Chapter 3
UK ESRD Incident Rates in 2008: national and centre-specific analyses

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Acceptance rates · Comorbidity · Dialysis · End stage renal disease · End stage renal failure · Haemodialysis · Incidence · Peritoneal dialysis · Primary Care Trust · Renal replacement therapy · Transplantation

Abstract
Introduction: This chapter describes the characteristics of adult patients starting renal replacement therapy (RRT) in the UK in 2008 and the acceptance rates for RRT in Primary Care Trusts and Local Authorities (PCT/LAs) in the UK. ***Methods:*** The basic demographics and clinical characteristics are reported on patients starting RRT from all UK renal centres. Late referral, defined as time between first being seen by a nephrologist and start of RRT being <90 days was also studied. Age and gender standardised ratios for acceptance rate in PCT/LAs were calculated. ***Results:*** In 2008, the acceptance rate in the UK was 108 per million population (pmp). Acceptance rates in Scotland (103 pmp), Northern Ireland (97 pmp) and Wales (117 pmp) have all fallen although Wales still remains the country with the highest acceptance rate. There were wide variations between PCT/LAs with respect to the standardised ratios, which were lower in more PCT/LAs in the North West and South East of England and higher in London, the West Midlands, Scotland, Northern Ireland, and Wales. The median age of all incident patients was 64.1 years and for non-Whites 56.1 years. Diabetic renal disease remains the single most common cause of renal failure (24%). By 90 days, 67.7% of patients were on haemodialysis, 19.8% on peritoneal dialysis, 5.9% had had a transplant and 6.6% had died or had stopped treatment. By 90 days, 77.4% of all dialysis patients were on HD. The geometric mean eGFR at the start of RRT was 8.6 ml/min/1.73 m^2 which was similar to the eGFR of those starting in 2007. The incidence of late presentation (<90 days) has fallen from 28% in 2003 to 22% in 2008. There was no relationship between social deprivation and referral pattern. ***Conclusions:*** Acceptance rates have fallen in Northern Ireland, Scotland and Wales whilst they have plateaued in England over the last three years. Wales continued to have the highest acceptance rate of the countries making up the UK.

Introduction

The term established renal failure (ERF) used within this chapter is synonymous with the terms end stage renal failure (ESRF) and end stage renal disease (ESRD), which are in more widespread international usage. Within the UK, patient groups have disliked the term 'end stage' which formerly reflected the inevitable outcome of this disease.

Table 3.1. Number of new adult patients starting RRT in the UK in 2008

	England	Wales	Scotland	N Ireland	**UK**
All UK centres	5,585	349	532	173	**6,639**
* Total estimated population mid-2008 (millions)	51.4	3.0	5.2	1.8	**61.4**
Acceptance rate (pmp)	109	117	103	97	**108**
(95% CI)	(106–111)	(104–129)	(94–112)	(83–112)	**(106–111)**

* Data extrapolated by the Office for National Statistics – based on the 2001 census

UK Renal Registry coverage

This chapter includes analyses of adult patients starting renal replacement therapy (RRT) in the UK in 2008. It describes regional and national variations in acceptance rates on to RRT in the UK, the demographics and clinical characteristics of all patients starting RRT in the UK and late referral to a renal centre for initiation of RRT. The methodology and the results for these analyses are discussed for the 3 sections separately.

For the first time, in 2008, the UK Renal Registry (UKRR) received individual patient level data returns from all adult renal centres in the UK (5 renal centres in Wales, 6 in Northern Ireland, 9 in Scotland and 52 in England). Data from centres in Scotland were obtained from the Scottish Renal Registry. Data on children and young adults can be found in chapter 14 Demography of the UK Paediatric RRT Population.

1 Geographical variation in acceptance rates

Over the years there have been wide variations in trends in acceptance between renal centres. Equity of access to RRT is an important aim and the need for RRT depends on many variables including social and demographic factors such as age, gender, social deprivation and ethnicity. Hence comparison of crude acceptance rates by geographical area can be misleading. This section, as in previous reports, uses age and gender standardisation and ethnic minority profiles to compare RRT incident rates. The impact of social deprivation was recorded in the 2003 report [1].

Methods

Crude acceptance rates were calculated per million population (pmp) and standardised acceptance ratios were calculated as detailed in appendix D: methodology used for analyses of PCT incidence and prevalence rates and of standardised ratios (www.renalreg.org). Briefly, data from all covered areas was used to calculate overall age and gender specific acceptance rates. The age and gender breakdown of the population in each Primary Care Trust (PCT) area in England, Local Authority (LA) area in Wales, Scotland (called Council Area) and in Northern Ireland (called District Council Area) was obtained from the 2001 Census data from the Office for National Statistics (ONS) [2]. These will be referred to by the umbrella term 'PCT/LA' in this report. This population breakdown was extrapolated by the ONS from the 2001 census data to mid-2006 estimates. This is the second year that the mid-2006 estimates have been used. The population breakdown and the overall acceptance rates were used to calculate the expected age and gender specific acceptance numbers for each PCT/LA. The age and gender standardised acceptance ratio was the observed acceptance numbers divided by the expected acceptance numbers. A ratio below 1 indicated that the observed rate was less than expected given the area's population structure. This was statistically significant at the 5% level if the upper confidence limit was less than 1. Analyses were undertaken for each of the last 6 years and, as the incident numbers for one year can be small for smaller areas, a combined years analysis was also done. The proportion of non-Whites in each PCT/LA area was obtained from the ONS.

Results

In 2008 the number of adult patients starting RRT in the UK was 6,639 equating to an acceptance rate of 108 pmp (table 3.1), very similar to the rate of 109 pmp in 2007. Acceptance rates in Scotland (103 pmp), Northern Ireland (97 pmp) and Wales (117 pmp) have all fallen although Wales still remained the country with the highest acceptance rate (figure 3.1). In England, acceptance rates remained stable for the last 3 years. There continues to be very marked gender differences in take-on rates, 135 pmp (95% CI 131–139) in males and 82 pmp (95% CI 79–85) in females.

Table 3.2 shows acceptance rates and standardised ratios for PCTs and LAs. The 95% confidence intervals are given for the standardised ratios from the combined years analysis and ratios that are significantly different

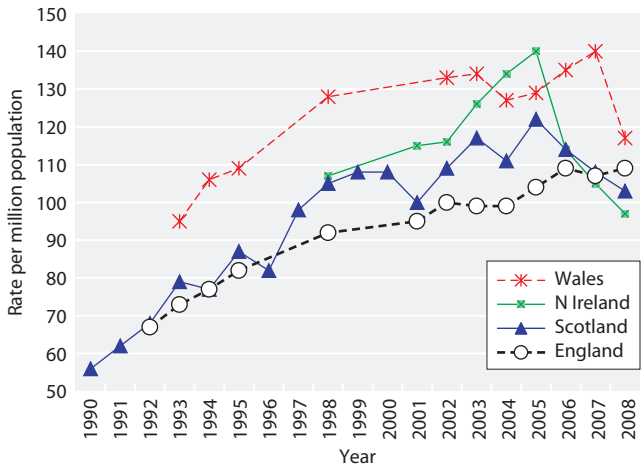

Fig. 3.1. RRT incident rates in the countries of the UK 1990–2008

from 1 are highlighted, provided that the area has been covered for at least three years. Small differences in the 2003–2007 results may be seen in comparison with previous publications because of retrospective data updating in collaboration with local renal centres.

In 2008 two small areas had no incident patients and hence crude acceptance rates of 0 pmp (table 3.2). These were Shetland Islands (population 22,000) and Limavady (population 33,900). With just two/three incident patients respectively these areas would have had rates close to the national average. The highest rate was 262 pmp on the Isle of Anglesey (population 68,800). There were similar wide variations in the standardised acceptance ratios from 0 (the two areas as above) to 3.04 in the Heart of Birmingham PCT (population 271,400). The latter PCT has a 60% non-White population. Changes over the 6 years between 2003 and 2008 showed wide variations in annual standardised acceptance ratios, particularly as would be expected, in areas with small populations. Over this 6-year period, of those PCT/LA areas with data for a minimum of 3 years, 45 had significantly low ratios, 52 had high ratios and 118 normal ratios. There were significant differences between regions ($p < 0.0001$), with acceptance rates being lower in more PCT/LAs in North West and South East England and higher in London, the West Midlands, Northern Ireland, Scotland and Wales (table 3.3). Importantly, the North East and North West of England have seen a rise in the number of PCT/LAs with significantly lower acceptance rates.

Confidence intervals are not presented for the crude rates but figure 3.2 has been included to enable assessment of whether an observed acceptance rate differs significantly from the national average. For any population size (x-axis), the upper and lower 95% confidence intervals around the national average acceptance rate (dotted lines) can be read from the y-axis. An observed acceptance rate outside these limits is significantly different from the national average. In order to be judged as significantly different from national norms the observed acceptance rate for a population of 80,000 would have to be outside the limits of 36 to 180 pmp per year, whilst for a population of 1 million, the limits are from 88 to 128 pmp per year. The plot begins at population 80,000 because below this the number of expected cases is small and the statistical assumptions used to produce the plot are not valid.

In those PCT/LA areas with significantly high acceptance ratios the median percentage of the population who were non-White was 20.6%, which was significantly higher (Wilcoxon rank sum test $p < 0.001$) than in those areas with low (2.3%) or normal (1.3%) ratios (figure 3.3). Likewise, those PCT/LAs with >10% of the population non-White (42 of 215 PCT/LAs) were significantly more likely to have high standardised acceptance ratios ($p < 0.0001$).

The number of new patients accepted by each renal centre from 2003 to 2008 is shown in table 3.4, along with the percentage difference between these years for each of those 52 centres with full reporting during that period and for the same centres on a national level. There have been large variations in acceptance trends between centres ranging from an increase of 81.7% in Guys to a reduction of 42.1% in York. The variation may reflect chance fluctuation, completeness of reporting, changing incidence of established renal failure, changes in referral patterns or catchment populations and areas, and the introduction of conservative care programmes. Acceptance rates of individual renal centres have not been calculated, as their catchment populations are not precisely defined.

By country, only England has seen an increase in numbers of accepted patients (7.2%), whilst both Scotland and Wales have seen a fall. Northern Ireland could not be included in the analysis as the UKRR only received data from 2005 onwards. The overall number of accepted patients in the UK remained relatively stable between 2007 and 2008 and this was consistent when looking only at those centres with complete reporting from 2003 to 2008. The increase of 3.8% in the number of UK patients accepted between 2003 and 2008 is considerably less than the 9.2% increase between 2002 and 2007 and the 12% increase between 2002 and 2006.

Table 3.2. Crude adult acceptance rates (pmp) and standardised ratios 2003–2008

O/E = standardised acceptance ratio
[a] For those areas not covered by the Registry for the entire period 2003–2008, the standardised acceptance ratio and the acceptance rates are averages for the years covered by the Registry
[b] per million population
[c] Lower confidence limit
[d] Upper confidence limit
Blank cells – no data returned to the Registry for that year
Areas with data for minimum 3 years and with significantly low acceptance ratios over 6 years are italicised in greyed areas, those with significantly high ratios are bold in greyed areas
% non-White = percentage of the PCT/LA population that is non-White, from 2001 census
PCT/LA = Primary Care Trust (England), Local Authority (Wales), Council Area (Scotland), District Council (N Ireland)

			2003	2004	2005	2006	2007	2008		2003–2008[a]				% non-
UK Area	**PCT/LA**	**Tot Pop**	**O/E**	**O/E**	**O/E**	**O/E**	**O/E**	**O/E**	**pmp[b]**	**O/E**	**LCL[c]**	**UCL[d]**	**pmp**	**White**
North East	*County Durham*	*500,400*	*0.83*	*0.84*	*0.92*	*0.83*	*0.67*	*0.70*	*80*	*0.80*	*0.71*	*0.90*	*89*	*1.0*
	Darlington	99,100	0.99	0.79	0.46	0.70	1.15	0.98	111	0.85	0.65	1.10	92	2.1
	Redcar and Cleveland	139,200	1.15	1.08	0.83	0.90	0.98	0.74	86	0.94	0.76	1.16	107	1.1
	Hartlepool	91,100	1.32	0.88	0.83	1.37	0.50	1.30	143	1.03	0.80	1.33	110	1.1
	Middlesbrough	138,500	1.15	0.92	1.08	1.37	1.25	1.12	116	1.15	0.95	1.41	116	6.3
	North Tees	189,200	0.93	1.10	0.82	0.88	0.59	0.84	90	0.86	0.70	1.04	88	2.7
	Gateshead	*190,500*	*1.00*	*1.00*	*0.71*	*0.67*	*0.86*	*0.68*	*79*	*0.82*	*0.67*	*0.99*	*91*	*1.6*
	Newcastle	270,400	0.95	1.19	1.01	0.71	1.26	1.04	107	1.02	0.88	1.19	102	6.9
	North Tyneside	*195,100*	*0.88*	*1.08*	*0.69*	*0.48*	*0.84*	*0.49*	*56*	*0.73*	*0.60*	*0.90*	*82*	*1.9*
	Northumberland	*309,900*	*0.84*	*0.93*	*0.63*	*0.67*	*0.73*	*0.68*	*84*	*0.74*	*0.64*	*0.87*	*88*	*1.0*
	South Tyneside	151,000	0.76	1.07	0.89	0.95	1.03	0.52	60	0.87	0.71	1.07	97	2.7
	Sunderland Teaching	280,600	1.27	0.64	0.73	0.72	1.05	0.80	89	0.87	0.74	1.01	93	1.9
North West	Wirral	311,100	1.00	1.24	1.20	0.73	0.71	0.77	90	0.93	0.81	1.07	106	1.7
	Liverpool	436,200	0.81	1.06	1.32	1.18	1.07	1.16	119	1.10	0.98	1.24	110	5.7
	Central and Eastern Cheshire	451,200					0.66	0.63	73	0.65	0.51	0.82	75	1.6
	Western Cheshire	*235,100*	*0.68*	*1.07*	*0.60*	*0.88*	*0.86*	*0.61*	*72*	*0.78*	*0.66*	*0.93*	*89*	*1.6*
	Knowsley	151,500	1.39	0.98	0.65	0.87	1.01	0.44	46	0.88	0.71	1.10	89	1.6
	Sefton	*277,500*	*0.69*	*0.56*	*0.92*	*0.79*	*0.53*	*0.81*	*97*	*0.72*	*0.61*	*0.85*	*84*	*1.6*
	Halton and St Helens	297,000	0.79	0.82	1.29	1.22	1.05	0.59	64	0.96	0.83	1.11	101	1.2
	Warrington	*194,300*	*0.63*	*0.94*	*0.74*	*0.79*	*0.66*	*0.62*	*67*	*0.73*	*0.59*	*0.90*	*76*	*2.1*
	Blackburn with Darwen	141,200	1.33	1.00	1.41	1.40	1.27	0.45	42	1.14	0.93	1.41	104	22.0
	Blackpool	*142,800*	*0.32*	*0.32*	*0.73*	*0.57*	*0.87*	*0.88*	*105*	*0.62*	*0.49*	*0.80*	*72*	*1.6*
	North Lancashire	*329,000*	*0.63*	*0.35*	*0.38*	*0.46*	*0.59*	*0.52*	*64*	*0.49*	*0.41*	*0.59*	*58*	*1.7*
	Cumbria	*496,000*	*0.76*	*0.61*	*0.87*	*0.62*	*0.62*	*0.72*	*89*	*0.70*	*0.62*	*0.79*	*83*	*0.7*
	Central Lancashire	*451,600*	*0.51*	*0.67*	*0.71*	*0.59*	*0.78*	*0.93*	*102*	*0.70*	*0.61*	*0.80*	*75*	*5.6*
	East Lancashire	*384,500*	*0.69*	*0.67*	*0.73*	*0.90*	*0.69*	*0.67*	*73*	*0.73*	*0.63*	*0.84*	*76*	*8.1*
	Ashton, Leigh and Wigan	*305,500*	*0.86*	*0.80*	*0.94*	*0.71*	*0.57*	*0.45*	*49*	*0.72*	*0.61*	*0.84*	*75*	*1.3*
	Bolton	*262,500*	*0.99*	*0.71*	*0.71*	*0.88*	*0.82*	*0.65*	*69*	*0.79*	*0.67*	*0.94*	*81*	*11.0*
	Bury	*182,900*	*0.57*	*0.91*	*0.80*	*0.55*	*0.61*	*0.67*	*71*	*0.68*	*0.55*	*0.85*	*70*	*6.1*
	Manchester	451,900					1.32	1.37	119	1.34	1.11	1.63	117	19.0
	Heywood, Middleton and Rochdale	206,400					0.94	0.85	87	0.89	0.65	1.23	92	11.4
	Oldham	*219,800*	*0.79*	*0.69*	*0.56*	*0.84*	*0.85*	*1.12*	*114*	*0.81*	*0.67*	*0.98*	*80*	*13.9*
	Salford	*217,800*	*1.35*	*0.53*	*0.41*	*0.90*	*0.52*	*1.10*	*115*	*0.80*	*0.66*	*0.97*	*81*	*3.9*
	Stockport	280,800					0.84	0.78	89	0.81	0.62	1.07	93	4.3
	Tameside and Glossop	247,700					1.37	0.69	73	1.03	0.79	1.34	109	4.9
	Trafford	212,100					0.95	0.61	66	0.78	0.56	1.08	85	8.4

