

# Chapter 3: New Adult Patients Starting Renal Replacement Therapy in the UK in 2006

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## Summary

- In 2006 the overall annual acceptance rate for the whole UK, including children and young adults, was 113 per million population (pmp), an increase from 110 pmp in 2005. This was derived from complete data for the UK, as data were obtained separately from the five adult English centres not currently returning to the Registry.
- For adults only the acceptance rate for renal replacement therapy (RRT) in 2006 in the UK was 111 pmp, an increase from 108 pmp in 2005.
- The 2006 adult acceptance rates in England (109 pmp) and Wales (135 pmp) continued to increase, whilst those in Scotland (114 pmp) and Northern Ireland (114 pmp) have fallen. The only rate markedly different from the others is that in Wales.
- From 2002 to 2006, there has been a 12% rise in the number accepted, the percentage rise being greater in England (14%) than in Scotland (5%) and Wales (4%).
- In the UK, for adults in 2006, the crude annual acceptance rates in Local Authorities (with a population >150,000) varied widely from 55 in Bury (population 180,607) to 208 in Plymouth (pop. 240,722), 177 in Westminster (pop. 181,284) and 176 in Newham (pop. 243,889). The standardised acceptance rate ratios for acceptance varied from 0.51 (Bury) to 2.21 (Newham).
- Over the period 2001 to 2006, of those areas with data for a minimum of three years, 38 had significantly low acceptance ratios, all but two of them (Shetland and Stirling) in England. Forty-eight areas had significantly high acceptance ratios: 30 in England (including 20 in London and the East and West Midlands), 10 in Wales and 8 in Scotland. Twenty-four of these high areas had ethnic minority populations of more than 10%. Eight were in Scotland where data on ethnicity were not available. Of the remaining 16 with high acceptance ratios without large ethnic minorities, 10 were in Wales and 3 in the South-West.
- The median age of patients starting renal replacement therapy in the UK was 65.0 years. This has changed only minimally over the period 2000 to 2006. The median age of incident UK non-White patients was considerably lower than White patients at 59.1 years.
- In England and Scotland the acceptance rate is highest within the 75–79 age group (at 407 and 507 pmp respectively). In Wales and Northern Ireland the peak is within the 80–84 age group (at 567 and 759 pmp respectively).
- Diabetic renal disease remains the most common specific primary renal diagnosis in the UK. The proportion of new patients with this diagnosis has increased since 2005 in the UK from 20% to 22%.
- In the UK in 2006, haemodialysis (HD) was the first modality of RRT in 77% of patients, peritoneal dialysis (PD) in 20% and pre-emptive transplant in just over 3%. The proportion whose first modality was HD has progressively increased since 1998 from 58%.
- By 90 days, in the 2006 UK cohort, 8% of incident patients had died, less than 1% had stopped treatment, leaving 92% of the original cohort remaining on RRT, (73% were on HD, 22% on PD and 5% had received a transplant).
- Data on first referral to a nephrologist was available from 26 centres for at least part of the period 2001 to 2006 (for a total of 7,256 patients). In 2006, the mean percentage of

patients referred less than 90 days before dialysis initiation was 23%, representing a slight fall from previous years.

- Patients referred late were older. Patients with polycystic kidney disease and diabetic nephropathy tended to be referred early whilst those with uncertain aetiology and no recorded diagnosis were more likely to be late referrals.
- White patients referred late had lower estimated glomerular filtration rate (eGFR) at initiation of RRT compared to earlier referrals, but this was not the case in Black and South Asian patients.
- Patients referred late had lower haemoglobin concentrations at initiation of RRT compared to earlier referrals, were more likely to initiate RRT on HD and to remain on that treatment modality.

## Introduction

The acceptance data presented are from the whole UK. In 2006, the UK Renal Registry (UKRR) received complete returns from all 5 centres in Wales, all 6 centres in Northern Ireland and 90% of the centres in England. Data from all 10 centres in Scotland were obtained from the Scottish Renal Registry. In this report, Glasgow Royal Infirmary and Glasgow Western Infirmary are grouped together as Glasgow. In addition summary data were obtained separately from the 5 remaining English centres not currently returning to the Registry, to enable accurate calculation of acceptance rates.

Extrapolation from Registry data to derive information relating to the whole UK was still necessary. These results must still be viewed

with caution, although the reliability of estimates improves as coverage increases. The proportion of the population aged over 65 years was similar in the fully covered population (defined below, based on Local Authority areas whose population was thought to be fully covered by participating centres) compared with the general population of England and Wales. The proportion from ethnic minority groups was lower in the fully covered population at 8.1% compared with 9.0% in the total population, because some areas not reporting to the Registry have catchments with high ethnic minority populations.

For adults, the data from the Registry are fully valid for comparisons between centres and between local areas fully covered by the UKRR.

## Adult patients accepted for renal replacement therapy in the UK, 2006

### Overall take-on rate

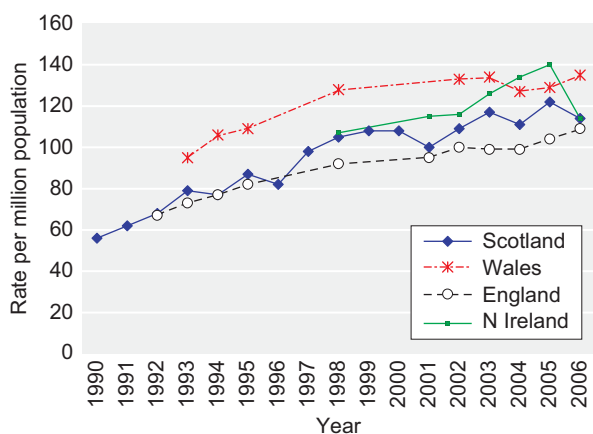
In 2006, the number of adult patients starting renal replacement therapy (RRT) in the whole UK was 6,716, equating to an acceptance rate of 111 per million population (pmp) (Table 3.1), an increase from 108 pmp in 2005. The acceptance rates in England (109 pmp) and Wales (135 pmp) continued to increase, whilst those in Scotland (114 pmp) and Northern Ireland (114 pmp) have fallen (Figure 3.1). The only country with an acceptance rate markedly different from the others is Wales.

There continues to be marked gender differences in take-on rates, 139 (95% CI 135–143) pmp in males and 84 (95% CI 81–87) pmp in females.

**Table 3.1: Number of new adult patients accepted in the UK in 2006**

	England	Wales	Scotland	N Ireland	UK
Centres contributing to UKRR (67)	5,062	401	583	199	<b>6,245</b>
All UK centres (67 + 5 = 72)	5,533	401	583	199	<b>6,716</b>
*Total estimated population mid 2006 (millions)	50.8	3.0	5.1	1.7	<b>60.6</b>
Acceptance rate (pmp)	109	135	114	114	<b>111</b>
(95% CI)	(106–112)	(122–148)	(105–123)	(98–130)	<b>(108–113)</b>

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



**Figure 3.1: Adult incident rates in the countries of the UK; 1990–2006**

Including the acceptances for children and young adults this gave a total annual acceptance rate for the UK of 113 pmp.

### Acceptances by individual centres

Acceptance rates of individual centres have not been calculated as their catchment populations are not precisely defined.

The number of patients accepted by each centre in the years 2002 to 2006 is shown in Table 3.2. It shows the percentage change in those numbers over that time for each of the 49 centres with full reporting during that period

**Table 3.2: Number of new patients accepted by individual centres reporting to the UK Renal Registry 2002–2006**

Country	Centre	Year					% change since 2002
		2002	2003	2004	2005	2006	
England	B Heart	66	104	102	116	119	80
	B QEH			195	195	187	
	Basldn		53	46	29	44	
	Bradfd	62	74	62	66	49	-21
	Brightn			119	110	131	
	Bristol	124	163	164	176	173	40
	Camb	74	99	112	160	92	24
	Carlis	26	31	29	31	27	4
	Carsh	175	201	167	182	190	9
	Chelms			51	39	50	
	Chestr	3	4	5		4	33
	Colche					0	
	Covnt	96	75	76	84	104	8
	Derby		60	67	71	72	
	Dorset		66	60	45	55	
	Dudley	25	41	55	38	45	80
	Exeter	82	98	110	111	114	39
	Glouc	54	53	53	60	73	35
	Hull	105	80	109	126	98	-7
	Ipswi	41	39	44	55	42	2
	Kent				104	124	
	L Barts			187	183	179	
	L George				90	100	
	L Guys	141	93	104	133	133	-6
	L Kings	116	108	114	136	111	-4
	L Rfree				131	206	
	L West	234	230	272	267	272	16
	Leeds	152	185	174	164	186	22
	Leic	152	168	162	225	241	59
	Liv Ain			3	29	36	
Liv RI	153	114	129	139	142	-7	
ManWst		143	113	111	127		
ManRI				181	160		
Middlbr	111	103	102	84	97	-13	

Table 3.2: (continued)

Country	Centre	Year					% change since 2002
		2002	2003	2004	2005	2006	
	Newc	107	108	106	94	110	3
	Norwch			94	121	110	
	Nottm	87	115	107	146	136	56
	Oxford	170	187	172	163	163	-4
	Plymth	79	64	62	58	93	18
	Ports	146	141	118	151	174	19
	Prstn	110	98	79	118	121	10
	Redng	39	63	59	74	72	85
	Sheff	156	159	169	158	167	7
	Shrew			55	43	54	
	Stevng	101	119	88	91	115	14
	Sthend	33	42	40	34	44	33
	<i>Stoke</i>				87	87	
	Sund	57	56	51	59	58	2
	Truro	59	53	67	32	50	-15
	Wirral	40	49	63	58	56	40
	Wolve	99	88	105	93	93	-6
	York	63	57	48	43	47	-25
N Ireland	Antrim				42	31	
	Belfast				131	113	
	Derry					3	
	Newry				28	14	
	Tyrone				22	30	
	Ulster				9	8	
Scotland	Abrdn	60	52	69	64	50	-17
	Airdrie	60	52	51	39	55	-8
	D&Gall	22	22	16	21	22	0
	Dundee	68	63	62	76	50	-27
	Dunfn	29	27	29	44	35	21
	Edinb	81	90	98	99	105	30
	Glasgw	175	221	188	203	187	7
	Inverns	29	35	33	44	27	-7
	Klmarnk	32	40	29	43	52	63
Wales	Bangor	29	33	36	40	40	38
	Clwyd	20	12	14	27	17	-15
	Crdff	181	166	187	183	206	14
	Swanse	113	128	93	97	113	0
	Wrexm	42	32	29	41	25	-41
<b>England</b>		<b>3,338</b>	<b>3,784</b>	<b>4,469</b>	<b>5,294</b>	<b>5,533</b>	
<b>N Ireland</b>					<b>232</b>	<b>199</b>	
<b>Scotland</b>		<b>556</b>	<b>602</b>	<b>575</b>	<b>633</b>	<b>583</b>	
<b>Wales</b>		<b>385</b>	<b>371</b>	<b>359</b>	<b>388</b>	<b>401</b>	
<b>UK</b>		<b>4,279</b>	<b>4,757</b>	<b>5,403</b>	<b>6,547</b>	<b>6,716</b>	
<b>Including only centres reporting continuously 2002–2006</b>							
<b>England</b>		<b>3,335</b>	<b>3,458</b>	<b>3,474</b>	<b>3,725</b>	<b>3,807</b>	<b>14</b>
<b>Scotland</b>		<b>556</b>	<b>602</b>	<b>575</b>	<b>633</b>	<b>583</b>	<b>5</b>
<b>Wales</b>		<b>385</b>	<b>371</b>	<b>359</b>	<b>388</b>	<b>401</b>	<b>4</b>
<b>Total</b>		<b>4,276</b>	<b>4,431</b>	<b>4,408</b>	<b>4,746</b>	<b>4,791</b>	<b>12</b>

Blank cells – no data returned to the Registry for that year.  
Renal centres in italics are those providing summary data only.

and also on a national level for the same centres. There have been wide variations in trends in acceptances between centres, ranging from increases of 80% or more (Birmingham Heartlands, Dudley and Reading) to reductions of 20% or more (Bradford, York, Dundee and Wrexham). The most dramatic changes appear to reflect changes in catchment populations and areas. The variation may also reflect chance fluctuation, completeness of reporting, changing incidence of established renal failure (ERF), changes in referral patterns and the introduction of conservative care programmes. Overall there has been a 12% rise in the numbers accepted, the percentage rise being greater in England (14%) than in Scotland (5%) and Wales (4%). Three centres with less than 10 patients (Chester (4), Derry (3) and Ulster (8)) starting RRT in 2006 are not shown in subsequent analyses.

## Geographical variation in adult acceptance rates in England, Northern Ireland, Scotland and Wales

### Introduction

Equity of access to RRT is an important goal of service provision. The need for RRT depends on many social and demographic factors including age, gender, social deprivation and ethnicity, so 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 profile to compare RRT incident rates. The impact of social deprivation was recorded in the 2003 Report<sup>1</sup>. The population used for standardisation is the sum of all Local Authority (LA) areas for which the Registry had full coverage in 2006.

### Methods

Standardised acceptance rate ratios were calculated as detailed in Appendix D found on the UKRR website at <http://www.renalreg.org>. Briefly, age and gender specific acceptance numbers were first calculated using the available Registry data on the number of incident patients for the covered areas of England,

Wales, Scotland and Northern Ireland. The age and gender breakdown of the population of each Local Authority area was obtained from the 2001 Census data from the Office for National Statistics (ONS)<sup>2</sup> and used to calculate the expected age and gender specific acceptance numbers for each LA area. The age and gender standardised acceptance rate ratio is the observed acceptance numbers divided by the expected acceptance numbers. A ratio below 1 indicates that the observed rate is less than expected given the LA area's population structure. This is statistically significant at the 5% level if the upper confidence limit is less than 1.

### Significance of results

Acceptance rates in Local Authorities with complete coverage by the Registry are shown in Table 3.3. Acceptance rates for RRT in relatively small populations such as those covered by individual Local Authorities have wide confidence intervals for any observed rate. To enable assessment of whether an observed acceptance rate differs significantly from the national average, Figure 3.2 has been included.

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. The example plot shown in Figure 3.2 assumes that the national average is 111 pmp. 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 take-on rate for a population of 50,000 would have to be outside the limits of 19 to 203 per million population per year, whilst for a population of 1 million, the limits are from 90 to 132 per million population per year.

## Results

### Local Authority acceptance rates 2006

From Figure 3.2 it can be seen that quoting an acceptance rate for a population of less than 150,000 has such wide error margins as to be meaningless. However, no such small areas had single year acceptance rates significantly different from the mean.

**Table 3.3: Crude adult annual acceptance rates (pmp) and standardised rate ratios 2001–2006**

\*For those areas not covered by the Registry for the entire period 2001–2006, the standardised acceptance rate ratio and the acceptance rates are averages for the years covered by the Registry.

O/E = standardised acceptance rate ratio.

Blank cells – no data returned to the Registry for that year.

Areas with data for minimum 3 years and with significantly high average acceptance ratios are bold in darker greyed areas, areas with significantly low acceptance ratios are italicised in darker grey areas.

% non-White = sum of % South Asian and Black from 2001 UK census.

