99.5
Y10	Lambeth, Southwark and Lewisham	745,200			77.8	107.4	134.2
Y11	Buckinghamshire	681,900	57.0	68.9	64.5	86.5	68.9
Y11	East Surrey	419,900	71.4	78.6	45.2	59.5	83.4
Y11	I of Wight, Portsmouth & S-E Hampshire	671,700				71.5	72.9
Y11	North and Mid Hampshire	556,900				61.1	73.6
Y11	Northamptonshire	615,800	71.5	73.1	89.3	84.4	86.1
Y11	Oxfordshire	616,700	76.2	64.9	61.6	82.7	74.6
Y11	Southampton & SWest Hampshire	542,300				66.4	70.1
Y11	West Surrey	640,600					73.4
Y12	Avon	999,300	82.1	84.1	109.1	109.1	93.1
Y12	Cornwall and Isles of Scilly	490,400			120.3	104.0	175.4
Y12	Gloucestershire	557,300	89.7	95.1	87.9	82.5	93.3
Y12	North and East Devon	479,300	81.4	87.6	91.8	91.8	87.6
Y12	Somerset	489,300	67.4	83.8	69.5	87.9	98.1
Y12	South and West Devon	589,100	118.8	106.9	96.8	127.3	115.4
Y12	Wiltshire	605,500				66.1	61.1
W00	Gwent	557,200	102.3	75.4	93.3	113.1	98.7
W00	Bro Taf	739,600	87.9	110.9	97.3	85.2	110.9
W00	Dyfed Powys	479,400			83.4	106.4	102.2
W00	North Wales	657,500			111.0	120.2	123.2
W00	Morgannwg	499,700			116.1	126.1	128.1

Table 4.6. % patients in different ethnic groups, by centre

Treatment centre	% returns	% White	% Black	% Asian	% Chinese	% Other
Glouc	100.0	100.0	0.0	0.0	0.0	0.0
H&C	100.0	42.7	12.4	25.8	0.0	19.1
Heart	100.0	66.1	5.1	25.4	0.0	3.4
Notts	100.0	94.3	2.3	3.4	0.0	0.0
Redng	100.0	83.7	14.0	2.3	0.0	0.0
Sheff	100.0	92.9	0.6	4.5	0.6	1.3
Stevn	100.0	87.2	3.2	7.4	1.1	1.1
Wolve	100.0	80.8	5.1	13.1	1.0	0.0
Words	100.0	100.0	0.0	0.0	0.0	0.0
Prstn	99.1	84.4	2.8	11.9	0.0	0.9
Newc	99.0	94.2	1.0	3.9	1.0	0.0
Leic	98.7	85.2	0.7	12.8	0.0	1.3
Bristl	98.4	94.3	2.5	0.8	0.8	1.6
Carls	96.6	100.0	0.0	0.0	0.0	0.0
Plym	92.9	98.7	1.3	0.0	0.0	0.0
York	92.5	100.0	0.0	0.0	0.0	0.0
Ports	91.6	95.4	0.8	3.1	0.8	0.0
Sund	91.1	98.0	0.0	2.0	0.0	0.0
Livrpl	88.0	94.7	0.8	0.0	3.0	1.5
Middlbr	83.9	95.7	0.0	2.1	2.1	0.0
Swnse	78.4	98.9	0.0	1.1	0.0	0.0
Covnt	77.3	81.3	5.3	13.3	0.0	0.0
Guys	76.8	76.0	17.7	5.2	1.0	0.0
Hull	61.9	98.5	0.0	0.0	1.5	0.0
Camb	37.3	100.0	0.0	0.0	0.0	0.0
Truro	31.0	100.0	0.0	0.0	0.0	0.0
Bradf	30.0	27.8	0.0	72.2	0.0	0.0
StJms	28.8	91.3	0.0	0.0	0.0	0.0
Sthend	28.6	100.0	0.0	0.0	0.0	0.0
Extr	26.8	90.9	4.5	0.0	4.5	0.0
Carsh	23.1	85.0	2.5	7.5	0.0	5.0
Clwyd	21.1	100.0	0.0	0.0	0.0	0.0
Wrex	19.0	100.0	0.0	0.0	0.0	0.0
Bangr	13.8	100.0	0.0	0.0	0.0	0.0
LGI	11.1	100.0	0.0	0.0	0.0	0.0
Wirrl	7.5	66.7	0.0	0.0	0.0	33.3
Crdff	4.2	100.0	0.0	0.0	0.0	0.0
Eng	69.6	88.1	3.0	6.7	0.7	1.5
Wls	31.8	99.1	0.0	0.9	0.0	0.0
E&W	65.9	88.6	2.8	6.5	0.7	1.4
E& W for units >90% returns	**> 90%**	**87.2**	**3.5**	**6.4**	**0.6**	**2.2**