Table 3.2. Continued

UK area	PCT/LA	Tot pop	2003 O/E	2004 O/E	2005 O/E	2006 O/E	2007 O/E	2008 O/E	2008 pmp[b]	2003–2008[a] O/E	2003–2008[a] LCL[c]	2003–2008[a] UCL[d]	2003–2008[a] pmp	% non-White
Yorkshire and the Humber	*East Riding of Yorkshire*	*331,100*	*1.02*	*0.72*	*1.10*	*0.59*	*0.67*	*1.07*	*133*	*0.86*	*0.75*	*0.98*	*104*	*1.2*
	Hull	256,200	0.89	1.19	1.24	0.76	1.00	1.00	101	1.01	0.86	1.18	99	2.3
	North East Lincolnshire	159,900	0.68	1.04	1.21	1.03	1.05	1.11	125	1.03	0.85	1.24	112	1.4
	North Lincolnshire	155,200	0.73	1.34	0.97	0.97	0.71	0.88	103	0.93	0.76	1.13	105	2.5
	North Yorkshire and York	*783,200*	*1.11*	*1.00*	*0.89*	*0.88*	*0.77*	*0.73*	*87*	*0.89*	*0.81*	*0.97*	*102*	*1.4*
	Barnsley	223,700	0.71	0.88	0.75	0.94	0.83	1.12	125	0.87	0.74	1.04	95	0.9
	Doncaster	*290,400*	*0.98*	*0.88*	*0.70*	*0.78*	*0.58*	*0.83*	*93*	*0.78*	*0.67*	*0.92*	*86*	*2.3*
	Rotherham	253,000	0.94	1.18	1.07	0.91	1.03	1.39	154	1.09	0.94	1.26	117	3.1
	Sheffield	526,100	0.97	1.19	1.08	1.13	1.14	1.13	120	1.11	1.00	1.23	113	8.8
	Bradford and Airedale	**493,000**	**1.54**	**1.25**	**1.34**	**0.84**	**1.52**	**1.13**	**110**	**1.27**	**1.14**	**1.40**	**119**	**21.7**
	Calderdale	198,600	1.35	1.03	0.88	0.83	0.74	0.79	86	0.93	0.77	1.11	97	7.0
	Wakefield District	*321,000*	*0.87*	*1.06*	*0.64*	*1.00*	*0.56*	*0.73*	*81*	*0.81*	*0.69*	*0.94*	*86*	*2.3*
	Kirklees	398,400	1.21	1.31	0.76	1.19	0.72	0.70	73	0.97	0.86	1.11	97	14.4
	Leeds	750,300	1.06	1.02	1.12	0.92	0.82	0.96	97	0.98	0.89	1.08	96	8.1
East Midlands	**Leicester City**	**289,700**	**1.70**	**1.34**	**1.57**	**1.60**	**1.88**	**1.51**	**138**	**1.60**	**1.41**	**1.82**	**142**	**36.1**
	Leicestershire County and Rutland	*673,600*	*0.81*	*0.71*	*0.77*	*0.87*	*0.87*	*0.71*	*80*	*0.79*	*0.71*	*0.88*	*87*	*5.1*
	Northamptonshire	*669,200*	*0.74*	*0.70*	*0.84*	*0.88*	*1.00*	*0.96*	*102*	*0.86*	*0.77*	*0.95*	*87*	*4.9*
	Nottinghamshire County	657,500	1.06	1.04	1.22	1.17	1.08	0.91	105	1.08	0.99	1.18	120	2.8
	Bassetlaw	111,000	0.94	0.60	1.04	0.61	1.61	0.70	81	0.92	0.73	1.16	104	1.4
	Derby City	236,400	0.92	1.06	1.16	1.21	0.99	1.56	165	1.16	0.99	1.34	118	12.6
	Derbyshire County	*720,800*	*0.87*	*0.70*	*0.71*	*0.67*	*0.79*	*1.05*	*123*	*0.80*	*0.72*	*0.88*	*91*	*1.5*
	Lincolnshire	*688,700*	*0.57*	*0.75*	*1.05*	*0.83*	*0.79*	*0.66*	*83*	*0.78*	*0.70*	*0.86*	*94*	*1.4*
	Nottingham City	286,400	0.93	1.15	1.35	1.29	0.92	1.30	119	1.16	1.00	1.34	102	15.1
West Midlands	Dudley	305,200	0.81	1.19	1.00	0.92	0.96	0.88	102	0.96	0.83	1.10	107	6.4
	Birmingham East and North	**395,900**		**1.59**	**1.83**	**1.78**	**1.36**	**1.67**	**167**	**1.65**	**1.47**	**1.84**	**161**	**22.3**
	Heart of Birmingham Teaching	**271,400**		**2.25**	**2.10**	**2.37**	**2.63**	**3.04**	**243**	**2.49**	**2.20**	**2.81**	**194**	**59.9**
	South Birmingham	**339,400**		**1.66**	**1.22**	**1.10**	**1.32**	**1.53**	**153**	**1.36**	**1.19**	**1.55**	**133**	**15.1**
	Sandwell	**287,700**		**1.91**	**1.46**	**1.28**	**1.53**	**2.13**	**226**	**1.66**	**1.46**	**1.88**	**172**	**20.3**
	Solihull	203,000	1.56	1.22	1.10	1.25	0.81	0.98	113	1.15	0.98	1.34	128	5.4
	Walsall Teaching	**254,700**	**1.25**	**1.56**	**1.13**	**1.45**	**1.09**	**1.31**	**145**	**1.30**	**1.13**	**1.48**	**139**	**13.6**
	Wolverhampton City	**236,900**	**1.65**	**1.65**	**1.63**	**1.24**	**0.96**	**1.38**	**152**	**1.41**	**1.23**	**1.61**	**150**	**22.2**
	Coventry Teaching	**306,600**	**1.21**	**0.89**	**0.97**	**1.11**	**1.32**	**1.51**	**153**	**1.17**	**1.02**	**1.34**	**115**	**16.0**
	Herefordshire	178,000		0.97	0.77	0.69	0.79	0.92	118	0.82	0.67	1.01	103	0.9
	Warwickshire	522,300	0.72	0.90	0.97	1.06	1.04	0.98	113	0.95	0.85	1.06	106	4.4
	Worcestershire	*553,000*		*0.91*	*0.80*	*0.66*	*0.81*	*1.03*	*121*	*0.84*	*0.75*	*0.95*	*97*	*2.4*
	North Staffordshire	211,400					0.56	0.84	99	0.70	0.50	0.97	83	1.5
	South Staffordshire	603,500					0.98	0.96	109	0.97	0.82	1.15	111	2.7
	Shropshire County	289,500		1.10	0.86	0.95	0.66	1.14	142	0.94	0.81	1.10	115	1.2
	Stoke on Trent	247,600					1.21	1.03	113	1.12	0.87	1.44	123	5.1
	Telford and Wrekin	161,800		1.41	0.82	1.37	1.45	1.03	105	1.21	1.00	1.48	121	5.2
East of England	*Bedfordshire*	*403,600*	*0.91*	*0.78*	*0.61*	*1.08*	*0.58*	*0.86*	*92*	*0.80*	*0.70*	*0.92*	*82*	*6.7*
	Luton	**187,200**	**1.74**	**0.81**	**1.58**	**1.22**	**1.57**	**1.13**	**107**	**1.34**	**1.14**	**1.59**	**123**	**28.1**
	West Hertfordshire	*530,600*	*0.61*	*0.62*	*0.75*	*1.02*	*0.79*	*1.15*	*123*	*0.83*	*0.74*	*0.94*	*86*	*7.6*
	East and North Hertfordshire	*527,800*	*0.94*	*0.71*	*0.77*	*0.89*	*0.69*	*0.75*	*80*	*0.79*	*0.70*	*0.89*	*81*	*5.0*
	Mid Essex	361,400		1.05	0.83	0.91	0.95	0.75	83	0.90	0.77	1.04	97	2.4
	North East Essex	315,400						1.34	162	1.34	1.01	1.76	162	2.6
	South East Essex	329,900		1.21	0.90	1.23	1.02	0.95	112	1.06	0.92	1.21	123	3.0

Table 3.2. Continued

UK area	PCT/LA	Tot pop	2003 O/E	2004 O/E	2005 O/E	2006 O/E	2007 O/E	2008 O/E	2008 pmp[b]	2003–2008[a] O/E	2003–2008[a] LCL[c]	2003–2008[a] UCL[d]	2003–2008[a] pmp	% non-White
East of England	South West Essex	388,300		1.30	0.84	1.08	0.95	1.13	118	1.06	0.92	1.21	109	3.8
	West Essex	*274,700*		*0.94*	*0.75*	*0.74*	*0.68*	*0.39*	*44*	*0.70*	*0.57*	*0.84*	*76*	*4.2*
	Cambridgeshire	589,600	0.82	0.91	0.95	1.15	0.88	0.91	98	0.94	0.84	1.04	98	4.1
	Peterborough	163,400	1.13	0.93	1.25	1.25	1.02	0.91	92	1.08	0.89	1.31	106	10.3
	Norfolk	738,900		0.89	1.17	0.98	1.04	0.81	103	0.98	0.89	1.07	122	1.5
	Suffolk	*585,300*		*0.80*	*0.98*	*0.77*	*0.90*	*0.86*	*101*	*0.86*	*0.77*	*0.96*	*99*	*3.1*
	Great Yarmouth and Waveney	**210,600**		**1.38**	**1.26**	**1.30**	**1.18**	**1.22**	**157**	**1.27**	**1.09**	**1.47**	**160**	**1.3**
London	**Barnet**	**328,400**			**0.70**	**1.55**	**1.90**	**1.41**	**140**	**1.40**	**1.21**	**1.62**	**138**	**26.0**
	Camden	227,200			0.77	1.31	1.00	0.94	79	1.01	0.80	1.26	84	26.8
	Enfield	**285,400**			**1.08**	**1.52**	**1.04**	**1.29**	**126**	**1.23**	**1.04**	**1.46**	**120**	**22.9**
	Haringey Teaching	**225,600**			**1.44**	**1.47**	**1.38**	**1.54**	**129**	**1.46**	**1.21**	**1.76**	**121**	**34.4**
	Islington	**185,500**			**1.74**	**1.66**	**1.48**	**1.15**	**97**	**1.51**	**1.23**	**1.85**	**125**	**24.6**
	Barking and Dagenham	165,400		1.25	0.76	0.78	0.99	1.65	151	1.08	0.87	1.35	97	14.8
	City and Hackney Teaching	**216,200**				**1.19**	**1.43**	**1.26**	**102**	**1.30**	**1.02**	**1.64**	**105**	**39.7**
	Havering	227,500				0.98	0.76	0.73	84	0.82	0.65	1.05	95	4.8
	Newham	**248,300**		**2.08**	**2.33**	**2.32**	**1.70**	**1.91**	**145**	**2.06**	**1.79**	**2.38**	**152**	**60.6**
	Redbridge	**251,800**		**1.37**	**0.95**	**1.10**	**1.44**	**1.69**	**163**	**1.31**	**1.12**	**1.53**	**123**	**36.5**
	Tower Hamlets	**212,500**		**1.26**	**1.56**	**1.50**	**1.82**	**2.00**	**151**	**1.64**	**1.37**	**1.95**	**120**	**48.6**
	Waltham Forest	**222,100**				**1.72**	**2.60**	**1.38**	**122**	**1.90**	**1.58**	**2.29**	**168**	**35.5**
	Brent Teaching	**271,400**				**1.69**	**2.06**	**2.06**	**192**	**1.94**	**1.65**	**2.28**	**181**	**54.7**
	Ealing	**306,400**	**1.88**	**2.17**	**1.82**	**1.90**	**2.02**	**1.60**	**147**	**1.89**	**1.69**	**2.12**	**168**	**41.3**
	Hammersmith and Fulham	**171,400**	**2.05**	**1.79**	**1.26**	**1.13**	**1.54**	**0.67**	**58**	**1.39**	**1.16**	**1.66**	**117**	**22.2**
	Harrow	**214,600**				**1.44**	**0.68**	**1.83**	**186**	**1.32**	**1.07**	**1.63**	**135**	**41.2**
	Hillingdon	**250,100**		**1.40**	**1.10**	**1.56**	**1.10**	**1.55**	**152**	**1.34**	**1.15**	**1.57**	**129**	**20.9**
	Hounslow	**218,600**		**2.24**	**1.52**	**1.94**	**1.61**	**1.31**	**119**	**1.72**	**1.47**	**2.00**	**152**	**35.1**
	Kensington and Chelsea	178,000				0.80	0.63	1.10	107	0.84	0.63	1.13	82	21.4
	Westminster	231,700				1.49	0.79	1.40	129	1.22	0.98	1.53	114	26.8
	Bexley	221,600	1.06	0.83	0.95	1.06	1.12	1.17	126	1.04	0.88	1.22	108	8.6
	Bromley	299,400	0.94	1.00	1.04	0.86	0.69	1.24	137	0.96	0.83	1.11	102	8.4
	Greenwich Teaching	**222,600**	**1.37**	**0.55**	**2.13**	**0.98**	**1.54**	**1.69**	**153**	**1.38**	**1.19**	**1.62**	**121**	**22.9**
	Lambeth	**272,200**	**1.28**	**1.46**	**1.78**	**1.48**	**1.98**	**1.62**	**132**	**1.61**	**1.40**	**1.84**	**126**	**37.6**
	Lewisham	**255,600**	**1.01**	**1.89**	**1.77**	**1.72**	**1.96**	**1.65**	**141**	**1.67**	**1.46**	**1.91**	**138**	**34.1**
	Southwark	**269,000**	**1.56**	**1.19**	**1.81**	**1.46**	**2.32**	**2.18**	**182**	**1.77**	**1.55**	**2.01**	**142**	**37.0**
	Croydon	**337,000**	**1.28**	**1.25**	**1.72**	**1.02**	**1.73**	**1.58**	**154**	**1.43**	**1.27**	**1.62**	**135**	**29.8**
	Kingston	156,000					0.87	1.21	115	1.04	0.73	1.48	99	15.5
	Richmond and Twickenham	179,500					0.78	0.79	78	0.79	0.54	1.14	78	9.0
	Sutton and Merton	382,000					1.37	1.46	141	1.41	1.17	1.71	137	18.1
	Wandsworth	279,200					1.87	1.31	111	1.59	1.27	1.99	134	22.0
South East	*Isle of Wight*	*138,200*	*0.61*	*0.66*	*0.40*	*0.48*	*0.16*	*0.27*	*36*	*0.42*	*0.32*	*0.57*	*54*	*1.3*
	Hampshire	*1,265,900*	*0.73*	*0.64*	*0.67*	*0.84*	*0.80*	*0.81*	*92*	*0.75*	*0.69*	*0.81*	*83*	*2.2*
	Portsmouth City Teaching	*196,300*	*0.92*	*0.58*	*0.60*	*0.77*	*0.94*	*0.88*	*87*	*0.78*	*0.63*	*0.97*	*74*	*5.3*
	Southampton City	229,100	0.85	0.60	0.76	0.76	0.86	1.18	113	0.84	0.70	1.02	78	7.6
	West Kent	662,600					1.07	1.02	113	1.05	0.89	1.23	116	3.9
	Medway	251,900					1.42	0.71	71	1.07	0.82	1.39	107	5.4
	Eastern and Coastal Kent	720,400					1.31	1.17	136	1.24	1.08	1.42	145	2.4
	Hastings and Rother	176,200		1.05	0.72	1.02	0.56	0.79	102	0.83	0.67	1.01	106	2.4
	Brighton and Hove City	251,500		0.95	0.89	0.85	0.86	1.13	115	0.94	0.78	1.12	93	5.7
	East Sussex Downs and Weald	*330,200*		*1.21*	*0.65*	*0.96*	*0.84*	*0.66*	*85*	*0.86*	*0.74*	*0.99*	*109*	*2.3*