UK Area	LA name	Tot Pop	2001	2002	2003	2004	2005	2006		2001–2006*				% non White
			O/E	O/E	O/E	O/E	O/E	O/E	Pmp	O/E	LCL	UCL	Pmp	
North East	<i>Darlington</i>	97,838	0.74	0.91	0.96	0.77	0.45	0.70	82	0.75	0.56	1.00	80	2.1
	<i>Durham</i>	493,469	0.54	1.02	0.80	0.86	0.89	0.86	101	0.83	0.74	0.94	89	1.0
	Hartlepool	88,610	1.08	0.57	1.31	0.99	0.82	1.28	147	1.01	0.78	1.31	105	1.2
	Middlesbrough	134,855	1.09	1.13	1.15	0.92	1.08	1.25	133	1.10	0.90	1.36	108	6.3
	Redcar and Cleveland	139,132	0.73	1.83	1.14	1.14	0.75	0.72	86	1.04	0.85	1.28	113	1.1
	Stockton-on-Tees	178,408	0.86	1.06	0.90	1.07	0.84	0.86	95	0.93	0.77	1.13	93	2.8
	Gateshead	191,151		1.22	1.06	0.92	0.63	0.83	99	0.92	0.76	1.13	103	1.6
	Newcastle upon Tyne	259,536		1.03	0.93	1.13	0.98	0.81	89	0.97	0.82	1.15	99	6.9
	North Tyneside	191,658		0.95	0.81	0.91	0.63	0.82	99	0.82	0.66	1.01	92	1.9
	<i>Northumberland</i>	307,190		0.73	0.96	0.87	0.52	0.76	94	0.77	0.65	0.91	88	1.0
	South Tyneside	152,785		0.82	0.66	0.97	0.90	1.03	124	0.88	0.70	1.10	98	2.7
Sunderland	280,807	0.77	1.07	1.22	0.63	0.75	0.73	82	0.86	0.73	1.01	88	1.9	
North West	Cheshire	673,787												1.6
	<b>Halton</b>	<b>118,209</b>	<b>1.65</b>	<b>0.84</b>	<b>1.24</b>	<b>1.34</b>	<b>1.41</b>	<b>1.36</b>	<b>144</b>	<b>1.31</b>	<b>1.06</b>	<b>1.61</b>	<b>125</b>	<b>1.2</b>
	Knowsley	150,459	0.76	0.94	1.31	0.97	0.71	0.75	80	0.90	0.73	1.13	88	1.6
	<b>Liverpool</b>	<b>439,471</b>	<b>1.95</b>	<b>0.99</b>	<b>0.75</b>	<b>1.01</b>	<b>1.22</b>	<b>1.23</b>	<b>132</b>	<b>1.18</b>	<b>1.06</b>	<b>1.32</b>	<b>116</b>	<b>5.7</b>
	<i>Sefton</i>	282,958	0.98	1.00	0.67	0.54	0.86	0.83	102	0.81	0.69	0.95	91	1.6
	St. Helens	176,843	1.26	0.98	0.60	0.50	1.23	1.09	124	0.95	0.78	1.15	98	1.2
	<i>Warrington</i>	191,080	0.81	1.00	0.63	0.96	0.74	0.76	84	0.82	0.67	1.00	81	2.1
	Wirral	312,293	0.52	0.84	1.00	1.21	1.19	0.77	93	0.93	0.81	1.07	101	1.7
	<b>Blackburn with Darwen</b>	<b>137,470</b>	<b>0.89</b>	<b>1.45</b>	<b>1.30</b>	<b>0.98</b>	<b>1.37</b>	<b>1.40</b>	<b>138</b>	<b>1.24</b>	<b>1.01</b>	<b>1.52</b>	<b>112</b>	<b>22.1</b>
	<i>Blackpool</i>	142,283	0.81	1.02	0.37	0.43	0.63	0.55	70	0.63	0.49	0.80	73	1.6
	<i>Cumbria</i>	487,607	0.90	0.74	0.76	0.60	0.87	0.66	82	0.75	0.66	0.85	85	0.7
	<i>Lancashire</i>	1,134,975	0.94	0.64	0.60	0.57	0.61	0.66	77	0.67	0.61	0.73	70	5.3
	<i>Bolton</i>	261,037			0.97	0.74	0.69	0.84	92	0.81	0.66	1.00	83	11.0
	<i>Bury</i>	180,607			0.56	0.84	0.74	0.51	55	0.66	0.50	0.87	68	6.1
	Manchester	392,821												19.0
	<i>Oldham</i>	217,276			0.77	0.67	0.58	0.82	87	0.71	0.56	0.91	71	13.9
	Rochdale	205,357			1.01	0.82	0.57	0.83	88	0.80	0.63	1.02	80	11.4
	<i>Salford</i>	216,105			1.28	0.50	0.34	0.95	106	0.77	0.61	0.97	81	3.9
	Stockport	284,527												4.3
Tameside	213,043												5.4	
Trafford	210,145												8.4	
Wigan	301,415			0.86	0.83	0.93	0.72	80	0.83	0.69	1.01	87	1.3	
Yorkshire and the Humber	<i>East Riding of Yorkshire</i>	314,113	0.86	0.85	1.03	0.73	1.10	0.63	80	0.86	0.75	1.00	99	1.2
	Kingston upon Hull	243,588	1.02	1.07	0.97	1.27	1.26	0.92	99	1.08	0.93	1.27	106	2.3
	North East Lincolnshire	157,981	0.27	1.16	0.67	1.10	1.14	1.10	127	0.92	0.75	1.13	96	1.4
	North Lincolnshire	152,848	0.80	0.95	0.61	1.34	0.96	1.04	124	0.95	0.78	1.17	104	2.5
	North Yorkshire	569,660	0.88	1.25	0.99	1.05	0.94	0.79	98	0.98	0.89	1.08	110	1.1
	York	181,096	0.87	1.49	1.47	0.95	0.88	1.14	133	1.13	0.95	1.34	120	2.2
	Barnsley	218,063	0.77	1.10	0.70	0.92	0.70	0.91	105	0.85	0.71	1.02	89	0.9
	<i>Doncaster</i>	286,865	0.95	0.91	0.93	0.86	0.68	0.78	91	0.85	0.72	0.99	89	2.3
	Rotherham	248,175	1.64	0.87	0.98	1.18	1.18	0.92	105	1.12	0.96	1.30	116	3.1
	Sheffield	513,234	1.01	0.96	0.95	1.16	1.03	1.07	121	1.03	0.93	1.15	106	8.8
	<b>Bradford</b>	<b>467,664</b>	<b>1.58</b>	<b>1.32</b>	<b>1.53</b>	<b>1.28</b>	<b>1.33</b>	<b>0.87</b>	<b>90</b>	<b>1.31</b>	<b>1.18</b>	<b>1.45</b>	<b>123</b>	<b>21.7</b>
	Calderdale	192,405	1.19	0.70	1.34	0.82	0.77	0.88	99	0.95	0.79	1.14	96	7.0

Table 3.3: (continued)

UK Area	LA name	Tot Pop	2001	2002	2003	2004	2005	2006		2001–2006*				% non White
			O/E	O/E	O/E	O/E	O/E	O/E	Pmp	O/E	LCL	UCL	Pmp	
Yorkshire and the Humber	<b>Kirklees</b>	<b>388,567</b>	<b>0.99</b>	<b>1.26</b>	<b>1.24</b>	<b>1.33</b>	<b>0.79</b>	<b>1.20</b>	<b>1.29</b>	<b>1.13</b>	<b>1.00</b>	<b>1.28</b>	<b>111</b>	<b>14.4</b>
	Leeds	715,403	1.05	0.87	1.04	0.94	1.16	0.93	101	1.00	0.91	1.10	99	8.2
	Wakefield	315,172	0.82	0.85	0.87	1.06	0.64	1.09	124	0.89	0.77	1.03	91	2.3
East Midlands	<b>Leicester</b>	<b>279,920</b>	<b>1.28</b>	<b>1.57</b>	<b>1.68</b>	<b>1.33</b>	<b>1.42</b>	<b>1.60</b>	<b>1.57</b>	<b>1.48</b>	<b>1.30</b>	<b>1.69</b>	<b>133</b>	<b>36.1</b>
	<i>Leicestershire</i>	<i>609,578</i>	<i>1.21</i>	<i>0.84</i>	<i>0.82</i>	<i>0.76</i>	<i>0.81</i>	<i>0.94</i>	<i>108</i>	<i>0.89</i>	<i>0.80</i>	<i>0.99</i>	<i>94</i>	<i>5.3</i>
	<i>Northamptonshire</i>	<i>629,676</i>	<i>0.98</i>	<i>0.95</i>	<i>0.76</i>	<i>0.73</i>	<i>0.88</i>	<i>0.95</i>	<i>103</i>	<i>0.88</i>	<i>0.79</i>	<i>0.98</i>	<i>86</i>	<i>4.9</i>
	<i>Rutland</i>	<i>34,563</i>	<i>0.59</i>	<i>0.28</i>	<i>1.07</i>	<i>0.27</i>	<i>0.75</i>	<i>0.24</i>	<i>29</i>	<i>0.53</i>	<i>0.30</i>	<i>0.94</i>	<i>58</i>	<i>1.9</i>
	Derby	221,709			0.89	1.07	1.21	1.21	135	1.10	0.91	1.33	116	12.6
	<i>Derbyshire</i>	<i>734,585</i>	<i>0.89</i>	<i>0.46</i>	<i>0.83</i>	<i>0.71</i>	<i>0.68</i>	<i>0.69</i>	<i>83</i>	<i>0.71</i>	<i>0.64</i>	<i>0.79</i>	<i>77</i>	<i>1.5</i>
	<i>Lincolnshire</i>	<i>646,644</i>	<i>0.71</i>	<i>0.65</i>	<i>0.60</i>	<i>0.76</i>	<i>1.08</i>	<i>0.91</i>	<i>116</i>	<i>0.79</i>	<i>0.71</i>	<i>0.88</i>	<i>92</i>	<i>1.3</i>
	<b>Nottingham</b>	<b>266,988</b>	<b>1.70</b>	<b>0.64</b>	<b>0.89</b>	<b>1.10</b>	<b>1.33</b>	<b>1.29</b>	<b>131</b>	<b>1.16</b>	<b>1.00</b>	<b>1.35</b>	<b>107</b>	<b>15.1</b>
	Nottinghamshire	748,508	0.94	0.83	1.05	0.97	1.21	1.07	127	1.02	0.93	1.11	109	2.6
West Midlands	<b>Birmingham</b>	<b>977,085</b>				<b>1.70</b>	<b>1.59</b>	<b>1.64</b>	<b>1.68</b>	<b>1.64</b>	<b>1.50</b>	<b>1.80</b>	<b>161</b>	<b>29.6</b>
	<i>Dudley</i>	<i>305,153</i>	<i>0.57</i>	<i>0.61</i>	<i>0.80</i>	<i>1.16</i>	<i>0.95</i>	<i>0.97</i>	<i>115</i>	<i>0.85</i>	<i>0.73</i>	<i>0.99</i>	<i>92</i>	<i>6.3</i>
	<b>Sandwell</b>	<b>282,904</b>				<b>1.83</b>	<b>1.39</b>	<b>1.32</b>	<b>148</b>	<b>1.50</b>	<b>1.27</b>	<b>1.78</b>	<b>163</b>	<b>20.3</b>
	<b>Solihull</b>	<b>199,515</b>	<b>1.28</b>	<b>0.78</b>	<b>1.54</b>	<b>1.26</b>	<b>1.09</b>	<b>1.26</b>	<b>150</b>	<b>1.21</b>	<b>1.03</b>	<b>1.41</b>	<b>130</b>	<b>5.4</b>
	<b>Walsall</b>	<b>253,498</b>	<b>1.13</b>	<b>1.32</b>	<b>1.22</b>	<b>1.53</b>	<b>1.11</b>	<b>1.41</b>	<b>162</b>	<b>1.29</b>	<b>1.12</b>	<b>1.48</b>	<b>134</b>	<b>13.6</b>
	<b>Wolverhampton</b>	<b>236,582</b>	<b>1.25</b>	<b>1.70</b>	<b>1.62</b>	<b>1.62</b>	<b>1.55</b>	<b>1.39</b>	<b>161</b>	<b>1.53</b>	<b>1.34</b>	<b>1.74</b>	<b>160</b>	<b>22.2</b>
	<b>Coventry</b>	<b>300,849</b>	<b>1.69</b>	<b>1.51</b>	<b>1.16</b>	<b>0.85</b>	<b>0.92</b>	<b>1.11</b>	<b>120</b>	<b>1.19</b>	<b>1.04</b>	<b>1.36</b>	<b>117</b>	<b>16.0</b>
	Herefordshire, County of	174,871				0.94	0.74	0.76	97	0.81	0.61	1.06	99	0.9
	Warwickshire	505,858	1.11	1.00	0.74	0.89	0.96	1.11	130	0.97	0.87	1.08	103	4.4
	<i>Worcestershire</i>	<i>542,105</i>				<i>0.93</i>	<i>0.81</i>	<i>0.70</i>	<i>83</i>	<i>0.81</i>	<i>0.69</i>	<i>0.95</i>	<i>92</i>	<i>2.5</i>
	Shropshire	283,173				1.16	0.91	1.02	127	1.03	0.85	1.25	122	1.2
	Staffordshire	806,743												2.4
	Stoke-on-Trent	240,635												
Telford and Wrekin	158,325				1.38	0.84	1.12	114	1.11	0.84	1.46	107		5.2
East of England	Bedfordshire	381,572	0.91	0.96	0.88	0.86	0.70	1.16	126	0.91	0.80	1.05	90	6.7
	<i>Hertfordshire</i>	<i>1,033,978</i>	<i>0.88</i>	<i>0.69</i>	<i>0.73</i>	<i>0.64</i>	<i>0.75</i>	<i>0.86</i>	<i>95</i>	<i>0.76</i>	<i>0.69</i>	<i>0.83</i>	<i>76</i>	<i>6.3</i>
	<b>Luton</b>	<b>184,373</b>	<b>1.49</b>	<b>0.92</b>	<b>1.79</b>	<b>0.93</b>	<b>1.57</b>	<b>1.12</b>	<b>108</b>	<b>1.30</b>	<b>1.10</b>	<b>1.55</b>	<b>115</b>	<b>28.1</b>
	<i>Essex</i>	<i>1,310,837</i>				<i>0.98</i>	<i>0.73</i>	<i>0.84</i>	<i>98</i>	<i>0.85</i>	<i>0.77</i>	<i>0.94</i>	<i>95</i>	<i>2.9</i>
	Southend-on-Sea	160,259	0.95	1.20	1.32	0.97	1.02	1.14	137	1.10	0.92	1.32	121	4.2
	Thurrock	143,128				1.60	1.21	1.03	105	1.27	0.97	1.66	123	4.7
	Cambridgeshire	552,659	0.94	0.69	0.87	1.00	1.44	0.67	74	0.94	0.84	1.05	94	4.1
	Norfolk	796,728				0.99	1.23	1.03	134	1.08	0.97	1.21	136	1.5
	Peterborough	156,061	0.96	1.20	1.14	0.94	1.19	1.21	128	1.11	0.91	1.35	107	10.3
Suffolk	668,555				0.93	1.17	0.70	87	0.93	0.81	1.06	110	2.8	
London	Barnet	314,561					0.73	1.56	162	1.15	0.92	1.45	118	26.0
	Camden	198,020					0.97	1.39	126	1.18	0.87	1.60	106	26.8
	Enfield	273,559					1.07	1.64	168	1.36	1.08	1.71	137	22.9
	Haringey	216,505					1.38	1.60	139	1.49	1.15	1.95	127	34.4
	Islington	175,797					1.71	1.59	142	1.65	1.25	2.17	145	24.6
	Barking & Dagenham	163,942				1.13	0.62	0.78	79	0.83	0.61	1.14	81	14.8
	City of London	7,183						1.20	139	1.20	0.17	8.54	139	15.4
	<b>Hackney</b>	<b>202,824</b>				<b>1.65</b>	<b>1.72</b>	<b>1.25</b>	<b>104</b>	<b>1.54</b>	<b>1.22</b>	<b>1.93</b>	<b>122</b>	<b>40.6</b>
	Havering	224,247						0.97	116	0.97	0.66	1.42	116	4.8
	<b>Newham</b>	<b>243,889</b>				<b>1.89</b>	<b>2.08</b>	<b>2.21</b>	<b>176</b>	<b>2.06</b>	<b>1.72</b>	<b>2.48</b>	<b>157</b>	<b>60.6</b>
	Redbridge	238,634				1.34	1.05	1.01	105	1.13	0.90	1.40	112	36.5
	<b>Tower Hamlets</b>	<b>196,105</b>				<b>1.25</b>	<b>1.42</b>	<b>1.39</b>	<b>112</b>	<b>1.35</b>	<b>1.06</b>	<b>1.74</b>	<b>105</b>	<b>48.6</b>
	Waltham Forest	218,341						1.28	119	1.28	0.87	1.88	119	35.5
	Brent	263,463						1.44	137	1.44	1.04	2.00	137	54.7
	<b>Ealing</b>	<b>300,948</b>		<b>1.90</b>	<b>1.84</b>	<b>2.12</b>	<b>1.62</b>	<b>1.53</b>	<b>146</b>	<b>1.79</b>	<b>1.58</b>	<b>2.04</b>	<b>159</b>	<b>41.3</b>
	<b>Hammersmith &amp; Fulham</b>	<b>165,244</b>		<b>1.87</b>	<b>1.97</b>	<b>1.85</b>	<b>0.90</b>	<b>1.14</b>	<b>103</b>	<b>1.53</b>	<b>1.26</b>	<b>1.85</b>	<b>128</b>	<b>22.2</b>
Harrow	206,817						1.27	135	1.27	0.88	1.84	135	41.2	