Table 4.7. Median age of ethnic groups accepted for RRT

Median Age of Incident Patients related to ethnicity		
Centre	**Ethnic Minority**	**All**
Bradf	60.3	65
Bristl	42.1	67
Carsh	66.6	65
Covnt	64.0	63
Extr	57.8	71
Guys	48.1	60
Heart	68.8	69
Hull	74.9	66
Leic	66.0	65
Livrpl	55.6	66
Notts	69.2	68
Oxfrd	70.2	66
Plym	38.0	66
Ports	48.3	63
Prstn	52.0	61
Redng	63.4	63
Sheff	60.4	61
Stevn	53.6	59
StJms	56.0	65
Sund	51.2	64
Swnse	67.0	69
Wolve	58.0	62
E&W	**60.1**	**66**

Age

The median age of patients starting renal replacement therapy is rising and was 65.5 years in 2002. This has risen from 64.8 years in 2001 and 64.4 years in 2000. The percentage of patients by age band and change from 1997 – 2002 is shown in Figure 4.3.

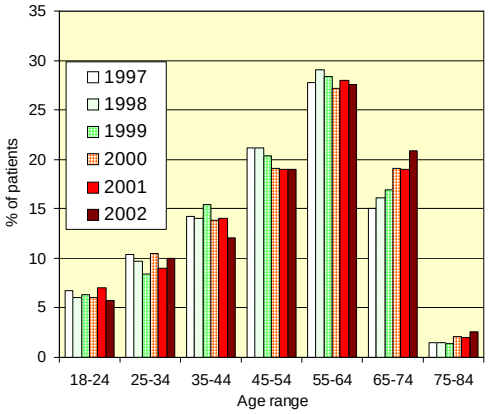

Figure 4.3. Percentage of new patients by age group 1997 -2002

The median age by centre is shown in Figure 4.4.

