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UK Renal Registry 18th Annual Report (December 2015) Chapter 5: Survival and Causes of Death in UK Adult Patients on Renal Replacement Therapy in 2014: National and Centre-specific Analyses

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Key Words

Causes of death · Comorbidity · Dialysis · End stage renal disease · Established renal failure · Haemodialysis · Outcome · Peritoneal dialysis · Renal replacement therapy (RRT) · Survival · Transplant · Vintage

Summary

- Survival of incident patients on RRT continued to improve over the last 14 years for both short and long term survival up to 10 years post RRT start.
- One year after 90 day age adjusted survival for incident RRT patients in the 2013 cohort increased to 91.4% from the previous year (91.0%); survival increased in incident patients aged <65 years and in older patients (⩾65 years).
- There was a difference in one year after 90 day incident survival by age group and diabetic status: diabetic patients aged <65 years have slightly worse survival than non-diabetic patients, but survival for older diabetic patients (⩾65 years) was significantly better than for non-diabetic patients.
- One year age adjusted survival for prevalent dialysis patients was 88.6% in the 2013 cohort, a slight decrease from the 2012 cohort (89.3%). Age adjusted one year survival for prevalent dialysis patients with diabetic primary renal disease has been declining slightly since 2012.
- Centre and UK country variability was evident in incident and prevalent patient survival after adjusting to age 60 and this finding would benefit from further investigation.
- The relative one year risk of death on RRT decreased with age from about 19 times that of the general population at age 35–39 years to 2.6 times at age 85 and over.
- In the prevalent RRT population, cardiovascular disease was the most common cause of death, accounting for 23% of deaths. Infection accounted for 20% of deaths and treatment withdrawal for 16% of deaths.

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Introduction

The analyses presented in this chapter examine: a) survival from the start of renal replacement therapy (RRT) of adult patients; b) survival amongst prevalent adult dialysis patients alive on 31st December 2013; c) the death rate in the UK compared to the general population; d) the causes of death for incident and prevalent adult patients. They encompass the outcomes of the total incident adult UK RRT population (2013) reported to the UK Renal Registry (UKRR), including the 19.7% who started on peritoneal dialysis and the 8.3% who received a pre-emptive renal transplant. These results are therefore a true reflection of the outcomes in the whole UK adult incident RRT population. Analyses of survival within the first year of starting RRT include patients who were recorded as having started RRT for established renal failure (as opposed to acute kidney injury) but who had died within the first 90 days of starting RRT, a group excluded from most other countries' registry data. As is common in other countries, survival analyses are also presented for the first year after 90 days.

The term established renal failure (ERF) used throughout this chapter is synonymous with the terms end stage renal failure (ESRF) and end stage renal disease (ESRD) which are in more widespread international usage. Within the UK, patients have disliked the term 'end stage'; the term ERF was endorsed by the English National Service Framework for Renal Services, published in 2004.

Since 2006, the UKRR has openly reported and published centre attributable RRT survival data. It is again stressed that these are raw data which continue to require very cautious interpretation. The UKRR can adjust for the effects of the different age distributions of patients in different centres, but lacks sufficient data from many participating centres to enable adjustment for primary renal diagnosis, other comorbidities at start of RRT (age and comorbidity, especially diabetes, are major factors associated with survival [1–3]) and ethnic origin, which have been shown to have an impact on outcome (for instance, better survival is expected in centres with a higher proportion of Black and South Asian patients) [4]. This lack of information on case-mix makes interpretation of any apparent difference in survival between centres and UK countries difficult. Despite the uncertainty about any apparent differences in outcome, for centres which appear to be outliers the UKRR will follow the clinical governance procedures as set out in chapter 2 of the 2009 UKRR Report [5].

Methods

The unadjusted survival probabilities (with 95% confidence intervals) were calculated using the Kaplan–Meier method, in which the probability of surviving more than a given time can be estimated for all members of a cohort of patients overall or by subgroup such as age group, but without any adjustment for confounding factors such as age that affect the chances of survival. Where centres are small, or the survival probabilities are greater than 90%, the confidence intervals are only approximate.

In order to estimate the difference in survival of different subgroups of patients within the cohort, a stratified proportional hazards model (Cox) was used where appropriate. The results from the Cox model were interpreted using a hazard ratio. When comparing two groups, the hazard ratio is the ratio of the estimated hazard for group A relative to group B, where the hazard is the risk of dying at time t given that the individual has survived until this time. The underlying assumption of a proportional hazards model is that the hazard ratio remains constant throughout the period under consideration. Whenever used, the assumptions of the proportional hazards model were tested by plotting the log(−log(survival)) versus the log of survival time or by testing time dependent covariates in the model.

To allow for comparisons between centres with differing age distributions, survival analyses were statistically adjusted for age and reported as survival adjusted to age 60. This gives an estimate of what the survival would have been if all patients in that centre had been aged 60 at the start of RRT. This age was chosen because it was approximately the average age of patients starting RRT 15 years ago at the start of the UKRR's data collection. The average age of patients commencing RRT in the UK has recently stabilised around an age of 62 years, but the UKRR has maintained age adjustment to 60 years for comparability with all previous years' analyses. Diabetic patients were included in all analyses unless stated otherwise and for some analyses, diabetic and non-diabetic patients were analysed separately and compared. Non-diabetic patients were defined as all patients excluding those patients with diabetes as the primary renal disease. All analyses were undertaken using SAS 9.3.

Centre variability for incident and prevalent patient survival was analysed using a funnel plot. For any number of patients in the incident or prevalent cohort (x-axis), one can identify whether any given survival probability (y-axis) falls within, plus or minus two standard deviations (SDs) from the national mean (solid lines, 95% limits) or 3SDs (dotted lines, 99.9% limits).

Definition of RRT start date

The incident survival figures quoted in this chapter are from the first day of RRT whether with dialysis or a pre-emptive transplant. In the UKRR all patients starting RRT for ERF are included from the date of the first RRT treatment wherever it took place (a date currently defined by the clinician) if the clinician considered the renal failure irreversible. Should a patient recover renal function within 90 days they were then excluded. These UK data therefore may include some patients who died within 90 days who had developed acute potentially reversible renal failure but were recorded by the clinician as being in irreversible established renal failure.

Previously, the UKRR asked clinicians to re-enter a code for established renal failure in patients initially coded as having

acute renal failure once it had become clear that there was no recovery of kidney function. However, adherence to this requirement was very variable, with some clinicians entering a code for established renal failure only once a decision had been made to plan for long-term RRT [6]. All UK nephrologists have now been asked to record the date of the first haemodialysis session and to record whether the patient was considered to have acute kidney injury (acute renal failure) or to be in ERF at the time. For patients initially categorised as 'acute', but who were subsequently categorised as ERF, the UKRR assigns the date of this first 'acute' session as the date of start of RRT.

UKRR analyses of electronic data extracted for the immediate month prior to the start date of RRT provided by clinicians highlighted additional inconsistencies in the definition of this first date when patients started on peritoneal dialysis, with the date of start reported to the UKRR being later than the actual date of start. These findings are described in detail in chapter 13 of the 2009 Report [6]. This concern is unlikely to be unique to the UK, but will be common to analyses from all renal centres and registries.

In addition to these problems of defining day 0 within one country, there is international variability when patient data are collected by national registries with some countries (often for financial re-imbursement or administrative reasons) defining the 90th day after starting RRT as day 0, whilst others collect data only on those who have survived 90 days and report as zero the number of patients dying within the first 90 days.