Table 3.3: (continued)

UK Area	LA name	Tot Pop	2001	2002	2003	2004	2005	2006		2001–2006*				% non White
			O/E	O/E	O/E	O/E	O/E	O/E	Pmp	O/E	LCL	UCL	Pmp	
London	<b>Hillingdon</b>	<b>243,006</b>				<b>1.37</b>	<b>0.99</b>	<b>1.39</b>	<b>144</b>	<b>1.25</b>	<b>1.02</b>	<b>1.54</b>	<b>123</b>	<b>20.9</b>
	<b>Hounslow</b>	<b>212,342</b>				<b>2.26</b>	<b>1.49</b>	<b>1.64</b>	<b>155</b>	<b>1.78</b>	<b>1.47</b>	<b>2.16</b>	<b>162</b>	<b>35.1</b>
	Kensington and Chelsea	158,916						0.80	82	0.80	0.46	1.38	82	21.4
	Westminster	181,284						1.75	177	1.75	1.24	2.48	177	26.8
	Bexley	218,307	0.79	1.23	0.99	0.77	0.97	1.10	124	0.98	0.83	1.16	100	8.6
	Bromley	295,532	0.64	0.92	0.94	1.00	1.00	0.82	95	0.89	0.76	1.04	94	8.4
	<b>Greenwich</b>	<b>214,404</b>		<b>1.45</b>	<b>1.37</b>	<b>0.69</b>	<b>2.04</b>	<b>1.01</b>	<b>98</b>	<b>1.31</b>	<b>1.10</b>	<b>1.56</b>	<b>118</b>	<b>22.9</b>
	<b>Lambeth</b>	<b>266,169</b>	<b>0.81</b>	<b>1.61</b>	<b>1.31</b>	<b>1.43</b>	<b>1.84</b>	<b>1.34</b>	<b>113</b>	<b>1.40</b>	<b>1.21</b>	<b>1.63</b>	<b>108</b>	<b>37.6</b>
	<b>Lewisham</b>	<b>248,923</b>	<b>0.97</b>	<b>1.81</b>	<b>0.98</b>	<b>1.88</b>	<b>1.80</b>	<b>1.65</b>	<b>149</b>	<b>1.52</b>	<b>1.32</b>	<b>1.76</b>	<b>125</b>	<b>34.1</b>
	<b>Southwark</b>	<b>244,866</b>		<b>1.73</b>	<b>1.57</b>	<b>1.34</b>	<b>1.82</b>	<b>1.63</b>	<b>143</b>	<b>1.62</b>	<b>1.39</b>	<b>1.89</b>	<b>132</b>	<b>37.0</b>
	<b>Croydon</b>	<b>330,588</b>	<b>0.73</b>	<b>1.51</b>	<b>1.26</b>	<b>1.17</b>	<b>1.56</b>	<b>1.11</b>	<b>112</b>	<b>1.23</b>	<b>1.08</b>	<b>1.40</b>	<b>112</b>	<b>29.8</b>
	Kingston upon Thames	147,273												15.5
	Merton	187,908												25.0
	Richmond upon Thames	172,335												9.0
	Sutton	179,767				0.88	1.15	1.32	139	1.12	0.88	1.45	113	10.8
Wandsworth	260,380												22.0	
South East	<i>Hampshire</i>	<i>1,240,102</i>	<i>0.68</i>	<i>0.75</i>	<i>0.73</i>	<i>0.59</i>	<i>0.69</i>	<i>0.84</i>	<i>98</i>	<i>0.72</i>	<i>0.66</i>	<i>0.78</i>	<i>76</i>	<i>2.2</i>
	<i>Isle of Wight</i>	<i>132,731</i>	<i>0.67</i>	<i>0.70</i>	<i>0.61</i>	<i>0.67</i>	<i>0.40</i>	<i>0.55</i>	<i>75</i>	<i>0.59</i>	<i>0.46</i>	<i>0.76</i>	<i>74</i>	<i>1.3</i>
	<i>Portsmouth</i>	<i>186,700</i>	<i>1.16</i>	<i>0.70</i>	<i>0.89</i>	<i>0.61</i>	<i>0.67</i>	<i>0.70</i>	<i>75</i>	<i>0.78</i>	<i>0.63</i>	<i>0.97</i>	<i>76</i>	<i>5.3</i>
	<i>Southampton</i>	<i>217,444</i>	<i>0.70</i>	<i>0.78</i>	<i>0.78</i>	<i>0.69</i>	<i>0.68</i>	<i>0.75</i>	<i>78</i>	<i>0.73</i>	<i>0.59</i>	<i>0.90</i>	<i>69</i>	<i>7.6</i>
	Kent	1,329,716												3.1
	Medway	249,488												5.4
	Brighton and Hove	247,817				0.97	0.83	0.81	89	0.87	0.68	1.10	91	5.7
	East Sussex	492,326				1.13	0.67	0.99	134	0.92	0.80	1.07	120	2.3
	<i>Surrey</i>	<i>1,059,017</i>				<i>0.77</i>	<i>0.61</i>	<i>0.85</i>	<i>98</i>	<i>0.74</i>	<i>0.66</i>	<i>0.84</i>	<i>82</i>	<i>5.0</i>
	<i>West Sussex</i>	<i>753,612</i>				<i>0.59</i>	<i>0.79</i>	<i>0.88</i>	<i>111</i>	<i>0.76</i>	<i>0.66</i>	<i>0.87</i>	<i>92</i>	<i>3.4</i>
	Bracknell Forest	109,616				1.08	0.81	1.45	137	1.12	0.80	1.57	100	4.9
	<i>Buckinghamshire</i>	<i>479,026</i>	<i>1.03</i>	<i>0.70</i>	<i>0.67</i>	<i>0.80</i>	<i>0.67</i>	<i>0.72</i>	<i>79</i>	<i>0.76</i>	<i>0.66</i>	<i>0.87</i>	<i>76</i>	<i>7.9</i>
	Milton Keynes	207,057	0.83	0.98	1.38	1.10	0.87	0.89	82	1.01	0.83	1.22	85	9.3
	Oxfordshire	605,489	1.06	0.89	1.16	0.78	0.92	0.90	97	0.95	0.85	1.05	93	4.9
	Reading	143,096	0.96	0.76	1.11	0.64	0.97	1.08	105	0.92	0.73	1.17	82	13.2
	<b>Slough</b>	<b>119,064</b>	<b>1.40</b>	<b>1.14</b>	<b>1.57</b>	<b>1.98</b>	<b>1.94</b>	<b>1.69</b>	<b>160</b>	<b>1.63</b>	<b>1.34</b>	<b>1.99</b>	<b>140</b>	<b>36.3</b>
	West Berkshire	144,485	0.87	0.61	0.79	1.23	1.22	0.52	55	0.87	0.69	1.10	84	2.6
	Windsor & Maidenhead	133,625					1.10	0.73	82	0.91	0.62	1.33	101	7.6
Wokingham	150,231	1.03	0.53	1.22	0.94	1.01	1.04	107	0.97	0.78	1.20	90	6.1	
South West	Bath & NE Somerset	169,040	0.72	0.63	0.65	1.31	0.97	0.89	106	0.87	0.71	1.06	95	2.8
	<b>Bristol, City of</b>	<b>380,616</b>	<b>1.63</b>	<b>0.96</b>	<b>1.37</b>	<b>1.24</b>	<b>1.15</b>	<b>1.29</b>	<b>137</b>	<b>1.27</b>	<b>1.13</b>	<b>1.43</b>	<b>122</b>	<b>8.2</b>
	Gloucestershire	564,559	0.90	0.84	0.85	0.90	0.84	1.05	126	0.90	0.81	1.00	98	2.8
	North Somerset	188,564	1.12	0.92	1.34	1.24	1.16	0.91	117	1.11	0.94	1.31	129	1.4
	South Gloucestershire	245,641	1.03	1.25	1.02	1.02	1.22	1.00	110	1.09	0.93	1.27	109	2.4
	Swindon	180,051	0.64	1.10	0.98	1.28	0.60	0.73	78	0.89	0.72	1.09	85	4.8
	<i>Wiltshire</i>	<i>432,972</i>	<i>0.68</i>	<i>0.46</i>	<i>0.61</i>	<i>0.57</i>	<i>0.80</i>	<i>0.75</i>	<i>88</i>	<i>0.65</i>	<i>0.56</i>	<i>0.75</i>	<i>69</i>	<i>1.6</i>
	<i>Bournemouth</i>	<i>163,444</i>				<i>0.59</i>	<i>0.75</i>	<i>0.68</i>	<i>86</i>	<i>0.68</i>	<i>0.50</i>	<i>0.92</i>	<i>82</i>	<i>3.3</i>
	<i>Dorset</i>	<i>390,980</i>				<i>0.74</i>	<i>0.56</i>	<i>0.54</i>	<i>77</i>	<i>0.61</i>	<i>0.50</i>	<i>0.74</i>	<i>83</i>	<i>1.3</i>
	<i>Poole</i>	<i>138,288</i>				<i>0.81</i>	<i>0.46</i>	<i>0.62</i>	<i>80</i>	<i>0.63</i>	<i>0.44</i>	<i>0.89</i>	<i>77</i>	<i>1.8</i>
	<i>Somerset</i>	<i>498,095</i>	<i>0.79</i>	<i>0.94</i>	<i>0.82</i>	<i>0.91</i>	<i>0.65</i>	<i>0.82</i>	<i>104</i>	<i>0.82</i>	<i>0.73</i>	<i>0.92</i>	<i>95</i>	<i>1.2</i>
	<b>Cornwall &amp; Isles of Scilly</b>	<b>501,267</b>	<b>1.05</b>	<b>1.49</b>	<b>1.23</b>	<b>1.39</b>	<b>0.70</b>	<b>1.07</b>	<b>142</b>	<b>1.15</b>	<b>1.04</b>	<b>1.26</b>	<b>138</b>	<b>1.0</b>
	Devon	704,491	0.89	0.83	0.88	1.04	1.04	1.00	133	0.95	0.87	1.04	115	1.1
	<b>Plymouth</b>	<b>240,722</b>	<b>1.54</b>	<b>1.47</b>	<b>1.39</b>	<b>1.03</b>	<b>1.04</b>	<b>1.85</b>	<b>208</b>	<b>1.39</b>	<b>1.21</b>	<b>1.59</b>	<b>141</b>	<b>1.6</b>
	Torbay	129,706	1.18	0.46	1.07	1.31	1.00	0.91	123	0.99	0.81	1.21	122	1.2
Wales	<b>Cardiff</b>	<b>305,353</b>	<b>0.96</b>	<b>1.73</b>	<b>1.60</b>	<b>1.36</b>	<b>1.34</b>	<b>1.33</b>	<b>138</b>	<b>1.39</b>	<b>1.22</b>	<b>1.58</b>	<b>131</b>	<b>8.4</b>
	<b>Merthyr Tydfil</b>	<b>55,979</b>	<b>0.76</b>	<b>1.82</b>	<b>1.73</b>	<b>2.43</b>	<b>1.78</b>	<b>2.66</b>	<b>304</b>	<b>1.89</b>	<b>1.49</b>	<b>2.41</b>	<b>197</b>	<b>1.0</b>
	<b>Rhondda, Cynon, Taff</b>	<b>231,947</b>	<b>1.19</b>	<b>1.53</b>	<b>1.08</b>	<b>1.63</b>	<b>1.37</b>	<b>1.32</b>	<b>151</b>	<b>1.35</b>	<b>1.18</b>	<b>1.56</b>	<b>141</b>	<b>1.2</b>

Table 3.3: (continued)