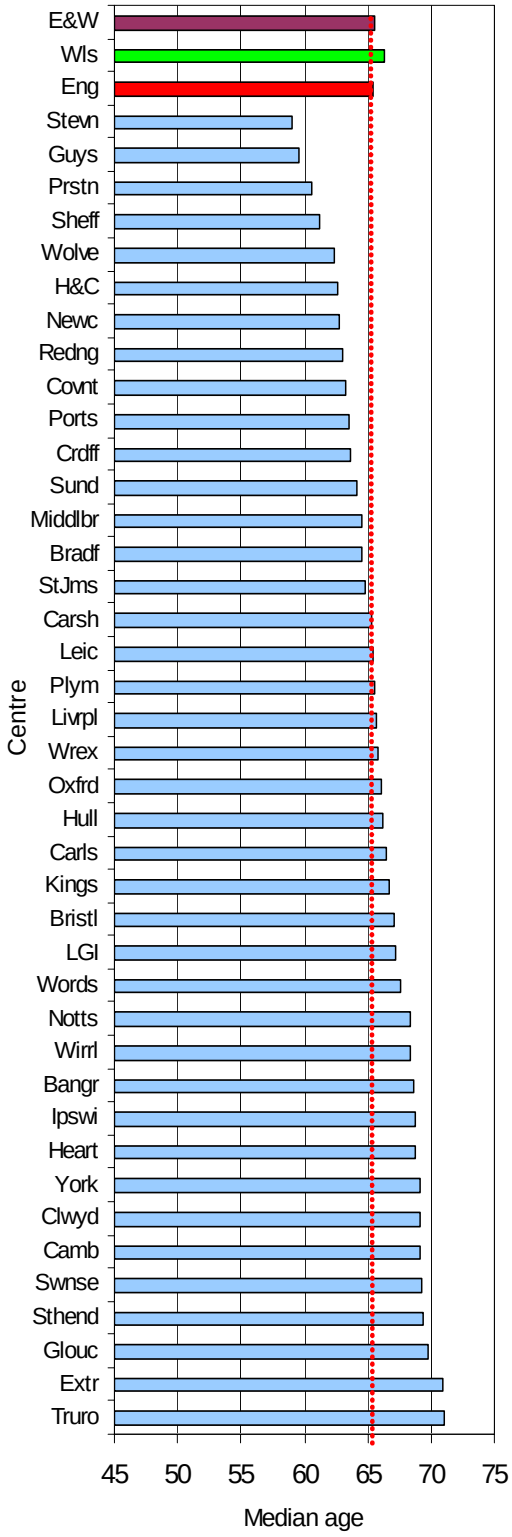

Figure 4.4. Median Age new patients by centre

Gender

Gender specific acceptance rates for the contiguous population covered by the UKRR are shown in Table 4.1. There has been little change in the overall proportion of new cases who are male, which remains at just over 60% (Table 4.8).

Combining the 2001 and 2002 cohort (Figure 4.5), there was a trend over the age of 45 for an increasing proportion of males starting renal replacement therapy.

Table 4.8. Percentage of males, by age, 1998–2002

	1998	1999	2000	2001	2002
England & Wales	62.8	62.2	59.3	63.2	61.8

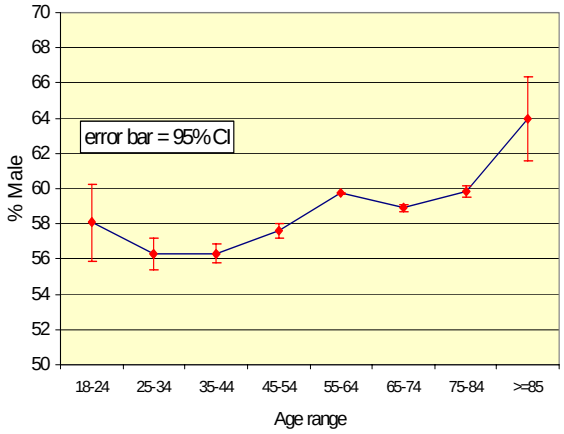

Figure 4.5. Percentage males starting RRT by age band

Primary renal diagnosis

The distribution of new patients by age, gender and cause of ERF is shown in Tables 4.9 and 4.10.

Diabetes is the commonest specific cause overall, and increasing. This is due to the very high incidence in those under 65, although it is not the most common cause in elderly patients. The aetiology uncertain/ glomerulonephritis not proven (GN NP) group is an important category, especially in the elderly, and there is still a high percentage of cases given 'no cause'.

The male:female ratio is over one as expected for most types of kidney disease. The PKD gene is distributed equally amongst the general population so the excess of males on renal replacement therapy may be related to hypertension and reno-vascular disease being more common in males. There is also a gender imbalance in patients with diabetic nephropathy and this may be for a similar reason.

There is a significant variation between units in the percentage starting RRT with diabetic kidney disease, which generally follows the pattern of population distribution of ethnic minorities (Tables 4.10, 4.11). In the absence of firm definitions for diagnostic categories e.g. hypertensive disease, reno-vascular disease, some centre variation in cause is likely to reflect differences in classification rather than geographical differences in underlying disease.

Diabetic nephropathy was the cause of ERF in 18.6% of patients starting RRT in 2001 (after excluding patients with a missing diagnosis) and 18.7% in 1999. The apparent rise this year to 19.8% may be related to the two renal units from inner London joining, with their high ethnic minority population.

Table 4.9. Percentage primary renal diagnosis, by age, and gender ratio

	E&W <65	E&W > 65	E&W all	M:F
Diagnosis	N=1714	N=1790	N=3504	
Aetiology uncertain/GN NP*	17.5	26.5	21.9	1.5
Glomerulonephritis	13.5	6.5	9.8	2.0
Pyelonephritis	6.7	6.3	6.5	1.5
Diabetes	20.4	14.5	17.6	1.6
Renal vascular disease	2.8	11.2	7.0	2.1
Hypertension	5.1	5.9	6.1	2.3
Polycystic kidney	9.9	3.0	6.3	1.3
Other	14.4	12.6	13.6	1.3
Not sent	9.6	13.6	11.4	1.6