Thus, as many other national registries do not include reports on patients who do not survive the first 90 days, survival from 90 days onwards is also reported to allow international comparisons. This distinction is important, as there is a much higher death rate in the first 90 days, which would distort comparisons.

Methodology for incident patient survival

The incident population is defined as all patients over 18 who started RRT at UK renal centres. Patients were considered 'incident' at the time of their first RRT, thus patients re-starting dialysis after a failed transplant were not included in the incident cohort (see appendix B:1 for a detailed definition of the incident (take-on) population).

For incident survival analyses, patients newly transferred into a centre who were already on RRT were excluded from the incident population for that centre and were counted at the centre at which they started RRT. Some patients recovered renal function after more than 90 days but subsequently returned to RRT and for these patients the most recent start of RRT was used.

The incident survival cohort was **NOT** censored at the time of transplantation and therefore included the survival of the 8.3% who received a pre-emptive transplant. An additional reason for not censoring was to facilitate comparison between centres. Centres with a high proportion of patients of South Asian and Black origin are likely to have a healthier dialysis population, because South Asian and Black patients are less likely to undergo early transplantation [7], and centres with a high pre-emptive transplant rate are likely to have a less healthy dialysis population as transplantation selectively removes fitter patients. However, censoring at transplantation was performed in the 1997–2013 cohort to establish the effect on long term survival by age group and also in the 2010–2013 cohort to investigate the effect on the outlying status of centres.

The one year incident survival is for patients who started RRT from 1st October 2012 until the 30th September 2013 and followed up for one full year (e.g. patients starting RRT on 1st December 2012 were followed through to 30th November 2013). The 2014 incident patients could not be analysed as they had not yet been followed for a sufficient length of time. For analysis of one year after 90 day survival, patients who started RRT from 1st October 2012 until 30th September 2013 were included in the cohort and they were followed up for a full one year after the first 90 days of RRT.

Two years' incident data (2012–2013) were combined to increase the size of the patient cohort, so that any differences between the four UK countries can be more reliably identified. To help identify any centre differences in survival from the small centres (where confidence intervals are large), an analysis of one year after 90 day survival using a rolling four year combined incident cohort from 2010 to 2013 was also undertaken. A 10 year rolling cohort was used when analysing trends over time and for long term survival, a cohort from 1997 to 2013 was analysed.

The death rate per 1,000 patient years was calculated by dividing the number of deaths by the person years exposed. Person years exposed are the total years at risk for each patient (until death, recovery or lost to follow up). The death rate is presented by age group and UK nation.

Adjustment of one year after 90 day survival for the effect of comorbidity was undertaken using a rolling four year combined incident cohort from 2010 to 2013. Twenty-five centres returned $\geqslant$85% of comorbidity data for patients in the combined cohort. Adjustment was first performed to a mean age of 60 years, then to the average distribution of primary diagnoses for the 25 centres. The individual centre data were then further adjusted for average distribution of comorbidity present at these centres.

Methodology for prevalent dialysis patient survival

The prevalent dialysis patient group was defined as all patients over 18 years old, alive and receiving dialysis on 31st December 2013 who had been on dialysis for at least 90 days at one of the UK adult renal centres. Prevalent dialysis patients on 31st December 2013 were followed-up in 2014 and were censored at transplantation. When a patient is censored at transplantation, this means that the patient is considered as alive up to the point of transplantation, but the patient's status post-transplant is not considered.

As discussed in previous reports, comparison of survival of prevalent dialysis patients between centres is complex. Survival of prevalent dialysis patients can be studied with or without censoring at transplantation and it is common practice in some registries to censor at transplantation. Censoring could cause apparent differences in survival between those renal centres with a high transplant rate and those with a low transplant rate, especially in younger patients where the transplant rate is highest. Censoring at transplantation systematically removes younger fitter patients from the survival data. The differences are likely to be small due to the relatively small proportion of patients being transplanted in a given year compared to the whole dialysis population (about 13% of the dialysis population aged under 65 and about 2% of the population aged 65 years and over). To allow comparisons with other registries the survival results for prevalent dialysis patients **CENSORED** for transplantation have been quoted. To understand survival of patients, including survival following

transplantation, the incident patient analyses should be viewed. The effect of not censoring at transplantation was performed in the 2013 cohort to investigate the effect on the outlying status of centres.

Methodology for comparing mortality in prevalent RRT patients with the mortality in the general population

Data on the UK population in mid-2014 and the number of deaths in each age group in 2014 were obtained from the Office of National Statistics. The age specific UK death rate was calculated as the number of deaths in the UK per thousand people in the population. The age specific expected number of deaths in the RRT population was calculated by applying the UK age specific death rate to the total of years exposed for RRT patients in that age group. This is expressed as deaths per 1,000 patient years. The age specific number of RRT deaths is the actual number of deaths observed in 2014 in RRT patients. The RRT observed death rate was calculated as number of deaths observed in 2014 per 1,000 patient years exposed. Relative risk of death was calculated as the ratio of the observed and expected death rates for RRT patients. The death rate was calculated for the UK general population by age group and compared with the same age group for prevalent patients on RRT on 31st December 2013.

Methodology of causes of death

The EDTA-ERA Registry codes for causes of death were used. These have been grouped into the following categories:

- Cardiac disease
- Cerebrovascular disease
- Infection
- Malignancy
- Treatment withdrawal
- Other
- Uncertain

Completeness of cause of death data was calculated for all prevalent patients on RRT that died in a specific year with cause of death data completed for that year. Patients that were lost to follow up or that recovered were not included in the cause of death completeness calculation.

Adult patients aged 18 years and over from England, Wales, Scotland and Northern Ireland were included in the analyses of cause of death. The incident patient analysis included all patients starting RRT in the years 2000–2013. Analysis of prevalent patients included all those aged over 18 years and receiving RRT on 31st December 2013 and followed-up for one year in 2014.

Results

Incident (new RRT) patient survival

Overall survival

The 2013 incident cohort included 7,030 patients who started RRT. Age adjusted (adjusted to age 60) one year after 90 days survival for incident patients starting RRT in 2013 (table 5.1), increased compared to last year: 91.4% compared to 91.0% in the 2012 cohort. Survival at 90 days (adjusted to age 60) was also higher in the 2013 cohort at 96.9% (table 5.1) compared to 96.2% in the 2012 cohort.

Survival by UK country

There was no evidence of a significant difference in survival at 90 days between the UK countries (table 5.2), but there was evidence that one year after 90 day survival in Wales was lower compared to the other UK countries (table 5.2). It has to be stressed that the data has not been adjusted for differences in primary renal diagnosis, ethnicity, socio-economic status or comorbidity, nor for differences in life expectancy in the general populations of the four UK countries. There are known regional differences in the life expectancy of the general population within the UK and these are likely to be one of the reasons contributing to the variation in survival between renal centres and UK countries. Table 5.3 shows differences in life expectancy of the

Table 5.1. Survival of incident patients, 2013 cohort

Interval	Unadjusted survival (%)	Adjusted survival (%)	*95% CI*	*N*
Survival at 90 day	94.9	96.9	*96.4–97.4*	7,030
Survival one year after 90 days	88.4	91.4	*90.6–92.2*	6,657

Table 5.2. Incident survival across the UK countries, combined two year cohort (2012–2013), adjusted to age 60

	England	N Ireland	Scotland	Wales	UK
Survival at 90 day (%)	96.5	95.2	97.1	96.1	96.5
95% CI	*96.1–96.9*	*93.5–97.0*	*96.2–98.0*	*95.0–97.2*	*96.1–96.9*
Survival 1 year after 90 days (%)	91.5	91.9	90.6	86.5	91.2
95% CI	*90.9–92.1*	*89.5–94.4*	*88.9–92.3*	*84.4–88.8*	*90.6–91.7*

Table 5.3. Life expectancy in years in the UK countries, 2012–2014 (source ONS [8])

	At birth		At age 65	
Country	Male	Female	Male	Female
England	79.4	83.1	18.6	21.1
Northern Ireland	78.3	82.3	18.1	20.5
Scotland	77.1	81.1	17.3	19.6
Wales	78.4	82.3	18.0	20.5
UK	**79.1**	**82.8**	**18.4**	**20.9**

general population between the UK countries for the period 2012–2014.