UK Area	LA name	Tot Pop	2001	2002	2003	2004	2005	2006		2001–2006*				% non
			O/E	O/E	O/E	O/E	O/E	O/E	Pmp	O/E	LCL	UCL	Pmp	White
Wales	The Vale of Glamorgan	119,292	0.87	1.16	0.95	1.27	0.74	1.42	168	1.07	0.86	1.33	115	2.2
	Carmarthenshire	172,842	1.10	1.10	1.40	1.10	1.07	1.04	133	1.13	0.96	1.34	132	0.9
	Ceredigion	74,941	1.42	1.36	0.59	0.82	0.77	0.42	53	0.88	0.65	1.17	100	1.4
	Pembrokeshire	114,131	1.25	0.87	1.21	0.76	1.20	0.96	123	1.04	0.84	1.29	121	0.9
	Powys	126,353	0.73	0.69	0.33	0.99	1.30	0.84	111	0.82	0.66	1.03	99	0.9
	Blaenau Gwent	70,064	1.33	1.27	0.13	1.08	1.14	0.98	114	0.98	0.73	1.32	105	0.8
	<b>Caerphilly</b>	<b>169,519</b>	<b>0.96</b>	<b>1.47</b>	<b>1.05</b>	<b>1.05</b>	<b>1.59</b>	<b>1.37</b>	<b>153</b>	<b>1.26</b>	<b>1.06</b>	<b>1.50</b>	<b>128</b>	<b>0.9</b>
	Monmouthshire	84,885	2.07	1.21	0.73	1.05	1.17	0.94	118	1.18	0.93	1.49	134	1.1
	Newport	137,012	1.26	1.05	1.43	0.93	0.94	1.17	131	1.13	0.92	1.38	116	4.8
	Torfaen	90,949	1.37	1.42	1.14	0.94	0.88	1.03	121	1.12	0.88	1.43	119	0.9
	<b>Bridgend</b>	<b>128,645</b>	<b>1.21</b>	<b>1.16</b>	<b>1.76</b>	<b>1.32</b>	<b>1.10</b>	<b>1.46</b>	<b>171</b>	<b>1.34</b>	<b>1.11</b>	<b>1.61</b>	<b>143</b>	<b>1.4</b>
	<b>Neath Port Talbot</b>	<b>134,468</b>	<b>1.33</b>	<b>1.40</b>	<b>1.54</b>	<b>1.34</b>	<b>0.88</b>	<b>1.33</b>	<b>164</b>	<b>1.30</b>	<b>1.08</b>	<b>1.56</b>	<b>145</b>	<b>1.1</b>
	<b>Swansea</b>	<b>223,300</b>	<b>2.10</b>	<b>1.41</b>	<b>1.75</b>	<b>1.22</b>	<b>0.99</b>	<b>1.36</b>	<b>166</b>	<b>1.46</b>	<b>1.27</b>	<b>1.66</b>	<b>161</b>	<b>2.2</b>
	Conwy	109,596		1.23	0.51	1.10	0.75	0.93	128	0.90	0.70	1.15	115	1.1
	Denbighshire	93,065	0.31	0.68	0.28	1.02	1.91	0.59	75	0.81	0.62	1.07	95	1.2
	<b>Flintshire</b>	<b>148,594</b>		<b>1.32</b>	<b>1.26</b>	<b>1.13</b>	<b>1.37</b>	<b>1.20</b>	<b>135</b>	<b>1.25</b>	<b>1.03</b>	<b>1.53</b>	<b>131</b>	<b>0.8</b>
	<b>Gwynedd</b>	<b>116,843</b>		<b>1.60</b>	<b>1.53</b>	<b>1.22</b>	<b>1.50</b>	<b>1.45</b>	<b>180</b>	<b>1.46</b>	<b>1.20</b>	<b>1.78</b>	<b>168</b>	<b>1.2</b>
	<b>Isle of Anglesey</b>	<b>66,829</b>		<b>0.96</b>	<b>1.44</b>	<b>1.17</b>	<b>1.71</b>	<b>1.29</b>	<b>165</b>	<b>1.32</b>	<b>1.01</b>	<b>1.73</b>	<b>156</b>	<b>0.7</b>
	Wrexham	128,476	1.24	1.03	1.28	0.83	1.20	1.02	117	1.10	0.89	1.35	114	1.1
Scotland	Aberdeen City	212,125	0.83	1.15	0.99	1.71	1.07	0.65	71	1.06	0.90	1.26	106	
	Aberdeenshire	226,871	1.02	1.11	0.71	0.93	1.03	0.79	88	0.93	0.78	1.10	93	
	<b>Angus</b>	<b>108,400</b>	<b>1.55</b>	<b>2.18</b>	<b>0.91</b>	<b>1.33</b>	<b>1.09</b>	<b>0.75</b>	<b>92</b>	<b>1.28</b>	<b>1.04</b>	<b>1.57</b>	<b>143</b>	
	Argyll & Bute	91,306	0.96	0.71	1.35	0.97	0.81	0.78	99	0.93	0.72	1.20	106	
	Scottish Borders	106,764	0.36	0.94	0.73	1.39	0.76	0.88	112	0.85	0.66	1.09	98	
	Clackmannanshire	48,077	0.92	1.10	1.46	1.05	1.18	0.76	83	1.07	0.76	1.53	107	
	West Dunbartonshire	93,378	1.75	0.56	0.64	1.39	0.40	1.34	150	1.00	0.77	1.30	102	
	<b>Dumfries &amp; Galloway</b>	<b>147,765</b>	<b>1.46</b>	<b>1.34</b>	<b>1.39</b>	<b>1.04</b>	<b>1.25</b>	<b>1.15</b>	<b>149</b>	<b>1.27</b>	<b>1.07</b>	<b>1.50</b>	<b>149</b>	
	<b>Dundee City</b>	<b>145,663</b>	<b>1.42</b>	<b>1.42</b>	<b>1.86</b>	<b>1.29</b>	<b>2.17</b>	<b>1.34</b>	<b>158</b>	<b>1.59</b>	<b>1.35</b>	<b>1.87</b>	<b>170</b>	
	East Ayrshire	120,235	1.31	0.75	1.11	0.64	1.20	1.51	175	1.10	0.88	1.36	115	
	East Dunbartonshire	108,243	0.69	0.75	1.33	0.71	0.67	1.28	148	0.91	0.71	1.17	95	
	East Lothian	90,088	0.91	0.98	0.31	0.83	1.07	0.75	89	0.81	0.61	1.07	87	
	East Renfrewshire	89,311	0.61	0.46	0.99	0.88	1.24	1.09	123	0.89	0.68	1.18	91	
	Edinburgh, City of	448,624	0.85	0.81	1.04	1.05	1.00	1.01	109	0.96	0.85	1.09	95	
	Falkirk	145,191	1.03	0.57	0.67	0.68	1.14	0.91	103	0.84	0.67	1.05	86	
	Fife	349,429	1.18	1.13	0.93	1.02	1.39	0.99	114	1.11	0.98	1.26	116	
	<b>Glasgow City</b>	<b>577,869</b>	<b>1.19</b>	<b>1.27</b>	<b>1.73</b>	<b>1.42</b>	<b>1.26</b>	<b>1.09</b>	<b>118</b>	<b>1.32</b>	<b>1.21</b>	<b>1.45</b>	<b>130</b>	
	<b>Highland</b>	<b>208,914</b>	<b>1.36</b>	<b>1.26</b>	<b>1.46</b>	<b>1.29</b>	<b>1.83</b>	<b>1.00</b>	<b>120</b>	<b>1.36</b>	<b>1.18</b>	<b>1.58</b>	<b>148</b>	
	<b>Inverclyde</b>	<b>84,203</b>	<b>1.62</b>	<b>2.26</b>	<b>1.13</b>	<b>1.02</b>	<b>0.96</b>	<b>0.82</b>	<b>95</b>	<b>1.28</b>	<b>1.01</b>	<b>1.62</b>	<b>135</b>	
	<b>Midlothian</b>	<b>80,941</b>	<b>0.80</b>	<b>1.02</b>	<b>1.70</b>	<b>2.08</b>	<b>1.03</b>	<b>1.54</b>	<b>173</b>	<b>1.37</b>	<b>1.08</b>	<b>1.74</b>	<b>140</b>	
	Moray	86,940	0.72	0.92	1.32	0.99	1.34	1.39	161	1.13	0.88	1.45	119	
	North Ayrshire	135,817	0.47	1.34	1.20	1.21	1.26	1.53	177	1.18	0.97	1.44	124	
	North Lanarkshire	321,067	1.42	1.23	1.26	0.98	0.79	0.94	100	1.09	0.95	1.25	105	
	Orkney Islands	19,245	1.05	1.50	1.90	0.48	1.34	0.86	104	1.18	0.71	1.96	130	
	Perth & Kinross	134,949	0.79	1.24	1.31	1.31	0.86	0.65	82	1.02	0.83	1.25	116	
	<b>Renfrewshire</b>	<b>172,867</b>	<b>1.06</b>	<b>1.79</b>	<b>1.19</b>	<b>1.20</b>	<b>1.22</b>	<b>0.92</b>	<b>104</b>	<b>1.22</b>	<b>1.03</b>	<b>1.45</b>	<b>125</b>	
	<i>Shetland Islands</i>	<i>21,988</i>	<i>0.00</i>	<i>0.00</i>	<i>0.46</i>	<i>1.40</i>	<i>0.44</i>	<i>0.00</i>	<i>0</i>	<i>0.39</i>	<i>0.16</i>	<i>0.93</i>	<i>38</i>	
	South Ayrshire	112,097	0.85	0.65	1.16	0.70	1.02	0.63	80	0.84	0.66	1.07	97	
	South Lanarkshire	302,216	1.37	1.20	0.91	0.99	0.86	1.01	113	1.05	0.91	1.21	106	
<i>Stirling</i>	<i>86,212</i>	<i>0.75</i>	<i>0.72</i>	<i>0.68</i>	<i>0.68</i>	<i>0.32</i>	<i>1.03</i>	<i>116</i>	<i>0.70</i>	<i>0.50</i>	<i>0.96</i>	<i>72</i>		
West Lothian	158,714	0.54	0.96	0.56	0.64	1.19	1.15	113	0.85	0.68	1.07	77		
Eilean Siar	26,502	0.36	0.68	0.97	1.29	0.00	0.88	113	0.70	0.40	1.20	82		
N Ireland	Antrim	48,366					2.31	1.34	124	1.82	1.11	2.97	165	
	Ards	73,244					1.05	0.63	68	0.84	0.49	1.44	89	

Table 3.3: (continued)

UK Area	LA name	Tot Pop	2001	2002	2003	2004	2005	2006		2001–2006*				% non White
			O/E	O/E	O/E	O/E	O/E	O/E	Pmp	O/E	LCL	UCL	Pmp	
N Ireland	Armagh	54,262					1.98	0.76	74	1.36	0.80	2.29	129	
	Ballymena	58,610					1.32	1.11	119	1.21	0.73	2.01	128	
	Ballymoney	26,895					1.87	0.72	74	1.29	0.61	2.70	130	
	Banbridge	41,389					1.01	1.46	145	1.24	0.67	2.31	121	
	Belfast	277,391					1.26	1.43	148	1.35	1.07	1.68	137	
	Carrickfergus	37,658					2.43	2.86	292	2.65	1.71	4.10	266	
	Castlereagh	66,488					2.33	1.33	150	1.82	1.25	2.65	203	
	Coleraine	56,314					2.62	1.01	107	1.80	1.17	2.76	186	
	Cookstown	32,581					2.73	0.99	92	1.84	1.02	3.32	169	
	Craigavon	80,671					1.70	0.50	50	1.09	0.68	1.75	105	
	Derry	105,066					1.17	1.68	143	1.43	0.97	2.12	119	
	Down	63,828					1.82	2.23	219	2.03	1.37	3.01	196	
	Dungannon	47,735					1.13	0.65	63	0.89	0.44	1.77	84	
	Fermanagh	57,527					1.05	1.34	139	1.20	0.71	2.02	122	
	Larne	30,833					0.92	0.59	65	0.75	0.31	1.80	81	
	Limavady	32,422					1.46	1.41	123	1.43	0.72	2.87	123	
	Lisburn	108,694					1.60	0.87	83	1.23	0.83	1.81	115	
	Magherafelt	39,778					1.41	1.09	101	1.25	0.65	2.39	113	
	Moyle	15,932					0.00	1.75	188	0.89	0.29	2.77	94	
	Newry and Mourne	87,058					0.90	0.74	69	0.82	0.47	1.41	75	
	Newtownabbey	79,996					0.98	1.06	113	1.02	0.64	1.64	106	
	North Down	76,323					1.19	0.80	92	0.99	0.62	1.59	111	
	Omagh	47,953					0.70	1.35	125	1.03	0.54	1.98	94	
	Strabane	38,246					0.58	0.83	78	0.71	0.29	1.70	65	

In the UK, for adults in 2006, the crude annual acceptance rates in Local Authorities (with a population >150,000) varied significantly from 55 in Bury (population 180,607) to 208 in Plymouth (pop. 240,722), 177 in Westminster (pop. 181,284) and 176 in Newham (pop. 243,889). The standardised rate ratios for acceptance varied

from 0.51 (Bury) to 2.21 (Newham) (Table 3.3). The acceptance ratio for West Berkshire was 0.52 in 2006, a drop of 62% from that in 2005. This could be due to the fact that the London West centre whose catchment population includes West Berkshire, may not be sending a complete cohort of patients starting RRT.

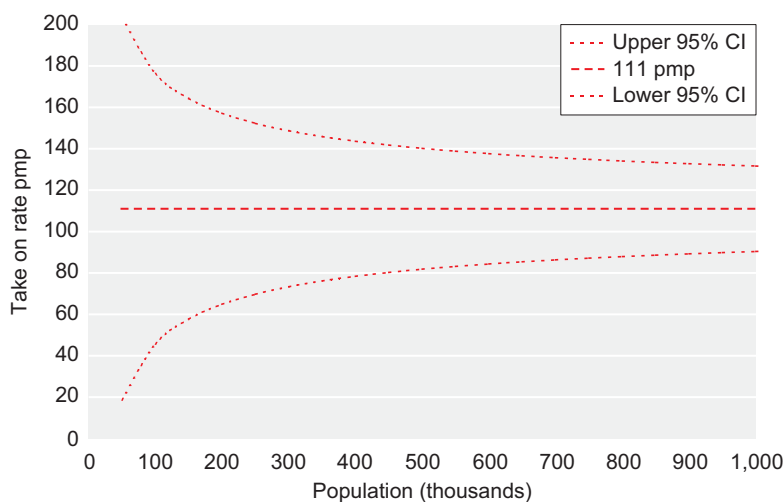


Figure 3.2: 95% confidence limits for take on rate of 111 pmp for population size 50,000–1 million

### Local Authority acceptance rates 2001–2006

Over the 6 years from 2001 to 2006 there were wide variations in annual standardised acceptance ratios in areas with small populations, especially those with habitually low take-on rates.

By combining data from six years it was possible to identify significant differences between relatively small populations for which similar analysis would not be meaningful for a single year. This does however ignore trends within this period. As examples, Wiltshire still has a low acceptance ratio but it does appear to be rising and Bath has risen from a low ratio to become average.

Over the period 2001–2006, of those areas with data for a minimum of 3 years, 38 had significantly low acceptance ratios, all but two of them (Shetland and Stirling) were in England. Ten of these areas had ratios below 0.7: Shetland Islands (0.39), Rutland (0.53), Isle of Wight (0.59), Dorset (0.61), Poole (0.63), Blackpool (0.63), Wiltshire (0.65), Bury (0.66), Lancashire (0.67) and Bournemouth (0.68).

In those areas with significantly low ratios, 3.6% of the population were non-White; only Oldham (13.5%) and Bolton (11%) had >10% non-White. Over the same period 48 had significantly high ratios, 30 of whom were in

England (including 19 in London and the West Midlands), 10 in Wales and 8 in Scotland. Four of the 48 had ratios greater than 1.7 (Hounslow (1.78), Ealing (1.79), Merthyr Tydfil (1.89) and Newham (2.06)). In those areas with significantly high ratios, the mean percentage of non-Whites in the population was 20.5, and 24 of these areas had ethnic minority populations of more than 10%. Of the remaining 24 high acceptance areas, 8 were in Scotland where data on ethnicity were not available. The remaining 16 areas had high acceptance ratios without large ethnic minorities: 10 in Wales and 3 in the South-West.

The relationship between ethnicity and take-on rate is explored further in Figure 3.3 in which standardised acceptance ratios derived from these combined data are plotted against the percentage of non-Whites in the general population (ONS 2001 census) corresponding to the same area. It can be seen that in general, areas with a high ethnic minority population (and/or a socially deprived population, as shown in previous reports) have high standardised acceptance rate ratios.

The age standardised rates (Table 3.3) are all relative to an overall acceptance rate which still has not been adjusted for social deprivation and ethnicity, adjustments which would allow the population RRT requirement to be more accurately calculated.

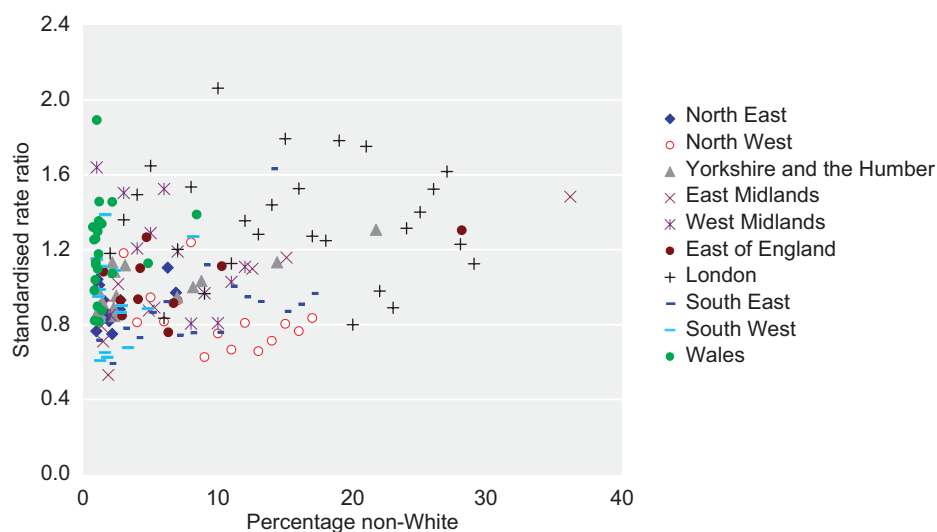


Figure 3.3: Relationship between ethnic mix and acceptance ratio (2001–2006)

**Table 3.4: Percentage of patients in different ethnic groups by centre**

Country	Centre	Completion %	Percentage in each ethnic group					
			White	Black	South Asian	Chinese	Other	
England	Glouc	100.0	100.0					
	Dorset	100.0	98.2	1.8				
	Nottm	100.0	92.6	2.2	4.4			0.7
	Basldn	100.0	90.9	4.5	4.5			
	ManWst	100.0	86.6		12.6	0.8		
	Stevng	100.0	85.2	6.1	8.7			
	Redng	100.0	83.3	2.8	9.7			4.2
	Dudley	100.0	80.0	4.4	15.6			
	L West	100.0	45.6	13.2	24.6			16.5
	L Rfree	99.5	46.3	22.4	18.5	2.0		10.7
	Newc	98.2	95.4	0.9	1.9	0.9		0.9
	Wolve	97.8	84.6	5.5	9.9			
	B QEH	97.3	73.1	9.3	13.7	0.5		3.3
	L Barts	96.6	46.8	10.4	30.1	0.6		12.1
	Middlbr	95.9	95.7		3.2	1.1		
	York	95.7	97.8					2.2
	Leic	95.4	83.0	2.6	13.9			0.4
	B Heart	94.1	73.2	4.5	22.3			
	Bradfd	93.9	56.5	2.2	39.1			2.2
	L Kings	93.7	61.5	26.9	9.6	1.9		
	Carlis	92.6	100.0					
	Prstn	90.1	86.2	1.8	11.0			0.9
	Bristol	88.4	95.4	2.0	2.6			
	Wirral	87.5	100.0					
	Sund	82.8	97.9			2.1		
	Shrew	81.5	97.7		2.3			
	Covnt	80.8	81.0	4.8	13.1	1.2		
	Ipswi	73.8	93.5	6.5				
	Sheff	73.7	93.5	1.6	3.3	0.8		0.8
	Camb	72.8	94.0	1.5	4.5			
	Ports	71.8	96.8	1.6	1.6			
	Liv RI	69.7	97.0			2.0		1.0
Oxford	60.1	82.7	4.1	10.2			3.1	
Truro	58.0	96.6	3.4					
L Guys	57.9	51.9	44.2	2.6	1.3			
Liv Ain	55.6	95.0		5.0				
N Ireland	Tyrone	90.0	100.0					
	Belfast	77.0	100.0					
	Antrim	61.3	100.0					
Scotland	Airdrie	94.5	100.0					
Wales	Swanse	98.2	98.2	1.8				
	Bangor	52.5	100.0					
<b>England</b>		<b>75.4</b>	<b>79.9</b>	<b>6.3</b>	<b>10.4</b>	<b>0.5</b>	<b>2.9</b>	
<b>N Ireland</b>		<b>71.9</b>	<b>100.0</b>					
<b>Scotland</b>		<b>12.2</b>	<b>100.0</b>					
<b>Wales</b>		<b>47.1</b>	<b>97.4</b>	<b>1.6</b>	<b>1.1</b>			
<b>UK</b>		<b>67.6</b>	<b>81.7</b>	<b>5.8</b>	<b>9.5</b>	<b>0.4</b>	<b>2.6</b>	

Centres with less than 10 patients and those with less than 50% returns are not shown.  
The country and overall averages include all centres.