Table 3.2. Continued

UK area	PCT/LA	Tot pop	2003 O/E	2004 O/E	2005 O/E	2006 O/E	2007 O/E	2008 O/E	2008 pmp[b]	2003–2008[a] O/E	2003–2008[a] LCL[c]	2003–2008[a] UCL[d]	2003–2008[a] pmp	% non-White
South East	*Surrey*	*1,073,400*		*0.79*	*0.60*	*0.79*	*0.82*	*0.97*	*108*	*0.79*	*0.72*	*0.87*	*86*	*4.9*
	West Sussex	*770,600*		*0.59*	*0.82*	*0.87*	*0.84*	*0.89*	*109*	*0.81*	*0.73*	*0.89*	*97*	*3.4*
	Milton Keynes	230,100	1.25	0.99	0.79	0.74	1.21	0.98	91	0.99	0.83	1.18	88	9.1
	Berkshire East	**382,200**	**0.91**	**0.95**	**1.22**	**1.18**	**1.30**	**1.26**	**123**	**1.14**	**1.01**	**1.30**	**108**	**16.0**
	Berkshire West	445,400	1.04	0.97	1.07	0.92	0.96	1.14	115	1.02	0.90	1.15	98	7.3
	Oxfordshire	*607,400*	*1.10*	*0.77*	*0.88*	*0.79*	*0.71*	*0.68*	*71*	*0.82*	*0.73*	*0.91*	*82*	*5.0*
	Buckinghamshire	*500,700*	*0.82*	*0.79*	*0.63*	*0.70*	*0.81*	*0.81*	*88*	*0.76*	*0.67*	*0.86*	*80*	*7.7*
South West	Bath and North East Somerset	175,600	0.67	1.28	1.05	0.85	1.01	0.71	80	0.93	0.77	1.12	101	2.8
	Bristol	**410,700**	**1.33**	**1.25**	**1.20**	**1.37**	**0.98**	**1.55**	**151**	**1.28**	**1.14**	**1.43**	**120**	**8.2**
	Gloucestershire	*578,500*	*0.85*	*0.91*	*0.85*	*1.02*	*0.88*	*0.62*	*73*	*0.86*	*0.77*	*0.95*	*97*	*2.9*
	Swindon	192,600	1.00	1.23	0.73	0.74	0.55	1.16	119	0.90	0.74	1.09	89	4.8
	South Gloucestershire	254,200	1.03	0.91	1.12	0.98	0.86	0.97	106	0.98	0.84	1.14	104	2.4
	Wiltshire	*448,600*	*0.60*	*0.51*	*0.81*	*0.71*	*0.64*	*0.86*	*98*	*0.69*	*0.60*	*0.79*	*77*	*1.6*
	Bournemouth and Poole	*297,900*		*0.67*	*0.63*	*0.65*	*0.61*	*0.83*	*101*	*0.68*	*0.57*	*0.81*	*81*	*2.6*
	Dorset	*403,100*		*0.71*	*0.63*	*0.53*	*0.70*	*0.87*	*119*	*0.69*	*0.60*	*0.79*	*93*	*1.2*
	North Somerset	201,200	1.35	1.16	1.13	0.91	0.77	1.22	149	1.08	0.93	1.27	128	1.4
	Somerset	*518,800*	*0.83*	*0.87*	*0.63*	*0.76*	*0.68*	*0.78*	*96*	*0.76*	*0.67*	*0.85*	*91*	*1.2*
	Devon	740,600	0.86	1.04	1.04	0.92	1.07	1.12	143	1.01	0.93	1.10	124	1.1
	Plymouth Teaching	**247,900**	**1.46**	**1.13**	**1.06**	**1.82**	**1.73**	**0.98**	**105**	**1.37**	**1.20**	**1.57**	**141**	**1.6**
	Torbay	133,000	1.09	1.33	1.01	0.73	0.92	1.61	211	1.11	0.92	1.34	140	1.2
	Cornwall and Isles of Scilly	526,200	1.21	1.35	0.68	1.04	0.92	0.91	116	1.01	0.92	1.12	124	1.0
Wales	**Cardiff**	**317,500**	**1.61**	**1.40**	**1.34**	**1.41**	**1.61**	**1.23**	**120**	**1.43**	**1.27**	**1.62**	**134**	**8.4**
	Merthyr Tydfil	**55,800**	**1.78**	**2.48**	**1.83**	**2.68**	**1.92**	**0.48**	**54**	**1.86**	**1.46**	**2.36**	**200**	**1.0**
	Rhondda, Cynon, Taff	**234,100**	**1.11**	**1.58**	**1.36**	**1.33**	**1.50**	**1.28**	**141**	**1.36**	**1.19**	**1.56**	**145**	**1.2**
	Vale of Glamorgan	123,200	0.87	1.26	0.81	1.26	0.92	0.79	89	0.99	0.79	1.23	108	2.2
	Carmarthenshire	**177,800**	**1.40**	**1.19**	**1.08**	**1.02**	**1.30**	**1.18**	**146**	**1.19**	**1.02**	**1.40**	**143**	**0.9**
	Ceredigion	77,100	0.59	0.93	0.77	0.52	1.05	1.16	143	0.84	0.63	1.12	99	1.4
	Pembrokeshire	116,800	1.28	0.75	1.05	0.93	0.95	1.02	128	1.00	0.80	1.23	121	0.9
	Powys	130,900	0.32	0.96	1.21	0.74	1.10	0.99	130	0.90	0.73	1.10	113	0.9
	Blaenau Gwent	69,500	0.14	1.11	1.18	0.99	1.00	0.38	43	0.80	0.58	1.11	89	0.8
	Caerphilly	**171,300**	**1.07**	**1.06**	**1.61**	**1.37**	**1.92**	**1.34**	**146**	**1.40**	**1.20**	**1.65**	**148**	**0.9**
	Monmouthshire	87,800	0.72	1.01	1.14	0.90	0.64	1.20	148	0.94	0.73	1.21	112	1.1
	Newport	140,500	1.38	0.94	0.89	1.10	1.38	0.99	107	1.11	0.91	1.36	116	4.8
	Torfaen	91,000	1.17	0.95	0.89	0.94	1.34	0.48	55	0.96	0.74	1.24	106	0.9
	Bridgend	**132,600**	**1.69**	**1.31**	**1.10**	**1.49**	**1.65**	**0.73**	**83**	**1.33**	**1.11**	**1.59**	**146**	**1.4**
	Neath Port Talbot	**137,100**	**1.64**	**1.30**	**0.90**	**1.33**	**1.60**	**1.49**	**175**	**1.38**	**1.16**	**1.63**	**157**	**1.1**
	Swansea	**227,000**	**1.76**	**1.25**	**1.02**	**1.34**	**1.29**	**1.29**	**150**	**1.32**	**1.15**	**1.52**	**148**	**2.2**
	Conwy	111,300	0.52	1.17	0.76	1.05	1.14	0.87	117	0.92	0.74	1.15	120	1.0
	Denbighshire	95,900	0.37	1.10	1.90	0.57	0.67	0.75	94	0.89	0.70	1.15	108	1.2
	Flintshire	150,000	1.25	1.05	1.35	1.05	1.12	0.59	67	1.06	0.88	1.29	116	0.8
	Gwynedd	**118,200**	**1.47**	**1.23**	**1.51**	**1.78**	**1.53**	**1.19**	**144**	**1.45**	**1.22**	**1.74**	**171**	**1.2**
	Isle of Anglesey	**68,800**	**1.42**	**1.15**	**1.56**	**1.25**	**1.74**	**2.09**	**262**	**1.54**	**1.23**	**1.93**	**187**	**0.7**
	Wrexham	131,000	1.21	0.83	1.13	0.87	0.82	0.89	99	0.95	0.77	1.19	103	1.1
Scotland	Aberdeen City	207,000	1.08	1.72	1.11	0.79	0.71	0.93	101	1.04	0.88	1.24	110	2.9
	Aberdeenshire	236,300	0.71	0.92	1.02	0.74	1.20	0.87	97	0.91	0.77	1.08	99	0.7
	Angus	109,500	0.99	1.32	1.24	0.95	1.04	1.20	146	1.12	0.91	1.38	132	0.8
	Argyll & Bute	91,200	1.44	0.96	0.81	0.76	0.95	0.61	77	0.91	0.71	1.17	111	0.8
	Scottish Borders	110,300	0.73	1.36	0.68	0.86	1.16	1.10	136	0.98	0.78	1.22	118	0.6

Table 3.2. Continued

UK area	PCT/LA	Tot pop	2003 O/E	2004 O/E	2005 O/E	2006 O/E	2007 O/E	2008 O/E	2008 pmp[b]	2003–2008[a] O/E	2003–2008[a] LCL[c]	2003–2008[a] UCL[d]	2003–2008[a] pmp	% non-White
Scotland	Clackmannanshire	48,800	1.44	1.03	1.36	0.73	1.48	1.31	143	1.22	0.89	1.68	130	0.8
	West Dunbartonshire	91,100	0.67	1.45	0.42	1.48	0.90	1.11	121	1.01	0.78	1.30	106	0.7
	Dumfries & Galloway	148,000	1.38	1.03	1.18	1.01	0.83	1.09	142	1.08	0.91	1.29	136	0.7
	Dundee City	**142,100**	**1.91**	**1.36**	**2.12**	**1.52**	**1.67**	**1.43**	**162**	**1.67**	**1.42**	**1.95**	**183**	**3.7**
	East Ayrshire	119,300	1.22	0.73	1.22	1.66	0.88	0.88	101	1.10	0.89	1.36	122	0.7
	East Dunbartonshire	105,700	1.34	0.72	0.67	1.19	0.65	0.41	47	0.82	0.64	1.06	93	3.1
	East Lothian	92,600	0.31	0.82	0.87	0.82	1.48	0.74	86	0.85	0.65	1.11	95	0.7
	East Renfrewshire	89,000	0.99	0.88	1.24	0.97	1.09	0.70	79	0.98	0.75	1.27	107	3.8
	Edinburgh, City of	463,300	1.06	1.12	1.00	1.02	0.71	1.09	112	1.00	0.89	1.12	99	4.1
	Falkirk	149,500	0.67	0.67	1.26	1.02	1.46	0.79	87	0.99	0.81	1.21	105	1.0
	Fife	359,200	0.93	1.01	1.46	1.04	0.98	0.99	111	1.07	0.94	1.21	116	1.3
	Glasgow City	**580,600**	**1.79**	**1.50**	**1.35**	**1.18**	**1.11**	**1.03**	**103**	**1.32**	**1.20**	**1.44**	**128**	**5.5**
	Highland	**215,400**	**1.37**	**1.24**	**1.77**	**0.91**	**0.88**	**0.85**	**102**	**1.16**	**1.00**	**1.35**	**135**	**0.8**
	Inverclyde	81,300	1.19	1.07	1.01	0.85	1.07	1.19	135	1.06	0.82	1.37	117	0.9
	Midlothian	**79,000**	**1.77**	**2.14**	**1.30**	**1.57**	**0.91**	**1.03**	**114**	**1.44**	**1.14**	**1.81**	**154**	**0.9**
	Moray	86,700	1.30	0.97	1.32	1.24	0.58	0.98	115	1.06	0.83	1.36	121	0.9
	North Ayrshire	135,300	1.20	1.13	1.33	1.57	0.70	1.03	118	1.16	0.96	1.40	129	0.7
	North Lanarkshire	323,700	1.26	0.98	0.80	0.93	1.03	0.91	96	0.98	0.85	1.13	99	1.3
	Orkney Islands	20,000	1.83	0.46	1.29	0.81	0.41	1.24	150	1.00	0.59	1.69	117	0.4
	Perth & Kinross	140,200	1.28	1.27	0.90	0.68	1.04	0.93	114	1.01	0.83	1.22	120	1.0
	Renfrewshire	169,300	1.23	1.23	1.27	0.94	0.95	0.96	106	1.09	0.91	1.30	117	1.2
	Shetland Islands	22,000	0.45	1.34	0.42	0.00	1.60	0.00	0	0.63	0.33	1.20	68	1.1
	South Ayrshire	111,900	1.25	0.86	1.03	0.76	0.99	0.71	89	0.93	0.74	1.16	113	0.7
	South Lanarkshire	307,700	0.91	0.94	0.88	0.98	0.88	0.68	75	0.88	0.76	1.02	94	1.1
	Stirling	*87,600*	*0.69*	*0.69*	*0.43*	*1.02*	*1.04*	*0.52*	*57*	*0.74*	*0.54*	*1.00*	*78*	*1.5*
	West Lothian	165,700	0.53	0.60	1.13	1.07	0.84	0.85	84	0.84	0.68	1.05	81	1.3
	Eilean Siar	25,900	1.01	1.34	0.00	0.89	1.81	0.30	39	0.89	0.55	1.43	109	0.6
N Ireland	**Antrim**	**51,500**			**2.39**	**1.65**	**1.25**	**1.67**	**155**	**1.73**	**1.23**	**2.43**	**160**	**0.5**
	Ards	76,000			1.02	0.84	0.97	0.49	53	0.83	0.57	1.21	89	0.9
	Armagh	56,400			1.91	0.72	0.18	1.10	106	0.97	0.63	1.48	93	0.5
	Ballymena	61,400			1.27	1.05	1.38	1.07	114	1.19	0.84	1.70	126	1.3
	Ballymoney	29,300			1.45	0.68	1.73	1.04	102	1.22	0.72	2.06	119	0.6
	Banbridge	45,400			0.96	1.36	0.69	1.38	132	1.10	0.70	1.72	105	0.4
	Belfast	**267,600**			**1.24**	**1.40**	**1.39**	**1.05**	**105**	**1.27**	**1.07**	**1.50**	**126**	**0.4**
	Carrickfergus	**39,800**			**2.53**	**2.39**	**3.15**	**1.22**	**126**	**2.32**	**1.69**	**3.19**	**239**	**0.3**
	Castlereagh	65,600			2.25	1.33	0.81	0.41	46	1.19	0.86	1.66	133	0.4
	Coleraine	**56,900**			**2.90**	**0.97**	**1.48**	**0.99**	**105**	**1.57**	**1.14**	**2.16**	**167**	**0.3**
	Cookstown	34,600			2.67	0.95	1.27	0.64	58	1.37	0.85	2.20	123	1.3
	Craigavon	86,800			1.62	0.35	0.95	0.96	92	0.96	0.68	1.36	92	0.6
	Derry	107,800			1.01	1.38	0.75	0.64	56	0.95	0.68	1.32	81	0.8
	Down	68,400			1.71	1.91	0.75	0.90	88	1.31	0.94	1.83	128	0.7
	Dungannon	52,700			1.27	0.40	0.61	1.02	95	0.82	0.50	1.33	76	0.7
	Fermanagh	60,600			1.01	1.43	0.97	0.32	33	0.94	0.62	1.41	95	0.8
	Larne	31,400			0.89	1.12	0.86	1.72	191	1.15	0.70	1.88	127	0.4
	Limavady	33,900			1.73	1.31	1.32	0.00	0	1.08	0.63	1.87	96	0.6
	Lisburn	113,300			1.54	0.73	0.83	1.20	115	1.07	0.80	1.43	102	0.7
	Magherafelt	42,900			0.78	0.99	0.25	1.76	163	0.95	0.57	1.57	87	0.7
	Moyle	17,000			0.00	1.63	0.55	0.55	59	0.69	0.29	1.67	74	0.3

Table 3.2. Continued

UK area	PCT/LA	Tot pop	2003 O/E	2004 O/E	2005 O/E	2006 O/E	2007 O/E	2008 O/E	2008 pmp[b]	2003–2008[a] O/E	2003–2008[a] LCL[c]	2003–2008[a] UCL[d]	2003–2008[a] pmp	% non-White
N Ireland	Newry & Mourne	93,600			0.85	0.69	0.58	0.82	75	0.73	0.49	1.08	67	0.4
	Newtownabbey	81,400			1.09	1.14	1.28	1.05	111	1.14	0.83	1.56	120	0.3
	North Down	79,000			1.29	0.88	1.01	0.90	101	1.02	0.73	1.41	114	1.0
	Omagh	51,200			0.66	1.25	0.85	1.70	156	1.12	0.73	1.72	103	0.4
	Strabane	39,200			0.55	0.78	1.58	1.58	153	1.13	0.70	1.81	108	0.8

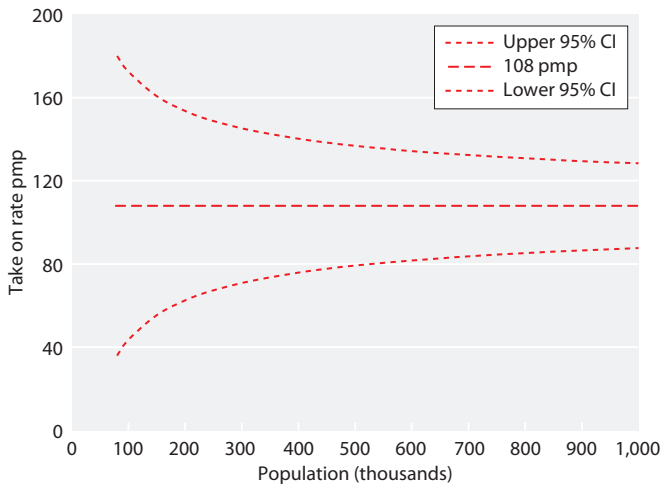

Fig. 3.2. 95% confidence limits for take on rate of 108 pmp for population size 80,000–1 million

Table 3.3. Number of PCT/LAs with low, normal and high standardised acceptance ratios (2003–2008)

Region	Standardised acceptance ratio Low	Normal	High	Total
NE England	4	8	0	12
NW England	13	5	0	18
Yorkshire & Humber	4	9	1	14
East Midlands	4	4	1	9
West Midlands	1	6	7	14
East of England	5	6	2	13
London	0	7	20	27
SE England	8	5	1	14
SW England	5	7	2	14
England	**44**	**57**	**34**	**135**
Wales	**0**	**12**	**10**	**22**
Scotland	**1**	**27**	**4**	**32**
N Ireland	**0**	**22**	**4**	**26**
Total	**45**	**118**	**52**	**215**

2 Demographics and clinical characteristics of patients accepted onto RRT

Methods

Age, gender, primary renal disease, ethnic origin and first modality at start of RRT were examined in those patients starting RRT. Some centres electronically upload ethnicity coding to their renal information technology (IT) system from the hospital Patient Administration Systems (PAS). Ethnicity coding in these PAS systems is based on self-reported ethnicity and uses a different coding system [3]. For the remaining centres, ethnicity coding is performed by clinical staff and recorded directly into the renal IT system (using a variety of coding systems). For all these analyses, data on ethnic origin were grouped into Whites, South Asians, Blacks, Chinese and Others. The details of regrouping of the PAS codes into the above ethnic categories are provided in appendix G: Ethnicity and ERA-EDTA coding. Chi-squared, Fisher's exact, ANOVA and Kruskal Wallis tests were used as appropriate to test for significant differences between groups.