Survival by modality

It is impossible to obtain truly valid comparisons of survival of patients starting RRT on different treatment modalities, as modality selection is not random. In the UK, patients starting peritoneal dialysis as a group were younger and fitter and were transplanted more quickly than those starting haemodialysis. The age adjusted one year survival estimates for incident patients starting RRT on haemodialysis (HD) and peritoneal dialysis (PD) were 89.8% and 93.4% respectively, with HD patient survival increasing by 0.6% from the previous year (figure 5.1). Over the last 10 years the one year after 90 days survival has progressively improved in HD patients, but in PD patients survival has remained static over the last five years (figure 5.1).

Survival by age

Tables 5.4 and 5.5 show survival for all incident patients, those aged ⩾65 years and those aged <65 years. Both short term (survival at 90 days) and one year after 90 days survival increased marginally: survival at 90 days increased to 94.9% compared to 94.5% in the previous year (2012 cohort) and one year after 90 days survival increased to 88.4% compared to 88.0% in the 2012 cohort. There was a steep decline in survival with advancing age (figures 5.2 and 5.3). There was evidence that one year after 90 days survival in the 85+ age group increased significantly from 66.2% in the 2012 cohort to 73.2% in the 2013 cohort.

There was a curvilinear increase in the death rate per 1,000 patient years with age for the period one year after 90 days (figure 5.3). There was evidence that the overall death rate in Wales was higher than in the other UK countries, mostly due to a higher death rate in Wales for older patients (⩾65 years old) (figure 5.3). A similar finding is reported in table 5.12, where there was evidence that the one year death rate in prevalent dialysis patients (2013 cohort) was higher in Wales compared to England. Results in table 5.2 also confirm a

Table 5.4. Unadjusted 90 day survival of incident patients, 2013 cohort, by age

Age group	Survival (%)	*95% CI*	*N*
18–64	98.1	*97.6–98.5*	3,585
⩾65	91.6	*90.7–92.5*	3,445
All ages	94.9	*94.4–95.4*	7,030

Table 5.5. Unadjusted one year after day 90 survival of incident patients, 2013 cohort, by age

Age group	Survival (%)	*95% CI*	*N*
18–64	94.2	*93.3–94.9*	3,506
⩾65	81.9	*80.5–83.2*	3,151
All ages	88.4	*87.6–89.1*	6,657

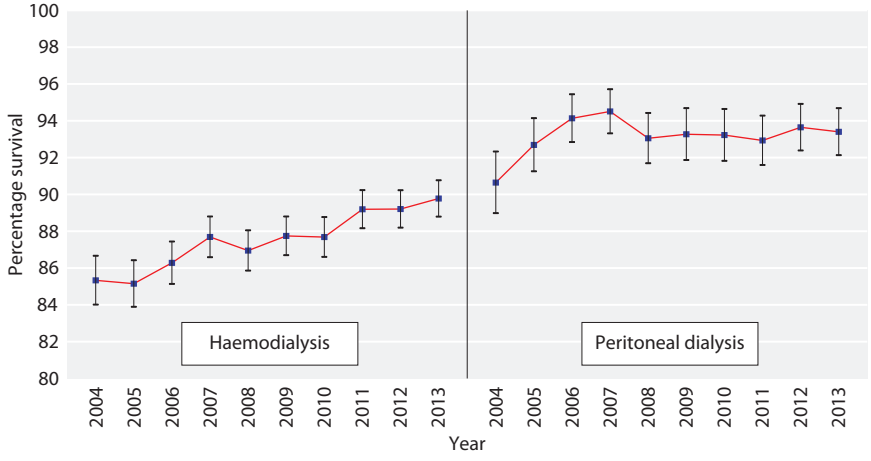

Fig. 5.1. Trend in one year after 90 day incident patient survival by first modality, 2004–2013 cohorts (adjusted to age 60, excluding patients whose first modality was transplantation)

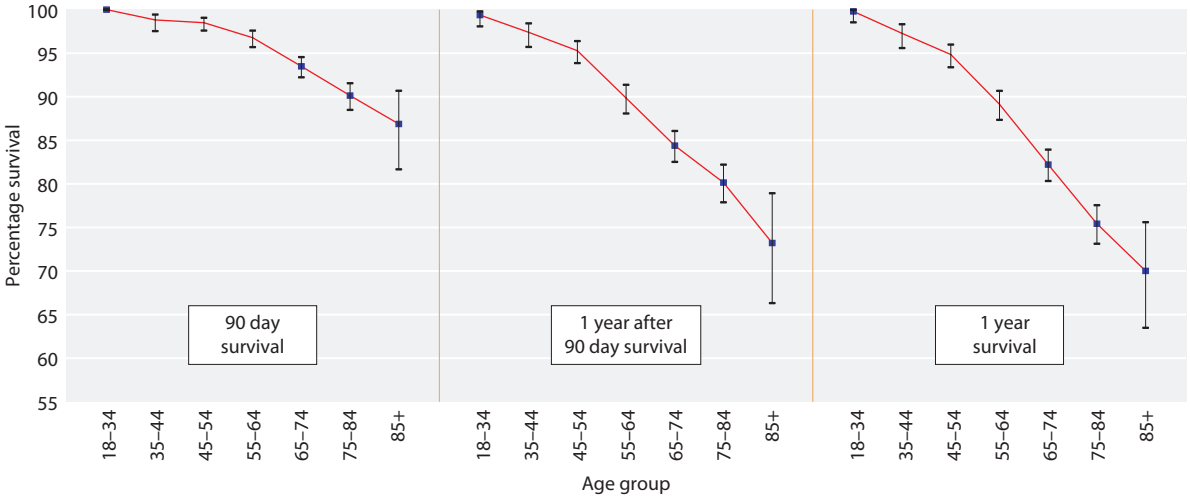

Fig. 5.2. Unadjusted survival of incident patients by age group, 2013 cohort

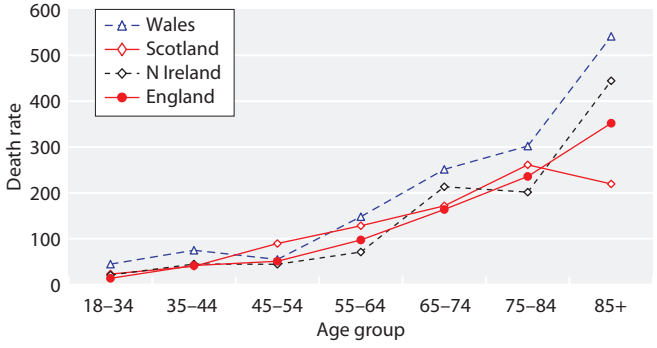

Fig. 5.3. One year after 90 days death rate per 1,000 patient years by UK country and age group for incident patients, 2010–2013 cohort

significantly higher death rate at one year after 90 days in Wales compared to the other UK countries (table 5.2).