## Ethnicity

Only 25 (39%) of the 64 centres submitting returns provided ethnicity data 90% or more complete. Whilst for 42 (66%) centres, the data was 50% or more complete (Table 3.4). This is similar to last year. This degree of incompleteness still makes the results of analysis of ethnicity data unreliable. In those centres with over 90% returns there was great variation in the percentage of new patients from ethnic minorities ranging from 0% in Tyrone, Gloucester, Carlisle and Airdrie to over 50% at the Royal Free, London Barts and London West. All the latter centres include areas with high standardised acceptance rates.

## Age

The median ages of patients starting renal replacement therapy were 64.6 years in England, 68.2 years in Northern Ireland, 65.5 years in Scotland, 67.5 years in Wales and for the whole UK 65.0 years (Table 3.5). These values have changed only minimally over the period 2000–2006.

In England and Scotland the acceptance rate is highest in the 75–79 age group (at 407 and 507 pmp respectively). In Wales and Northern Ireland the peak is in the 80–84 age group (at 567 and 759 pmp respectively) (Table 3.6). In the whole UK, 50% of accepted patients were aged over 65 years, the proportions being greater in Northern Ireland (58%), Wales (56%) and Scotland (51%), than in England (49%).

The median age of 59.1 years for incident UK non-White patients in 2006 was considerably lower than for Whites, possibly reflecting the lower median age of the ethnic minority

**Table 3.6: Acceptance rate per million population (pmp) within age groups by country**

Age	Pmp			
	England	Wales	Scotland	N Ireland
20–24	28	12	35	9
25–29	36	54	35	17
30–34	39	81	39	24
35–39	69	71	60	39
40–44	97	102	85	128
45–49	113	108	98	127
50–54	113	101	140	91
55–59	167	243	181	169
60–64	242	222	199	272
65–74	352	367	370	503
75–79	407	546	507	494
80–84	359	567	371	759
85–89	232	564	152	372
90+	39	155	0	0

populations in general compared with the White population.

Large variations persist in the median age of incident patients by centre (Figure 3.4). In three centres the median age was <60 years (Airdrie, Guys and Newcastle) and in five it was over 70 years (Dumfries & Galloway, Chelmsford, Swansea, Clwyd, and Antrim). These apparent differences between centres must be interpreted with extreme caution. Much of the difference maybe due to chance fluctuations because of low numbers taken on. Whether or not the centre is a transplant centre may also be a factor. Transplant patients are younger on average than dialysis patients, so importing of patients for pre-emptive transplantation will lower the median age. The median age of new patients in transplant centres was slightly but significantly lower than that in non-transplant centres (63.8 vs 66.5 years:  $p = <0.001$ ). There may be differences in local population demographics including

**Table 3.5: Median age of patients starting renal replacement therapy 2000–2006**

Country	Year						
	2000	2001	2002	2003	2004	2005	2006
England	64.0	64.8	65.4	64.6	64.9	65.2	64.6
N Ireland						68.1	68.2
Scotland	64.8	66.6	65.3	66.5	65.5	65.9	65.5
Wales	66.7	65.4	67.0	66.5	68.7	67.4	67.5
<b>UK</b>	<b>64.5</b>	<b>65.2</b>	<b>65.5</b>	<b>65.0</b>	<b>65.2</b>	<b>65.5</b>	<b>65.0</b>

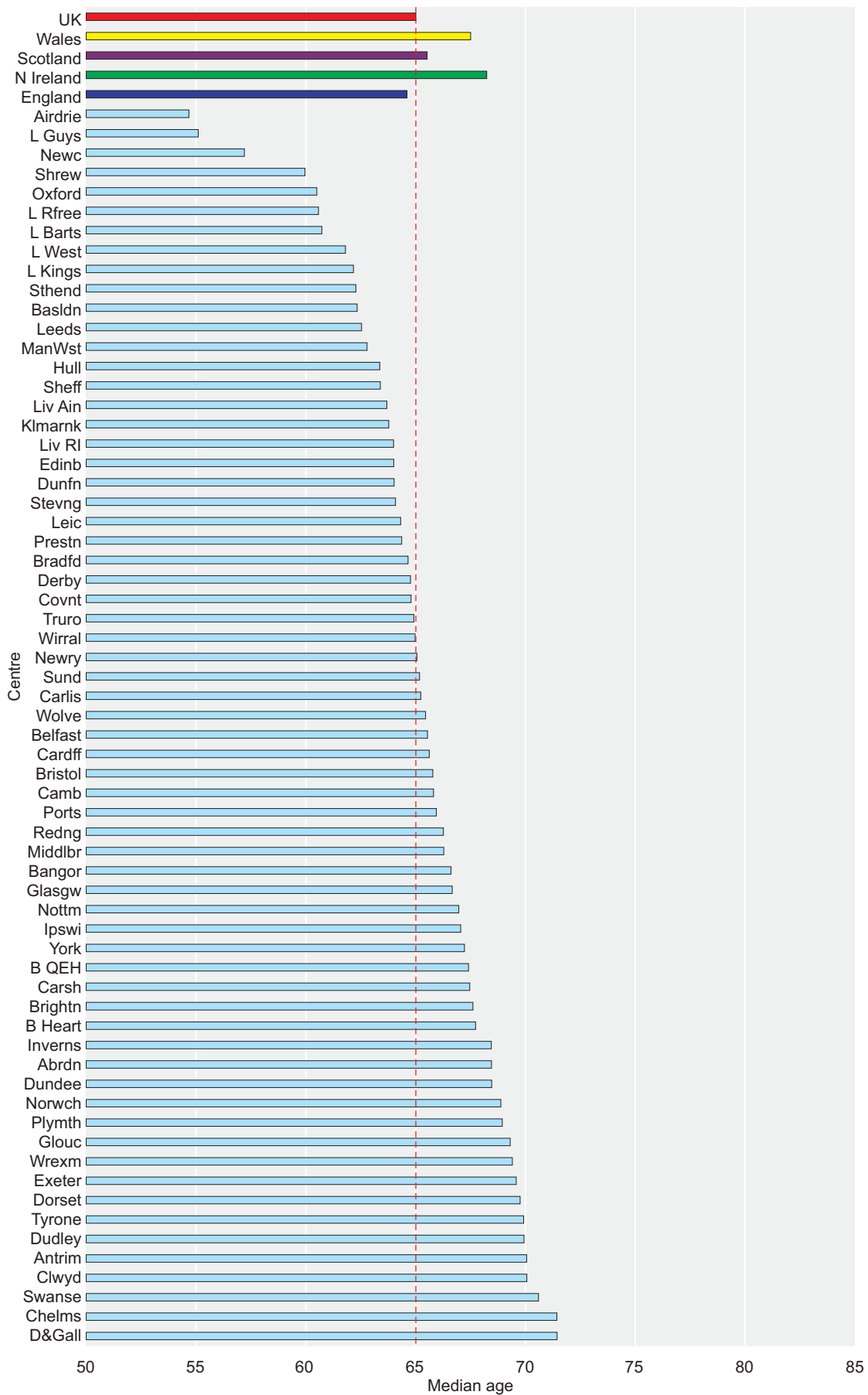


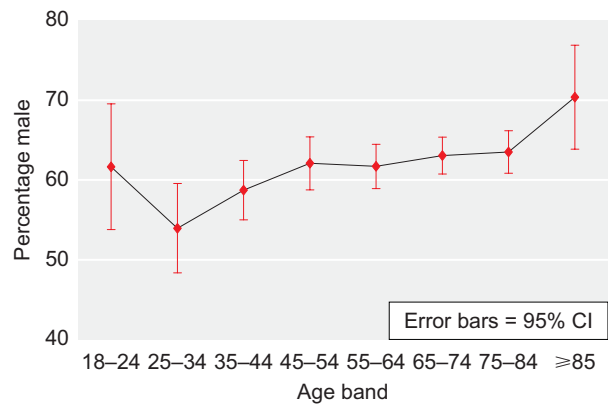
Figure 3.4: Median age of incident patients in each centre in 2006

the proportion of ethnic minorities in the catchment area. There may then be differences in the prevalence, nature and management of renal disease and in approaches to conservative management.

### Gender

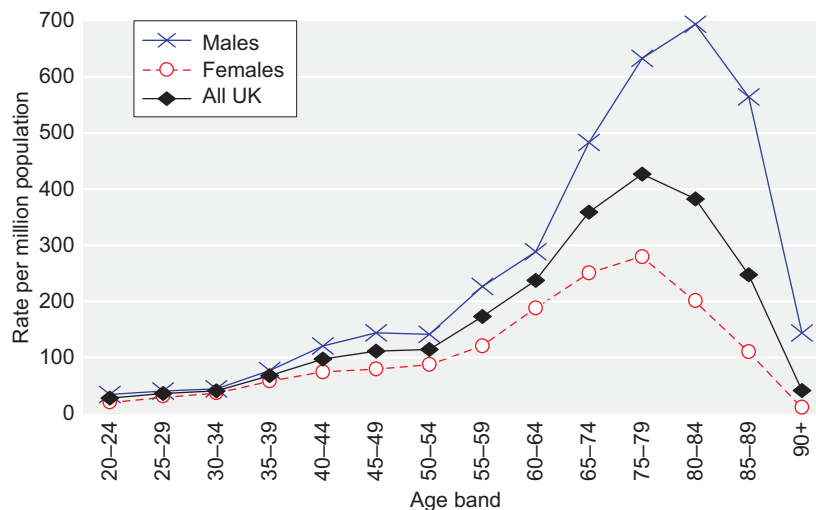
As in previous Registry reports there was an excess of males starting RRT in all age groups (Figure 3.5), with the relative proportion of males increasing in the very old (Figure 3.6).

In the whole UK, 62% of the 2006 incident cohort were male. All reporting centres except three had an excess of incident males, percentages varying from 37 to 76 (Figure 3.7). These extremes are likely to be an effect of small numbers as all three centres reporting less than 50%



**Figure 3.6: Percentage of males by age group among those starting RRT in 2006**

incident males in 2006 took on less than 50 patients in that year and Wrexham which had greater than 75% incident males took on only 25 patients.



**Figure 3.5: Incident rates by age and gender in 2006**

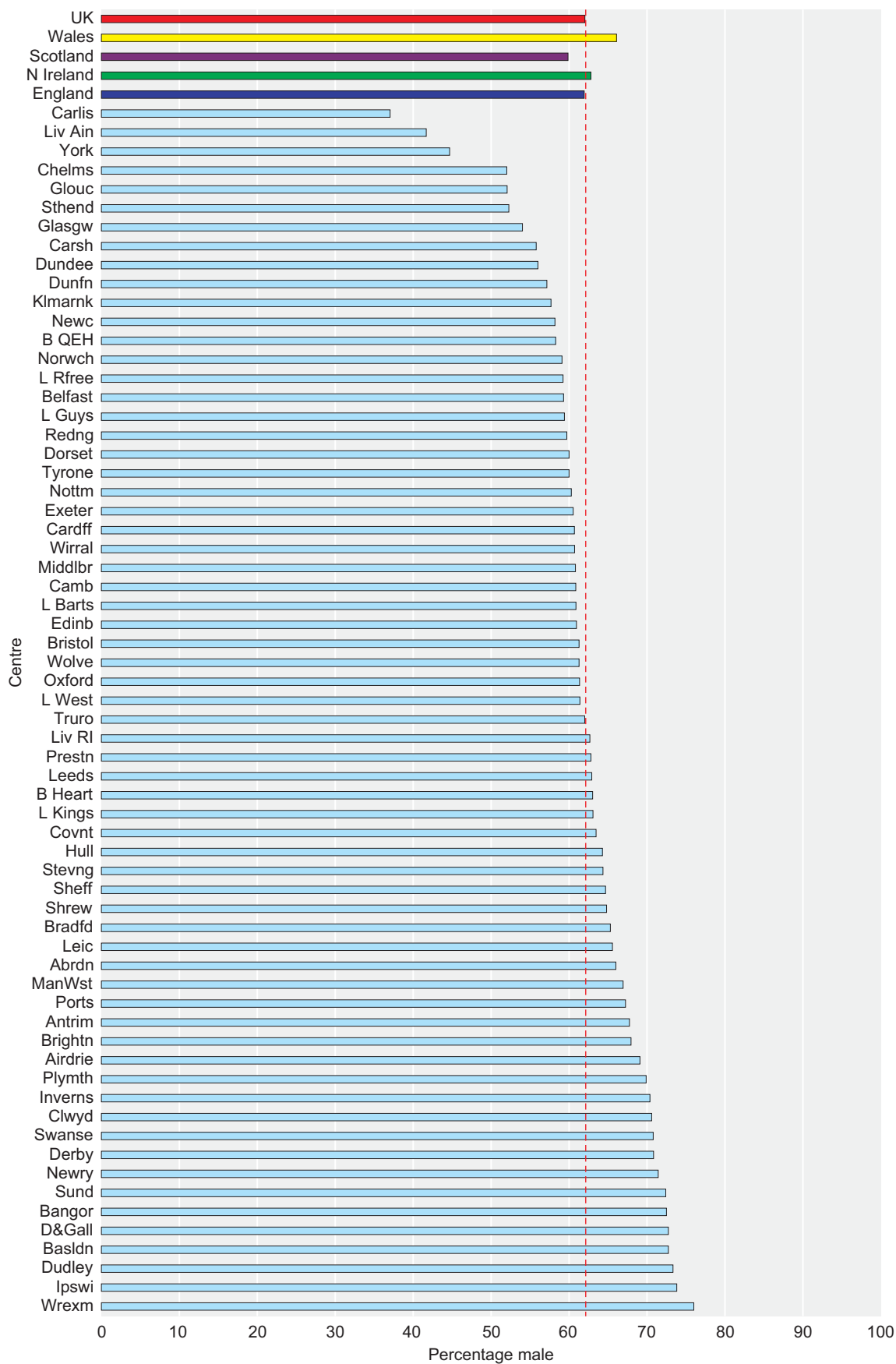


Figure 3.7: Percentage of incident patients who are male in each centre in 2006

## Primary renal diagnosis

### *Proportion of patients with each primary renal diagnosis*

The distribution of new patients by age, gender and cause of ERF is shown in Table 3.7. Patients with adult polycystic kidney disease (APKD) are relatively young when they develop ERF and this diagnosis was approximately 3 times more common in the younger incident cohort. Similarly the diagnoses of glomerulonephritis (twice as frequently diagnosed) and diabetes (40% more frequently diagnosed) were relatively more common in these younger patients. This contrasts with renal vascular disease which was over 5 times more common and hypertension which was 46% more common in the older cohort. Perhaps not surprisingly, uncertainty about the underlying diagnosis (aetiology uncertain/glomerulonephritis not biopsy proven), was also more common in the older cohort. For most primary renal diagnoses, the male to female ratio was >1.5:1. The gender imbalance may relate in part to the presence of hypertension, atheroma and renal vascular disease, which were more common in males and with increasing age. These factors may influence the rate of progression of renal failure. As would be expected from the mode of inheritance, APKD is a major exception, the ratio being much nearer to one for this condition.

The proportion of null returns for primary renal diagnosis again increased from a UK mean of 9.2% in 2004 to 12.0% in 2005 and 14.4% in 2006. This was mainly due to an increase in England, the proportions in Northern Ireland, Scotland and Wales have decreased. There was also very marked variation between centres (Table 3.8). There has been a slight reduction in the UK as a whole and in each individual home country with respect to the diagnosis aetiology uncertain/glomerulonephritis not biopsy proven, though there was still huge variation between centres. Some of this variation was likely to reflect the lack of clear definition of certain diagnostic categories eg hypertensive disease and renal vascular disease and some may have resulted from differences between centres in the degree of certainty required to record other diagnoses.

