Chapter 5: All Patients Receiving Renal Replacement Therapy in 2002

Summary

- The UK prevalence of RRT was 626 p.m.p with 34% aged over 65.
- The annual increase in prevalent RRT patients is 4%.
- The median age of all patients on RRT was 55.9 years. This was 64.5, 58.3, 49.6 years for HD, PD and transplant patients respectively.
- While the median age of prevalent patients on HD has increased from 1998 – 2002, the median age of those on PD is decreasing.
- 46% of RRT patients had a functioning transplant and although the overall numbers are increasing, this as a % of total RRT patients has fallen year on year.
- The 1 year prevalent transplant and dialysis survival was 97.6% and 86.1% respectively.
- After adjusting for age, there was no significant difference in dialysis survival between centres.
- Analysis of seasonal variations in death rates indicate that the winter peak of deaths in HD patients precedes the peak seen in the general population. This occurred across all age bands for HD patients. Deaths in transplant patients followed a similar pattern to that of the general population.

Prevalence rates

In Chapter 3, data from the Renal Survey 2003 showed that the prevalence rate for patients receiving renal replacement therapy in the UK at the end of 2002 was 626 patients per million population (p.m.p.). As all units in the UK participated in the survey, this is the most accurate estimation of the RRT prevalence rate currently available. There is a significant variation between the four countries with England having the lowest prevalence rate amongst the 4 countries (Table 5.1). There were more units per million population in Wales, Scotland and Northern Ireland than in England, resulting in the units in England being on average larger in size.

The number of units participating in the UK Renal Registry activity has increased to 40, providing data for 22,412 RRT patients, which were 60% of the total UK RRT patients (69% of total England and Wales patients). The number of prevalent patients in each of the units in England and Wales providing data to the Registry is given in Table 5.2 and Figure 5.1. The wide variation in the proportion of transplanted patients in each unit is partly the result of different policies for follow-up of patients at transplant centres. Some transplant centres continue to follow up the patients they transplant for other renal units; others transfer them back to their parent unit but at variable times post transplant. Some renal units do not follow any transplanted patients. Thus, units with a transplant centre tend to have higher proportion of transplant patients under follow up in the unit compared with units without a transplant centre. The table now includes Newcastle, but two of the other large transplant centres, Birmingham and Manchester, which do not return patients to the parent unit until a relatively late stage, are still not contributing to the Registry.

For the 23 units which have been participating with Registry activity since 1999, the prevalent number continues to increase year by year (Table 5.3). However, the actual and proportional increase year by year seems to be decreasing in the last 3 years. Data from the Renal Survey 2002 in Chapter 3 showed an annual increase of around 4%.

Table 5.1. UK Patients receiving Renal Replacement Therapy – December 31, 2002

	England	Wales	Scotland	N.Ireland	UK
No of renal units	52	5	10	4	71
Total RRT patients	30,498	2006	3,418	1,117	37,039
Rate p.m.p (95% CI)	615 (608-622)	692 (652-722)	684 (661-707)	657 (619-696)	626 (620-633)
Rate per unit	587	401	342	279	522
Units p.m.p	1.0	1.7	2.0	2.4	1.2
Haemodialysis	11369 (37%)	720 (36%)	1380 (40%)	512 (46%)	13981 (38%)
Home haemodialysis	420 (1%)	9 (0%)	52 (2%)	1 (0%)	482 (1%)
Peritoneal dialysis	4605 (15%)	380 (19%)	376 (11%)	80 (7%)	5441 (15%)
Transplants	14,104* (46%)	897 (45%)	1,610 (47%)	524 (47%)	17,135* (46%)
% dialysis pts on HD	72%	66%	79%	87%	73%

Table 5.2. Prevalent RRT patients in each unit, 31 December 2002

Treatment Centre	Dialysis No.	Transplant No.	RRT No.	% Transplant
Oxford*	515	859	1374	63
Guys*	487	706	1193	59
Livrpl*	540	632	1172	54
Cardiff*	504	615	1119	55
Ham &Cx*	679	406	1085	37
Leics*	610	460	1070	43
Ports*	429	613	1042	59
Sheff*	618	410	1028	40
Bristl*	433	561	994	56
StJms*	334	484	818	59
Notts*	435	380	815	47
Carsh*	455	339	794	43
Camb*	324	392	716	55
Newc*	189	465	654	71
Prstn	410	191	601	32
Covnt*	312	262	574	46
Kings	337	237	574	41
Stevn	383	147	530	28
SCleve*	242	280	522	54
Hull	328	192	520	37
Extr	297	222	519	43
Heart	302	185	487	38
Plym*	177	221	398	56
Swnse	289	105	394	27
LGI	226	164	390	42
Wolve	282	84	366	23
Bradf	181	100	281	36
Sund	127	129	256	50
Words	141	94	235	40
Ipswi	128	87	215	41
Truro	152	63	215	29
Glouc	161	51	212	24
Wrex	165	47	212	22
Redng	197	7	204	3
Sthend	148	29	177	16
York	138	34	172	20
Carls	85	85	170	50
Wirrl	137	0	137	0
Bangr	90	0	90	0
Clwyd	61	26	87	30

* transplant centres

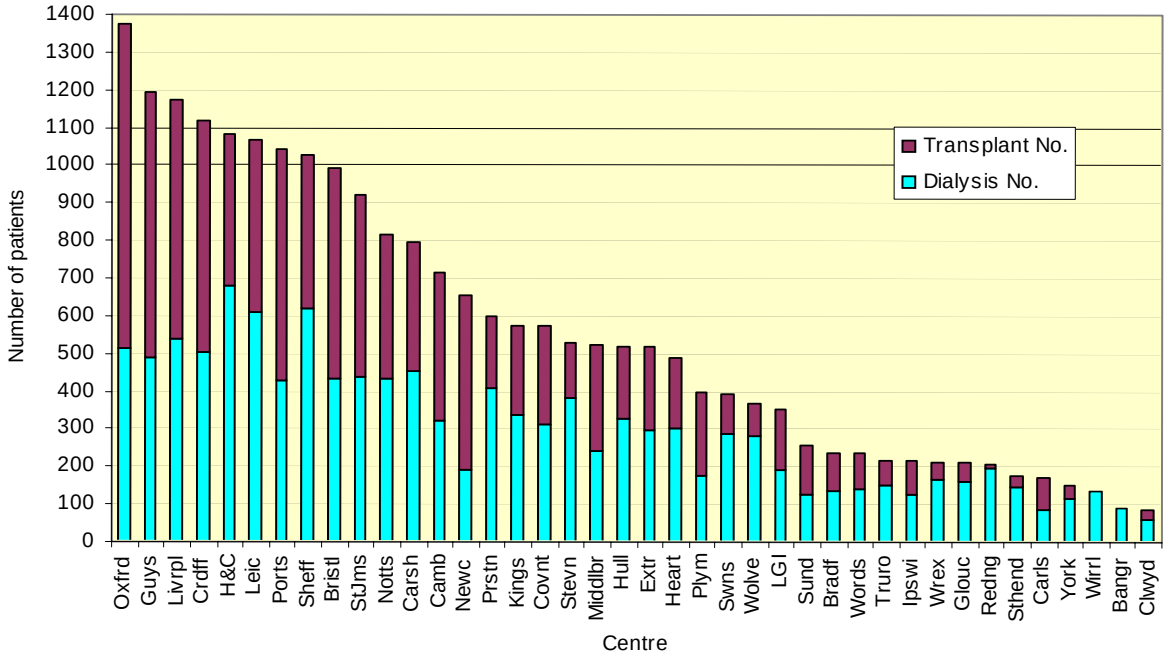

Figure 5.1. Distribution of RRT in prevalent patients

Table 5.3. Number of patients in the same 23 centres on RRT, 1999–2002

	1999	2000	2001	2002
No of RRT patients in the 4th qtr	11447	12447	13222	13791
Actual increase in number	-	1000	775	569
% increase	-	9%	6%	4%

Prevalence by Health Authority

Table 5.4 shows prevalent patients according to the old Health Authorities by postcode of residence in England and Wales. Only those Health Authorities where there is more or less complete coverage by the Registry are included. This allows an estimate of the prevalence (p.m.p.) to be made. Comparisons across England and Wales are more valid from these data than when the information is presented according to renal unit (see Chapter 4). There are wide variations between Health Authorities for reasons which include differences in local age structure, ethnicity and social deprivation, as well as differing policies for referral and acceptance of patients and service provisions.