* GN NP, glomerulonephritis not proven

Table 4.10. Percentage distribution of diagnoses for new RRT patients by centre

Unit	Not sent	Aetiology unc. / Glomer. NP	Diabetes	GN	Polycystic Kidney	Hypertension	Reno-vascular	Pyelo-nephritis	Other
Bangr	0	42.9	21.4	3.6		7.1	3.6	10.7	10.7
Bradf	0	20.0	36.7	8.3	3.3	5.0	6.7	11.7	8.3
Bristl	0	33.1	14.5	10.5	12.1	0.8	8.1	10.5	10.5
Camb	14.7	37.3	13.3	1.3	4.0	1.3	8.0	4.0	16.0
Carls	6.9	24.1	3.4	13.8	6.9	13.8	17.2		13.8
Carsh	17.9	5.2	16.2	9.2	11.0	9.8	9.2	4.6	16.8
Clwyd	5.3	36.8	36.8		10.5			5.3	5.3
Covnt	8.2	23.7	16.5	9.3	5.2	1.0	7.2	13.4	15.5
Crdff	9.9	51.4	9.2	10.6	7.0	2.1	2.1	4.9	2.8
Extr	31.7	19.5	3.7	7.3	7.3	1.2	9.8	6.1	13.4
Glouc	1.8	28.1	10.5	21.1	12.3		5.3	5.3	15.8
Guys	22.9	7.1	27.1	10.0	5.7	6.4	7.1	2.9	10.7
H&C	7.3	14.0	28.1	4.5	4.5	19.1	2.2	2.2	18.0
Heart	0	18.6	16.9	6.8		10.2	15.3	10.2	22.0
Hull	12.4	22.9	26.7	8.6	5.7	2.9	2.9	5.7	12.4
Ipswi	0	28.6	28.6	4.8			4.8	4.8	28.6
Kings	0	17.9	23.9	7.7	6.8	17.9	8.5	5.1	12.0
Leic	4.6	23.8	18.5	13.2	9.3	0.7	11.9	6.0	11.9
LGI	41.3	7.9	11.1	7.9	3.2	7.9	4.8	3.2	12.7
Livrpl	2.0	36.7	16.7	6.0	5.3	12.0	2.7	6.7	12.0
Middlbr	0.9	25.0	18.8	17.0	5.4	6.3	7.1	4.5	15.2
Newc	29.5	3.8	7.6	9.5	14.3	5.7	5.7	7.6	16.2
Notts	0	32.2	19.5	11.5	6.9	3.4	5.7	5.7	14.9
Oxfrd	16.9	20.0	17.5	5.6	8.8	1.9	8.8	9.4	11.3
Plym	24.4	11.6	15.1	8.1	2.3		10.5	9.3	18.6
Ports	10.5	21.7	16.1	14.7	9.8	4.2	4.9	6.3	11.9

Table 4.10. (continued)

Unit	Not sent	Aetiology unc. / Glomer. NP	Diabetes	GN	Polycystic Kidney	Hypertension	Reno-vascular	Pyelo-nephritis	Other
Prstn	8.8	14.2	22.1	17.7	3.5	8.0	2.7	6.2	16.8
Redng	0	23.3	25.6	9.3	2.3	4.7	14.0	7.0	14.0
Sheff	0.6	12.2	15.4	19.9	7.1	14.1	4.5	12.2	14.1
Stevn	2.1	36.1	18.6	2.1	6.2	3.1	3.1	2.1	26.8
Sthend	48.6	20.0	5.7	11.4			5.7	5.7	2.9
StJms	15.0	16.3	15.0	11.3	7.5	2.5	10.0	6.3	16.3
Sund	10.7	8.9	23.2	14.3	3.6	8.9	8.9	8.9	12.5
Swnse	5.4	16.2	13.5	6.3	3.6	4.5	21.6	10.8	18.0
Truro	20.7	20.7	19.0	12.1	3.4	1.7	5.2	5.2	12.1
Wirrl	0	90.0	7.5						2.5
Wolve	0	19.2	28.3	10.1	4.0	5.1	7.1	8.1	18.2
Words	0	40.0	12.0	16.0	4.0	16.0			12.0
Wrex*	90.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
York	32.8	19.4	4.5	10.4	4.5	6.0	13.4	6.0	3.0
Eng	10.8	20.8	18.1	10.1	6.5	6.4	6.9	6.4	14.1
Wales	17.3	32.2	12.6	7.0	4.7	2.9	8.2	7.0	8.2
E&W**	11.4	21.8	17.6	9.8	6.3	6.1	7.0	6.5	13.6

*With so few returns from Wrexham, no calculations could be made
**The E&W total is calculated from those units with 80% or more returns.