Diabetic nephropathy remained the most frequent specific primary renal diagnosis in the UK at about 22%. The proportion with this diagnosis has increased since 2005 from 20% in the UK as a whole and has risen in each of the home countries. The proportions of the other major diagnoses have changed little.

### *Incidence rates of primary renal diagnoses*

Table 3.9 shows the primary renal disease diagnosis incidence rates per million population in

**Table 3.7: Percentage distribution of primary renal diagnosis by age and gender ratio, in 2006 incident cohort**

Diagnosis	UK <65		UK ≥65		UK All		M:F
	Incl. not sent	Excl. not sent	Incl. not sent	Excl. not sent	Incl. not sent	Excl. not sent	
Aetiology uncertain/GN*							
not biopsy proven	18.3	21.0	26.5	31.5	22.4	26.2	1.6
GN* biopsy proven	11.8	13.6	5.9	7.0	8.9	10.4	2.3
Pyelonephritis	6.2	7.2	6.0	7.2	6.1	7.2	1.4
Diabetes	22.1	25.4	15.9	18.9	19.0	22.2	1.6
Renal vascular disease	1.9	2.2	9.7	11.6	5.8	6.8	2.0
Hypertension	3.7	4.3	5.4	6.5	4.6	5.4	2.2
Polycystic kidney	8.9	10.2	2.6	3.1	5.8	6.7	1.2
Other	14.1	16.2	12.0	14.3	13.1	15.3	1.4
Not sent	13.0	–	15.9	–	14.4	–	1.6
Number of patients	3,121	2,715	3,124	2,628	6,245	5,343	

\*GN – glomerulonephritis.

**Table 3.8: Percentage distribution of primary renal diagnosis by centre in 2006 incident cohort**

Country	Centre	Not sent	Aetiology uncertain/ GN* not biopsy proven	Diabetes	Glomerulonephritis	Hypertension	Other	Polycystic kidney	Pyelonephritis	Renovascular disease
England	B Heart	0.0	26.9	24.4	10.9	3.4	13.5	4.2	11.8	5.0
	B QEH	61.5								
	Basldn	2.3	9.3	20.9	11.6	4.7	16.3	7.0	9.3	20.9
	Bradfd	10.2	22.7	31.8	13.6	2.3	13.6	4.6	2.3	9.1
	Brightn	50.4								
	Bristol	19.1	21.4	24.3	15.7	3.6	12.9	8.6	10.0	3.6
	Camb	0.0	89.1	1.1	3.3	0.0	4.4	1.1	1.1	0.0
	Carlis	0.0	0.0	22.2	0.0	11.1	25.9	11.1	3.7	25.9
	Carsh	43.2								
	Chelms	0.0	38.0	12.0	2.0	6.0	16.0	12.0	10.0	4.0
	Covnt	1.9	15.7	23.5	13.7	13.7	9.8	6.9	7.8	8.8
	Derby	0.0	19.4	31.9	16.7	0.0	9.7	4.2	13.9	4.2
	Dorset	3.6	22.6	17.0	17.0	5.7	13.2	17.0	5.7	1.9
	Dudley	2.2	25.0	29.6	13.6	9.1	6.8	2.3	9.1	4.6
	Exeter	37.7								
	Glouc	0.0	30.1	19.2	5.5	2.7	19.2	9.6	4.1	9.6
	Hull	3.1	14.7	25.3	9.5	7.4	19.0	7.4	11.6	5.3
	Ipswi	2.4	53.7	14.6	4.9	2.4	12.2	7.3	2.4	2.4
	L Barts	0.6	19.1	37.1	8.4	5.6	14.0	5.6	5.6	4.5
	L Guys	0.8	12.1	24.2	11.4	9.1	25.0	6.8	3.8	7.6
	L Kings	1.8	1.8	21.1	10.1	10.1	45.9	3.7	4.6	2.8
	L Rfree	100.0								
	L West	8.5	14.1	31.7	12.1	12.9	15.7	6.8	4.4	2.4
	Leeds	44.1								
	Leic	20.8	21.5	20.9	12.0	1.6	17.3	9.4	7.3	10.0
	Liv Ain	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Liv RI	0.7	53.2	13.5	5.7	6.4	7.1	4.3	7.1	2.8
	ManWst	0.0	96.1	0.8	0.0	0.0	0.8	0.0	0.8	1.6
	Middlbr	6.2	26.4	18.7	13.2	9.9	4.4	8.8	9.9	8.8
	Newc	3.6	18.9	17.0	15.1	1.9	23.6	7.6	9.4	6.6
	Norwch	0.0	42.7	21.8	10.9	3.6	9.1	5.5	3.6	2.7
	Nottm	0.0	21.3	23.5	12.5	3.7	16.2	6.6	8.1	8.1
	Oxford	3.1	22.2	27.2	12.0	1.3	20.9	10.1	3.2	3.2
	Plymth	2.2	19.8	16.5	12.1	3.3	20.9	5.5	7.7	14.3
	Ports	3.5	23.2	26.2	7.7	5.4	16.7	10.7	6.0	4.2
	Prstn	13.2	15.2	29.5	10.5	19.1	13.3	6.7	4.8	1.0
	Redng	0.0	20.8	16.7	5.6	2.8	25.0	6.9	13.9	8.3
	Sheff	13.2	37.2	16.6	9.7	2.8	12.4	6.2	11.0	4.1
	Shrew	1.9	22.6	24.5	7.6	7.6	15.1	7.6	9.4	5.7
	Stevng	0.0	31.3	27.8	8.7	3.5	19.1	4.4	3.5	1.7
	Sthend	2.3	23.3	20.9	16.3	7.0	16.3	4.7	4.7	7.0
	Sund	5.2	9.1	25.5	9.1	18.2	20.0	7.3	1.8	9.1
	Truro	20.0	7.5	27.5	20.0	5.0	12.5	5.0	15.0	7.5
	Wirral	3.6	98.2	0.0	1.9	0.0	0.0	0.0	0.0	0.0
	Wolve	19.4	13.3	21.3	16.0	2.7	18.7	6.7	9.3	12.0
	York	12.8	22.0	22.0	7.3	9.8	22.0	4.9	4.9	7.3

Table 3.8: (continued)

Country	Centre	Not sent	Aetiology uncertain./ GN* not	Diabetes	Glomerulonephritis	Hypertension	Other	Polycystic kidney	Pyelonephritis	Reno-vascular disease
			biopsy proven							
N Ireland	Antrim	0.0	25.8	29.0	9.7	0.0	16.1	0.0	12.9	6.5
	Belfast	6.2	18.9	24.5	12.3	5.7	9.4	8.5	9.4	11.3
	Newry	0.0	0.0	14.3	7.1	0.0	28.6	14.3	7.1	28.6
	Tyrone	0.0	6.7	16.7	10.0	16.7	10.0	6.7	20.0	13.3
Scotland	Abrdn	18.0	19.5	39.0	14.6	0.0	9.8	4.9	9.8	2.4
	Airdrie	5.5	21.2	34.6	5.8	0.0	13.5	7.7	7.7	9.6
	D&Gall	13.6	26.3	21.1	5.3	10.5	5.3	10.5	15.8	5.3
	Dundee	6.0	8.5	14.9	14.9	17.0	12.8	4.3	12.8	14.9
	Dunfn	2.9	20.6	8.8	17.7	2.9	20.6	8.8	11.8	8.8
	Edinb	0.0	19.1	21.9	10.5	2.9	11.4	14.3	12.4	7.6
	Glasgw	15.5	15.8	22.2	13.9	0.0	19.6	10.8	9.5	8.2
	Inverns	3.7	15.4	15.4	15.4	11.5	23.1	3.9	11.5	3.9
	Klmarnk	15.4	15.9	20.5	4.6	6.8	9.1	6.8	15.9	20.5
	Wales	Bangor	2.5	18.0	23.1	10.3	7.7	35.9	2.6	0.0
Clwyd		0.0	47.1	41.2	0.0	0.0	11.8	0.0	0.0	0.0
Crdff		1.0	38.2	27.0	7.8	5.4	4.4	7.4	8.8	1.0
Swanse		8.9	16.5	29.1	6.8	2.9	9.7	1.9	6.8	26.2
Wrexm		12.0	18.2	22.7	4.6	4.6	22.7	4.6	9.1	13.6
<b>England</b>		<b>16.2</b>	<b>27.4</b>	<b>21.6</b>	<b>10.5</b>	<b>5.6</b>	<b>15.9</b>	<b>6.5</b>	<b>6.5</b>	<b>6.1</b>
<b>N Ireland</b>		<b>3.5</b>	<b>16.2</b>	<b>24.0</b>	<b>10.4</b>	<b>6.3</b>	<b>12.0</b>	<b>7.3</b>	<b>11.5</b>	<b>12.5</b>
<b>Scotland</b>		<b>9.8</b>	<b>17.3</b>	<b>22.6</b>	<b>11.8</b>	<b>3.8</b>	<b>14.8</b>	<b>9.3</b>	<b>11.2</b>	<b>9.1</b>
<b>Wales</b>		<b>4.0</b>	<b>29.6</b>	<b>27.5</b>	<b>7.3</b>	<b>4.7</b>	<b>10.4</b>	<b>4.9</b>	<b>7.0</b>	<b>8.6</b>
<b>UK</b>		<b>14.4</b>	<b>26.2</b>	<b>22.2</b>	<b>10.4</b>	<b>5.4</b>	<b>15.3</b>	<b>6.7</b>	<b>7.2</b>	<b>6.8</b>

\*GN – glomerulonephritis.

The percentage in each category has been calculated after excluding those patients with a missing diagnosis. For those centres with a high percentage of missing primary diagnoses, the percentages in the other diagnostic categories have not been calculated.

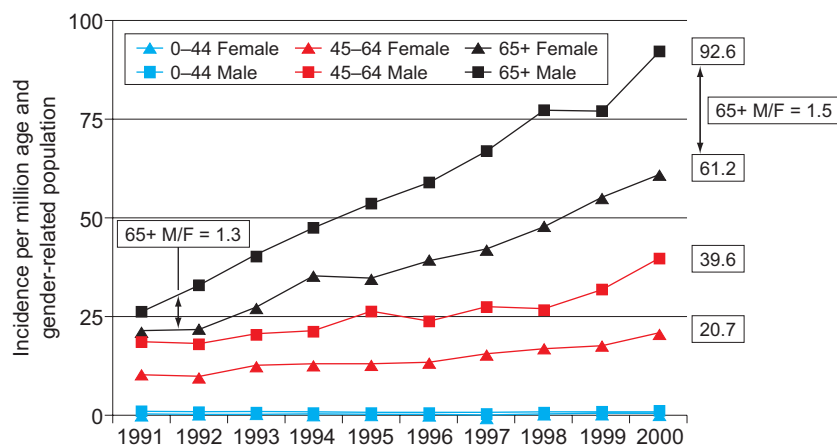
Table 3.9: Diagnosis incidence rates per million population (unadjusted) 2006

Diagnosis	Pmp*				
	England	N Ireland	Scotland	Wales	UK
Aetiology uncertain/GN** not					
biopsy proven	26.0	17.8	17.8	38.4	25.6
Glomerulonephritis	9.9	11.5	12.1	9.4	10.1
Pyelonephritis	6.2	12.6	11.5	9.1	7.0
Diabetes	20.5	26.4	23.2	35.7	21.7
Polycystic kidney	6.2	8.0	9.6	6.4	6.6
Hypertension	5.3	6.9	3.9	6.1	5.2
Reno-vascular disease	5.8	13.8	9.4	11.1	6.7
Other	15.1	13.2	15.2	13.5	14.9
Not sent	18.4	4.0	11.1	5.4	16.5
<b>All</b>	<b>113.2</b>	<b>114.4</b>	<b>113.9</b>	<b>135.0</b>	<b>114.5</b>

\*The denominator population used includes only areas covered by the Registry.

\*\*GN – glomerulonephritis.

These are minimal estimates for the incidence of each primary renal disease, as there will also be a contribution from the diagnosis not sent category.



**Figure 3.8: Trends in the incidence of RRT for treatment of type II diabetic nephropathy by gender and age category**

The numbers on the right hand side indicate the incidence per million age and gender related population for each group for the year 2000. Reproduced from: Van Dijk *et al. Kidney Int.* 2005; 67 (4):1489–99

the 2006 cohort in the four home countries. In estimating these, the incidence rates for England and those for the whole UK were based only on data from centres making Registry returns. Hence the overall incident figures for England and the UK are slightly different from those quoted earlier in the chapter (Table 3.1). There were some major national differences in the frequency of primary renal disease diagnoses in this ERF cohort. Most notably it was apparent that the higher overall take-on rate in Wales was mainly accounted for by the higher reported diabetes incidence rates along with a higher incidence of those with uncertain aetiology. The reported incidences of renovascular disease and pyelonephritis were higher in Northern Ireland, Wales and Scotland than in England. The incidence of null returns was much higher in England.

It is important not to confuse incidence rates and the proportions of patients with a specific diagnosis. As an example, the proportion of patients with diabetes as a cause of ERF was higher in those under 65 than those over (25% and 19% respectively). However as ERF was more common in those over 65, the actual annual incidence of diabetic nephropathy as a cause of ERF was higher in those over 65 (57.2 pmp vs 15.0 pmp). The USRDS<sup>3</sup> and the European Renal Registry<sup>4</sup> have demonstrated that the major increase in diabetic nephropathy seen in recent years is largely from patients with Type II diabetes who developed ERF over the age of 60 (Figure 3.8).

## First established treatment modality

In the UK in 2006, haemodialysis (HD) was the first modality of RRT in 76.6% of patients, peritoneal dialysis (PD) in 20% and pre-emptive transplant in just over 3.4% (defined as first treatment recorded irrespective of any later change). The frequency of HD as the first treatment modality continued to increase, in 1998 HD was the first treatment modality in 58% of incident patients.

Many patients, especially those referred late, undergo a brief period of HD, before a change to other modalities can be considered. Hence the established modality at 90 days is more representative of the elective first modality. By 90 days in the 2006 UK cohort, 8% of incident patients had died, a further 0.6% had stopped treatment, leaving 92% of the original cohort remaining on RRT (Table 3.10). Expressed as a percentage of the whole 2006 UK cohort, 67% were on HD, 21% on PD and 4% had received a transplant (Table 3.10). Expressed as percentages of those still receiving RRT at 90 days, 73% were on HD, 22% on PD and 5% had received a transplant. Figure 3.9 shows the modality at 90 days of RRT patients in the 2006 incident cohort. Only around 0.1% of HD patients were receiving their treatment at home by 90 days, with the vast majority on centre-based treatment either in main hospital centres or satellite units. Around 30% of patients on PD were on automated treatments.