For parts of England and Wales where there has been complete coverage by the Registry for 5 years there are some interesting differences. For instance, in Calderdale & Kirklees and County Durham & Darlington, the prevalence has increased by almost 50% whereas there has been much less of an increase in Leicestershire, Nottingham, Coventry and Dudley Health Authorities. Although this may be partly due to incomplete data in earlier years it may represent growth in areas where the prevalence was relatively low 5 years ago. The highest overall prevalence was in Ealing, Hammersmith and Hounslow which also had the highest dialysis prevalence, presumably reflecting the ethnicity of the local population.

Table 5.4. Changes in prevalence rate in health authorities, 1998–2002

		Prevalence rates					Modalities 2002			No of pts
		1998	1999	2000	2001	2002				2002
Health Authority	Population	All	All	All	All	All	Transp	Dial	% transp	All
England										
Bradford	483,300				579	662	283	379	43	320
Calderdale & Kirklees	583,800	346	336	519	579	624	324	300	52	364
County Durham & Darlington	607,800	336	344	393	466	579	326	253	56	352
East Riding and Hull	574,500	447	463	512	479	541	216	326	40	311
Gateshead & S Tyneside	353,500				280	600	362	238	60	212
Leeds	727,400			571	561	587	268	319	46	427
Newcastle & N Tyneside	470,100				232	574	357	217	62	270
North Cumbria	319,300	485	501	504	542	526	279	247	53	168
North Yorkshire	742,400	321	280	469	459	537	229	308	43	399
Northumberland	309,600				207	604	365	239	60	187
Sunderland	292,300	431	438	452	489	558	349	209	63	163
Tees	556,300	466	482	518	546	561	325	235	58	312
Wakefield	318,800			555	521	521	248	273	48	166
Barnsley	228,100	460	509	574	592	666	307	359	46	152
Doncaster	290,500	423	465	513	530	596	220	375	37	173
Leicestershire	928,700	600	602	649	639	672	305	367	45	624
Lincolnshire	623,100	425	456	514	533	534	238	297	44	333
North Derbyshire	370,200	397	405	446	478	494	213	281	43	183
North Nottinghamshire	388,900	465	496	550	589	594	255	339	43	231
Nottingham	642,700	577	624	653	669	633	249	384	39	407
Rotherham	254,400	448	460	562	645	668	240	428	36	170
Sheffield	531,100	409	442	512	523	587	217	371	37	312
South Humber	308,600	531	544	590	486	583	230	353	39	180
Coventry	304,300	670	664	677	723	723	276	447	38	220
Dudley	311,500	472	494	526	465	462	186	276	40	144
Solihull	205,600	365	355	413	438	462	151	311	33	95
Walsall	261,200					497	84	413	17	130
Warwickshire	506,700	519	555	610	614	653	326	328	50	331
Wolverhampton	241,600		592	679	662	712	145	567	20	172
East Lancashire	511,200	270	276	362	325	426	127	299	30	218
Liverpool	461,500				579	615	247	368	40	284
Morecambe Bay	310,300	226	235	329	313	371	126	245	34	115
North Cheshire	311,900				439	455	202	253	44	142
North-West Lancashire	466,300	300	315	412	371	444	150	294	34	207
Sefton	287,700				476	521	205	316	39	150
St Helens and Knowsley	333,000				502	571	255	315	45	190
Wirral	327,100				345	611	263	349	43	200
Bedfordshire	556,600	214	225		546	562	228	334	41	313
Cambridgeshire	468,000	111	122		669	756	321	436	42	354
Hertfordshire	1,033,600	483	472			342	92	250	27	353
Suffolk	671,100				176	378	182	197	48	254
Bexley, Bromley, Greenwich	730,000			355	356	582	275	307	47	425
Croydon	338,200	322	355	441	446	535	210	325	39	181
Ealing, Hammrsm, Hounslow	617,200				125	930	262	668	28	574
Hillingdon	251,200				68	506	195	311	39	127
Lambeth, Sthwark Lewisham	745,200			515	514	789	309	480	39	588
Merton, Sutton, Wandsworth	627,000	214	220	305	285	364	155	209	43	228
Berkshire	800,200	331	347	693	502	569	295	274	52	455
Buckinghamshire	681,900	422	431	524	537	553	301	252	54	377
East Surrey	419,900	324	348	402	405	460	262	198	57	193
IoW, Portsmouth, SE Hamps	671,700				549	572	331	241	58	384
North and Mid Hampshire	556,900				386	406	223	183	55	226
Northamptonshire	615,800	445	463	513	549	562	268	294	48	346
Oxfordshire	616,700	431	454	491	542	582	318	264	55	359
Southampton, SW Hamps	542,300				454	476	278	197	59	258
West Surrey	640,600	190	211	268	304	436	204	231	47	279
Avon	999,300	534	550	592	617	648	346	302	53	648
Cornwall and Isles of Scilly	490,400				642	693	281	412	41	340
Gloucestershire	557,300	458	511	642	468	535	248	287	46	298
North and East Devon	479,300	463	503	547	534	547	246	300	45	262
Somerset	489,300			501	521	576	260	317	45	282
South and West Devon	589,100	502	535	587	606	606	290	316	48	357
Wiltshire	605,500	342	337	353	453	467	256	211	55	283
Wales										
Gwent	557,200	549	560	623	630	727	377	350	52	405
Bro Taf	739,600	533	581	633	648	699	339	346	50	517
Dyfed Powys	479,400			638	499	565	215	330	39	271
North Wales	657,500				525	695	259	437	37	457
Morgannwg	499,700			558	616	706	326	380	46	353

Age

Table 5.5 shows the age breakdown of the prevalent patients in the UK in 2002 from the National Renal Review. 34% of the patients on RRT were over 65 years old. The proportion of over 65s in Northern Ireland seems to be high, but for this analysis Belfast City Hospital could not be included as it was not able to provide the age breakdown for stock patients. As Belfast City Hospital is the transplant centre for Northern Ireland, inclusion of their data would most likely change the age distribution to be more in line with the rest of the UK.

Table 5.5. Age groups of prevalent patients in the UK in 2002: data from the National Review

Age groups	Eng	W	Scot	N I	UK
18-44	27%	25%	31%	18%	27%
45-64	39%	41%	33%	36%	38%
65+	34%	34%	35%	46%	34%

From the Registry data, we were able to analyse the age profile further and calculate the median age for each of the treatment modalities (Figure 5.2). As expected, the median age is lowest for the transplant patients, followed by the peritoneal dialysis patients, with the haemodialysis patients having the highest median age. Compared with previous years, the median age for all prevalent RRT patients has increased from 54.3 years in 1998 to 55.9 years in 2002. The median age for patients on peritoneal dialysis has shown a trend to decrease where as the median age for haemodialysis patients has increased from 62.6 years to 64.5 years (Table 5.6). The wide variation in the median age of dialysis patients between each unit is shown in Figure 5.3. This may be due to differences in the demography of the local population, referral and acceptance policies, survival rates, and facilities for service provision.