Table 4.11. Percentage diagnoses, excluding 'not sent'

Unit	Aetiology uncertain/ GN NP	Diabetes	GN	Polycystic kidney	Hypertension	Reno-vascular	Pyelo-nephritis	Other
E&W	24.7	19.8	11.1	7.1	6.8	7.9	7.3	15.3

First established treatment modality

In 2002, haemodialysis was the very first modality of RRT in 68.2% of patients in England and Wales. Many patients, especially those referred late to a renal unit, undergo a brief period of haemodialysis before being established on peritoneal dialysis. As an indication of the elective treatment modality, the established modality at 90 days is a more clearly defined and representative figure (Figure 4.6). Of the 2002 patient cohort on day 90 of treatment, 68.8% of all dialysis patients were on haemodialysis; only 2.7 % had received a transplant.

There is a wide variation between units in the proportion of patients on HD at day 90 (Figure 4.7).

The comparison of HD usage in the under and over 65 age group is shown in Figure 4.8. The data for Salford and Manchester have been supplied from the Manchester SIRS database.

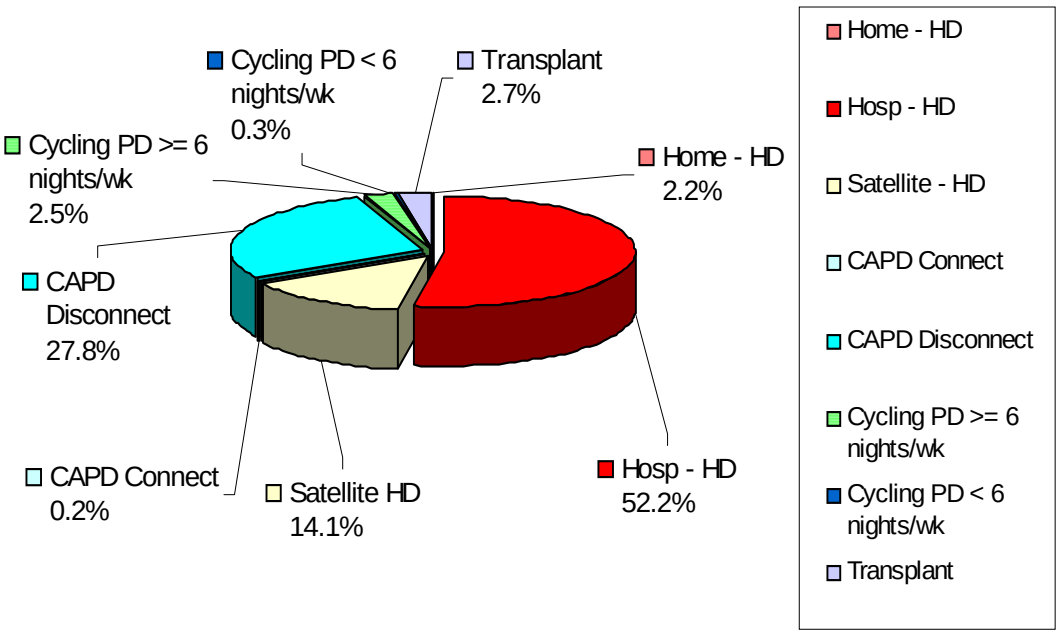

Figure 4.6. RRT modality at day 90 - 2002 cohort

When analysing modality by age <65 and 65+, 58% and 79% of patients respectively were on HD at day 90 in England & Wales (Figure 4.8).

There were significant differences between individual units within England and Wales in the percentage of new patients established on haemodialysis (p< 0.0001). Peritoneal dialysis patients have a lower median age than HD patients (57.8 years and 67.8 years respectively, p<0.0001).

Changes in established treatment modality in the first 3 years of RRT

Changes in modality from the start of RRT are shown for up to 3 years from the start in Tables 4.12-4.15. The patterns are similar to those seen in previous reports.

The first year

The switch from PD to HD is much larger than the converse switch, and continues for at least 3 years (p<0.0001). For the combined 1999-2001 cohort it was 11.7% in the first year after 90 days (Tables 4.12, 4.13). Patients starting PD have a greater chance of receiving a transplant (p<0.0001), reflecting their younger age. PD mortality is also lower than that of HD (p<0.0001): this probably largely reflects the differences in age and clinical factors associated with selection of patients for modality.