**Table 3.10: RRT modality at 90 days in incident patients in 2006**

Country	Centre	Percentage of patients on each modality				
		HD	PD	Tx	Stopped treatment	Died
England	B Heart	69.0	16.8	1.8	0.0	12.4
	B QEH	73.9	19.4	2.8	0.0	3.9
	Basldn	67.5	27.5	0.0	2.5	2.5
	Bradfd	72.5	13.7	0.0	0.0	13.7
	Brightn	65.6	25.8	0.0	0.0	8.6
	Bristol	68.1	19.8	3.3	0.0	8.8
	Camb	67.6	4.9	8.8	0.0	18.6
	Carlis	73.5	23.5	0.0	0.0	2.9
	Carsh	74.3	15.6	3.9	0.0	6.1
	Chelms	67.4	14.0	0.0	2.3	16.3
	Covnt	55.7	23.7	11.3	0.0	9.3
	Derby	64.5	28.9	0.0	0.0	6.6
	Dorset	49.1	36.8	5.3	7.0	1.8
	Dudley	66.7	18.8	0.0	0.0	14.6
	Exeter	65.0	24.3	3.9	0.0	6.8
	Glouc	73.8	13.8	3.1	0.0	9.2
	Hull	72.7	19.2	0.0	0.0	8.1
	Ipswi	52.5	40.0	0.0	0.0	7.5
	L Barts	51.9	39.2	5.3	0.0	3.7
	L Guys	77.5	15.2	5.8	0.0	1.4
	L Kings	66.7	22.7	5.7	0.0	5.0
	L Rfree	71.4	18.0	7.4	0.0	3.2
	L West	75.4	8.2	14.6	0.4	1.4
	Leeds	67.6	17.6	4.3	0.0	10.6
	Leic	62.7	19.3	7.3	0.0	10.7
	Liv Ain	84.8	0.0	0.0	4.3	10.9
	Liv RI	50.7	30.8	2.7	2.7	13.0
	ManWst	59.5	33.9	1.7	0.0	5.0
	Middlbr	67.7	19.4	2.2	0.0	10.8
	Newc	60.0	18.1	12.4	1.0	8.6
	Norwch	71.1	9.3	0.0	1.0	18.6
	Nottm	56.4	31.6	2.3	0.0	9.8
	Oxford	53.0	29.2	12.5	0.6	4.8
	Plymth	66.3	16.9	6.7	1.1	9.0
	Ports	62.4	23.1	6.9	0.0	7.5
	Prestn	71.2	22.0	1.7	0.0	5.1
	Redng	63.6	28.6	0.0	0.0	7.8
	Sheff	65.8	21.1	5.0	0.0	8.1
	Shrew	62.0	22.0	6.0	0.0	10.0
	Stevng	78.7	10.7	4.1	0.8	5.7
	Sthend	76.6	14.9	0.0	0.0	8.5
	Sund	78.4	13.5	0.0	0.0	8.1
Truro	71.7	21.7	0.0	0.0	6.5	
Wirral	66.0	24.5	0.0	3.8	5.7	
Wolve	62.4	19.8	0.0	2.0	15.8	
York	63.0	26.1	0.0	0.0	10.9	
N Ireland	Antrim	70.0	23.3	0.0	0.0	6.7
	Belfast	66.7	16.7	0.9	8.8	7.0

Table 3.10: (continued)

Country	Centre	Percentage of patients on each modality				
		HD	PD	Tx	Stopped treatment	Died
Scotland	Newry	71.4	21.4	0.0	0.0	7.1
	Tyrone	89.7	6.9	0.0	0.0	3.4
	Abrdn	82.5	12.3	0.0	0.0	5.3
	Airdrie	81.1	13.2	0.0	0.0	5.7
	D&Gall	75.0	5.0	0.0	5.0	15.0
	Dundee	69.0	17.2	1.7	0.0	12.1
	Dunfn	70.7	24.4	0.0	0.0	4.9
	Edinb	57.8	25.6	7.8	0.0	8.9
	Glasgw	65.4	21.2	3.4	0.0	10.1
	Inverns	52.8	44.4	0.0	0.0	2.8
Wales	Klmarnk	74.5	19.6	0.0	0.0	5.9
	Bangor	40.5	31.0	0.0	11.9	16.7
	Clwyd	80.0	4.0	0.0	0.0	16.0
	Cardff	66.1	19.3	6.4	0.0	8.3
	Swanse	76.0	18.2	0.8	0.0	5.0
	Wrexm	62.5	28.1	3.1	0.0	6.3
<b>England</b>		<b>66.4</b>	<b>20.7</b>	<b>4.7</b>	<b>0.4</b>	<b>7.8</b>
<b>N Ireland</b>		<b>70.7</b>	<b>16.7</b>	<b>0.5</b>	<b>5.1</b>	<b>7.1</b>
<b>Scotland</b>		<b>68.4</b>	<b>20.9</b>	<b>2.4</b>	<b>0.2</b>	<b>8.2</b>
<b>Wales</b>		<b>66.9</b>	<b>19.9</b>	<b>3.7</b>	<b>1.1</b>	<b>8.4</b>
<b>UK</b>		<b>66.8</b>	<b>20.6</b>	<b>4.2</b>	<b>0.6</b>	<b>7.8</b>

The percentage of the incident cohort who had died by day 90 appeared to vary considerably between individual centres (1% to 19%). Definition may be a major factor in apparent variation between centres; determining whether patients who died within 90 days were considered as acute or chronic renal failure. Another significant factor was small numbers, four of

the seven centres with a death rate above 15% took on 50 or fewer patients. In addition, the median age of incident patients in all seven centres with the higher death rate was higher than the UK incident median.

Other factors may also have contributed such as policies with respect to both conservative management and ‘trials of dialysis’ in patients in whom the benefits of initiating RRT may not have been clear. The percentage of patients with functioning transplants by 90 days, currently about 5%, appeared to be increasing, perhaps because of drives to encourage live donation and pre-emptive transplantation. There was wide variation between centres with respect to the percentage of patients with functioning transplants by 90 days (Table 3.10), which ranged from 0–15%. The mean percentage of patients with functioning transplants by 90 days was significantly higher in transplanting than in non-transplanting centres (6.7 vs 1.5:  $p < 0.001$ ): this was partly if not totally due to importing of patients from other centres for pre-emptive transplantation.

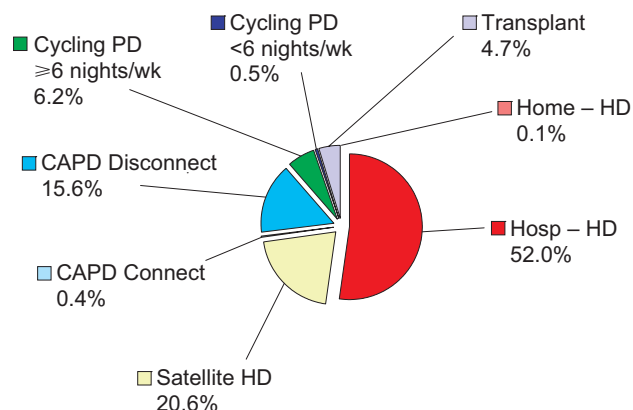


Figure 3.9: RRT modality at day 90 in incident patients in 2006

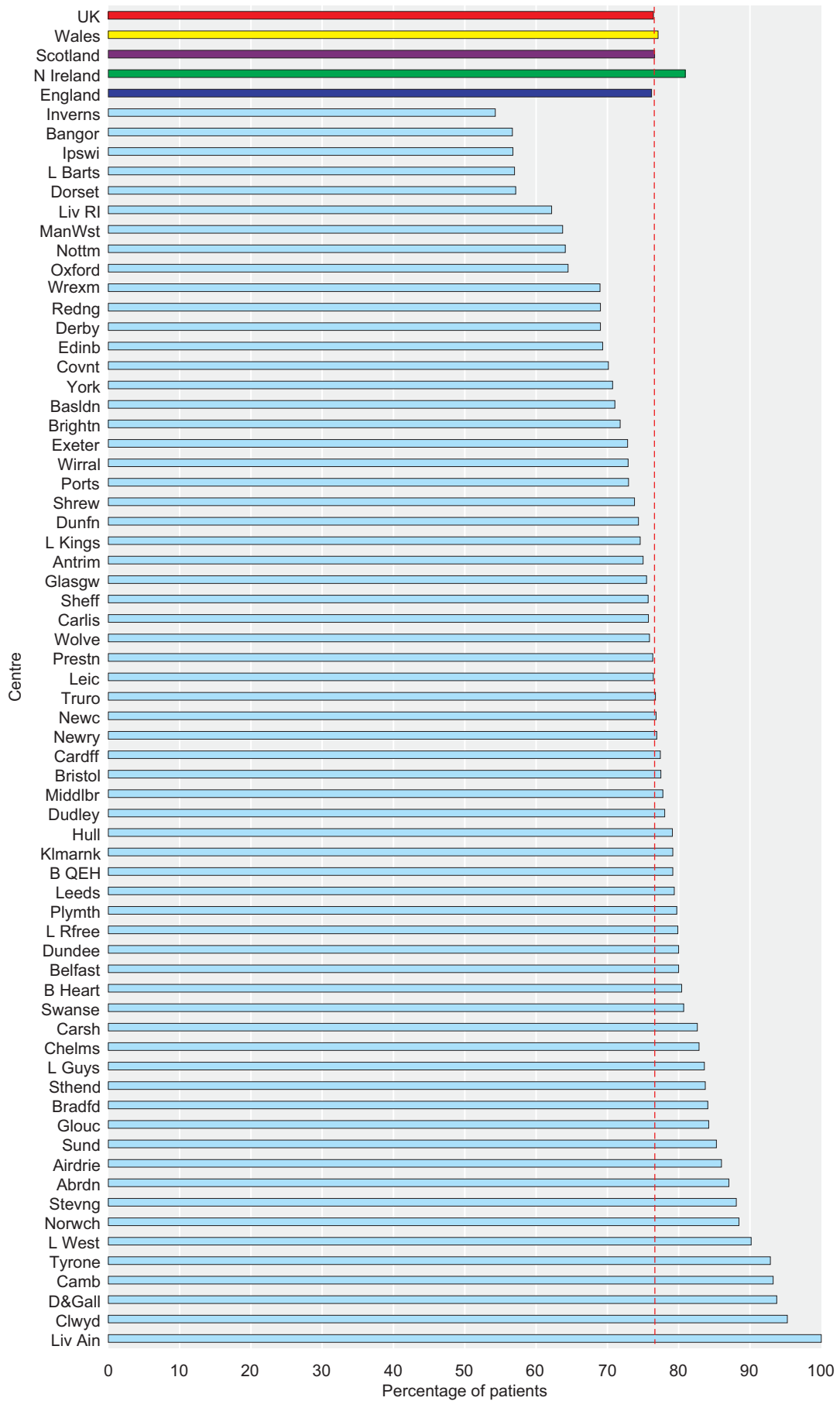


Figure 3.10: Percentage of incident dialysis patients in each centre on HD on day 90 in 2006

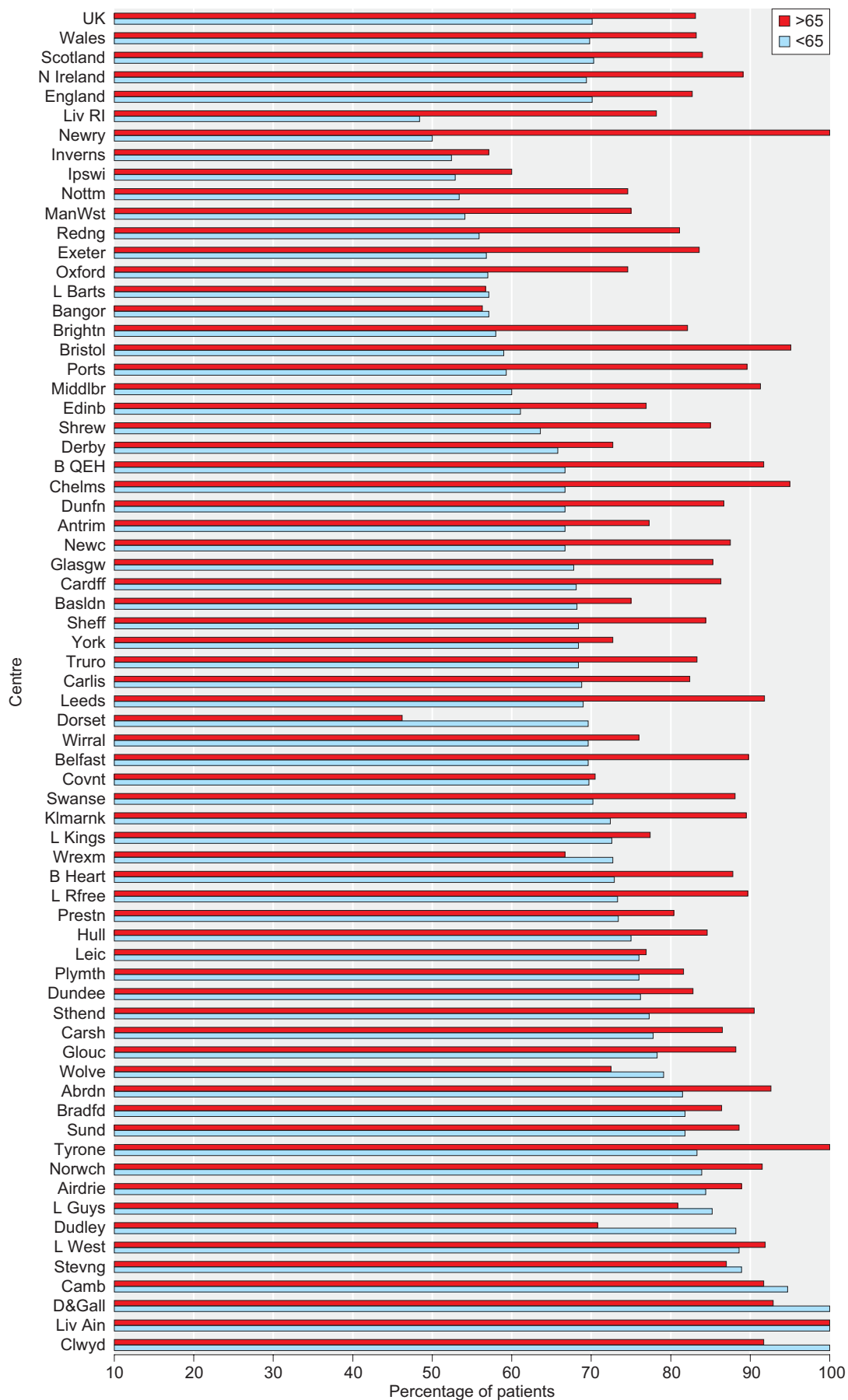


Figure 3.11: Percentage of incident dialysis patients in 2006 cohort on HD at 90 days, by age

**Table 3.11: Percentage of patients on HD and PD at 90 days by age in 2006**

Country	Aged <65 (%)		Aged >65 (%)	
	HD	PD	HD	PD
England	70	30	83	17
N Ireland	69	31	89	11
Scotland	70	30	84	16
Wales	70	30	83	17
<b>UK</b>	<b>70</b>	<b>30</b>	<b>83</b>	<b>17</b>

There were also differences between individual centres in the percentage of new dialysis patients established on HD at 90 days (Figure 3.10). Again small numbers played a major role in the centres at the extremes. In addition some centres such as Derry, Chester and Liverpool Aintree only offer HD on site, with nearby centres training their patients for PD. Excluding these 3 centres, 20 centres had 80% or more of their patients on HD at 90 days.

Older patients were more likely to be on HD rather than PD at 90 days (Figure 3.11). In the whole UK, 70% of incident patients aged less than 65 years were on HD at this stage compared with 83% of patients aged over 65. This difference was highly significant ( $p < 0.0001$ ) (Table 3.11). Hence the percentage of patients on PD was almost twice as high in patients aged <65 years as in older patients (30% vs 17%). These overall UK differences were reflected in the majority of centres though the number in whom the proportions were equal or reversed has increased from 5 in 2005 to 11 in 2006 (Liverpool Aintree excluded as it offers only HD on site). The centres in which PD was as or more popular in the elderly as in younger patients were Dorset, Dudley, Clwyd, Dumfries & Galloway, Wolverhampton, Wrexham, London Guys, Cambridge, Stevenage, Bangor and London Barts. There was no difference in the male:female ratio between patients on HD and PD.

## Renal function at the time of starting RRT

The eGFR of patients starting RRT was calculated using the abbreviated 4 variable MDRD calculation<sup>5</sup>. Data from patients with no available serum creatinine measurement within 14

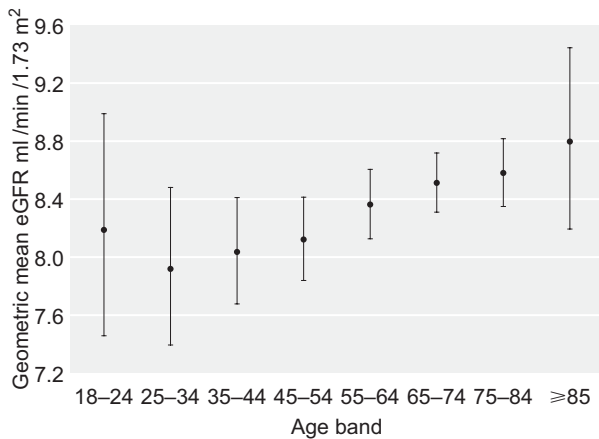
days before the start of RRT were not used. Patients with an eGFR  $>20$  ml/min/1.73 m<sup>2</sup> were excluded from analysis. Currently there are no defined standards for a threshold eGFR at which patients should start RRT for ERF. However, there are defined thresholds for pre-emptive listing for a kidney transplant. For example, the United Network for Organ Sharing (UNOS) permits patients to be waitlisted for a kidney transplant when their eGFR falls below 20 ml/min/1.73 m<sup>2</sup> (www.unos.org). The European Best Practice guidelines (EBPG) recommend that patients with progressive deterioration in renal function and a creatinine clearance of  $<15$  ml/min/1.73 m<sup>2</sup> should be considered for pre-emptive transplantation; patients with ERF secondary to diabetes should be considered for an early and pre-emptive transplantation when their eGFR decreases to  $<20$  ml/min/1.73 m<sup>2</sup><sup>6</sup>. The British Transplantation Society endorses the EBPG (<http://www.bts.org.uk>) and the current UK Renal Association guidelines recommend that patients should be placed on the kidney transplant waiting list within six months of their anticipated dialysis start date<sup>7</sup>. It is therefore conceivable that patients could have started RRT for ERF at eGFR values as high as 20 ml/min/1.73 m<sup>2</sup>. Patients with an eGFR  $>20$  ml/min/1.73 m<sup>2</sup> were therefore excluded from the eGFR analyses due to concerns that the reported eGFR might not have been measured within two weeks prior to start of RRT. The log of the eGFR was taken to normalise the data and two sample t-tests and ANOVA were used as appropriate to compare the groups.