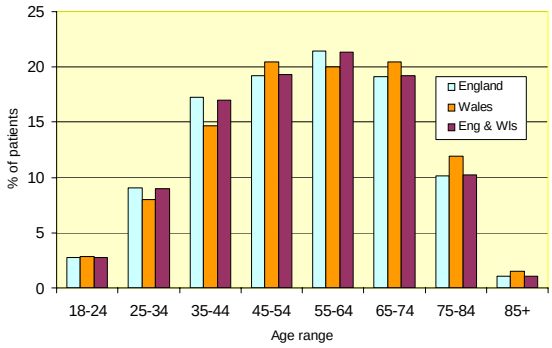

Figure 5.2. Age profile of prevalent patients

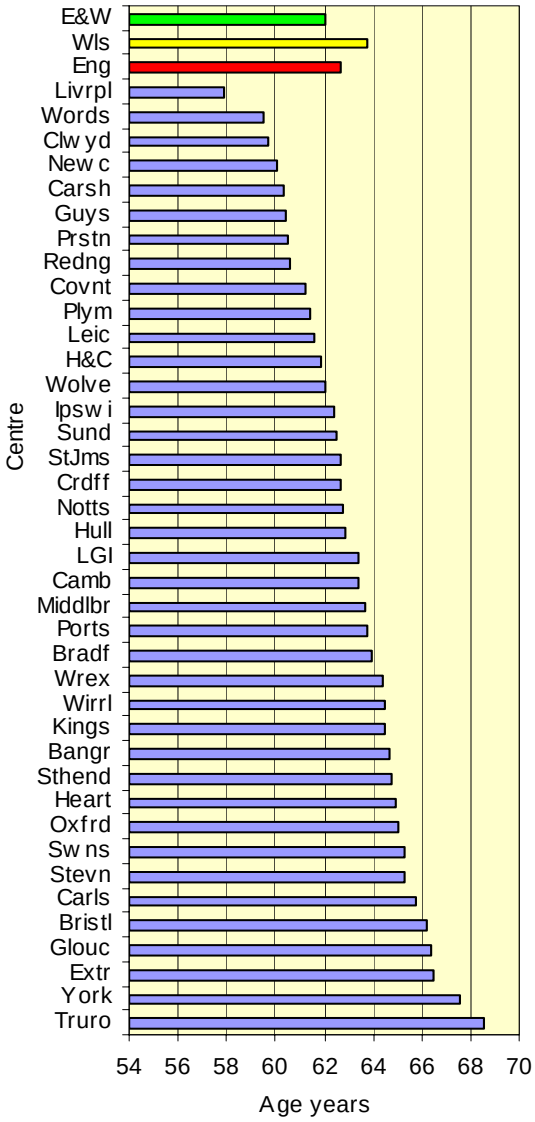

Figure 5.3. Median age of dialysis patients at 31 December 2002 by centre

Table 5.6. Median age and treatment modality for England and Wales 2002

	Transplants	PD	HD	All
Median age 2002	49.6	58.3	64.5	55.9
Interquartile range	39-60	45-69	51-74	43-68
Range between units	40-55	49-64	58-71	52-65
Median age 2001	48.9	58.7	64.0	55.1
Median age 2000	48.9	58.6	63.5	54.9
Median age 1999	48.9	58.8	62.7	54.6
Median age 1998	49.0	58.9	62.6	54.3

Gender

Of the prevalent patients 61% were male, and this male preponderance was evident across all age groups (Figure 5.4).

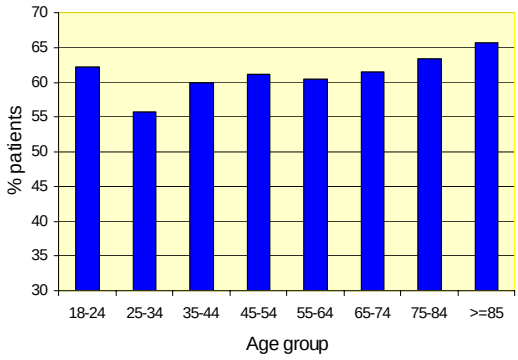

Figure 5.4. Percentage of male patients according to age

Ethnicity

The number of units providing data on ethnicity for prevalent patients has increased. 22 units had completed data returns on at least 90% of patients compared with 17 last year. There were 9 newcomers to this category (Gloucester, Hammersmith and Charing Cross, Newcastle, Carlisle, Liverpool, Portsmouth, Swansea, Middlesbrough and Stevenage), however in 4 of the units (Hull, Exeter, Carshalton and Southend) the percentage of completed data had fallen. It is to be hoped that providing feedback on returns will encourage units to develop means of providing this important information.

From these 22 units, the percentage of Indo-Asian was 7%, African-Caribbean 3.6% and Chinese 0.5%. There was a marked variation of ethnic mix amongst the different units reflecting the ethnic diversity of the different catchment areas. The units with the higher proportion of Indo-Asians and African-Caribbean patients were in the London/South East area, West Midlands and Yorkshire regions (Table 5.7).

In Chapter 4, a high proportion of ethnic minorities has been shown to be associated with a higher standardised acceptance ratio. It would therefore be envisaged that units in such areas may expand more rapidly than units serving mainly white catchment areas.

A more detailed analysis of the different ethnic groups is presented in Chapter 20.

Primary Renal Disease

Table 5.8 shows detail of the primary renal disease based on the original EDTA coding. Although the number of prevalent patients on the Registry has increased by 16% there has been no difference in the pattern of diagnoses compared with last year. The most common identifiable diagnosis for the under 65s was glomerulonephritis (17.8%), and for those over 65 was diabetes (12.9%). Overall 11.5% of the prevalent patients had a primary diagnosis of diabetic nephropathy in contrast to the 18% of the incident patients, although a significant proportion of patients also have diabetes mellitus as a co-morbid disease. Another

interesting observation is the low percentage of over 65s with diagnosis of reno-vascular disease (4.6%) in comparison to the 11.2% in the over 65s in the incident group. These differences between incidence and prevalence of these two groups may be due to lower survival of such patients.

Diabetes

Tables 5.9a and 5.9b show the median age and modalities of treatment for diabetic patients compared with other patients. The only notable difference from previous years is in the modality of treatment of non-diabetics under the age of 65, in whom the proportion on HD has fallen from 34% to 27%. The proportion transplanted has increased from 50% to 60%, whilst there has been a smaller change in those on PD from 15% to 13%. This may reflect the influence of the new large transplanting units which have joined the Registry. There is further discussion and analysis of the diabetic renal patients in Chapter 19.

Table 5.7. Ethnicity groups of prevalent patients 2002

Treatment centre	% Return	% White	% Black	% Asian	% Chinese	% Other
Glouc	100	99.1	0.5	-	0.5	-
Ham & Cx	100	43.1	12.1	22.6	0.7	21.5
Heart	100	73.9	5.3	19.1	0.6	1.0
Sheff	100	93.9	1.6	3.3	0.7	0.6
Words	100	90.6	0.9	8.1	0.4	-
Newc	99	97.5	0.3	1.7	0.5	-
Prstn	99	86.6	1.2	11.7	-	0.5
Wolve	99	74.8	6.6	17.5	1.1	-
Bristl	98	93.1	3.2	2.3	0.7	0.7
Redng	98	70.0	11.0	16.0	1.5	1.5
Carls	97	99.4	-	0.6	-	-
Leic	97	81.1	2.2	15.4	0.2	1.1
Plym	97	95.6	3.1	0.5	0.3	0.5
Livrpl	95	96.5	1.3	0.5	1.1	0.6
Sund	95	97.5	0.4	0.8	0.4	0.8
Notts	94	88.9	4.4	5.7	-	0.9
Ports	94	96.9	0.4	2.1	0.2	0.3
Swnse	93	98.9	0.3	0.5	-	0.3
Middlbr	92	95.4	-	3.7	0.8	-
Covnt	91	82.1	3.2	14.5	0.2	-
Guys	91	80.0	15.0	3.7	1.3	0.1
Stevn	90	82.0	4.7	12.7	0.6	-
Hull	89	98.7	0.2	0.2	0.4	0.4
York	87	98.5	-	1.5	-	-
Extr	84	98.9	0.7		0.2	0.2
StJms	82	86.0	3.2	10.2	-	0.7
Carsh	80	74.2	6.3	7.4	0.9	11.1
Sthend	77	92.7	4.4	2.9	-	-
Total	**77**	**86.8**	**3.6**	**7.0**	**0.5**	**2.1**
Bradf	62	63.7	1.4	34.2	-	0.7
Clwyd	59	96.1	2.0	-	2.0	-
Wrex	59	99.2	-	-	0.8	-
Bangr	56	98.0	2.0	-	-	-

Table 5.8. Primary renal disease in all prevalent patients, with age and gender

Diagnosis	% All patients	Inter unit range(%)	% Age <65	% Age ≥65	M:F ratio
Aetiology uncertain*	22.5	3-61	21.0	27.9	1.6
Glomerulonephritis**	15.6	5-25	17.8	7.8	2.2
Pyelonephritis	13.3	5-24	14.2	9.9	1.1
Diabetes	11.5	7-26	11.2	12.9	1.5
Polycystic kidney	3.6	0-6	1.7	10.0	2.2
Hypertension	6.6	1-14	6.0	8.4	2.2
Renal vascular disease	9.1	5-15	10.4	4.6	1.1
Not sent	4.5	0-29	3.4	8.4	1.7
Other	13.3	7-23	14.2	10.1	1.3

*Includes patients listed as ‘glomerulonephritis not biopsy proven’.
**Biopsy proven.