For the first time this year, rather than allocating all pre-emptive transplants to the transplanting centre, if an individual had a modality code 36 (transfer out pre-emptive transplant) from another centre up to 7 days before the transplant then

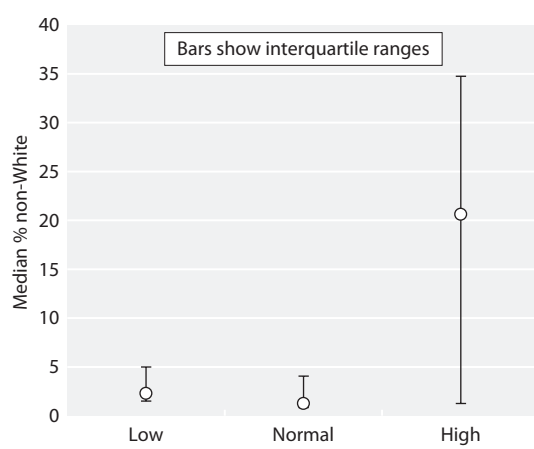

Fig. 3.3. Percentage non-Whites in PCT/LA areas with low, normal and high age-gender standardised ratios (2003–2008)

Table 3.4. Number of new patients accepted by individual renal centres reporting to the UK Renal Registry 2003–2008

Country	Centre	Year						% change since 2003
		2003	2004	2005	2006	2007	2008	
England	B Heart	103	102	116	115	101	108	4.9
	B QEH		194	196	186	222	271	
	Basldn	53	46	28	45	39	40	−24.5
	Bradfd	74	62	66	50	87	59	−20.3
	Brightn		118	110	130	117	116	
	Bristol	163	163	175	176	154	181	11.0
	Camb	94	107	110	156	125	102	8.5
	Carlis	31	29	32	27	26	31	0.0
	Carsh	199	168	178	185	195	212	6.5
	Chelms		49	37	48	51	33	
	Colche	n/a	n/a	n/a	n/a	n/a	47	
	Covnt	75	76	83	102	110	113	50.7
	Derby	60	67	71	70	61	92	53.3
	Donc	n/a	n/a	n/a	n/a	18	25	
	Dorset	66	60	47	53	59	84	27.3
	Dudley	41	54	38	44	39	49	19.5
	Exeter	97	109	111	105	125	134	38.1
	Glouc	53	54	60	73	58	45	−15.1
	Hull	80	108	126	100	99	117	46.3
	Ipswi	37	45	58	42	39	38	2.7
	Kent					172	132	
	L Barts		185	185	187	210	201	
	L Guys	93	100	128	132	162	169	81.7
	L Kings	108	114	136	113	126	151	39.8
	L Rfree			131	210	184	160	
	L St.G					89	89	
	L West	268	290	309	316	276	317	18.3
	Leeds*	185	178	161	172	125	155	−16.2*
	Leic	167	162	226	242	244	215	28.7
	Liv Ain	n/a	n/a	29	34	35	42	
	Liv RI**	114	130	139	139	114	103	−9.6
	M Hope	143	111	112	130	107	112	−21.7
	M RI					155	136	
	Middlbr	103	101	84	109	99	93	−9.7
	Newc	109	114	101	85	107	101	−7.3
	Norwch		94	118	106	106	92	
	Nottm	115	107	145	137	128	117	1.7
	Oxford	186	170	155	157	145	146	−21.5
	Plymth	64	62	58	91	76	70	9.4
	Ports	140	117	151	174	157	169	20.7
	Prestn	97	79	118	121	129	112	15.5
	Redng	65	60	79	75	93	99	52.3
	Sheff	159	167	157	168	166	180	13.2
	Shrew		55	42	54	55	62	
	Stevng	123	83	92	121	88	101	−17.9
	Sthend	42	39	34	47	35	35	−16.7
	Stoke					87	84	
	Sund	55	50	59	56	62	44	−20.0
	Truro	53	67	32	50	46	39	−26.4
	Wirral	52	66	59	53	53	41	−21.2
	Wolve	88	105	92	87	67	87	−1.1
	York	57	48	43	48	35	33	−42.1
N Ireland	Antrim			42	33	36	41	
	Belfast			130	112	89	68	

Table 3.4. Continued

Country	Centre	Year 2003	2004	2005	2006	2007	2008	% change since 2003
N Ireland	Derry				3	7	6	
	Newry			28	13	15	20	
	Tyrone			23	30	22	25	
	Ulster			9	8	15	13	
Scotland	Abrdn	52	69	63	53	56	55	5.8
	Airdrie	51	51	39	56	50	39	−23.5
	D&Gall	22	16	21	21	17	19	−13.6
	Dundee	64	62	76	52	61	65	1.6
	Dunfn	27	29	44	37	37	30	11.1
	Edinb	90	98	99	106	95	103	14.4
	Glasgw	221	189	201	187	189	162	−26.7
	Inverns	34	33	44	26	27	25	−26.5
	Klmarnk	40	29	44	57	36	34	−15.0
Wales	Bangor	33	36	40	42	36	42	27.3
	Cardff	161	185	181	205	220	153	−5.0
	Clwyd	11	14	27	18	23	13	18.2
	Swanse	134	95	98	115	128	120	−10.4
	Wrexm	32	29	41	27	27	22	−31.3
England		**3,812**	**4,465**	**4,817**	**5,122**	**5,458**	**5,585**	
N Ireland				**232**	**199**	**184**	**173**	
Scotland		**601**	**576**	**631**	**595**	**568**	**532**	
Wales		**371**	**359**	**387**	**406**	**434**	**349**	
UK		**4,784**	**5,400**	**6,067**	**6,322**	**6,644**	**6,639**	
Including only centres reporting continuously 2003–2008								
England		**3,812**	**3,770**	**3,969**	**4,167**	**3,957**	**4,087**	**7.2**
Scotland		**601**	**576**	**631**	**595**	**568**	**532**	**−11.5**
Wales		**371**	**359**	**387**	**406**	**434**	**349**	**−5.9**
UK		**4,784**	**4,705**	**4,987**	**5,168**	**4,959**	**4,968**	**3.8**

Blank cells – no data returned to the registry for that year
n/a – renal centre not yet operational
* Doncaster split from Leeds centre and accounts for an apparent fall
** Aintree split from Liverpool Royal

they were allocated to the 'transfer out'/'work up' centre rather than the transplanting centre. This affected 56 patients in 2008 and 101 of all take-on patients included in this year's analyses. Not all centres sent this level of data. Some patients remain incorrectly allocated to the transplanting centre.

Estimated glomerular filtration rate (eGFR) at the start of RRT was studied amongst patients with eGFR data within 14 days before the start of RRT. The eGFR was calculated using the abbreviated 4 variable MDRD study equation [4]. For the purpose of the eGFR calculation, patients who had missing ethnicity but a valid serum creatinine measurement were classed as Whites. The eGFR values were log transformed in order to normalise the data. Patients with an eGFR >20 ml/min/1.73 m^2 were excluded from the eGFR analyses due to concerns about possible data extraction errors.

Derry was excluded from the centre-specific analyses as they started less than 10 patients on RRT in 2008.

Results

Age

Acceptance rates within the UK have levelled off in the last three years but were still rising in those aged 65 and over until 2006. It now looks like even in these patients acceptance rates have plateaued and are even falling slightly (figure 3.4).

In 2008, the median age of patients starting renal replacement therapy was 64.1 years (table 3.5). Patients starting in England were the youngest of the four countries of the United Kingdom and this reflects the higher percentage of ethnic minorities who make up the population in England. In Northern Ireland the

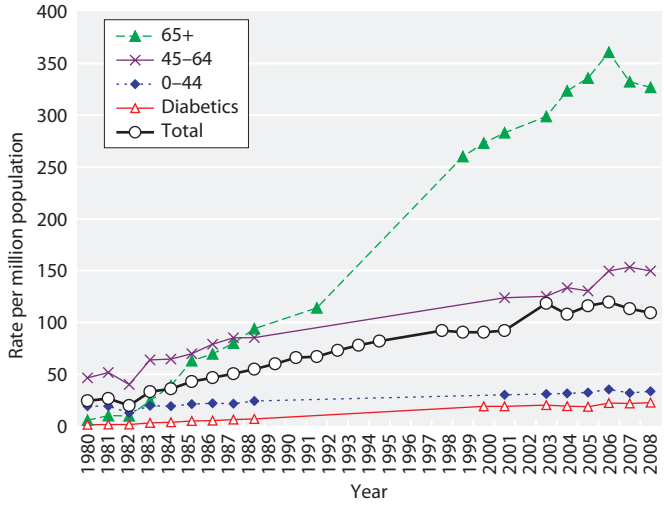

Fig. 3.4. Change in rate of UK incident RRT patients between 1980 and 2008

Table 3.6. Acceptance rate pmp by age band and country in 2008

Age	Pmp			
	England	Wales	Scotland	N Ireland
20–24	29	51	27	39
25–29	46	68	35	27
30–34	55	53	50	43
35–39	61	54	62	62
40–44	80	125	72	46
45–49	106	86	69	68
50–54	142	113	122	79
55–59	153	154	116	92
60–64	229	248	204	276
65–69	292	348	238	284
70–74	356	382	387	488
75–79	408	498	458	411
80–84	352	260	371	548
85+	166	150	148	191

median age of incident patients was 66.9 years, slightly higher than in Scotland (66.0 years) and Wales (65.2 years) and higher than in England (63.8 years). The median age of incident UK non-White patients was considerably lower at 56.1 years. This reflects the younger age distribution of ethnic minority populations in general compared with the White population (5.1% of ethnic minorities were over 65 years old compared to 16.9% of Whites) [5] and the higher rates of diabetes in the South Asians and Blacks.

Acceptance rates of patients over the age of 80 were much higher in Northern Ireland, as also reported in the 2008 Registry Report. In Wales, however, rates in that age cohort, having previously in 2007 been approximately twice as high as in England and Scotland, have fallen and are now the lowest (table 3.6). In England, Scotland, and Wales the acceptance rate peaked in the 75–79 age band (at 408, 458 and 498 pmp respectively). In Northern Ireland the peak was in those aged 80–84 years (548 pmp). In Wales there were increases in the numbers of patients aged 20–24 starting RRT (51 pmp) compared with last year and with the other countries of the UK.

There were large differences between centres with respect to the median age of their incident patients (figure 3.5). In 8 centres, the median age was <60 years and in 9 it was over 70 years. Possible explanations include chance fluctuations due to low take-on rates, the difference in the age structure of the underlying general population, the transplant status of the centre, variations in ethnic mix, differences in local approaches to conservative management, and other potential differences in the prevalence, nature and management of renal disease. The median age of patients in transplant centres remained slightly but significantly lower than that in non-transplant centres (62.5 vs. 65.4 years: $p < 0.0001$). Five of the 8 centres whose incident cohort had a median age <60 years were transplanting centres. Four

Table 3.5. Median age of patients starting renal replacement therapy 2003–2008

Country	Year					
	2003	2004	2005	2006	2007	2008
England	64.5	64.9	65.1	64.7	63.7	63.8
N Ireland			68.1	68.2	68.1	66.9
Scotland	66.4	65.5	65.9	65.8	61.7	66.0
Wales	66.4	68.7	67.5	67.2	67.6	65.2
UK	**64.9**	**65.2**	**65.4**	**65.1**	**64.0**	**64.1**

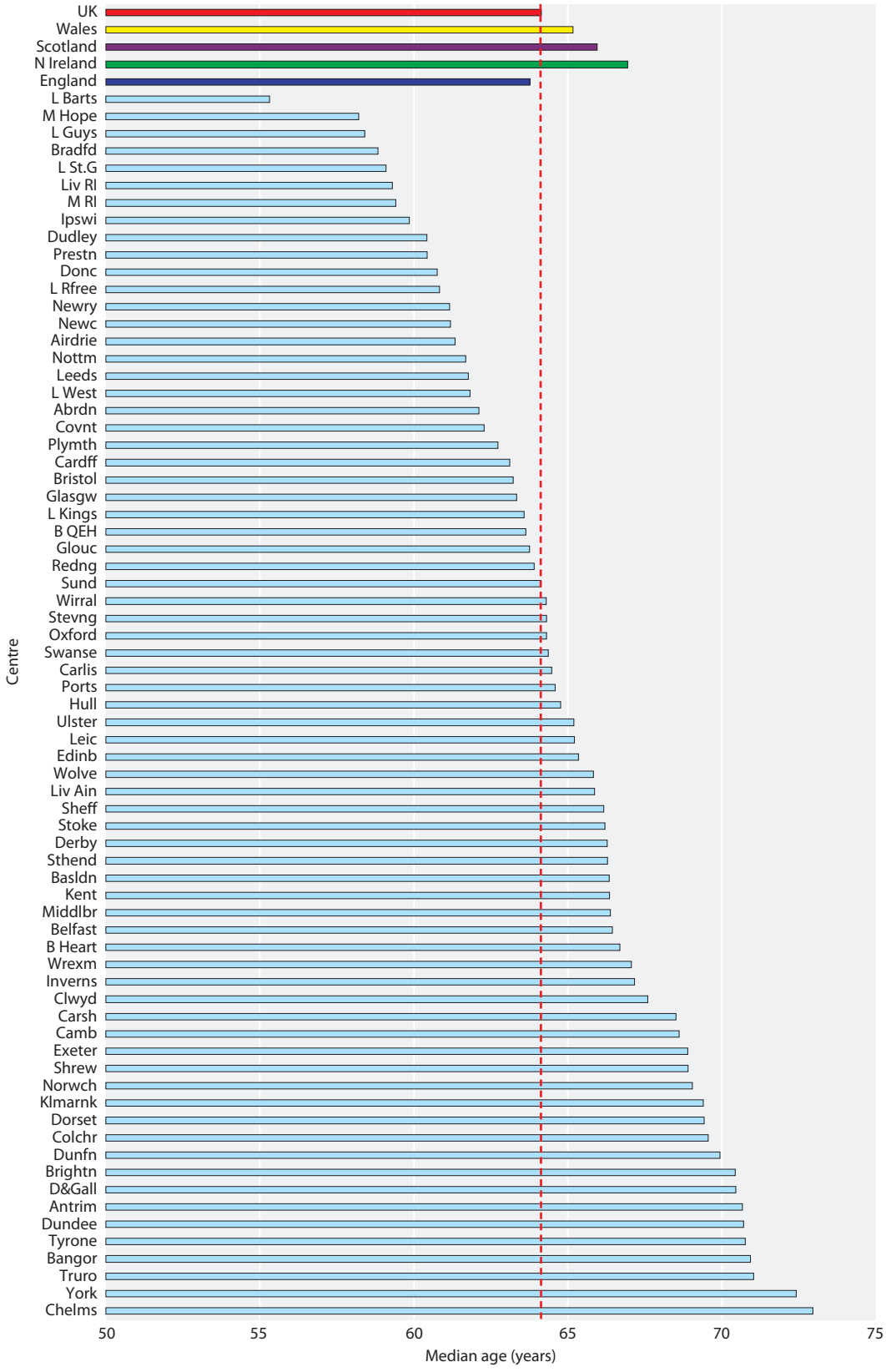

Fig. 3.5. Median age of new patients in each centre in 2008

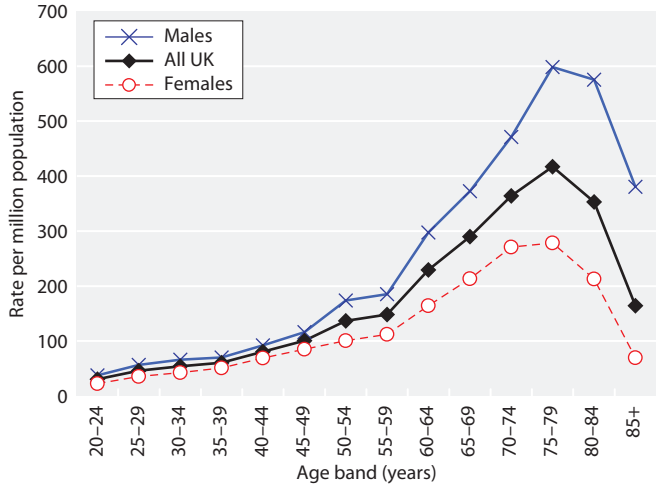

Fig. 3.6. Incident rates by age and gender in 2008

of the 9 centres whose incident cohort had a median age >70 years accepted less than 40 patients during 2008.

Gender

As in previous UKRR reports there was an excess of males starting RRT in all age groups but this was more prominent with older age (figure 3.6). Peak acceptance rate was in the 75–79 year age band in both males and females. The proportion of males remained fairly stable with age but was most prominent in those aged >85 years (figure 3.7).