From figure 5.4 it can be seen that 50% of patients starting RRT aged between 45–54 survived for over 10 years, 50% of patients starting RRT aged between 55–64 survived for about 5.9 years and 50% of patients starting RRT aged between 65–74 survived for about 3.4 years.

Figure 5.5 illustrates the survival of incident patients, excluding those who died within the first 90 days and shows that 50% of patients aged between 55–64 years survived for six years and 50% of patients aged between 65–74 years survived for about 3.7 years. These survival results are similar to those that included the first 90 days (figure 5.4).

Censoring at transplantation would make the longer term outcomes of younger patients (who were more likely to have undergone transplantation) appear worse than they actually were. Without censoring, the 10 year survival for patients aged 18–34 years was 83.7% (figure 5.4), which contrasts sharply with a 58.3% survival when censoring at the time of transplantation (data not shown). The 10 year survival without and with censoring at transplantation were 70.7% and 44.8% for age group 35–44 and 54.7% and 31.1% for age group 45–54 respectively. This difference in survival is less pronounced in older

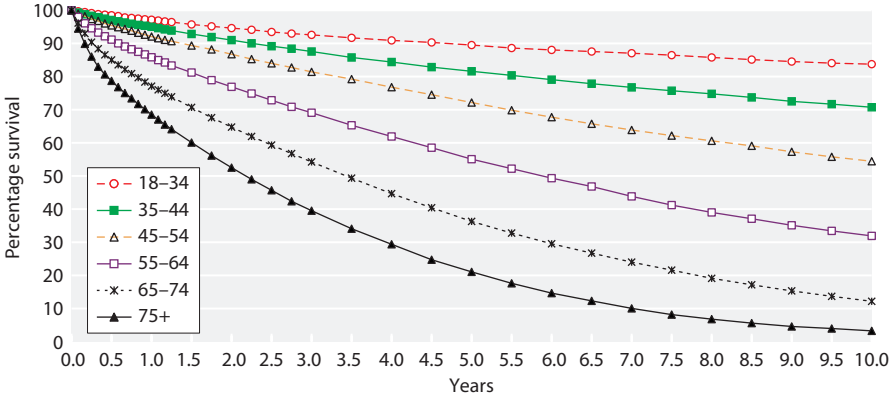

Fig. 5.4. Survival of incident patients (unadjusted), 1997–2013 cohort (from day 0), without censoring at transplantation

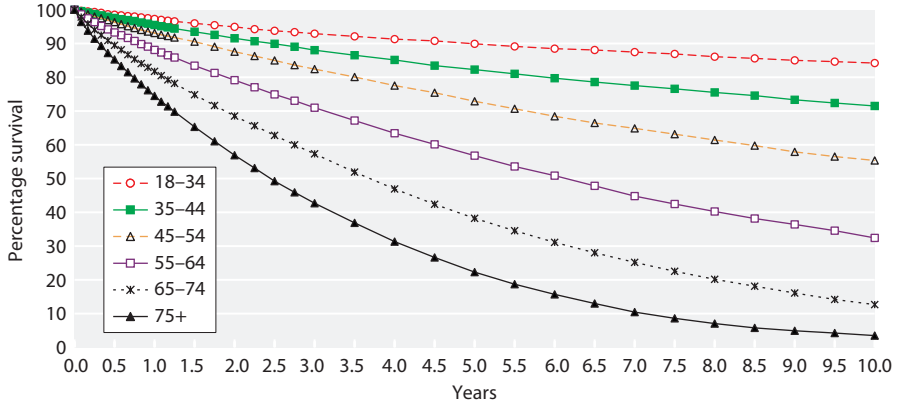

Fig. 5.5. Survival of incident patients (unadjusted), 1997–2013 cohort (from day 90), without censoring at transplantation

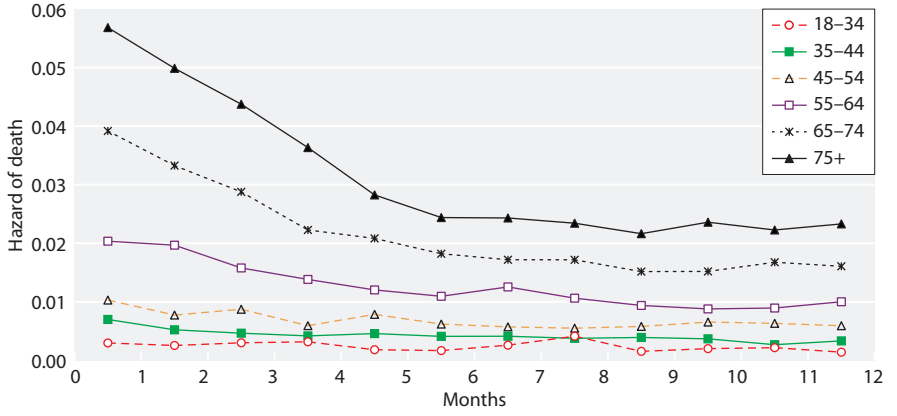

Fig. 5.6. First year monthly hazard of death, by age group, 1997–2013 combined incident cohort

age groups, especially for patients aged 65+. For more detailed information on this effect, refer to the 2008 Report [9].

Age and the hazard of death

Figure 5.6 shows the monthly hazard of death from the first day of starting RRT by age group, which falls sharply during the first 4–5 months, particularly for older patients (⩾65 years), after which time the hazard remains relatively stable up to one year.

The 10 year hazard of death at 90 days increased to 1.85 in the 2013 cohort from 1.68 (2012 cohort) whereas the hazard in the 1st year after 90 days was similar. A 10 year increase in patient age was associated with a 1.85 times increased risk of death within 90 days and a 1.65 times increased risk of death within one year after 90 days (table 5.6).

Survival by gender

There were no survival differences between genders in an incident cohort of patients starting RRT from 2002 to 2011 and followed up for a minimum of three years until 2014 (figure 5.7). There was also no evidence of a survival difference between genders in the first 90 days and one year after the first 90 days (data not shown).

Survival in the 2004–2013 cohort

The death rate per 1,000 patient years in the first year of starting RRT from 2004 to 2013 is shown in figure 5.8. There was a declining trend in the overall death rate with a steeper rate of decline in the older age group (⩾65 years). It is important to note that these death rates are not directly comparable with those produced by the USRDS Registry, as the UK data include the first 90 day period when death rates are higher than subsequent time periods.