Table 5.9a. Type of diabetes – median age, gender ratio and treatment modality

	Type I	Type II	All diabetes	Non-diabetics
Number	1670	896	2566	18815
M:F ratio	1.49	1.57	1.52	1.54
Median age on 31/12/02	51	66	57	55
Median age started RRT	47	63	54	47
Median years on treatment	3.2	2.1	2.8	5.7
% HD	41	65	49	37
% PD	22	23	23	14
% Transplant	36	12	28	50

Table 5.9b. Type of diabetes – age, sex ratio and treatment

	Type I <65	Type II <65	Non-diabetics <65	Type I ≥65	Type II ≥65	Non-diabetics ≥65
Number	1335	409	13201	335	487	5575
% HD	34	58	27	71	71	59
% PD	23	23	13	19	23	16
% Transplant	43	19	60	10	7	24

Table 5.10. Treatment modalities of prevalent patients in the UK 2002

	England	Wales	Scotland	N Ireland	UK
Haemodialysis	11369 (37%)	720 (36%)	1380 (40%)	512 (46%)	13981 (38%)
Home haemodialysis	420 (1%)	9 (0%)	52 (2%)	1 (0%)	482 (1%)
Peritoneal dialysis	4605 (15%)	380 (19%)	376 (11%)	80 (7%)	5441 (15%)
Transplants	14,104* (46%)	897 (45%)	1,610 (47%)	524 (47%)	17,135* (46%)
% dialysis pts on HD	72%	66%	79%	87%	73%

Modalities of Treatment

From the National Renal Review, at the end of 2002, 46% of the prevalent patients in the UK had a functioning transplant. Of the remaining patients on dialysis, 73% were on haemodialysis. Apart from Northern Ireland where there was less use of peritoneal dialysis, the distributions were similar in the other 3 countries. (Table 5.10)

Figure 5.5 shows the breakdown according to treatment modalities from the Registry data. The breakdown of 46.0% transplants, 37.5% haemodialysis, 1.2% home haemodialysis and 14.8% peritoneal dialysis is comparable to the data from the National Renal Review.

The variation in patterns of treatment with age are shown in Figure 5.6. Transplantation is the predominant treatment modality in patients less than 65 years old. In contrast it is haemodialysis which is more used in the over 65s. In terms of dialysis modality, haemodialysis is the main modality across all age groups, ranging from 63% in the 18-24 age group to 87% in the 85+ age group (Table 5.11).

Table 5.11. Dialysis modality percentages according to age groups

Age group	HD%	PD%
18-24	63	37
25-34	65	35
35-44	65	35
45-54	66	34
55-64	69	31
65-74	75	25
75-84	82	18
85+	87	13
All	72	28

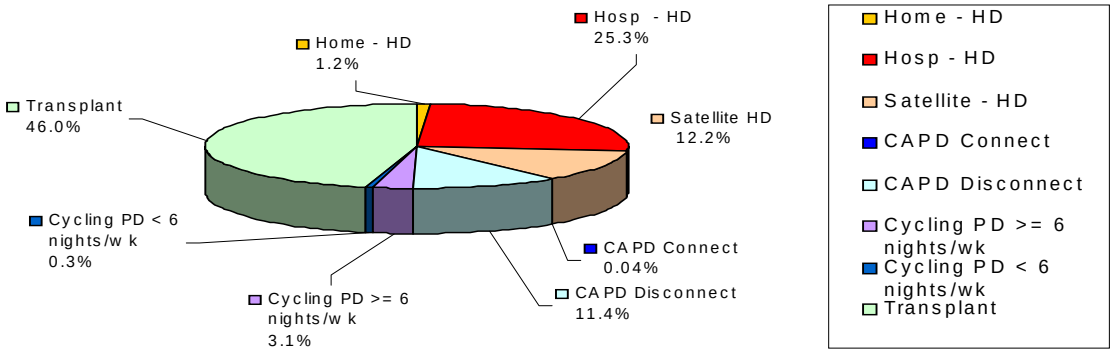

Figure 5.5. Percentage of patients on each dialysis modality, 31 December 2002

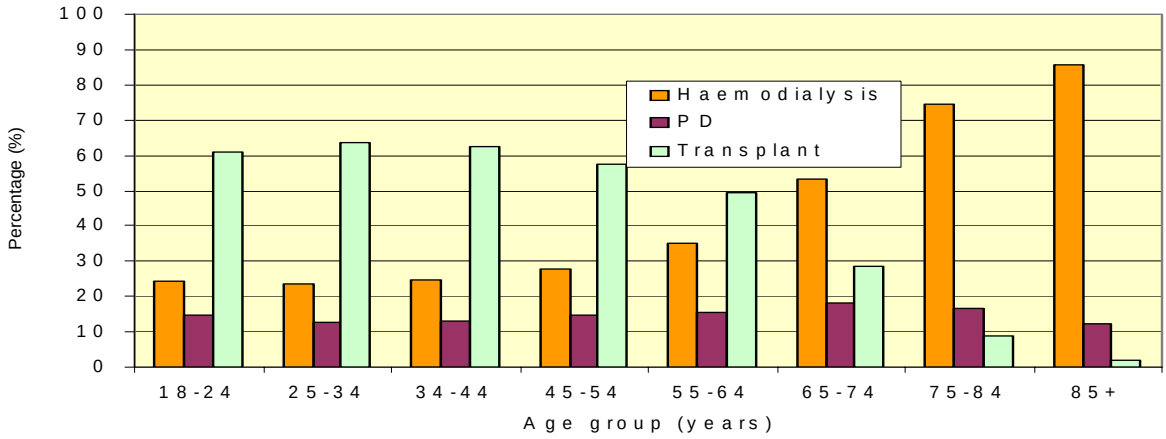

Figure 5.6. Patients on each modality according to age groups

Change in Treatment Modality 1997 – 2002

Table 5.12 and Figure 5.7 show the proportion of treatment modalities for prevalent patients in the Registry units only in 2002. There is a trend of increasing proportion of patients in haemodialysis facilities especially in satellite units and decreasing proportion of peritoneal dialysis and transplant patients. The proportion and the trend were the same as the data obtained from the National Renal Review presented in Chapter 3.

Haemodialysis

The proportion of dialysis patients treated by haemodialysis varied widely between the units and cannot be explained by age alone (Figure 5.8). The overall percentage of patients on HD dialysing in satellite units was 32% (Figure 5.9).