In the UK as a whole, 61.4% of the 2008 incident cohort were male (figure 3.8). The proportion of incident male patients varied from 42–79% between centres. All except five centres had an excess of incident males, whilst two were equally split male and female. It should be noted that five of these seven centres had accepted less than 50 patients during 2008. Likewise the three centres with >75% males accepted less than 40 patients for RRT in 2008. Wales, as last year, had a higher proportion of males starting RRT (66.8%, male to female ratio of 2).

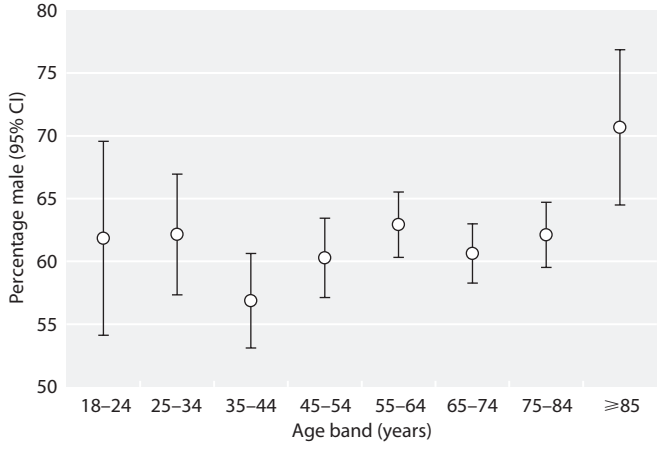

Fig. 3.7. Percentage of total starting RRT who are male, by age band in 2008

Ethnicity

This year 49 centres who accepted more than 10 patients onto RRT, returned ethnicity data that were 50% or more complete (table 3.7). Only 23 of these centres provided data that were 90% or more complete. From Welsh centres there has been an increase in data returns. Ethnicity is not a mandatory data item for the Scottish Renal Registry. The lack of ethnicity completeness means results should be interpreted with some caution. All of the English centres who were last year recorded as having 100% white patients, had some ethnic mix this year. There was great variation between centres with respect to the ethnic mix of incident patients ranging from 0% ethnic minorities in Sunderland, Carlisle, Ipswich, Wrexham and all Northern Ireland centres to over 50% in Bradford, London Barts and London Royal Free; all the latter centres cover areas with high standardised acceptance ratios.

Primary renal diagnosis

The distribution of incident patients by age, gender and primary renal disease (PRD) is shown in table 3.8 and the distribution of primary renal disease by centre is shown in table 3.9. Data for PRD were missing in 10.8% of patients and there remains a marked centre difference in completeness of data returns. Thirty-five centres provided data on all incident patients, whilst 11 centres had more than 25% data incompleteness for PRD, one of which returned no data. In the centres with >25% missing data, the percentages in the other diagnostic categories have not been calculated.

The Registry is concerned about some of the centres with apparently 100% data completeness for PRD but who also have very high rates of 'uncertain' diagnoses (EDTA codes 00 and 10). It is accepted that there will inevitably be a number of patients with uncertain aetiology, and that the proportion of these patients will vary between clinicians and centres as the definitions of renovascular disease, hypertensive nephropathy and chronic glomerulonephritis without tissue diagnosis remain relatively subjective. However, some centres with very high rates of uncertain diagnosis appear to have no patients with the more objective diagnoses such as polycystic kidney disease, reflux

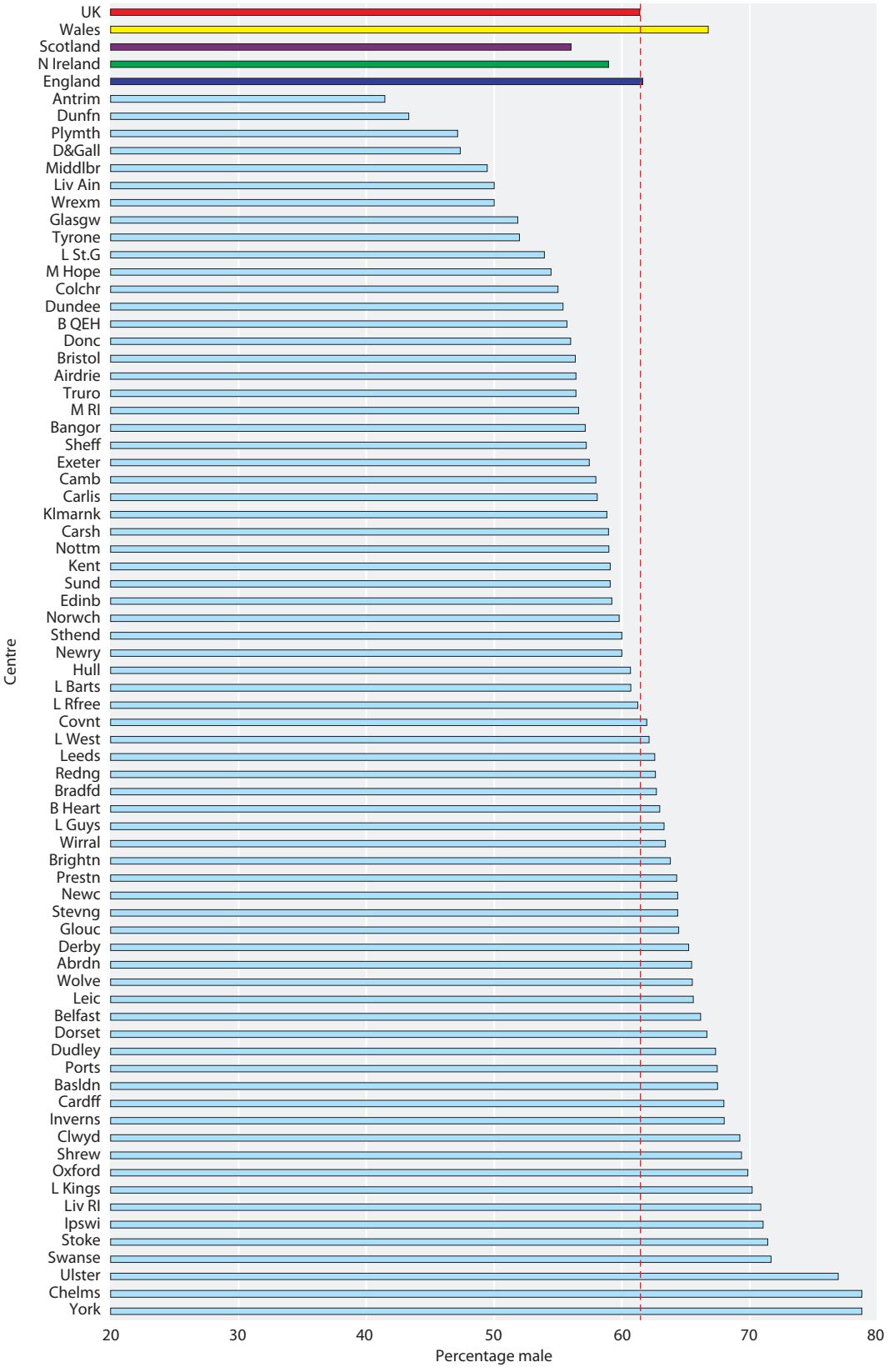

Fig. 3.8. Percentage of new patients who are male in renal centres reporting to UKRR in 2008

Table 3.7. Percentage of patients in different ethnic groups by centre

Country	Centre	% completion	Percentage				
			White	Black	South Asian	Chinese	Other
England	Dorset	100.0	97.6		2.4		
	Shrew	100.0	95.2		1.6	1.6	1.6
	Nottm	99.1	84.5	7.8	5.2		2.6
	M Hope	99.1	82.9	0.9	14.4		1.8
	B Heart	99.1	66.4	2.8	29.0	0.9	0.9
	Redng	99.0	72.4	6.1	21.4		
	Wolve	98.9	73.3	10.5	16.3		
	Newc	98.0	94.9	1.0	2.0	1.0	1.0
	Stevng	98.0	76.8	8.1	13.1	2.0	
	L Kings	98.0	64.2	27.0	8.8		
	B QEH	97.8	66.0	11.3	20.0	0.8	1.9
	Wirral	97.6	92.5	2.5			5.0
	Carlis	96.8	100.0				
	Leic	95.8	81.6	1.5	16.0	0.5	0.5
	L Rfree	93.1	49.0	20.8	14.8		15.4
	Basldn	92.5	91.9	5.4			2.7
	Donc	92.0	95.7	4.3			
	M RI	91.9	76.8	10.4	11.2	1.6	
	Bristol	91.7	84.9	6.0	4.2	4.2	0.6
	Camb	91.3	96.8		3.2		
	Derby	90.2	88.0	1.2	10.8		
	Bradfd	89.8	49.1	1.9	47.2		1.9
	Oxford	89.0	90.0	4.6	5.4		
	York	87.9	96.6	3.4			
	Prestn	87.5	84.7	1.0	14.3		
	Sund	84.1	100.0				
	Kent	84.1	99.1	0.9			
	Dudley	83.7	85.4	7.3	2.4	2.4	2.4
	Carsh	80.7	81.9	8.8	7.0	1.2	1.2
	L Barts	80.1	27.3	16.1	37.3	0.6	18.6
	Middlbr	77.4	95.8		2.8		1.4
	Ipswi	76.3	100.0				
	Leeds	76.1	79.7	2.5	16.9		0.8
	L St.G	75.3	70.1	11.9	9.0		9.0
	Chelms	72.7	87.5		8.3	4.2	
	Covnt	72.6	84.1	4.9	11.0		
	Ports	71.0	92.5	1.7	3.3	0.8	1.7
	L Guys	59.8	62.4	34.7	2.0		1.0
	Brightn	55.2	96.9	1.6	1.6		
	Norwch	54.3	98.0				2.0
	Sheff	51.1	91.3	2.2	5.4		1.1
N Ireland	Newry	85.0	100.0				
	Ulster	84.6	100.0				
	Tyrone	84.0	100.0				
	Antrim	70.7	100.0				
	Belfast	70.6	100.0				
Wales	Wrexm	100.0	100.0				
	Swanse	95.8	96.5	0.9	2.6		
	Cardff	66.7	97.1		2.0	1.0	
England		**73.9**	**78.0**	**7.4**	**11.3**	**0.6**	**2.6**
N Ireland		**75.7**	**100.0**				
Scotland		**0.6**	**66.7**			**33.3**	
Wales		**69.6**	**97.1**	**0.4**	**2.1**	**0.4**	
UK		**67.8**	**79.7**	**6.8**	**10.5**	**0.6**	**2.4**

Centres with fewer than 10 patients or with less than 50% data completeness are not shown
The national and UK averages include all centres

Table 3.8. Percentage distribution of primary renal diagnosis by age and gender ratio, in the 2008 incident cohort

Diagnosis	Age <65		Age ⩾65		All patients		M:F
	Including data not available	Excluding data not available	Including data not available	Excluding data not available	Including data not available	Excluding data not available	
Uncertain aetiology*	14.2	*15.8*	23.1	*26.1*	18.5	*20.7*	1.6
Glomerulonephritis	13.6	*15.2*	7.1	*8.1*	10.5	*11.8*	2.2
Pyelonephritis	7.3	*8.2*	6.5	*7.4*	6.9	*7.8*	1.5
Diabetes	23.5	*26.2*	19.1	*21.5*	21.4	*24.0*	1.6
Renal vascular disease	1.8	*2.0*	10.8	*12.2*	6.1	*6.9*	1.9
Hypertension	4.8	*5.4*	5.9	*6.6*	5.3	*6.0*	2.2
Polycystic kidney	9.8	*10.9*	3.0	*3.4*	6.5	*7.3*	1.1
Other	14.7	*16.4*	13.1	*14.8*	13.9	*15.6*	1.4
Data not available	10.2	–	11.5	–	10.8	–	1.3

* includes presumed glomerulonephritis not biopsy proven
M:F = male:female ratio

Table 3.9. Percentage distribution of primary renal diagnosis by centre in the 2008 incident cohort

Country	Centre	Data not available	Uncertain aetiology*	Diabetes	Glomerulo-nephritis	Hyper-tension	Other	Polycystic kidney	Pyelo-nephritis	Renal vascular disease
England	B Heart	0.9	27.1	29.0	8.4	2.8	15.9	1.9	7.5	7.5
	B QEH	2.6	18.9	25.0	11.7	5.7	14.4	4.9	9.1	10.2
	Basldn	0.0	12.5	22.5	12.5	5.0	20.0	10.0	2.5	15.0
	Bradfd	1.7	25.9	20.7	13.8	8.6	12.1	6.9	10.3	1.7
	Brightn	7.8	27.1	15.9	13.1	2.8	15.0	9.4	10.3	6.5
	Bristol	18.8	17.7	27.2	15.7	5.4	12.9	8.2	8.8	4.1
	Camb	0.0	66.7							
	Carlis	3.2	13.3	10.0	16.7	0.0	23.3	13.3	10.0	13.3
	Carsh	0.0	28.8	22.6	6.1	5.2	24.1	3.3	7.1	2.8
	Chelms	0.0	24.2	27.3	3.0	6.1	24.2	6.1	3.0	6.1
	Colchr	100.0								
	Covnt	0.0	15.9	22.1	9.7	7.1	14.2	14.2	7.1	9.7
	Derby	1.1	20.9	25.3	11.0	0.0	15.4	7.7	9.9	9.9
	Donc	0.0	40.0	24.0	8.0	8.0	8.0	8.0	0.0	4.0
	Dorset	1.2	25.3	13.3	6.0	9.6	13.3	12.1	13.3	7.2
	Dudley	0.0	20.4	30.6	8.2	10.2	14.3	8.2	6.1	2.0
	Exeter	66.4								
	Glouc	8.9	24.4	12.2	14.6	2.4	22.0	12.2	4.9	7.3
	Hull	9.4	25.5	15.1	12.3	12.3	16.0	5.7	12.3	0.9
	Ipswi	0.0	44.7	10.5	15.8	0.0	7.9	21.1	0.0	0.0
	Kent	0.0	25.8	14.4	12.9	6.1	18.2	12.1	7.6	3.0
	L Barts	0.0	18.9	33.3	9.5	8.0	15.4	6.5	7.0	1.5
	L Guys	0.0	7.7	27.8	13.6	13.6	14.2	10.7	8.3	4.1
	L Kings	0.0	11.3	34.4	9.3	14.6	17.9	1.3	4.6	6.6
	L Rfree	80.0								
	L St.G	2.3	13.8	31.0	16.1	8.1	14.9	4.6	9.2	2.3
	L West	0.0	17.0	30.6	10.1	3.8	17.4	5.7	9.5	6.0
	Leeds	45.8								
	Leic	9.8	26.3	20.1	10.3	3.1	9.3	8.3	11.9	10.8
	Liv Ain	0.0	100.0							
	Liv RI	0.0	68.9							
	M Hope	0.0	99.1							
	M RI	51.5								
	Middlbr	0.0	29.0	24.7	12.9	2.2	17.2	3.2	7.5	3.2

Table 3.9. Continued

Country	Centre	Data not available	Uncertain aetiology*	Diabetes	Glomerulo-nephritis	Hyper-tension	Other	Polycystic kidney	Pyelo-nephritis	Renal vascular disease
	Newc	1.0	23.0	16.0	6.0	5.0	26.0	8.0	7.0	9.0
	Norwch	6.5	30.2	20.9	10.5	0.0	17.4	9.3	5.8	5.8
	Nottm	0.0	23.9	23.1	14.5	2.6	19.7	9.4	5.1	1.7
	Oxford	2.1	22.4	21.7	18.2	2.8	16.1	7.7	7.7	3.5
	Plymth	0.0	11.4	22.9	14.3	5.7	18.6	12.9	5.7	8.6
	Ports	1.8	15.1	22.9	11.5	6.6	21.1	7.2	6.0	9.6
	Prestn	8.0	13.6	26.2	15.5	9.7	16.5	9.7	4.9	3.9
	Redng	0.0	18.2	36.4	13.1	1.0	10.1	5.1	8.1	8.1
	Sheff	1.1	23.6	23.0	7.9	6.2	10.7	9.0	13.5	6.2
	Shrew	0.0	11.3	21.0	8.1	17.7	11.3	8.1	8.1	14.5
	Stevng	1.0	30.0	22.0	7.0	5.0	14.0	9.0	5.0	8.0
	Sthend	0.0	22.9	17.1	17.1	0.0	17.1	11.4	8.6	5.7
	Stoke	0.0	9.5	20.2	10.7	11.9	14.3	10.7	10.7	11.9
	Sund	0.0	9.1	34.1	6.8	22.7	11.4	2.3	6.8	6.8
	Truro	61.5								
	Wirral	39.0								
	Wolve	0.0	20.7	28.7	18.4	6.9	5.8	4.6	5.8	9.2
	York	27.3								
N Ireland	Antrim	0.0	41.5	31.7	4.9	0.0	9.8	7.3	2.4	2.4
	Belfast	0.0	23.5	17.7	14.7	2.9	14.7	7.4	7.4	11.8
	Newry	0.0	20.0	30.0	15.0	0.0	10.0	10.0	5.0	10.0
	Tyrone	0.0	8.0	8.0	8.0	12.0	32.0	20.0	4.0	8.0
	Ulster	0.0	38.5	15.4	0.0	7.7	30.8	7.7	0.0	0.0
Scotland	Abrdn	10.9	18.4	20.4	14.3	4.1	18.4	8.2	12.2	4.1
	Airdrie	0.0	12.8	30.8	15.4	2.6	15.4	5.1	5.1	12.8
	D&Gall	5.3	16.7	16.7	16.7	11.1	22.2	5.6	5.6	5.6
	Dundee	40.0								
	Dunfn	3.3	17.2	34.5	10.3	6.9	10.3	3.5	6.9	10.3
	Edinb	1.0	16.7	17.7	8.8	8.8	23.5	8.8	5.9	9.8
	Glasgw	5.6	27.5	21.6	11.8	2.6	13.1	3.9	10.5	9.2
	Inverns	32.0								
	Klmarnk	58.8								
Wales	Bangor	0.0	26.2	21.4	2.4	4.8	31.0	4.8	2.4	7.1
	Clwyd	0.0	69.2							
	Cardff	0.0	30.1	32.0	18.3	5.9	4.6	5.2	3.3	0.7
	Swanse	4.2	9.6	26.1	10.4	1.7	16.5	6.1	10.4	19.1
	Wrexm	0.0	4.6	22.7	13.6	4.6	18.2	13.6	4.6	18.2
England		**11.5**	**20.7**	**23.9**	**11.6**	**6.2**	**15.6**	**7.5**	**8.0**	**6.5**
N Ireland		**0.0**	**26.0**	**20.8**	**9.8**	**4.6**	**17.3**	**9.3**	**4.6**	**7.5**
Scotland		**13.5**	**18.9**	**23.0**	**12.8**	**5.9**	**16.3**	**5.7**	**7.8**	**9.6**
Wales		**1.5**	**20.9**	**27.8**	**13.3**	**4.2**	**13.0**	**6.0**	**5.7**	**9.1**
UK		**10.8**	**20.7**	**24.0**	**11.8**	**6.0**	**15.6**	**7.3**	**7.8**	**6.9**

* includes presumed glomerulonephritis not biopsy proven
The percentage in each category has been calculated after excluding those patients with a missing diagnosis
For those centres with >25% missing primary diagnoses, the percentages in the other diagnostic categories have not been calculated
For those centres with >45% uncertain aetiology, the percentages in the other diagnostic categories have not been calculated

nephropathy, diabetic nephropathy or biopsy-proven glomerulonephritis, which is clearly improbable. Preliminary enquiries have shown that software in these centres, by default, assigns patients whose data is missing the code for 'uncertain' (EDTA code 00). These centres have now taken steps to rectify this, so that only patients in whom the clinician is genuinely uncertain as to the PRD will be assigned the 'uncertain' PRD code.