The time trend changes in one year after 90 days incident survival over the period 2004–2013 are shown

Table 5.6. Increase in proportional hazard of death for each 10 year increase in age, 2013 incident cohort

Interval	Hazard of death for 10 year age increase	*95% CI*
First 90 days	1.85	*1.68–2.03*
1 year after first 90 days	1.65	*1.56–1.75*

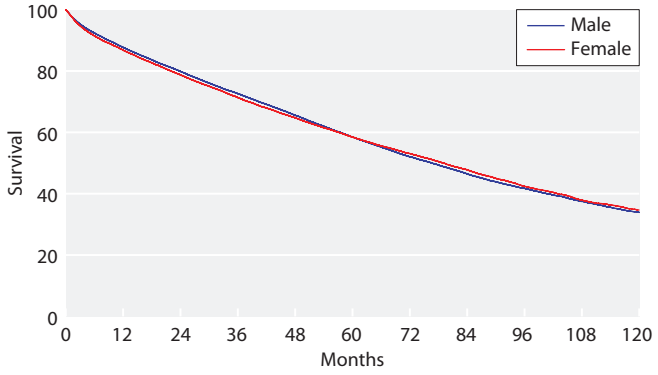

Fig. 5.7. Long term survival of incident patients by gender, 2002–2011 combined cohort, adjusted to age 60, followed-up for a minimum of three years

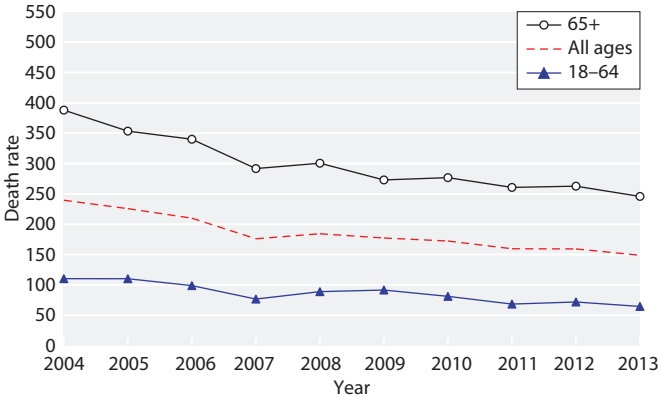

Fig. 5.8. One year incident death rate per 1,000 patient years by age group, 2004–2013 cohort

in figure 5.9. The left hand plot, which includes only those centres that have been sending data continuously since 2000, shows a similar improvement in survival to the plot in which data from all renal centres were analysed.

One year after 90 days incident patient survival in the 2004–2013 cohort by centre, UK country and overall, can be found in appendix 1, table 5.22.

Long term survival: trends up to 10 years post RRT start

Longer term survival from start of RRT continued to improve for incident patients (tables 5.7 and 5.8). There was a steep decline in survival with advancing age. The unadjusted survival analyses (tables 5.7, 5.8 and figures 5.10, 5.11) show a large improvement in one to 10 year survival across the years for both those aged under and those 65 years and over. One year survival amongst patients aged <65 years at start of RRT has improved from 87.5% in the 1998 cohort to 93.7% in the 2013 cohort.

Although survival has improved both in patients aged under 65 and those aged ⩾65 years, the improvement was more pronounced in patients aged ⩾65: there has been a 15.8% absolute improvement in one year survival from the 1998 to 2013 cohorts (table 5.8). As these are observational data it remains difficult to attribute this reduction in risk of death to any specific improvements in care.

Change in survival on RRT by vintage

Figure 5.12 shows the six monthly hazard of death by age group for incident patients. There is little evidence of a worsening prognosis with time on RRT (vintage) for the majority of incident RRT patients in the UK (not censored for transplantation), although an increased hazard over time is evident for incident patients aged 65 years and older. When censoring for transplantation an apparent vintage effect is evident (data not shown) and this effect is at least in part because younger and healthier patients are only included in the survival calculation up to the date of transplantation. In the older age groups there were decreasing numbers remaining alive beyond seven years accounting for the increased variability seen. Figures 5.13 and 5.14 show these data for the non-diabetic

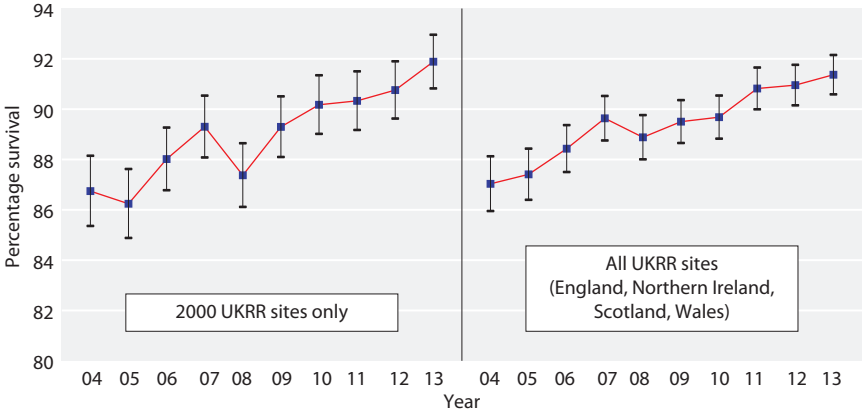

Fig. 5.9. Change in one year after 90 day survival, 2004–2013 incident cohort (adjusted to age 60)
Showing 95% confidence intervals

Table 5.7. Unadjusted survival of incident patients, 1998–2013 cohort for patients aged 18–64 years

Cohort	1 year	2 year	3 year	4 year	5 year	6 year	7 year	8 year	9 year	10 year	*95% CI for latest year*	*N*
2013	**93.7**										***92.9–94.5***	**3,585**
2012	93.1	87.3									*86.2–88.4*	3,542
2011	93.4	88.7	83.7								*82.4–84.9*	3,356
2010	92.2	86.6	81.7	77.3							*75.8–78.7*	3,365
2009	91.3	85.0	80.4	76.3	71.1						*69.5–72.6*	3,389
2008	91.5	86.0	81.1	76.9	73.2	69.5					*67.9–71.0*	3,445
2007	92.6	87.1	81.8	76.9	73.1	69.5	66.1				*64.4–67.7*	3,328
2006	90.6	85.0	80.1	75.7	72.0	68.1	64.1	61.3			*59.5–63.0*	3,160
2005	89.6	83.6	78.6	73.9	69.3	65.7	62.5	59.5	56.5		*54.7–58.3*	2,830
2004	89.6	83.4	78.0	72.6	67.9	64.2	61.0	57.2	54.6	53.0	*51.1–55.0*	2,563
2003	89.4	82.7	77.3	72.3	67.3	63.2	59.5	56.7	54.1	51.6	*49.5–53.6*	2,265
2002	88.5	80.7	74.7	69.1	65.0	61.1	57.7	54.8	51.6	49.5	*47.3–51.7*	2,023
2001	88.0	81.0	75.4	70.3	65.3	60.6	56.6	53.1	50.2	48.0	*45.7–50.4*	1,739
2000	89.1	81.3	74.5	69.1	63.6	59.0	55.5	52.3	49.9	47.2	*44.6–49.7*	1,528
1999	87.0	81.1	73.3	67.5	62.1	58.1	53.9	51.0	48.5	46.9	*44.2–49.6*	1,346
1998	87.5	80.2	74.4	69.5	64.1	59.1	55.1	53.1	49.9	47.7	*44.7–50.5*	1,166

Table 5.8. Unadjusted survival of incident patients, 1998–2013 cohort for patients aged ⩾65 years