Table 5.12. Proportion of patients with different modalities of RRT, 1997 - 2002

	% HD home	% HD hospital	% HD satellite	% HD total	% PD standard	% PD disconnect	% PD cycling	% PD total	% With Transplant
1997	3.7	19.7	9.0	32.4	2.7	12.9	1.0	16.7	51.0
1998	2.4	23.6	5.6	31.6	0.9	16.6	1.0	18.5	49.9
1999	2.0	21.9	10.9	34.8	0.7	15.0	2.1	17.9	47.3
2000	1.7	26.1	7.8	35.6	0.1	14.2	3.1	17.4	46.9
2001	1.3	24.5	10.9	36.6	0.0	14.0	2.7	16.8	46.6
2002	1.2	25.3	12.2	38.7	0.0	11.4	3.4	14.8	46.0

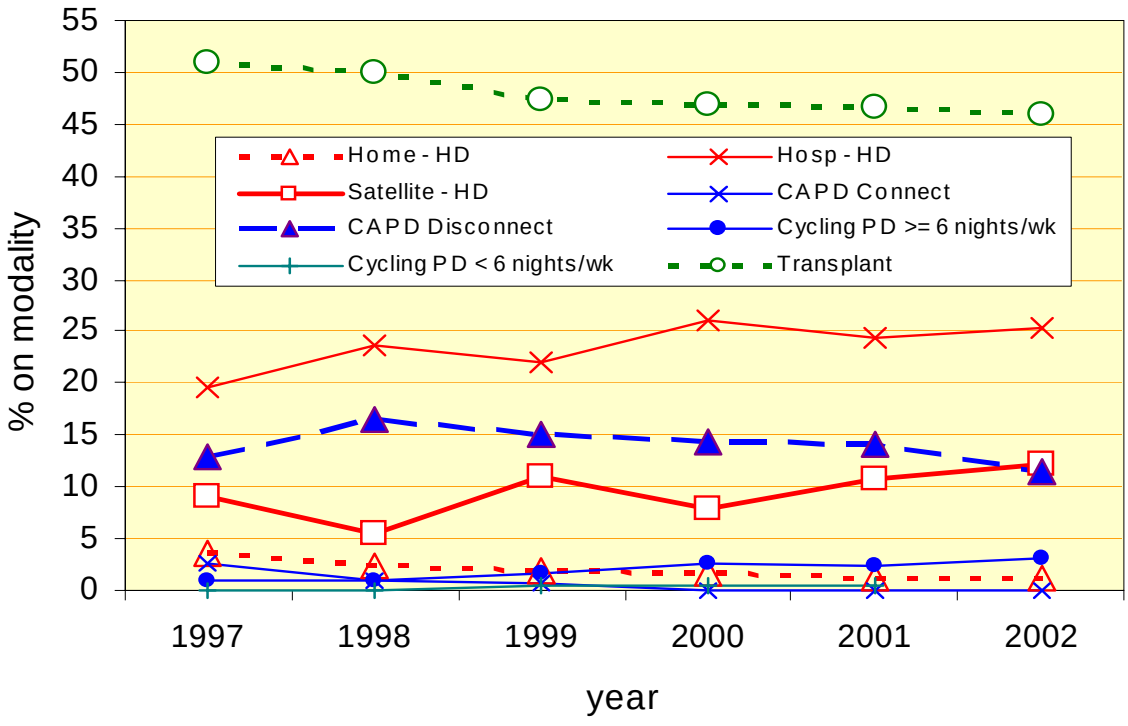

Figure 5.7. Trends of modality changes 1997-2002

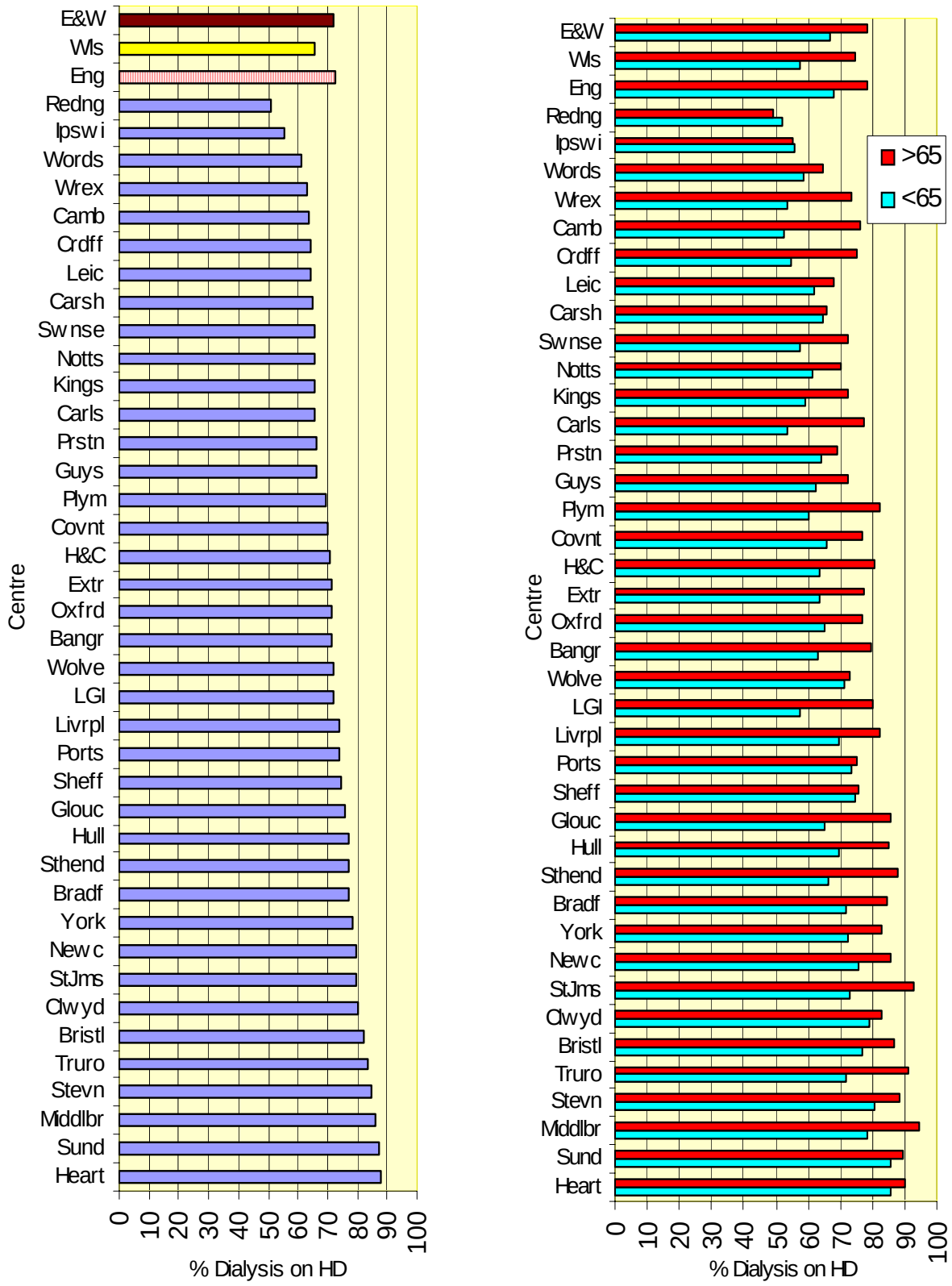

Figure 5.8. Proportion of patients on haemodialysis according to centre and age

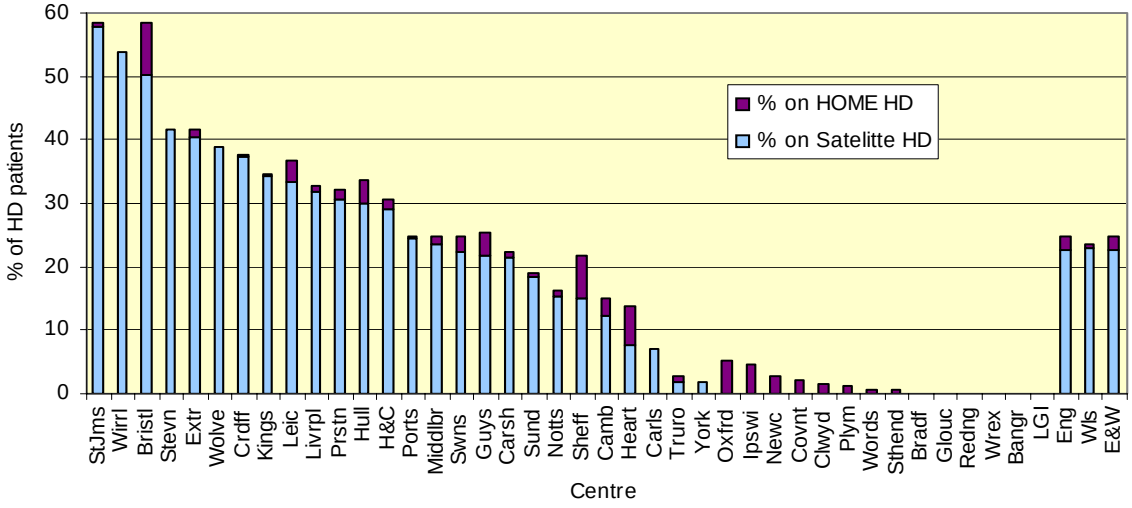

Figure 5.9. Percentage of HD patients treated at home and in satellite units

Peritoneal dialysis

Table 5.13 shows the distribution of types of peritoneal dialysis being used in the UK at the end of 2002. The two main types were CAPD disconnect and APD/CCPD, with a high percentage of patients in Scotland and Northern Ireland using the APD/CCPD methods.