## eGFR and age

In the 2006 cohort, older patient groups appear to have a higher geometric mean eGFR at start of RRT than younger groups (Figure 3.12).

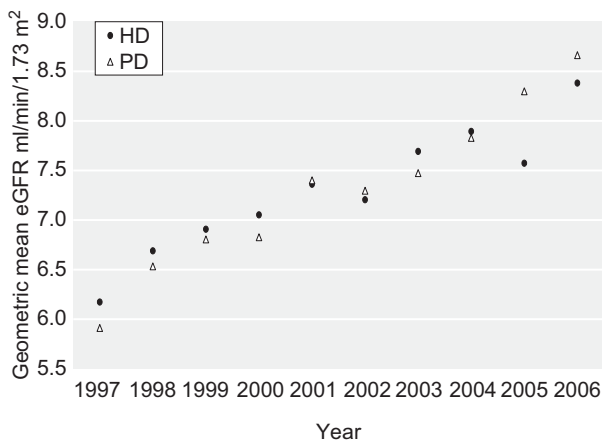
## Changes over time in eGFR at start of RRT

Analysis of serial data derived only from centres reporting continuously to the Registry since 1997 suggested that over this period there has been a tendency to initiate dialysis earlier at a higher geometric mean eGFR (Figure 3.13). There is no consistent difference in eGFR



**Figure 3.12: Geometric mean eGFR at start of RRT by age group in 2006**

(p value from an ANOVA to test for differences between these age groups is 0.02)



**Figure 3.13: Change in eGFR on starting RRT 1997-2006; PD and HD**

at start of RRT between dialysis modalities (Figure 3.13).

## Late referral of incident patients

### Methods

Data were included from all incident patients in the years 2001-2006 with the following exceptions:

1. All patients under 18 years of age at the start of RRT.
2. All Scottish data, since the date first seen by a nephrologist was only available for a handful of people.

3. The small number of patients who recovered sufficient renal function to allow discontinuation of dialysis.

The date of starting RRT and the date first seen by a nephrologist were used to calculate the referral time. This is the number of days between first being seen and starting RRT. A small proportion of data (2%) was excluded because of actual or potential inconsistencies. Centres who had an unfeasibly high percentage (>10%) of people with referral time zero (i.e. first seen date being the same as date of starting RRT) for a given year were also excluded from the analysis for that year. Forty-nine people were calculated to have negative referral times (-1 to -14 days). These were attributed as zero. This accounted for only 0.7% of the cohort. Only data from those centres/years with 75% or more completeness were used. After these exclusions, data on 7,256 patients was available for analysis. Table 3.12 shows the percentage completeness of data for patients starting RRT in 2001-2006. Referral times of 90 days or more were defined as early referrals. Referral times of less than 90 days were defined as late referrals.

### Late referral by centre and year

The percentage of patients referred to a nephrologist less than 90 days before RRT initiation in the included centres and years in the period 2001-2006 is shown in Table 3.13. The incidence of late referral ranged from 10-38% in 2006, giving a mean incidence of late referral of 23.2%.

### Time referred before dialysis initiation in the 2006 incident cohort

In 2006, 60% of incident patients had been referred over a year before they needed to start dialysis. There were 10.4% of patients referred within 6-12 months, 6.4% within 3-6 months and 23.2% within 3 months. If the analysis is restricted to the 4 centres supplying continuous data for the last 5 years (Middlesbrough, Nottingham, Portsmouth and Sheffield, Table 3.14), it appears that there has been a sustained and significant reduction in late referral over that period (p = 0.0052 by Chi-squared test). Furthermore several other centres showed a marked reduction in the last two years, suggesting that

Table 3.12: Percentage completeness for time of referral data for patients starting RRT 2001–2006

Centre	Year					
	2001	2002	2003	2004	2005	2006
Antrim						25.8
B Heart	0.0	0.0	0.0	0.0	0.0	0.0
B QEH				0.0	0.0	0.0
Bangor		65.5		97.2	87.5	
Basldn			96.2	97.8	89.7	100.0
Belfast					41.5	51.3
Bradfd				95.2	98.5	98.0
Brightn				0.0	0.0	0.0
Bristol	89.5	71.8	71.4	75.8	78.2	79.1
Camb	2.2	1.4		65.5	75.6	14.1
Cardff	0.6	0.0	3.0	1.6	1.1	0.5
Carlis				3.4	0.0	0.0
Carsh	0.0	0.0	0.5	0.0	0.6	0.0
Chelms				74.5	46.2	86.0
Chestr		33.3		60.0		0.0
Clwyd		0.0	0.0	0.0	0.0	0.0
Covnt	0.0	0.0	0.0	0.0	0.0	0.0
Derby	1.7		0.0	1.5	1.4	1.4
Derry						100.0
Dorset			98.5	100.0	100.0	100.0
Dudley	12.1	8.3	12.2			
Exeter	79.4	77.8	54.1	64.5	48.6	50.0
Glouc	0.0	1.9	0.0	13.2	93.3	81.9
Hull	4.1	0.0	1.3	0.0	2.4	0.0
Ipswi		92.7			94.4	92.9
L Barts				0.5	0.0	21.2
L Guys	0.9	0.0	0.0	0.0	0.0	0.0
L Kings		15.5	23.4	16.7	10.3	0.0
L Rfree					0.0	0.0
Leeds	66.9	64.7	76.5	87.0	88.3	83.9
Leic	90.7	87.4	94.0	92.5	60.3	50.8
Liv Ain				0.0	0.0	0.0
Liv RI	1.0	0.7	0.0	0.8	0.0	0.0
ManWst			52.8	58.4	75.7	87.4
Middlbr	85.2	91.0	92.2	87.3	90.5	76.3
Newc						97.3
Newry					32.1	71.4
Norwch				47.9	28.1	16.4
Nottm	99.2	93.8	99.1	98.1	98.6	97.8
Oxford	1.2	0.0	1.1	3.6	3.7	1.9
Plymth	0.0	0.0	0.0	0.0	0.0	0.0
Ports	97.8	95.0	95.0	93.1	91.3	94.2
Prestn	83.8	69.7	1.0	0.0	0.0	0.0
Redng	0.0	0.0	0.0	0.0	0.0	0.0
Sheff	95.3	97.4	98.7	98.2	97.4	95.2
Stevng			95.8	85.1	59.3	41.7
Sthend	5.6	0.0	0.0	0.0	0.0	0.0
Swanse	34.8	38.9	56.0	63.7	91.7	99.1
Truro	47.5	57.6	75.5	59.7	64.5	56.0

Table 3.12: (continued)

Centre	Year					
	2001	2002	2003	2004	2005	2006
Tyrone					95.5	96.7
Ulster						100.0
Wirral		32.5	31.9	48.3	75.4	71.4
Wolve	50.0	67.3	79.1	98.1	98.9	95.7
Wrexm	0.0	2.4	0.0	0.0	0.0	0.0
York	67.6	87.3	84.2	93.5		93.6
<b>Total</b>	<b>41.1</b>	<b>39.1</b>	<b>44.8</b>	<b>41.9</b>	<b>39.7</b>	<b>39.6</b>

Table 3.13: Percentage of patients referred to a nephrologist less than 90 days before dialysis initiation

Centre	Year					
	2001	2002	2003	2004	2005	2006
Bangor				34.3	40.0	
Basldn			39.2	35.6	19.2	25.0
Bradfd				16.9	32.3	16.7
Bristol	25.5			25.4	23.5	11.8
Camb					24.0	
Chelms						27.9
Dorset			25.0	18.6	35.6	16.4
Exeter	32.5	17.5				
Glouc					19.6	20.3
Ipswi		39.5			51.0	35.9
Leeds			35.7	28.6	32.6	30.8
Leic	21.2	28.8	19.2	22.3		
ManWst					20.2	13.5
Middlbr	17.4	32.7	26.3	31.5	22.4	17.6
Newc						22.4
Nottm	31.6	38.2	28.2	32.7	31.0	23.7
Ports	42.6	33.6	25.0	30.6	27.0	28.8
Prestn	20.2					
Sheff	24.5	20.9	26.9	19.8	20.9	22.0
Stevng			30.7	18.9		
Swanse					43.2	38.4
Truro			15.0			
Tyrone					23.8	10.3
Wirral					32.6	
Wolve			25.0	29.4	28.4	21.6
York		21.8	22.9	27.9		27.3
<b>Total</b>	<b>27.2</b>	<b>28.6</b>	<b>26.9</b>	<b>26.1</b>	<b>28.5</b>	<b>23.2</b>

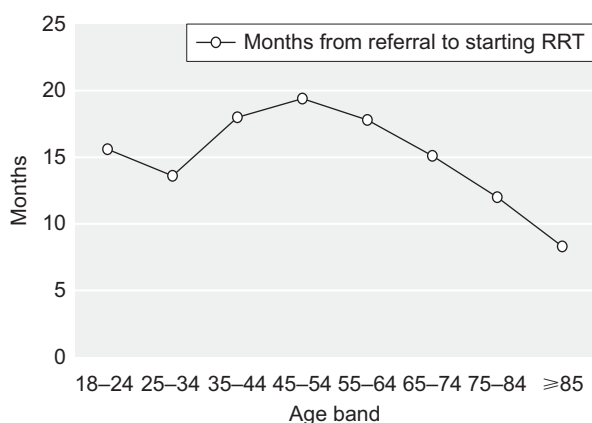
the UK guidelines for the diagnosis, management and referral of CKD (<http://www.renal.org>) and the Quality and Outcomes Framework (QOF) initiative in the UK (<http://www.dh.gov.uk>) may be having some effect.

### **Age and late referral**

In the whole cohort 2001–2006, patients who were referred late (<90 days before dialysis initiation) were significantly older than patients

**Table 3.14: Referral times by year in 4 centres contributing continuous data for 2002–2006**

Year	% <3 months	% 3–6 months	% 6–12 months	% >12 months
2002	30.1	9.8	11.1	49.0
2003	26.6	6.7	12.4	54.4
2004	27.4	8.6	9.7	54.2
2005	25.6	7.2	11.9	55.3
2006	23.9	6.6	11.0	58.4

**Figure 3.14: Duration of pre-dialysis care by age 2006**

referred earlier (median age 67.7 vs 64.8 years:  $p < 0.001$ ). Furthermore the median duration of pre-dialysis care diminished progressively with increasing age beyond the 45–54 age group (Figure 3.14).

### Gender and late referral

In the whole cohort 2001–2006, the male:female ratio was slightly but not significantly higher in those referred late (<90 days) than in those referred earlier (1.79 vs 1.62).

### Ethnicity, social deprivation and late referral

In this analysis of the 2001–2006 cohorts, ethnicity was restricted to South Asians and Blacks. Patients of other ethnic minority origin were excluded due to small numbers with referral data. The percentage of non-Whites (South Asian and Black) referred late (<90 days) was significantly lower than that of Whites (20% vs 26%:  $p = 0.0025$ ), suggesting that late referral may be less common in non-Whites. This may

be partly due to the high incidence of diabetes in non-Whites (as discussed below, patients with diabetes tend to be referred earlier) and may be related to the older median age of incident Whites. As discussed previously, advancing age was also associated with late referral. There was no relationship between social deprivation and referral pattern.

### Primary renal disease and late referral

In the 2001–2006 cohort, late referral (<3 months) differed significantly between primary renal diagnoses (Table 3.15,  $X^2$  test  $p < 0.001$ ). Multiple comparison tests between the different diagnoses groups have not been made as there would be a high risk of producing a ‘significant test’ by chance. Patients classified as aetiology uncertain/glomerulonephritis unproven appeared to have higher rates of late referral, as do those classified as ‘other diagnosis’ or in whom diagnosis was unavailable. Those with diabetes and adult polycystic disease had lower rates of late referral (Table 3.15).

### Modality and late referral

In the whole 2001–2006 cohort, referral pattern had a marked effect on initial modality choice. The percentage of patients whose initial modality was PD was significantly less in the late referral group in comparison to the group referred earlier (13% vs 29%:  $p < 0.0001$ ). By 90 days after dialysis initiation the difference was partially redressed, though the percentage

**Table 3.15: Late referral by primary renal diagnosis**

Diagnosis	Late referral	
	No	%
Aetiology unc./GN. NP*	544	31
Diabetes	202	16
Glomerulonephritis	150	19
Other	472	45
Polycystic kidney	42	9
Pyelonephritis	117	21
Renal vascular disease	266	28
Not available	136	40

\*Aetiology unc./GN. NP – aetiology uncertain/glomerulonephritis not biopsy proven.

**Table 3.16: Percentage prevalence of specific co-morbidities amongst patients referred late (0–89 days) compared with those referred early (>89 days)**

Co-morbidity	0–89 days	≥90 days	p-value
Cerebrovascular disease	11	11	0.6594
COPD*	8	7	0.0749
Diabetes (not a cause of ERF)	8	9	0.2214
Ischaemic heart disease	23	25	0.1618
Liver disease	3	2	0.0725
Malignancy	19	10	<0.0001
Peripheral vascular disease	10	14	0.0007
Smoking	18	17	0.3161

\*COPD – chronic obstructive pulmonary disease.

on PD was still significantly lower after late referral (19 vs 32%:  $p < 0.0001$ ).

### **Co-morbidity and late referral**

In the whole 2001–2006 cohort, significantly fewer patients who had been referred late (<90 days) were assessed as having no co-morbidity compared to the group referred earlier (40.2% vs 44.9%:  $p = 0.004$ ). In terms of specific co-morbidities, peripheral vascular disease was significantly less common in the group referred late (Table 3.16).

### **Haemoglobin and late referral**

In the whole 2001–2006 cohort, patients referred late had a significantly lower haemoglobin concentration at dialysis initiation than patients referred earlier (9.43 vs 10.38 g/dl:  $p < 0.001$ ), presumably because of the lack of opportunity to actively manage anaemia.

### **eGFR and late referral**

In the whole 2001–2006 cohort, eGFR at the onset of RRT was slightly lower in patients referred late compared to earlier referrals (7.49 vs 7.89 ml/min/1.73 m<sup>2</sup>:  $p = 0.0002$ ). The same relationship held true in males (7.74 vs 8.15 ml/min/1.73 m<sup>2</sup>:  $p = 0.002$ ) and females (7.05 vs 7.49 ml/min/1.73 m<sup>2</sup>:  $p = 0.011$ ).

In those over the age of 65 at the time of dialysis initiation the difference was more pronounced (7.57 vs 8.28 ml/min/1.73 m<sup>2</sup>:  $p < 0.0001$ ). The same relationship was found in 18–44 year olds (6.85 vs 7.61 ml/min/1.73 m<sup>2</sup>:  $p = 0.009$ ) but in the 45–64 year group there

was no difference between eGFR in early and late referrals.

The difference between eGFR in late and earlier referrals remained significant in Whites (7.43 vs 7.92 ml/min/1.73 m<sup>2</sup>:  $p < 0.001$ ), but there were no significant differences in South Asians or in Blacks. There were no clear differences in eGFR between those referred late and those referred earlier when stratified by the Townsend social deprivation score. When stratified by primary renal disease, eGFR was significantly lower in late referrals with renal disease of uncertain aetiology (6.92 vs 7.73 ml/min/1.73 m<sup>2</sup>:  $p < 0.0001$ ) and ‘other diagnoses’ (7.32 vs 7.84 ml/min/1.73 m<sup>2</sup>:  $p = 0.032$ ). When stratifying by co-morbidity, eGFR was lower in patients referred late compared to earlier referrals in all co-morbidity groups. This difference was significant in smokers, in patients with malignancy, in those with liver disease and of borderline significance ( $p = 0.05$ ) in those with cerebrovascular disease.

## **Survival of incident patients**

This analysis is found in Chapter 6.

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