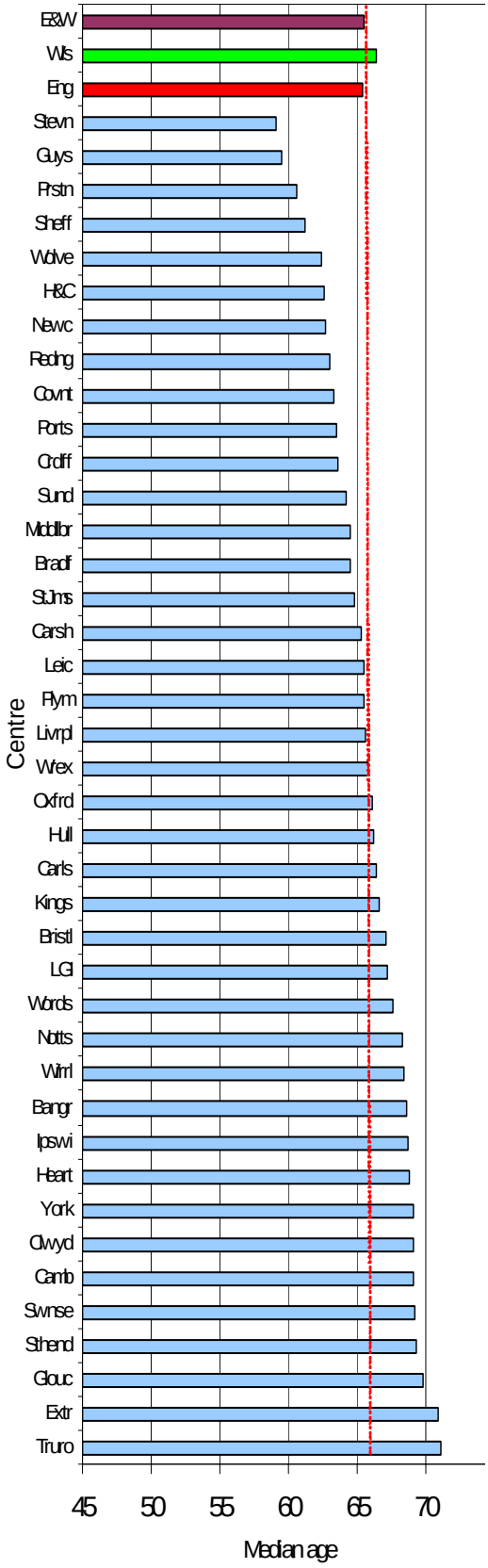

Figure 4.7. Percentage of incident dialysis patients on HD on day 90

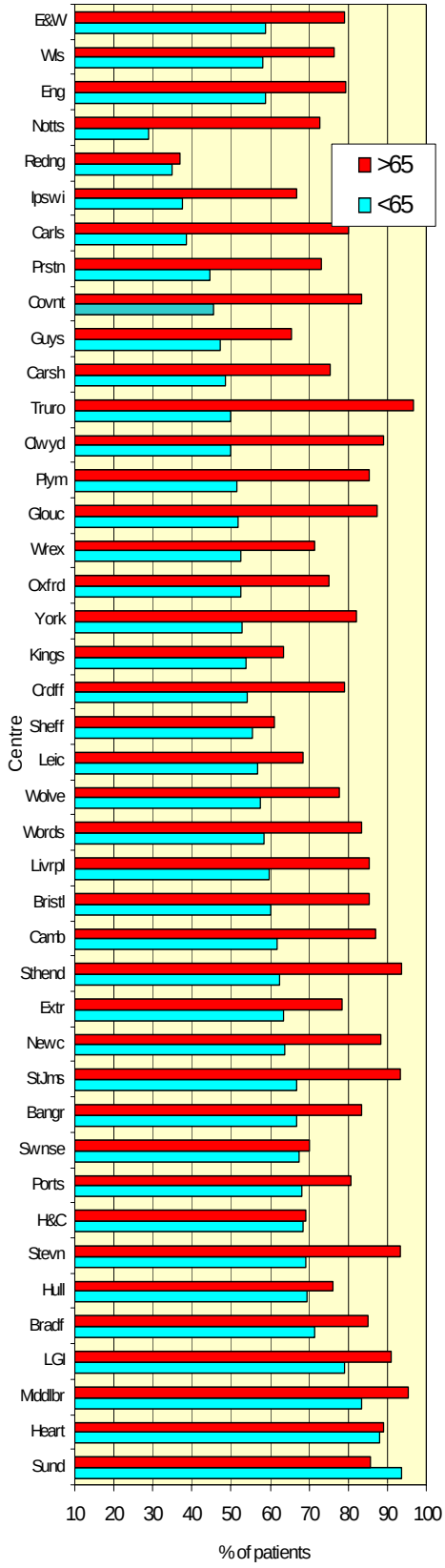

Figure 4.8. Percentage of incident dialysis patients on HD on day 90, by age, 2002

Table 4.12. HD patients at 90 days – changes in modality in the subsequent year

Established on HD (n=3157) Modality	No. of patients	Percentage
Remain on HD	2791	71.4
Changed to PD	125	3.2
Transplanted	161	4.1
Transferred out elsewhere	24	0.6
Recovered	51	1.3
Stopped treatment (died)	6	0.2
Died (no change in modality)	749	19.2

1999-2001 cohort

Table 4.13. PD patients at 90 days – changes in modality in the subsequent year

Established on PD (n=2482) Modality	No. of patients	Percentage
Remain on PD	1670	67.3
Change to HD	290	11.7
Transplanted	239	9.6
Transferred out elsewhere	27	1.1
Recovered	16	0.6
Stopped treatment (died)	1	0.04
Died (no change in modality)	239	9.6

1999-2001 cohort

The first 3 years

The results from combining the 3-year follow up data from the 1997 – 1999 incident patient cohort are shown in Tables 4.14 and 4.15.

These tables show that the attrition rate for patients starting on PD is much higher than that for those starting on HD, and is constant in each successive year. The rate of conversion from PD to HD is very much higher than the reverse. Conversion from HD to PD is virtually confined to the first year of treatment. By the end of year 3, 25% of patients that started on PD had died compared with 38% of HD patients, and 21% of PD patients were transplanted at the end of the 3rd year compared with only 13% of patients on HD.

These data are presented in a slightly different format in Tables 4.16 and 4.17, in which the proportions of patients on the treatment at the start of each year who subsequently change treatment in year are shown.