For units in the Registry, the percentages of patients on each of the main types of PD are shown in Figure 5.10.

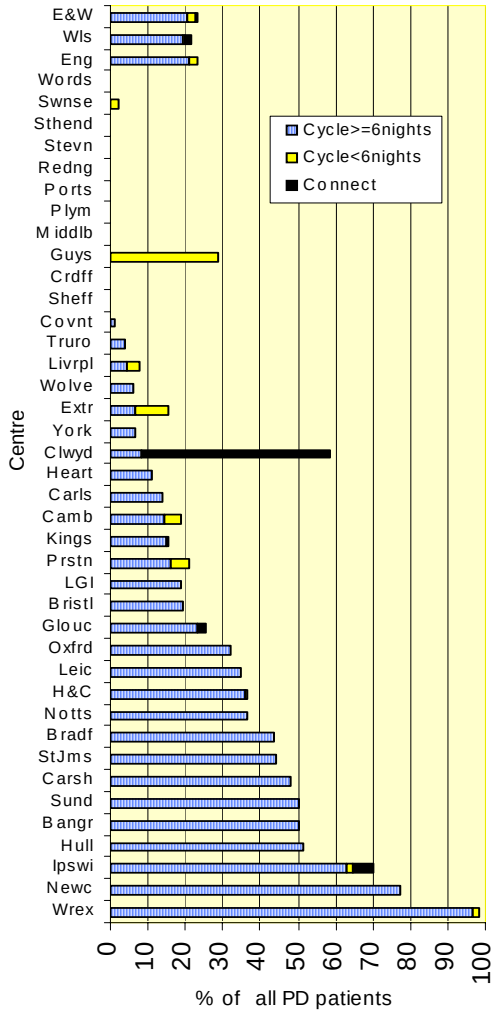

Figure 5.10. Use of connect and automated PD as a percentage of total PD

Survival of Patients Established on RRT

This section analyses the one year survival of all patients who had been established on RRT for at least 90 days on 1 January 2002. Where survival of dialysis patients is shown, patients have been censored at transplantation.

In Figure 5.11 the survival of prevalent dialysis patients for each age band is shown.

There were no significant differences between England and Wales, so the combined data are presented. The one year survival of HD patients in England & Wales has increased significantly from 83.4 in 2000 to 84.3 in 2001 and 86.1 in 2002.

Transplanted patients had better survival

than even the younger non-diabetic patients on dialysis and the data are shown in Table 5.14. The one year death rate for prevalent dialysis patients is 15.0 per 100 patient years (95% CI 14.3 – 17.8).

Table 5.13. Types of peritoneal dialysis in UK (National Review)

	Eng	W	Scot	N I	UK
CAPD disconnect %	74.2	78.2	47.9	32.5	72.0
APD/CCPD %	23.9	19.2	47.3	65.0	25.8
CAPD connect %	0.2	1.6	4.8	1.3	0.6
IPD %	1.6	0.8	0.0	1.3	1.5

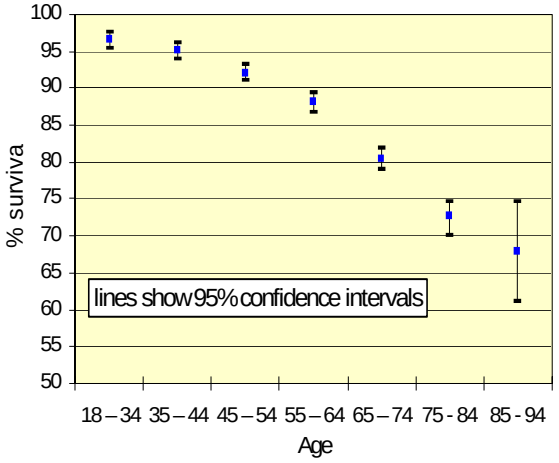

Figure 5.11. One year survival of prevalent dialysis patients by age group

Table 5.14. One year survival of established prevalent RRT patients in England and Wales

Patient group	No. of patients	No. of deaths	KM survival	KM 95% CI.
Transplant patients 2002				
Censored at dialysis	9285	215	**97.6**	97.3-98.0
Not censored at dialysis	9285	235	**97.5**	97.1-97.8
Dialysis patients 2002				
All 1/1/2001 (2 year)	9121	1339	**84.3**	83.3-85.3
All 2002	12484	1683	**86.1**	85.5-86.7
All age <65	5809	544	**92.1**	91.5-92.7
All age =>65	4619	1091	**77.1**	75.9-78.3
Non-diabetic <55	3036	165	**94.2**	93.3-95.0
Non-diabetic 55-64	1635	189	**87.9**	86.3-89.6
Non-diabetic 65-74	2051	401	**80.1**	78.4-81.9
Non-diabetic =>75	1624	439	**72.9**	70.7-75.1
Non-Diabetic <65	4678	354	**92.0**	91.2-92.8
Diabetic <65	906	159	**81.7**	79.1-84.2
Non-Diabetic =>65	3678	840	**76.9**	75.5-78.3
Diabetic =>65	602	171	**71.5**	67.9-75.1

Cohorts of patients alive 1/1/2002 unless indicated otherwise

Survival of Patients Established on RRT by Centre

The unadjusted survival of prevalent dialysis patients alive on 1/1/2002 is shown for each centre on the Registry in Figure 5.12. Survival has again been censored at the time of transplantation. The age adjusted analysis is shown in Figure 5.13. Although there is a significant difference in the unadjusted survival between centres ($p<0.0001$) this is not significant after adjusting for age. In Figure 5.14, the plot of unadjusted Z-scores (see Appendix B for statistical explanation) clearly shows that some centres fall outside the 95% confidence limits, with some below the line (worse survival) and some above the line (better survival). After adjustment for age (Figure 5.15) all the centres fall within the 95% confidence limits. These data have not been adjusted for the presence of co-morbidity and so the centre anonymity has been retained. Figures 5.15 and 5.16 show the data separated by those aged less than 65 years and those aged over 65 years.

The median age of death for patients on dialysis ranged from 67.0 to 76.3 years by centre and this may reflect the local age spread and co-morbidity of the general population.