Five centres with >45% 'uncertain' diagnoses have been excluded from further analyses, because it is likely

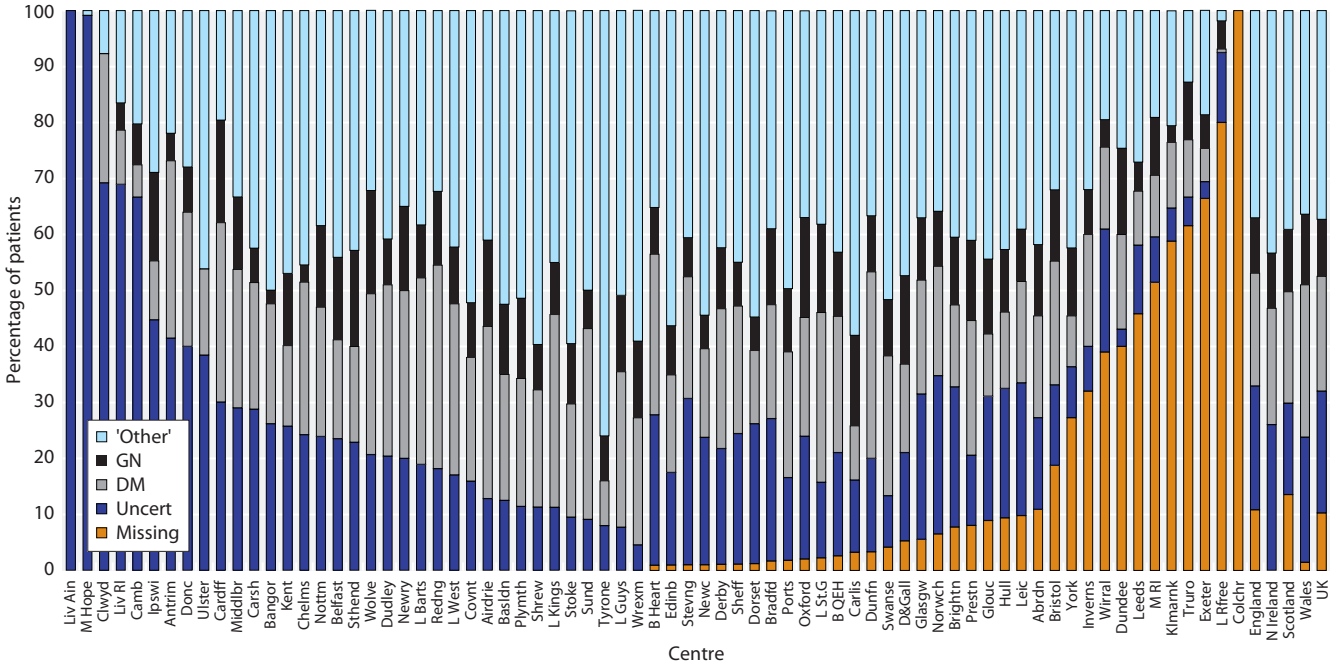

Fig. 3.9. Proportion of primary renal diagnoses by centre
'Other' = all other PRD categories, including: PKD, Pyelonephritis, HTN, RVD and Other

that the estimates of incidence of specific PRDs in these centres are falsely low. These centres have also been excluded from other analyses where PRD is included in the case-mix adjustment. This is more easily seen in figure 3.9. The centres on the right hand side of the graph have high rates of incomplete data returns and those with excessive or high uncertain diagnostic codes that have been excluded from table 3.9 are seen to the left. It is also more apparent that while many centres have a spectrum of diagnostic codes, their aggregate numbers are similar. This may reflect the subjectivity of softer diagnostic categories (renal vascular disease, hypertension, glomerulonephritis-no biopsy and CKD-uncertain).

Diabetic nephropathy was the most common specific renal diagnosis accounting for 24% of incident diagnoses (having excluded patients with missing data). This was the case irrespective of age, though the proportion was slightly higher in those aged <65 years. Biopsy proven glomerulonephritis (15.2% vs. 8.1%) and adult polycystic kidney disease (10.9% vs. 3.4%) were much more common in the younger incident cohort, whilst renal vascular disease was much more common in older incident patients (12.2% vs. 2.0%). It was perhaps not surprising that uncertainty about the underlying diagnosis was also more common in the older cohort (26.1% vs. 15.8%). The proportion of each major diagnosis has changed little in the last few years.

For all primary renal diagnoses except polycystic kidney disease, the male to female ratio was greater than 1.5. This gender difference may relate to factors such as hypertension, atheroma and renal vascular disease, which are more common in males and more common with increasing age. These factors may influence the rate of progression of renal failure. As would be expected from the mode of inheritance, adult polycystic kidney disease (PKD) is a major exception, the ratio approximating one in this condition.

Taking into account the excluded centres outlined above, there has been a further slight reduction in the UK as a whole with respect to uncertain aetiology (20.7%), although there is great variation between centres. Some of this variation is likely to reflect the lack of a clear definition of certain diagnostic categories e.g. hypertensive renal disease and renal vascular disease; some may result from differences between centres in attitudes to the degree of certainty required to record other diagnoses. In keeping with this, there are significant negative correlations between the frequency of uncertain diagnosis and all other diagnostic categories.

The proportion of incident patients whose primary renal disease was recorded as diabetes varied between

Table 3.10. Primary renal diagnosis incidence rates per million population (unadjusted) 2008

	England		Northern Ireland		Scotland		Wales		UK	
Diagnosis	Pmp	%	Pmp	%	Pmp	%	Pmp	%	Pmp	%
Uncertain aetiology*	20.3	18.3	25.4	26.0	16.8	16.4	24.3	20.5	20.3	18.5
Glomerulonephritis	11.4	10.3	9.6	9.8	11.4	11.1	15.5	13.1	11.5	10.5
Pyelonephritis	7.9	7.1	4.5	4.6	7.0	6.8	6.7	5.7	7.6	6.9
Diabetes	23.4	21.1	20.3	20.8	20.5	19.9	32.4	27.4	23.5	21.4
Polycystic kidney	7.3	6.6	9.0	9.2	5.0	4.9	7.0	6.0	7.2	6.5
Hypertension	6.0	5.5	4.5	4.6	5.2	5.1	4.9	4.2	5.9	5.3
Renal vascular disease	6.3	5.7	7.3	7.5	8.5	8.3	10.6	8.9	6.8	6.1
Other	15.3	13.8	16.9	17.3	14.5	14.1	15.1	12.8	15.3	13.9
Data not available	12.7	11.5	0.0	0.0	13.9	13.5	1.8	1.5	11.9	10.8
All	**111**	**100.0**	**97**	**100.0**	**103**	**100.0**	**118**	**100.0**	**110**	**100.0**

* includes presumed glomerulonephritis not biopsy proven

centres from 8% to 36%. Having excluded those centres with very high 'uncertain' PRD rates, no centres reported zero patients with diabetic nephropathy and only one centre reported a rate of <10%. These low rates may relate to chance fluctuations due to low take-on numbers and the ethnic mix of the incident population. Of the 12 centres reporting that 30% or more of their incident cohort had diabetes as the primary renal disease, 4 reported a high proportion of non-Whites in the incident population (27–72%) and a further 5 took on 56 patients or fewer in 2008. These factors undoubtedly contribute to the variation between centres with respect to the proportion of other primary renal disease in the incident cohort, as well as the variable diagnostic criteria in disease categories such as hypertension and renal vascular disease.

Table 3.10, showing the PRD incidence rates per million population in the 2008 cohort in the four home countries, reveals some national variations. There were no missing data for Northern Ireland and only 1.5% for Wales, whilst England and Scotland had 11.5% and 13.5% respectively. The incidence rate of uncertain diagnoses was higher in Northern Ireland (25.4 pmp) and Wales (24.3 pmp) than in Scotland (16.8 pmp) and England (20.3 pmp). The incidence of diabetes was much higher again in Wales (32.4 pmp) than in England (23.4 pmp), Northern Ireland (20.3 pmp) and Scotland (20.5 pmp). Likewise the incidence rate of renal vascular disease causing ERF was higher in Wales than other parts of the UK.

First established treatment modality

In the UK in 2008, haemodialysis (HD) was the first modality of RRT (defined as the first treatment recorded irrespective of any later change) in 75.8% of patients, peritoneal dialysis (PD) in 18.9% and pre-emptive transplant in 5.3%. The frequency of HD as the first treatment modality has remained relatively stable over the last few years, though it has increased considerably since the late 1990s (58% of incident patients in 1998). The frequency of PD usage however has fallen whilst pre-emptive transplantation has risen. This may be as a consequence of drives nationally to encourage live donation and pre-emptive transplantation and it is the 'fitter' patients approaching ERF who traditionally have started on PD.

Many patients, especially those referred late, undergo a brief period of HD, before switches to other modalities are, or can be, considered. Hence, the established modality at 90 days is more representative of the elective first modality. By 90 days in the 2008 UK cohort, 6.2% of incident patients had died and a further 0.4% had stopped treatment, leaving 93.4% of the original cohort remaining on RRT (table 3.11). Expressed as a percentage of the whole 2008 UK incident cohort, 67.7% were on HD, 19.8% on PD and 5.9% had received a transplant. Expressed as a percentage of those still receiving RRT at 90 days, 72.5% were on HD, 21.2% on PD and 6.3% had received a transplant (figure 3.10). Of those still on RRT at 90 days, only 0.1% were receiving home haemodialysis, with the vast majority of HD patients on centre-based treatment either in main hospital centres (48.6% of total) or satellite units (20.5%). Although Northern Ireland continued to have fewer patients on PD at 90 days (15.1% of the total incident cohort) compared with other parts of the UK, this was an increase from 9.1% of the 2007 incident cohort. The percentages in the 3 other countries have all fallen, most dramatically in Wales (24.6% to 20.9%) and Scotland (21.3% to 18.1%). This comes at a time when the Department of

Table 3.11. RRT modality at 90 days by centre in the 2008 cohort

		Percentage of patients				
Country	Centre	HD	PD	Tx	Stopped treatment	Died
England	B Heart	79.8	11.4	1.8	0.0	7.0
	B QEH	65.3	22.1	5.0	0.0	7.6
	Basldn	73.0	16.2	0.0	5.4	5.4
	Bradfd	79.7	13.0	0.0	0.0	7.3
	Brightn	64.3	29.5	2.7	0.0	3.6
	Bristol	64.7	19.6	9.8	0.0	6.0
	Camb	82.3	6.5	8.1	0.0	3.2
	Carlis	66.7	30.0	0.0	0.0	3.3
	Carsh	73.6	16.8	2.0	0.0	7.6
	Chelms	61.7	27.7	0.0	4.3	6.4
	Colchr	95.5	0.0	0.0	0.0	4.6
	Covnt	60.7	22.3	8.0	0.9	8.0
	Derby	56.6	37.4	0.0	0.0	6.1
	Donc	41.7	54.2	0.0	0.0	4.2
	Dorset	52.6	21.8	6.4	5.1	14.1
	Dudley	57.5	29.8	0.0	0.0	12.8
	Exeter	69.3	20.7	0.7	0.0	9.3
	Glouc	66.0	16.0	6.0	0.0	12.0
	Hull	70.0	24.0	0.0	0.0	6.0
	Kent	64.8	23.0	7.2	0.0	5.0
	Ipswi	62.2	33.3	2.2	0.0	2.2
	L Barts	55.6	40.3	2.0	0.0	2.0
	L Guys	63.3	12.1	22.3	0.0	2.4
	L Kings	71.8	23.1	1.9	0.0	3.2
	L Rfree	78.2	10.1	7.3	0.0	4.5
	L St.G	54.4	20.0	21.1	0.0	4.4
	L West	78.0	4.3	12.2	0.0	5.6
	Leeds	64.8	17.9	11.7	0.0	5.5
	Leic	70.0	12.4	11.9	0.0	5.7
	Liv Ain	85.7	5.7	0.0	0.0	8.6
	Liv RI	61.4	24.8	7.9	0.0	5.9
	M Hope	39.8	49.1	7.4	0.9	2.8
	M RI	70.1	13.9	9.5	0.0	6.6
	Middlbr	71.7	12.3	4.7	0.0	11.3
	Newc	71.7	15.8	8.3	0.8	3.3
	Norwch	77.3	11.8	4.6	0.9	5.5
	Nottm	60.6	26.6	5.3	0.0	7.5
	Oxford	46.2	35.6	11.4	0.0	6.8
	Plymth	50.7	28.2	15.5	0.0	5.6
	Ports	63.2	19.6	9.2	0.0	8.0
	Prestn	70.7	17.1	4.9	0.0	7.3
	Redng	52.8	31.9	8.8	0.0	6.6
	Sheff	77.1	11.4	6.0	1.0	4.5
	Shrew	76.2	19.1	0.0	1.6	3.2
	Stevng	81.8	13.1	2.0	0.0	3.0
	Sthend	65.7	17.1	2.9	0.0	14.3
	Stoke	69.6	23.2	0.0	0.0	7.3
	Sund	67.3	26.9	1.9	0.0	3.9
	Truro	73.2	14.6	2.4	0.0	9.8
	Wirral	58.5	36.6	0.0	0.0	4.9
	Wolve	68.8	25.0	2.5	0.0	3.8
	York	59.4	25.0	0.0	0.0	15.6
N Ireland	Antrim	68.4	10.5	0.0	10.5	10.5
	Belfast	77.4	14.5	3.2	0.0	4.8
	Newry	58.8	29.4	0.0	5.9	5.9

Table 3.11. Continued

Country	Centre	Percentage of patients				
		HD	PD	Tx	Stopped treatment	Died
N Ireland	Tyrone	86.7	10.0	0.0	3.3	0.0
	Ulster	64.3	28.6	0.0	0.0	7.1
Scotland	Abrdn	79.3	15.5	0.0	1.7	3.5
	Airdrie	78.1	14.6	0.0	0.0	7.3
	D&Gall	52.9	41.2	0.0	0.0	5.9
	Dundee	68.8	12.5	1.6	0.0	17.2
	Dunfn	73.0	24.3	2.7	0.0	0.0
	Edinb	62.9	20.6	6.2	0.0	10.3
	Glasgw	75.2	10.9	6.1	0.0	7.9
	Inverns	61.5	30.8	3.9	0.0	3.9
	Klmarnk	63.2	34.2	0.0	0.0	2.6
Wales	Bangor	56.4	15.4	0.0	15.4	12.8
	Clwyd	64.3	35.7	0.0	0.0	0.0
	Cardff	72.9	15.2	6.6	0.7	4.6
	Swanse	64.5	26.6	2.4	0.0	6.5
	Wrexm	52.4	28.6	0.0	0.0	19.1
England		**67.3**	**20.0**	**6.4**	**0.3**	**6.0**
N Ireland		**74.1**	**15.1**	**1.2**	**3.6**	**6.0**
Scotland		**70.5**	**18.1**	**3.5**	**0.2**	**7.7**
Wales		**66.5**	**20.9**	**3.7**	**2.0**	**6.9**
UK		**67.7**	**19.8**	**5.9**	**0.4**	**6.2**

Health is trying to increase the proportion of patients on home therapies, of which PD is the most common. Although the median age of patients starting RRT has not increased in latter years it may be that is a group of patients with increasing comorbidity who are unsuitable for PD.