Cohort	1 year	2 year	3 year	4 year	5 year	6 year	7 year	8 year	9 year	10 year	*95% CI for latest year*	*N*
2013	**78.5**										***77.1–79.9***	**3,445**
2012	77.3	65.3									*63.6–66.9*	3,334
2011	77.4	62.8	51.4								*49.7–53.1*	3,365
2010	76.3	63.4	51.2	41.9							*40.2–43.6*	3,277
2009	76.6	63.3	52.5	41.6	32.9						*31.3–34.5*	3,371
2008	74.6	61.2	49.9	40.5	32.3	25.8					*24.2–27.3*	3,175
2007	75.1	61.2	49.8	40.5	32.0	25.5	20.2				*18.8–21.6*	3,209
2006	72.0	58.2	46.9	37.2	29.0	23.2	17.7	13.5			*12.3–14.7*	3,120
2005	71.0	57.2	45.2	36.1	27.8	21.1	16.6	12.5	9.9		*8.9–11.0*	2,936
2004	68.9	53.9	42.4	33.9	26.8	20.9	16.3	12.9	9.9	7.6	*6.7–8.7*	2,628
2003	68.4	53.6	41.7	31.8	24.3	18.1	14.2	11.1	8.5	6.8	*5.8–7.9*	2,315
2002	66.0	50.7	40.3	31.8	23.9	18.3	13.7	10.9	8.2	6.5	*5.5–7.6*	2,086
2001	66.5	51.8	38.4	28.8	21.8	16.0	12.0	9.1	7.2	5.5	*4.5–6.7*	1,709
2000	66.0	52.3	39.5	28.5	22.2	17.2	13.1	9.7	7.5	5.7	*4.6–6.9*	1,496
1999	68.4	51.6	39.1	29.8	22.2	16.2	11.5	8.4	6.2	4.9	*3.8–6.2*	1,213
1998	62.7	45.5	36.2	26.5	20.1	14.0	10.6	7.6	5.7	4.6	*3.5–6.1*	1,016

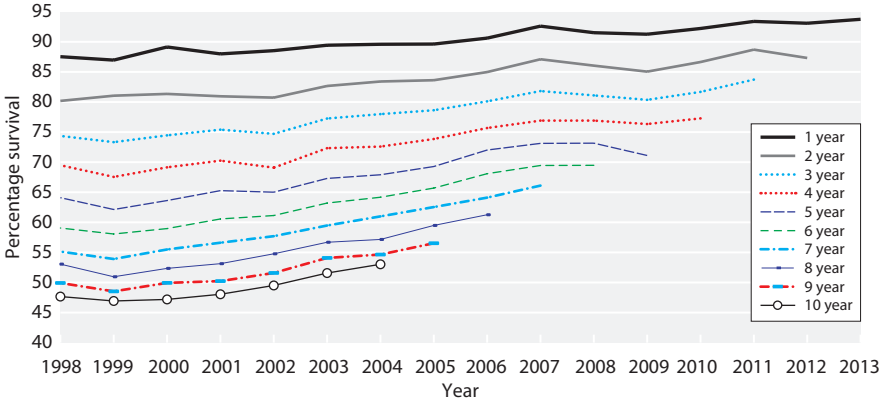

Fig. 5.10. Change in long term survival by year of starting RRT, for incident patients aged 18–64 years

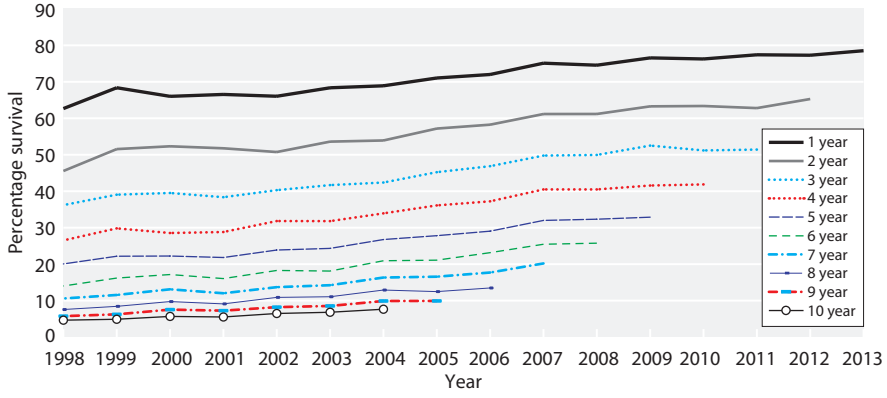

Fig. 5.11. Change in long term survival by year of starting RRT, for incident patients aged >65 years

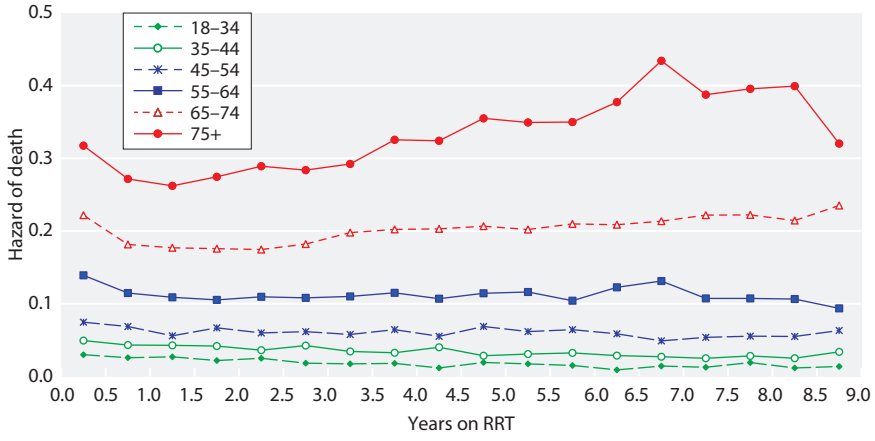

Fig. 5.12. Six monthly hazard of death, by vintage and age group, 1997–2013 incident cohort after day 90 (not censored at transplantation)

and diabetic patients respectively. An increased hazard of death over time is evident for diabetic patients predominantly over >65 years of age.

Centre variability in one year after 90 days survival

Centre variability was assessed in a larger cohort across several years due to small numbers of patients and wide confidence intervals (appendix 1, table 5.22) in the 2013 incident cohort. Similar to previous years, sustained performance was assessed in a rolling four year cohort from 2010 to 2013. These data are presented as a funnel plot in figure 5.15. Table 5.9 allows centres to be identified on this graph by finding the number of patients treated by the centre and then looking up this number on the x-axis. One centre (Swansea) had survival below the 95% lower limit whilst five centres (London St. George's, London Guy's, Western Trust Northern Ireland, Reading, Exeter) had survival above the 95% upper limit and this is an increase from the previous cohort where four centres were survival outliers above the 95% upper limit.

With 71 centres it would be expected that only three centres would be outside these limits by chance. It is

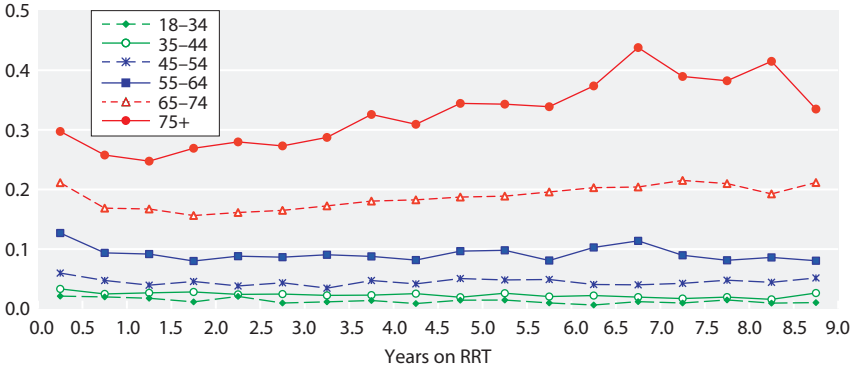

Fig. 5.13. Six monthly hazard of death, by vintage and age group, 1997–2013 non-diabetic incident cohort after day 90 (not censored at transplantation)