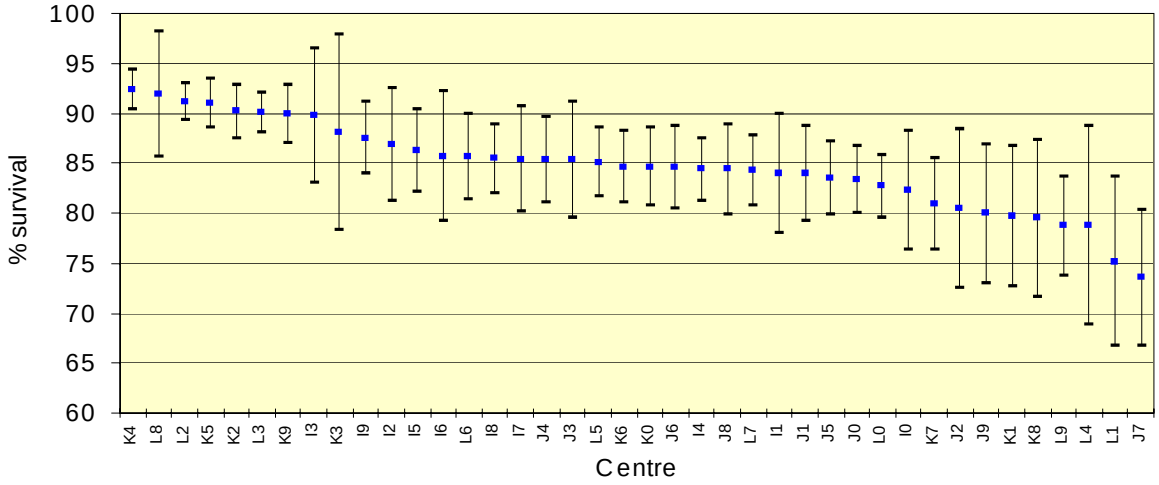

Figure 5.12. One year unadjusted survival of prevalent dialysis patients by centre

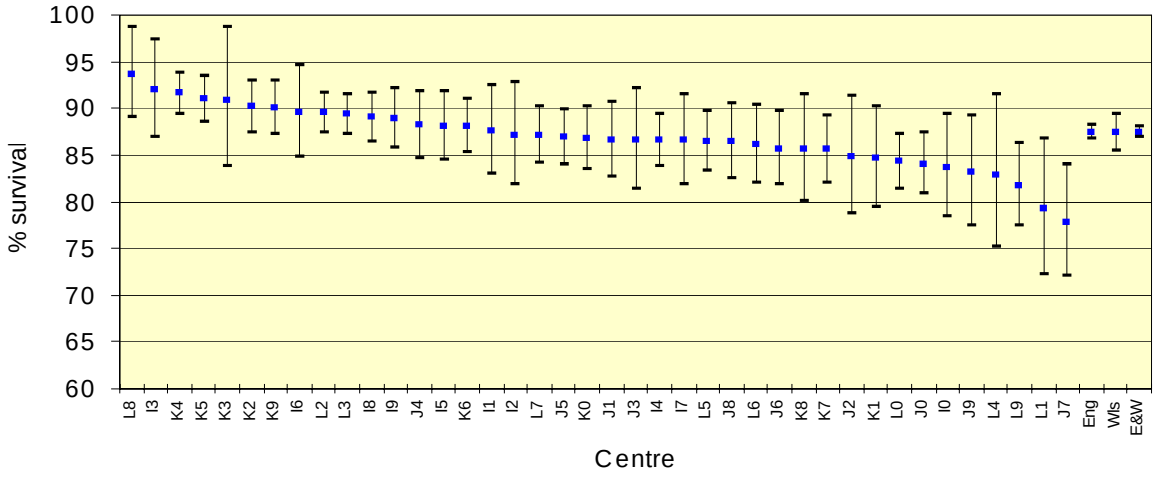

Figure 5.13. One year adjusted (age 60) survival of prevalent dialysis patients by centre

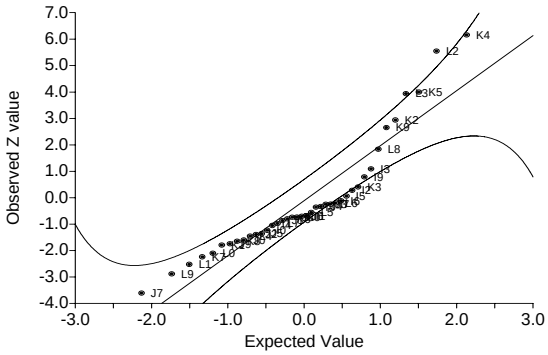

Figure 5.14. Un-adjusted Z scores of 1 year prevalent dialysis survival

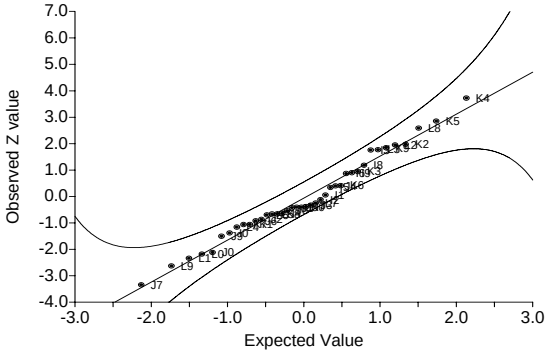

Figure 5.15. Adjusted Z scores of 1 year prevalent dialysis survival

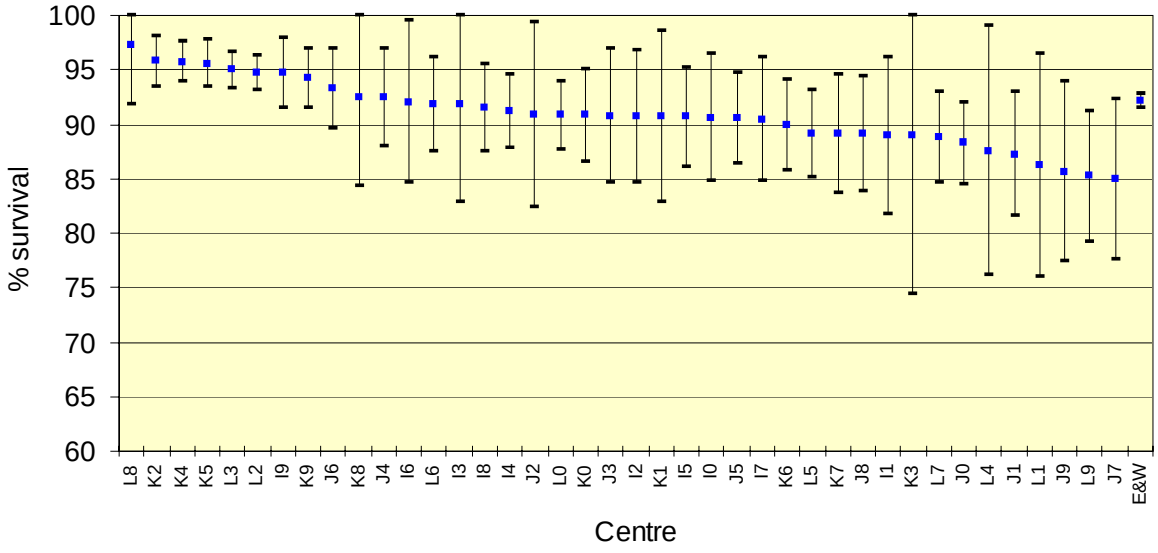

Figure 5.16. One year survival of prevalent dialysis patients aged <65 years by centre

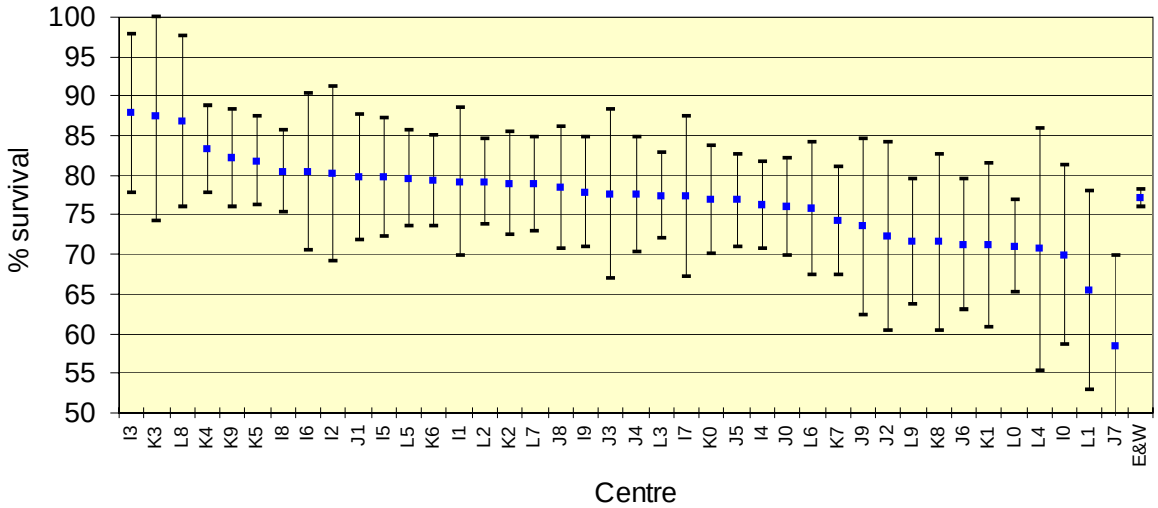

Figure 5.17. One year survival of prevalent dialysis patients aged 65+ years by centre

Seasonal variation in deaths of prevalent patients on renal replacement therapy

There has been no previous literature on seasonal variations in deaths on renal replacement therapy. Understanding of the reasons for the fluctuation in these seasonal deaths would assist in looking for avoidable causes of death.