The percentage of incident patients who had died by day 90 varied considerably between centres (0% to 19%, table 3.11). The definition of whether patients have acute or chronic renal failure may be a factor in this apparent variation. Many other factors probably contribute to these differences including centre size, age and attitudes to conservative therapy and 'trials of dialysis' for borderline dialysis candidates. Three of the five centres with a death rate above 14% accepted 50 or fewer patients and all 5 centres had a median age higher than the UK incident median (2 centres had a median age over 70 years). This may also account for some of the variation in the proportions stopping treatment during the first 90 days.

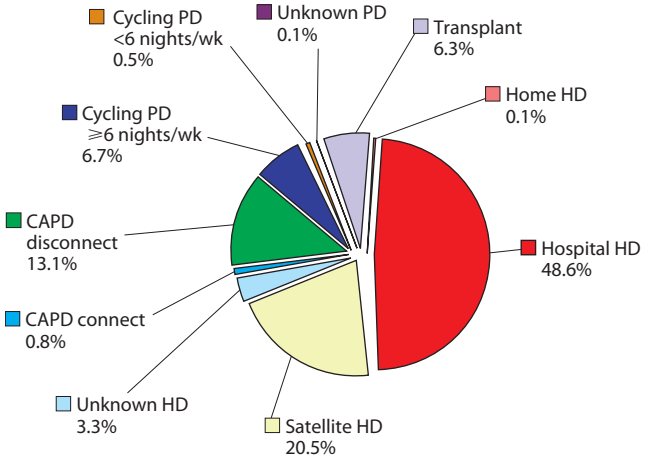

Fig. 3.10. RRT modality at day 90 in the 2008 incident cohort

The range in the proportion of incident patients who had a functioning transplant at 90 days was 0 to 22%. Of the 26 centres in which more than 5% of their incident cohort had received a transplant by 90 days, 23 were transplant centres. The mean percentage of the incident cohort with a functioning transplant by 90 days was significantly greater in transplanting compared to non-transplanting centres (8.9 vs. 3.2%: $p < 0.0001$). One possible reason could be that patients transplanted pre-emptively or early were attributed to the incident cohort of the transplanting centre rather than that of the referring centre (see below).

There were also major differences between individual centres in the percentage of new dialysis patients established on HD at 90 days (range 39.8–95.5%, table

3.11). Some of the centres with low HD numbers had high transplant numbers at day 90 (London Guys, London St Georges and Plymouth), whilst others had high PD numbers (Doncaster, London Barts, Reading, Manchester Hope and Dumfries). As discussed above, it is likely that some of the variation seen in transplant rates is artificial. For example, Dorset has 6% of patients transplanted by day 90, compared with 1.9% at London Kings. The likely explanation is that many of the patients who started RRT at Kings remain allocated to the transplanting centre (London Guys). Four centres had 40% or more of their incident dialysis patients on PD at day 90. Two of these four took on 40 or less patients during 2008.

Older patients were more likely to be on HD rather than PD at 90 days (median age on HD 66.1 years vs. PD 58.3 years). In the UK as a whole, 71.1% of incident patients aged less than 65 years were on HD at this stage compared with 84.0% of patients aged over 65 ($p < 0.001$) (table 3.12). The percentage of patients on PD at 90 days was almost twice as high in patients aged <65 years as in older patients (28.9 % vs. 16.0%). In only 6 centres (London West, London Barts, Chelmsford, York, Ipswich and Coventry) was this trend reversed and they were all different to the 7 centres from last year; these centres had a higher proportion of older patients on PD.

Between centres there was a large variation between the male:female ratio of patients on HD and PD (figure 3.11). Within the UK there was no significant difference in the male:female ratio of incident patients on HD and PD.

Renal function at the time of starting RRT

The mean eGFR at initiation of RRT in 2008 was 8.6 ml/min/1.73 m^2. This was highest in patients who were aged 85 and over, at 9.1 ml/min/1.73 m^2 (figure 3.12). There was a trend of increasing eGFR at initiation of RRT with increasing age.

When analysing serial data from centres reporting annually to the UKRR since 1997, figure 3.13 shows a continued tendency over the last 4 years to initiate PD at a higher mean eGFR than HD patients. In patients starting HD, there may be some plateauing of this level around an eGFR of 8.5 ml/min/1.73 m^2.

Some caution should be applied to the analysis of eGFR at the start of RRT. A review of pre-RRT biochemistry in nine renal centres revealed that up to 18% of patients may have an incorrect date of start of RRT allocated (by up to 5 weeks). In these patients, the

Table 3.12. Percentage of incident patients on dialysis at 90 days by modality and age

	Age <65 (%)		Age ⩾65 (%)		All patients (%)	
Centre	HD	PD	HD	PD	HD	PD
Abrdn	77.4	22.6	91.7	8.3	83.6	16.4
Airdrie	80.0	20.0	88.9	11.1	84.2	15.8
Antrim	76.9	23.1	94.1	5.9	86.7	13.3
B Heart	86.0	14.0	89.4	10.6	87.5	12.5
B QEH	71.5	28.5	78.3	21.7	74.7	25.3
Bangor	69.2	30.8	86.7	13.3	78.6	21.4
Basldn	73.3	26.7	88.9	11.1	81.8	18.2
Belfast	80.8	19.2	87.1	12.9	84.2	15.8
Bradfd	84.4	15.6	89.5	10.5	85.9	14.1
Brightn	56.8	43.2	75.0	25.0	68.6	31.4
Bristol	69.8	30.2	85.5	14.5	76.8	23.2
Camb	80.0	20.0	100.0	0.0	92.7	7.3
Cardff	75.0	25.0	90.8	9.2	82.7	17.3
Carlis	64.3	35.7	73.3	26.7	69.0	31.0
Carsh	76.0	24.0	85.4	14.6	81.5	18.5
Chelms	70.0	30.0	68.2	31.8	69.0	31.0
Clwyd	62.5	37.5	66.7	33.3	64.3	35.7
Colchr*	100.0		100.0		100.0	
Covnt	74.5	25.5	71.7	28.3	73.1	26.9
D&Gall	37.5	62.5	75.0	25.0	56.3	43.8
Derby	43.8	56.3	77.8	22.2	60.2	39.8
Donc	30.8	69.2	60.0	40.0	43.5	56.5
Dorset	61.9	38.1	75.7	24.3	70.7	29.3

Table 3.12. Continued

Centre	Age <65 (%)		Age ⩾65 (%)		All patients (%)	
	HD	PD	HD	PD	HD	PD
Dudley	58.6	41.4	83.3	16.7	65.9	34.1
Dundee	75.0	25.0	88.9	11.1	84.6	15.4
Dunfn	76.9	23.1	73.9	26.1	75.0	25.0
Edinb	64.3	35.7	87.2	12.8	75.3	24.7
Exeter	69.2	30.8	82.4	17.6	77.0	23.0
Glasgw	83.8	16.2	91.2	8.8	87.3	12.7
Glouc	70.8	29.2	94.1	5.9	80.5	19.5
Hull	67.3	32.7	83.3	16.7	74.5	25.5
Inverns	66.7	33.3	66.7	33.3	66.7	33.3
Ipswi	64.3	35.7	66.7	33.3	65.1	34.9
Kent	57.4	42.6	86.8	13.2	73.8	26.2
Klmarnk	44.4	55.6	84.2	15.8	64.9	35.1
L Barts	58.2	41.8	57.4	42.6	58.0	42.0
L Guys	77.0	23.0	90.6	9.4	84.0	16.0
L Kings	67.1	32.9	86.4	13.6	75.7	24.3
L Rfree	85.6	14.4	93.4	6.6	88.6	11.4
L St.G	71.0	29.0	75.0	25.0	73.1	26.9
L West	95.8	4.2	93.5	6.5	94.8	5.2
Leeds	67.7	32.3	89.7	10.3	78.3	21.7
Leic	76.6	23.4	91.7	8.3	85.0	15.0
Liv Ain	87.5	12.5	100.0	0.0	93.8	6.3
Liv RI	65.3	34.7	78.9	21.1	71.3	28.7
M Hope	41.3	58.7	51.5	48.5	44.8	55.2
M RI	77.3	22.7	91.8	8.2	83.5	16.5
Middlbr	79.5	20.5	90.0	10.0	85.4	14.6
Newc	75.4	24.6	89.6	10.4	81.9	18.1
Newry	44.4	55.6	100.0	0.0	66.7	33.3
Norwch	81.1	18.9	90.2	9.8	86.7	13.3
Nottm	60.0	40.0	81.1	18.9	69.5	30.5
Oxford	49.2	50.8	66.0	34.0	56.5	43.5
Plymth	50.0	50.0	83.3	16.7	64.3	35.7
Ports	70.8	29.2	81.4	18.6	76.3	23.7
Prestn	74.3	25.7	92.1	7.9	80.6	19.4
Redng	51.2	48.8	75.0	25.0	62.3	37.7
Sheff	86.9	13.1	87.2	12.8	87.1	12.9
Shrew	69.0	31.0	90.3	9.7	80.0	20.0
Stevng	80.4	19.6	93.0	7.0	86.2	13.8
Sthend	68.8	31.3	92.3	7.7	79.3	20.7
Stoke	68.6	31.4	82.8	17.2	75.0	25.0
Sund	65.2	34.8	76.9	23.1	71.4	28.6
Swanse	67.3	32.7	74.1	25.9	70.8	29.2
Truro	71.4	28.6	90.9	9.1	83.3	16.7
Tyrone	76.9	23.1	100.0	0.0	89.7	10.3
Ulster	60.0	40.0	75.0	25.0	69.2	30.8
Wirral	60.9	39.1	62.5	37.5	61.5	38.5
Wolve	67.6	32.4	78.9	21.1	73.3	26.7
Wrexm	62.5	37.5	66.7	33.3	64.7	35.3
York	80.0	20.0	64.7	35.3	70.4	29.6
England	**71.0**	**29.0**	**83.7**	**16.3**	**77.1**	**22.9**
N Ireland	**73.5**	**26.5**	**91.3**	**8.8**	**83.1**	**16.9**
Scotland	**72.6**	**27.4**	**86.2**	**13.8**	**79.6**	**20.4**
Wales	**70.4**	**29.6**	**81.7**	**18.3**	**76.1**	**23.9**
UK	**71.1**	**28.9**	**84.0**	**16.0**	**77.4**	**22.6**

* HD patients only

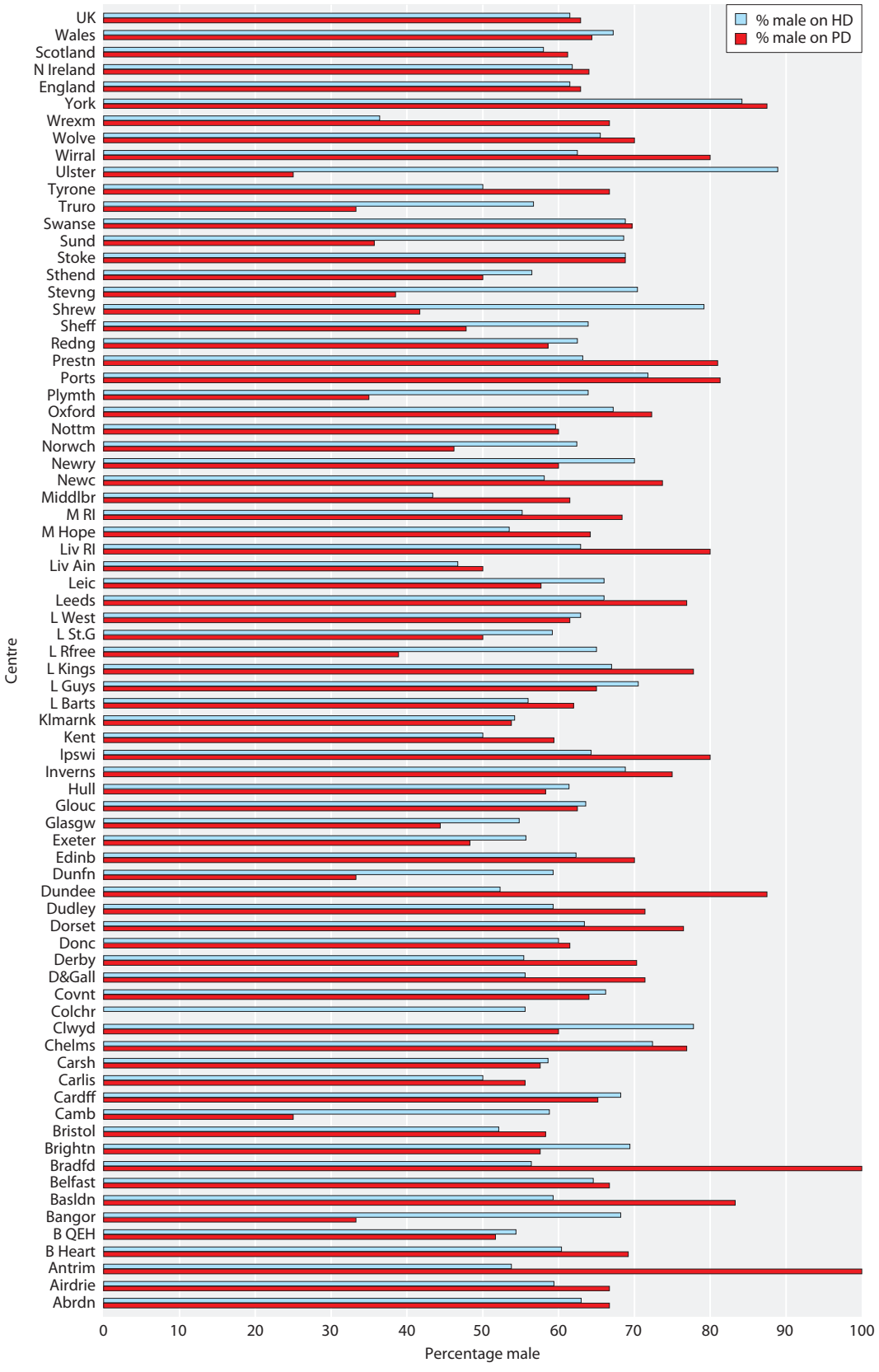

Fig. 3.11. Percentage of patients who are male by dialysis modality in incident cohort 2008

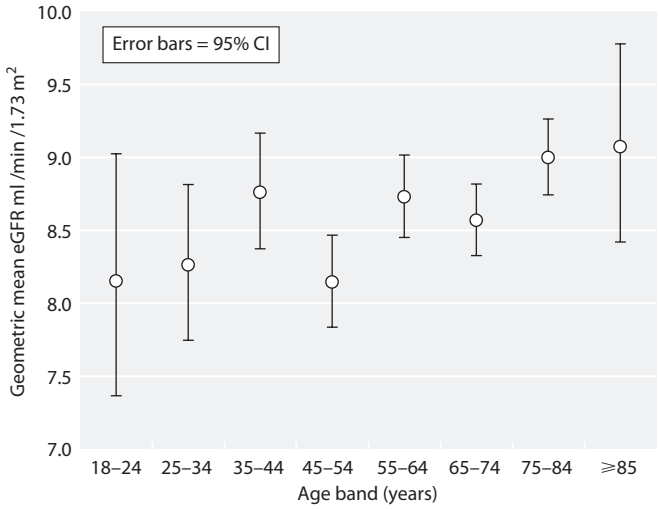

Fig. 3.12. Geometric mean eGFR at start of RRT by age band

eGFR used for analysis in some patients may have been taken whilst already receiving RRT and thus be artificially high. The details of this analysis and a subsequent validation study are described in detail in chapter 13 The UK Renal Registry Advanced CKD Study.

3 Late presentation (referral) of incident patients

Introduction

Late presentation to a nephrologist has many definitions and a range of possible causes. Chronic kidney disease may be asymptomatic until very advanced stages and patients may present with a variety of rapidly progressive glomerulopathies that present late and should be termed 'late presenters'. In contrast there are patients with chronic kidney disease, who may be regularly monitored in primary or secondary care, and referral to nephrological services has been delayed (late referral). The analyses presented encompass all these possibilities in any patient referred to renal services within 90 days of requiring RRT.