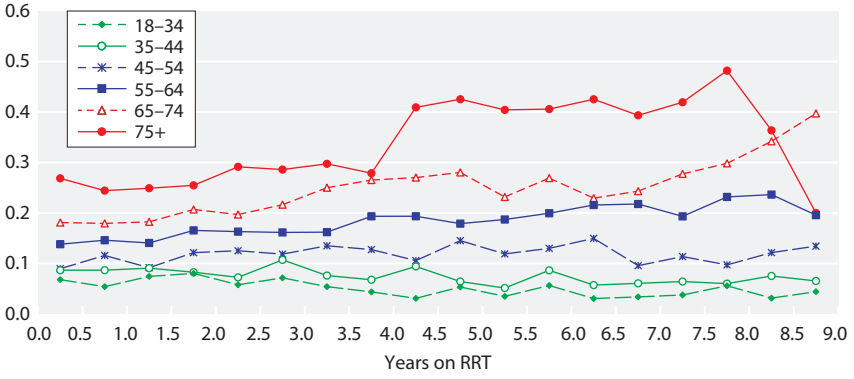

Fig. 5.14. Six monthly hazard of death, by vintage and age group, 1997–2013 diabetic incident cohort after day 90 (not censored at transplantation)

important to acknowledge that these data have not been adjusted for any patient related factor except age (i.e. not comorbidity, primary renal disease or ethnicity) and have not been censored at transplantation, so the effect of differing centre rates of transplantation was not taken into account. Figure 5.16 illustrates the effect of adjusting for comorbidity on survival in centres with good comorbidity returns (⩾85%), with the biggest improvement in survival seen in Swansea. Adjustment for comorbidity could have an important effect in some renal centres like Swansea that seem to have a higher comorbid burden in their RRT population and this could affect the outlier status of centres as illustrated in figure 5.15, but due to poor comorbidity returns for many renal centres, comorbidity adjustment for the entire incident RRT population is not yet possible. Case mix adjustment performed in a cohort of incident patients starting RRT in England from 2002 to 2006 and linked to the Hospital Episodes Statistics (HES) data, found that three of the four survival outliers were no longer outliers after adjustment for HES-derived case mix. Swansea could not be evaluated in this analysis as the linkage was only done for England's RRT patients, but the study results highlight that variability in survival between centres is affected by case mix [10].

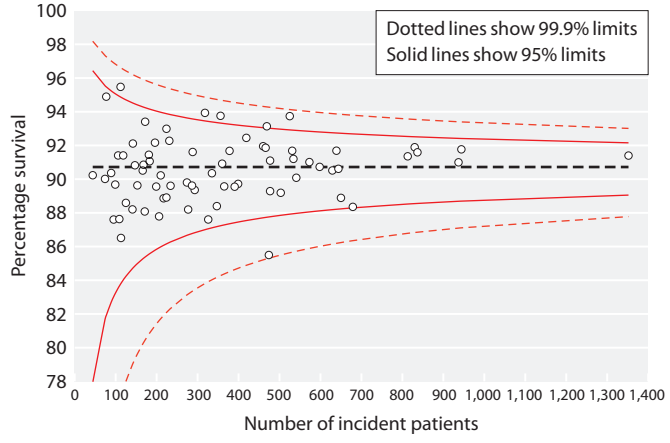

Fig. 5.15. Funnel plot for age adjusted one year after 90 days survival, 2010–2013 incident cohort

Also see appendix 1, table 5.22 and 5.23 for unadjusted and adjusted survival together with 95% confidence intervals for incident patient survival one year after 90 days and at 90 days. Table 5.24 in appendix 1 shows the one year after 90 day incident survival by centre for incident cohort years 2004–2013, adjusted to age 60. One to five year survival after the first 90 days of RRT adjusted to age 60 is included in appendix 1, table 5.25 for incident cohorts 2009–2013 and is a new table in the survival chapter.

Centre variability in one year after 90 day survival: impact of adjustment for comorbidity

Although comorbidity returns to the UKRR have remained poor, there was an increase in the number of centres (26 to 31 centres) returning ⩾85% of comorbidity data to the UKRR for patients starting RRT in 2013. These analyses use a different cohort, a combined incident cohort from 2010–2013 where 25 centres returned comorbidity data over the period for ⩾85% of patients and these centres were included in this analysis. Adjustment was first performed to age 60, then to the average distribution of primary renal diagnoses for the 25 centres. Further adjustment was then made to the average distribution of comorbidities present at those centres (table 5.10).

It can be seen that adjustment for age has the largest effect, most notably in those centres with the lower unadjusted survival figures. Survival improved for all centres after adjustment for age, as the average age for incident patients was higher than the adjustment to the average age of 60 years. There were only minor differences for most centres after adjustment for primary renal diagnosis, but survival increased by ⩾1% for two centres (Swansea, Newry). In five centres (Swansea, Newry, Basildon, Bradford, Leeds) adjustment for comorbidity had a noticeable effect (⩾1% increase) on

Table 5.9. Age adjusted (to age 60) one year after 90 day survival, 2010–2013 incident cohort

	1 year after 90 days					1 year after 90 days			
			Limits for funnel plot					Limits for funnel plot	
Centre	*N*	Adjusted survival %	Lower 95% limit	Upper 95% limit	Centre	*N*	Adjusted survival %	Lower 95% limit	Upper 95% limit
D & Gall	44	90.2	77.9	96.4	L St.G	318	93.9	87.0	93.5
Clwyd	74	90.0	81.7	95.5	Wolve	326	87.6	87.1	93.4
Inverns	77	94.9	81.9	95.5	Stoke	335	90.3	87.1	93.4
Bangor	89	90.4	82.7	95.2	Newc	347	88.4	87.2	93.4
Newry	95	87.6	83.0	95.1	Redng	356	93.8	87.2	93.3
Ulster	99	89.7	83.2	95.1	Hull	360	90.9	87.3	93.3
Carlis	106	91.4	83.5	95.0	Liv Roy	365	89.6	87.3	93.3
Antrim	109	87.6	83.7	94.9	B Heart	378	91.7	87.4	93.3
West NI	112	95.5	83.8	94.9	Covnt	391	89.5	87.4	93.2
Wrexm	113	86.5	83.8	94.9	Middlbr	399	89.7	87.5	93.2
Sthend	117	91.4	84.0	94.8	Nottm	419	92.4	87.5	93.1
Colchr	125	88.6	84.2	94.7	Camb	460	92.0	87.7	93.1
Klmarnk	141	88.2	84.7	94.5	Stevng	465	91.9	87.7	93.0
Ipswi	142	92.1	84.7	94.5	Swanse	465	85.3	87.7	93.0
Krkcldy	147	90.8	84.8	94.5	Exeter	469	93.1	87.7	93.0
Basldn	153	89.6	85.0	94.4	Brightn	477	89.3	87.8	93.0
York	166	90.5	85.3	94.3	Kent	477	91.1	87.8	93.0
Donc	168	90.9	85.3	94.3	Salford	503	89.2	87.9	93.0
Chelms	171	88.1	85.4	94.2	L Guys	525	93.7	87.9	92.9
Truro	172	93.4	85.4	94.2	Prestn	531	91.7	87.9	92.9
Dudley	181	91.4	85.5	94.2	Sheff	534	91.2	87.9	92.9
Dundee	183	91.1	85.6	94.2	L Kings	541	90.1	88.0	92.9
Abrdn	196	92.2	85.8	94.1	Leeds	573	91.0	88.1	92.8
Liv Ain	199	89.6	85.8	94.0	Bristol	598	90.7	88.1	92.8
Shrew	206	87.8	85.9	94.0	Ports	629	90.5	88.2	92.8
Wirral	210	90.2	86.0	94.0	Oxford	639	91.7	88.2	92.7
Airdrie	217	88.9	86.1	93.9	M RI	640	90.6	88.2	92.7
Plymth	224	93.0	86.2	93.9	Glasgw	650	88.9	88.2	92.7
Sund	224	88.9	86.2	93.9	Cardff	684	88.4	88.3	92.7
Glouc	231	92.3	86.2	93.8	B QEH	813	91.4	88.5	92.5
Bradfd	234	89.6	86.3	93.8	Carsh	830	91.9	88.5	92.5
Dorset	274	89.8	86.7	93.6	L Rfree	837	91.6	88.6	92.5
Edinb	277	88.2	86.7	93.6	Leic	937	91.0	88.7	92.4
Derby	286	89.6	86.8	93.6	L Barts	944	91.8	88.7	92.4
Belfast	288	91.6	86.8	93.6	L West	1352	91.4	89.1	92.2
Norwch	293	89.4	86.8	93.5					