Deaths in the general population

Data from the Office for National Statistics show a seasonal fluctuation in deaths in the general population, with a peak of deaths occurring in January. In Figure 5.18, there is a slightly higher percentage of the annual deaths occurring in females in this month than males (12.3% v 11.6%). The pattern is similar for the years 2000 and 2001.

The deaths in the general population over 3 years have been averaged by month and adjusted to a standardised mortality ratio. This shows a similar pattern, with a peak in January which appeared to be more marked in females although this was not significant ($p = 0.75$).

The average monthly temperatures in England & Wales (Figure 5.19) have been plotted against the standardised mortality ratios for each month during the period 1998 – 2000. There is an exponential inverse relationship (Figure 5.20) between average monthly temperature and the monthly standardised mortality ratios (log SMR = 2.23 – 0.24x log temp, $p < 0.0001$).

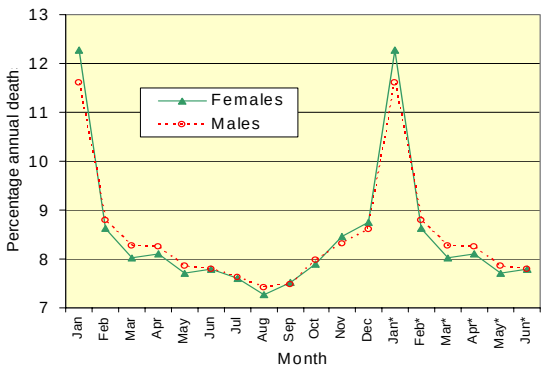

Figure 5.18. England & Wales population, percentage of deaths by gender, 2000

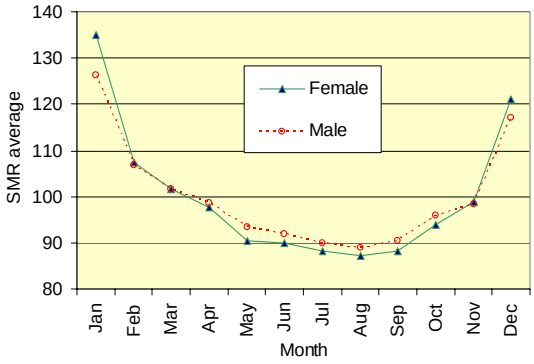

Figure 5.19. England & Wales population, SMR and month and gender, 1998 -2000

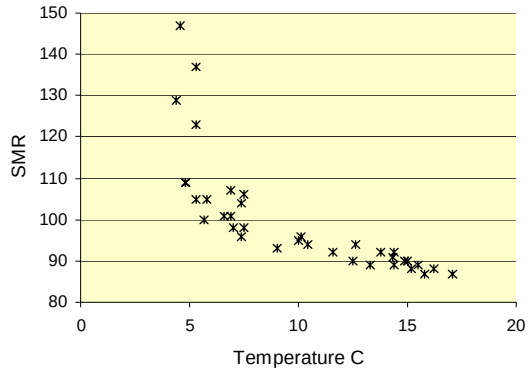

Figure 5.20. England & Wales population, monthly temperature and SMR, 1998 -2000

Deaths on renal replacement therapy

Deaths by month

In contrast with the general population, deaths on renal replacement therapy peak in December rather than January (Figure 5.21). The data were analysed by causes of death. The percentage of the monthly deaths that were due to a cardiac cause did vary, with the lowest at 27% throughout the spring and summer months April to August, compared with 33% in the winter months. The overall chi squared test for seasonal differences between causes of death was significant ($p= 0.015$). The data showed no monthly variation in treatment withdrawal.

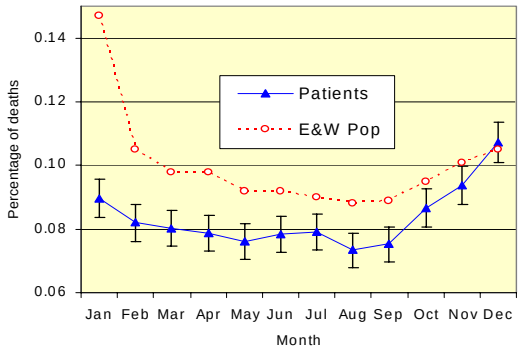

Figure 5.21. Deaths on RRT by month

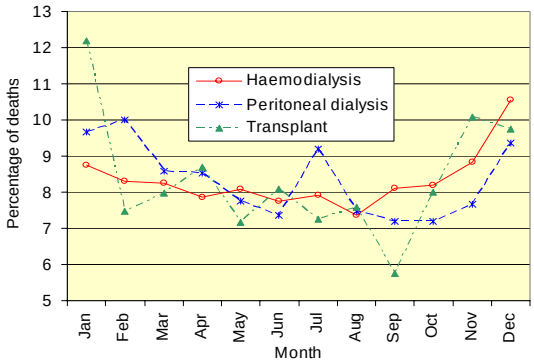

Figure 5.23. Deaths on RRT by month and treatment modality

Deaths by age group

The December peak of deaths (Figure 5.22) was similar for all the three age bands of 18 – 64, 65 –74 and 75+ (p = 0.53).

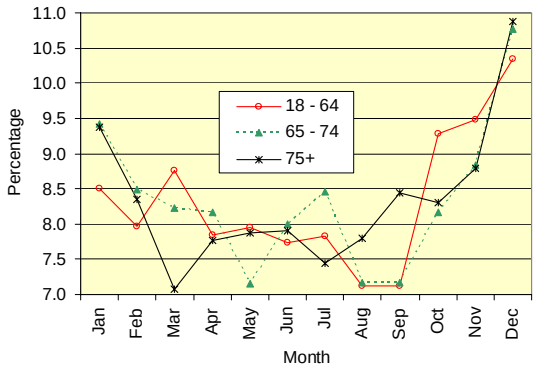

Figure 5.22. Deaths on RRT by month and age band

Deaths by modality

When analysed by modality, unlike dialysis patients, transplant patients have a similar monthly pattern of death to that of the general population (Figure 5.23). The increase in deaths in the haemodialysis population starts in November and peaks in December. In contrast deaths in the peritoneal dialysis population remain high for the 3 months throughout December to February, and also possibly peak again in July. The difference in deaths between modalities was significant (p = 0.05).

Discussion

In the general population the winter increase in deaths from cardiac causes is known to peak 2 weeks earlier than those from pneumonia. It is tempting to speculate that the earlier peak in deaths on dialysis compared with that of the general population may be due to a carwdiac peak, as the main cause of death in the dialysis population is cardiac disease (31% of deaths see Chapter 18). However, transplant deaths do not peak early, and cardiac deaths are also the largest cause of death in the transplant population (37%) with infection accounting for 19% of deaths (18% in the dialysis population). The peritoneal dialysis population has a more general spread of deaths throughout the winter. Further analyses are being undertaken and comparitive data with other countries are required.