Table 4.14. 3 year HD technique survival

n = 1,803	End of year 1	End of year 2	End of year 3
Remain on PD	71.3	54.2	42.4
Changed to HD	2.7	3.2	3.4
Had a transplant	4.9	10.5	13.3
Stopped treatment	0.1	0.2	0.4
Don’t know	0.2	0.3	0.3
Recovered	1.3	1.7	1.7
Died	19.5	29.8	38.3

Table 4.15. 3 year PD technique survival

n= 818	End of year 1	End of year 2	End of year 3
Remain on PD	67.2	43.9	28.4
Changed to HD	10.8	17.9	22.9
Had a transplant	10.2	17.1	21.1
Stopped treatment	0.0	0.1	0.2
Don't know	0.6	0.8	0.9
Recovered	0.6	1.1	1.2
Died	10.5	19.1	25.3

Table 4.16. Changes in modality over the first 3 years for patients on HD

Established on HD First change in modality	End of 1 year % of new patients starting RRT	End of 2 years % of patients alive at end of year 1	End of 3 years % of patients alive at end of year 2
Remains on HD	71.4	76.8	75.5
Changed to PD	3.2	0.8	0.4
Transplanted	4.1	6.3	5.2
Transferred out elsewhere	0.6	0.8	0.5
Recovered	1.3	0.2	0
Died (no change in modality)	19.4	15.2	18.4
Total patients	**3157**	**1674**	**575**

Table 4.17. Changes in modality over the first 3 years for patients on PD

Established on PD First change in modality	End of 1 year % of patients	End of 2 years % of patients alive at end of year 1	End of 3 years % of patients alive at end of year 2
Remains on PD	67.3	62.5	65.3
Changed to HD	11.7	12.5	10.2
Transplanted	9.6	11.5	8.6
Transferred out elsewhere	1.1	0.3	0.3
Recovered	0.6	0.2	0.3
Died (no change in modality)	9.6	12.9	15.0
Total patients	**2482**	**1045**	**314**

Survival of incident patients

This is considered in Chapter 15. International comparisons will be found in Chapter 22.