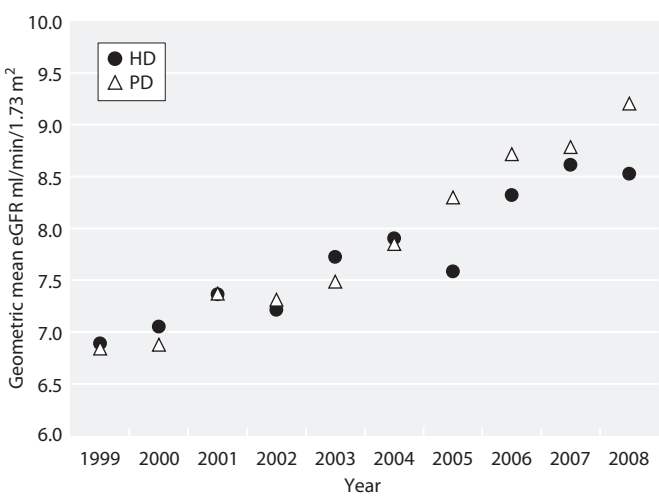

Fig. 3.13. eGFR on starting RRT 1999–2008; PD and HD
Restricted to centres reporting since 1997

Methods

Data were included from all incident patients in the years 2003–2008. The date first seen in a renal centre and the date of starting RRT were used to calculate the referral time. This is the number of days between first being seen and starting RRT. Two percent of data were excluded because of actual or potential inconsistencies. Only data from those centres with 75% or more completeness were used. Data were excluded for centres in the years where 10% or more of the patients were reported to have started RRT on the same date as the first presentation. After these exclusions, data on 9,913 patients were available for analysis. Referral times of 90 days or more were defined as early presentation. Referral times of less than 90 days were defined as late presentation.

Results

Table 3.13 shows the percentage completeness of data from 2003 to 2008 excluding centres with 10% or more of start dates for RRT being on the same day as first presentation. Overall there has been no change in the proportion of patients analysed with a reported date of referral.

Late presentation by centre and year

Late presentation ranged by centre from 8–41% in patients commencing RRT in 2008 (table 3.14). The overall rate of late presentation was 22.2%, comparable with last year.

There had been a steady decline nationally in the proportion of patients referred late to renal services in the previous 2 years. This may have been as a consequence of the National CKD guidelines published by the Medical and GP Royal Colleges [6] and the Quality and Outcomes Framework (QOF) initiative (www.dh.gov.uk) raising awareness of CKD amongst non-nephrologists. The incidence rate may have now plateaued, though some centres achieve <10% late presentation rates. The reasons for this are probably multifactorial and may include education policies, local referral guidelines and use of remote IT monitoring.

Table 3.13. Percentage completeness of late presentation data (2003 to 2008) by centre

	Year					
Centre	2003	2004	2005	2006	2007	2008
Antrim			*	39.4	52.8	70.7
B Heart	0.0	0.0	0.0	0.9	1.0	0.0
B QEH		0.0	0.0	0.0	0.5	0.0
Bangor	*	97.1	89.7	*	*	*
Basldn	96.2	97.8	89.3	100.0	100.0	90.0
Belfast			53.1	63.1	78.7	63.2
Bradfd	*	95.2	98.5	98.0	95.4	79.7
Brightn		0.0	0.0	0.0	0.0	0.0
Bristol	74.1	76.7	83.1	92.0	66.0	61.6
Camb	*	65.1	68.5	51.3	63.2	72.5
Cardff	0.0	0.5	0.0	0.0	0.9	0.0
Carlis	22.6	*	*	61.5	*	77.4
Carsh	0.5	0.6	0.0	0.0	0.0	0.0
Chelms		79.6	54.1	91.7	94.1	97.0
Clwyd	0.0	0.0	0.0	0.0	4.3	0.0
Colchr	n/a	n/a	n/a	n/a	n/a	0.0
Covnt	0.0	0.0	0.0	2.0	1.9	0.0
Derby	*	*	62.9	76.8	85.2	95.7
Donc	n/a	n/a	n/a	n/a	100.0	92.0
Dorset	98.5	100.0	97.9	100.0	100.0	98.8
Dudley	14.6	*	*	*	0.0	0.0
Exeter	54.6	64.2	50.0	53.8	23.8	11.4
Glouc	0.0	13.2	95.0	82.2	96.6	84.4
Hull	2.5	0.9	2.4	0.0	1.0	0.0
Ipswi	*	*	96.4	95.2	*	97.3
Kent					*	97.0
L Barts		0.5	0.0	19.8	0.0	0.5
L Guys	0.0	0.0	0.0	0.0	1.9	2.4
L Kings	23.4	16.8	15.4	10.6	17.6	96.7
L Rfree			0.0	0.0	0.0	0.6
L St.G					0.0	0.0
L West	*	*	*	*	*	*
Leeds	76.6	88.7	88.1	85.1	78.2	69.1
Leic	93.8	92.5	62.9	55.8	65.0	72.4
Liv Ain	n/a	n/a	0.0	0.0	0.0	0.0
Liv RI	0.0	0.8	0.0	0.0	0.9	0.0
M Hope	52.4	59.5	75.9	86.2	80.4	48.6
M RI					15.5	27.2
Middlbr	92.2	88.1	91.7	74.3	80.8	93.5
Newc	*	*	*	*	100.0	100.0
Newry			78.6	*	100.0	100.0
Norwch		52.1	30.5	28.3	17.0	12.0
Nottm	99.1	98.0	98.6	97.8	99.2	96.5
Oxford	90.2	88.8	88.2	90.8	99.3	99.3
Plymth	0.0	0.0	0.0	1.1	1.3	2.9
Ports	94.9	93.9	91.9	93.6	86.5	85.0
Prestn	0.0	0.0	0.0	0.8	0.8	0.0
Redng	4.6	18.3	12.8	12.0	12.9	7.1
Sheff	98.7	98.8	97.4	94.6	97.5	97.7
Shrew		*	*	*	*	98.4
Stevng	95.9	91.4	78.3	77.3	89.7	94.0
Sthend	0.0	0.0	0.0	0.0	0.0	0.0
Stoke					*	*
Sund	*	*	*	0.0	3.2	*
Swanse	58.3	63.4	93.9	98.2	96.8	93.2

Table 3.13. Continued

Centre	Year					
	2003	2004	2005	2006	2007	2008
Truro	75.5	59.7	71.0	54.0	91.1	*
Tyrone			95.7	96.6	90.9	96.0
Ulster			*	100.0	100.0	92.3
Wirral	38.5	48.5	76.3	76.5	82.4	82.1
Wolve	79.1	96.1	98.9	97.5	95.5	96.5
Wrexm	*	*	*	*	*	100.0
York	85.7	93.8	*	97.9	88.2	93.5
Total	**41.9**	**40.2**	**39.5**	**41.0**	**37.6**	**42.3**

Blank cells – data not available
* = data not shown as >10% of patients reported as starting RRT on the same date as first presentation
n/a = renal centre not yet operational

Table 3.14. Percentage of patients presenting to a nephrologist less than 90 days before dialysis initiation

Centre	Year					
	2003	2004	2005	2006	2007	2008
Bangor		36.4	40.0			
Basldn	39.2	35.6	20.0	26.7	20.5	33.3
Belfast					25.7	
Bradfd		16.9	32.8	16.3	20.5	19.1
Bristol		28.7	24.5	16.3		
Carlis						16.7
Chelms		23.1		29.5	25.0	25.0
Derby				17.0	21.2	19.3
Donc					27.8	13.0
Dorset	26.2	18.6	34.8	17.0	22.0	20.7
Glouc			19.3	21.7	21.4	18.4
Ipswi			51.9	35.0		36.1
Kent						40.6
L Kings						19.2
Leeds	36.2	29.9	31.4	29.4	23.7	
Leic	21.1	23.0				
M Hope			20.0	13.4	3.5	
Middlbr	27.4	31.5	22.1		17.5	18.6
Newc					20.0	27.7
Newry			22.7		20.0	10.0
Nottm	29.5	34.0	33.6	24.4	18.5	23.9
Oxford	27.3	26.7	28.9	26.1	20.6	18.9
Ports	26.0	29.9	27.2	30.4	23.0	24.6
Sheff	27.9	21.5	22.4	22.3	19.5	12.9
Shrew						29.5
Stevng	31.0	21.6	13.9	13.0	19.2	10.6
Swanse			43.5	37.8	27.3	25.7
Truro	15.0				17.1	
Tyrone			22.7	10.7	15.0	16.7
Ulster				12.5	26.7	8.3
Wirral			33.3	59.0	45.2	31.3
Wolve	26.5	30.6	30.0	25.3	27.0	25.3
Wrexm						18.2
York	22.9	26.7		26.1	23.3	13.8
Total	**27.8**	**26.9**	**28.6**	**24.3**	**21.3**	**22.2**

Blank cells = data not available, poor data completeness (<75%) or >10% with same date of start as date first seen

Table 3.15. Presentation times in 4 groups by year restricted to 8 centres contributing continuous data 2003–2008

Year	% <3 months	% 3–6 months	% 6–12 months	% ⩾12 months
2003	28.5	6.5	10.9	54.1
2004	26.9	6.3	9.0	57.8
2005	27.0	5.8	10.6	56.6
2006	23.9	6.8	9.6	59.7
2007	20.9	5.8	11.0	62.3
2008	19.8	5.7	8.6	65.9

Time referred before dialysis initiation in the 2008 incident cohort

In 2008, 62.5% of incident patients had been referred over a year before they needed to start dialysis. There were 9.2% of patients referred within 6–12 months, 6.2% within 3–6 months and 22.2% within 3 months. Table 3.15 shows data relating to time referred before dialysis initiation from those 8 centres supplying data for each of the last 6 years with >75% completeness (Basildon, Dorset, Nottingham, Oxford, Portsmouth, Sheffield, Stevenage and Wolverhampton). The proportion of patients presenting late in these centres since 2003 has steadily fallen, particularly since 2005 (figure 3.14), and similarly there has been an increase in those presenting 12 months or more before starting RRT.

Age and late presentation

In the 2003–2008 cohort, patients who presented late were significantly older than patients who presented earlier (>90 days before dialysis initiation) (median age 66.9 vs. 64.8 years: $p < 0.0001$). Furthermore, the median duration of pre-dialysis care diminished progressively with increasing age beyond the 45–54 age group (figure 3.15).

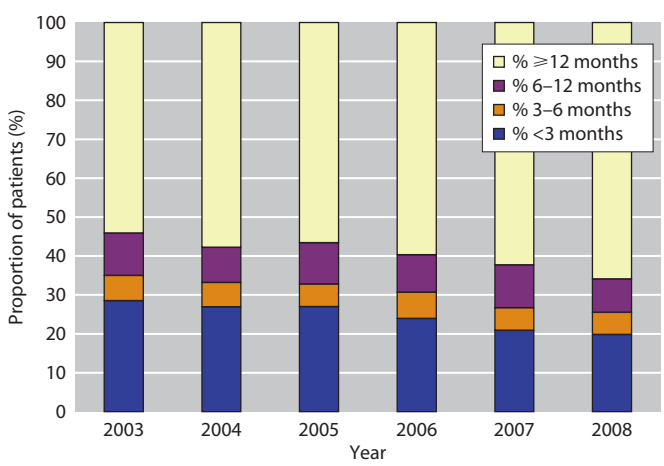

Fig. 3.14. Change in rate of late presentation by year 2003–2008

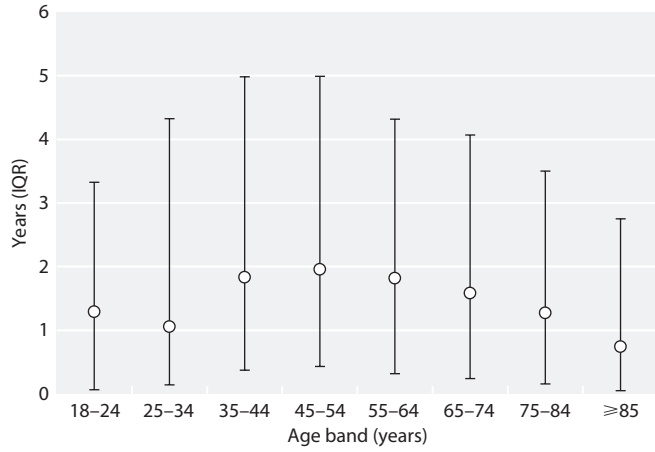

Fig. 3.15. Median duration of pre-dialysis care by age

Gender and late presentation

There was no significant difference in the proportion of males and females by time of presentation (male:female ratio 1.66 in early presenters, 1.72 in late presenters, $p = 0.47$).

Ethnicity, social deprivation and late presentation

This analysis of the 2003–2008 cohort was limited to patients from centres with >70% ethnicity and >75% referral time data. Patients from the Chinese and Other ethnic minority groups were excluded due to the small numbers with referral data. The percentage of non-Whites (South Asian and Black) presenting late (<90 days) was significantly lower than in Whites (21.2% vs. 25%: $p = 0.013$). The high incidence of diabetes in non-Whites (as discussed below, patients with diabetes tended to be referred earlier) and the older median age of incident Whites, may have a bearing. There was no relationship between social deprivation and referral pattern.

Primary renal disease and late presentation

In the 2003–2008 cohort, late presentation differed significantly between primary renal diagnoses (Chi-squared test $p < 0.0001$) (table 3.16). Patients with a diagnosis of 'other identified category', 'not available', and the aetiology uncertain/glomerulonephritis unproven groups appeared to have higher rates of late referral. Those with diabetes and adult polycystic kidney disease had lower rates.

Table 3.16. Late presentation by primary renal diagnosis

Diagnosis	Late presentation	
	N	%
Uncertain aetiology*	645	27.3
Diabetes	267	13.1
Glomerulonephritis	207	20.7
Other identified category	684	46.1
Polycystic kidney	55	8.3
Pyelonephritis	167	21.9
Renal vascular disease	331	26.2
Data not available	115	34.2

* includes presumed glomerulonephritis not biopsy proven

Modality and late presentation

In the 2003–2008 cohort, late presentation was associated with variations in initial choice of modality. The percentage of patients whose first modality was PD was significantly less in the late presentation group compared to those presenting earlier (11.5% vs. 27.4%: $p < 0.0001$). By 90 days after dialysis initiation this difference was reduced, although still highly significant (17.6% vs. 29.0%: $p < 0.0001$). This pattern has been evident for the last few years with little improvement in PD rates in the late presenters.

Comorbidity and late presentation

In the 2003–2008 cohort, significantly fewer patients who had presented late were assessed as having no comorbidity when compared with the group who presented earlier (40.1% vs. 43.6%: $p = 0.014$). Peripheral vascular disease was significantly less common in the group presenting late. Malignancy was significantly more common in those presenting late, perhaps because of the potential for rapid decline in renal function in this setting (table 3.17).

Table 3.17. Percentage prevalence of specific comorbidities amongst patients presenting late (0–89 days) compared with those presenting early (⩾90 days)

Comorbidity	0–89 days	⩾90 days	p-value
Cerebrovascular disease	10.2	10.3	0.9
COPD	6.9	6.8	0.8
Diabetes (not a cause of ERF)	8.2	8.8	0.5
Ischaemic heart disease	23.0	24.5	0.2
Liver disease	2.9	2.3	0.2
Malignancy	18.1	10.4	<0.0001
Peripheral vascular disease	10.7	13.5	0.003
Smoking	16.7	15.3	0.2

Haemoglobin and late presentation

In the 2003–2008 cohort, patients presenting late had a significantly lower haemoglobin concentration at dialysis initiation than patients presenting earlier (9.5 vs. 10.5 g/dl: $p < 0.0001$). This may reflect inadequate pre-dialysis care with limited anaemia management, but alternatively those presenting late may be more likely to have anaemia because of multisystem disease or intercurrent illness.

eGFR at start of RRT and late presentation

In the data set 2003–2008, eGFR was lower in patients who presented late (7.6 vs. 8.3 ml/min/1.73 m^2: $p < 0.0001$), both in males (7.8 vs. 8.5: $p < 0.0001$) and females (7.3 vs. 7.9: $p = 0.0001$). The same relationship held in older patients (>65 years) (7.8 vs. 8.5: $p < 0.0001$) and in younger patients (18–44 years) (6.8 vs. 8.1: $p < 0.0001$), but not in those in the intermediate age range (45–64 years) (7.6 vs. 8.0: $p = 0.06$). Similarly the relationship held in Whites (7.6 vs. 8.3: $p < 0.0001$) and Asians (7.0 vs. 7.9: $p = 0.05$) but not in Blacks (8.1 vs. 7.7: $p = 0.6$). It should be noted that patient numbers were small in ethnic minority groups.

eGFR at start of RRT was significantly lower in patients presenting late rather than early with renal disease of uncertain aetiology (6.9 vs. 8.0: $p < 0.0001$) and 'other diagnoses' (7.5 vs. 8.2: $p = 0.0009$). No differences were seen in any of the other diagnostic categories. When stratifying by comorbidity, eGFR was significantly lower in patients who presented late compared to earlier presentation in all comorbidity groups except cerebrovascular and peripheral vascular disease and diabetes. For example, amongst patients with liver disease, the eGFR at the start of RRT was 8.7 in those who presented early compared to 6.7 in those who presented late ($p = 0.0004$).

Survival of incident patients

This analysis is to be found in chapter 7 Survival and Causes of Death in UK Adult Patients on RRT in 2008.

Summary

For the first time this year, the UKRR had individual patient level coverage of all UK renal centres compared

with last year's report when one centre could only provide centre level data. This has enabled acceptance rates to be more accurately assigned to centres. Acceptance rates have fallen in Northern Ireland, Scotland and Wales whilst they have plateaued in England over the last 3 years. Wales continues to have the highest acceptance rates but it may be that the other parts of the UK are tending towards more similar rates. There remain large centre variations in acceptance rates for RRT and they are significantly affected by age, gender, primary renal diagnosis and ethnicity. Significant numbers of patients continue to present late to renal centres and the improvement of recent years may have halted.

Conflict of interest: none

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