adjusted survival (table 5.10, figure 5.16) helping to explain the lower survival noted in figure 5.15. After adjustment for age, primary renal diagnosis and comorbidity, Swansea, Ulster and Wrexham had a noticeable improvement in survival of 9.4%, 7.7% and 7.0% respectively.

Survival in patients with diabetes

Although it has previously been shown that diabetic patients have worse long term survival compared to non-diabetic patients [3], non-diabetic patient survival in the older age group ($\geqslant$65 years) was worse compared to diabetic patients in the same age group during the first 90 days of starting RRT (2013 cohort) (figure 5.17) and in the subsequent year (figure 5.18); this might be due to patient selection. Survival in patients $<$65 years was almost similar between diabetic and non-diabetic patients during the first 90 days of starting RRT and in the subsequent year.

Long term survival for diabetic and non-diabetic patients was evaluated in a cohort of patients starting RRT from 2002 to 2011 with a minimum of three years

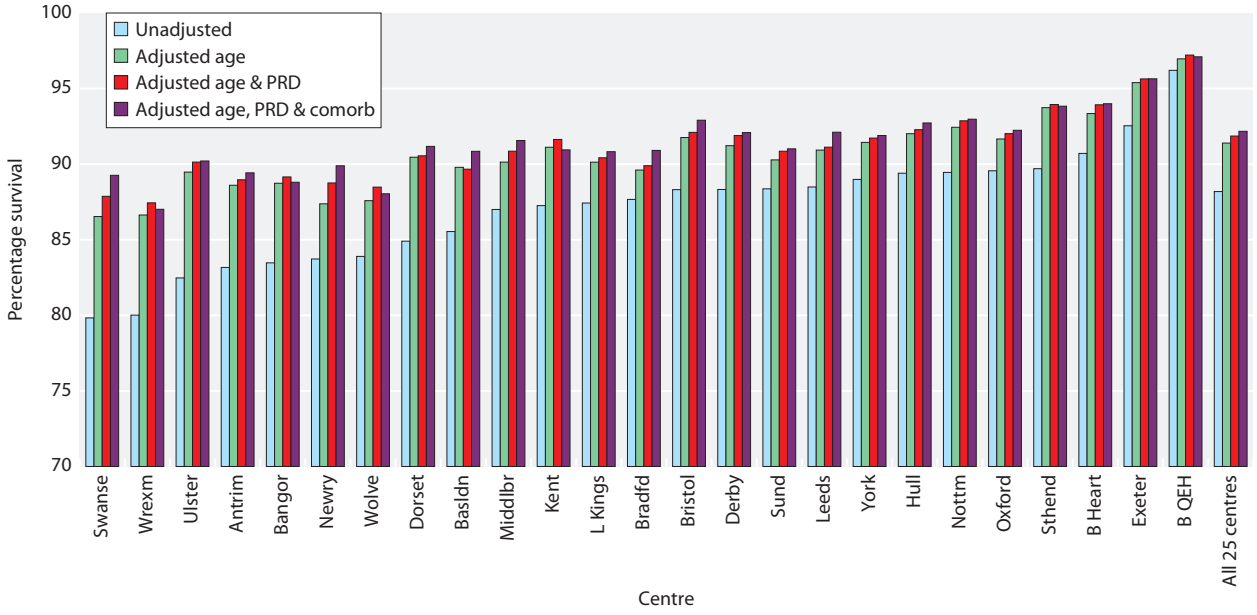

Fig. 5.16. The effect on survival after sequential adjustment for age, primary renal diagnosis and comorbidity, 2010–2013 incident cohort

Table 5.10. The effect of adjustment for age, primary renal diagnosis and comorbidity on survival, 2010–2013 incident cohort, % survival one year after 90 days

Centre*	Unadjusted	Age adjusted	Age, PRD adjusted	Age, PRD and comorbidity adjusted
Swanse	79.8	86.5	87.9	89.3
Wrexm	80.0	86.6	87.4	87.0
Ulster	82.5	89.5	90.1	90.2
Antrim	83.2	88.6	89.0	89.4
Bangor	83.5	88.7	89.2	88.8
Newry	83.7	87.4	88.8	89.9
Wolve	83.9	87.6	88.5	88.0
Dorset	84.9	90.5	90.6	91.2
Basldn	85.5	89.8	89.7	90.8
Middlbr	87.0	90.1	90.9	91.6
Kent	87.3	91.1	91.6	90.9
L Kings	87.4	90.1	90.4	90.8
Bradfd	87.7	89.6	89.9	90.9
Bristol	88.3	91.8	92.1	92.9
Derby	88.3	91.2	91.9	92.1
Sund	88.4	90.3	90.9	91.0
Leeds	88.5	90.9	91.1	92.1
York	89.0	91.4	91.7	91.9
Hull	89.4	92.0	92.3	92.7
Nottm	89.5	92.4	92.9	93.0
Oxford	89.6	91.7	92.0	92.2
Sthend	89.7	93.7	93.9	93.8
B Heart	90.7	93.3	93.9	94.0
Exeter	92.5	95.4	95.6	95.6
B QEH	96.2	97.0	97.2	97.1
All 25 centres	88.2	91.4	91.9	92.2

PRD primary renal diagnosis
*Centre included if ⩾85% comorbidity data available

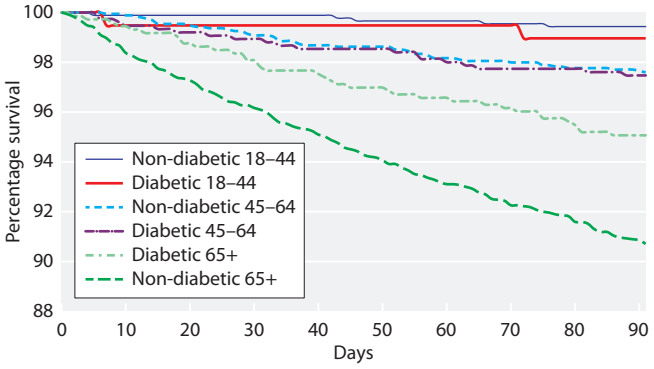

Fig. 5.17. Survival at 90 days for incident diabetic and non-diabetic patients by age group for patients starting RRT, 2013 cohort

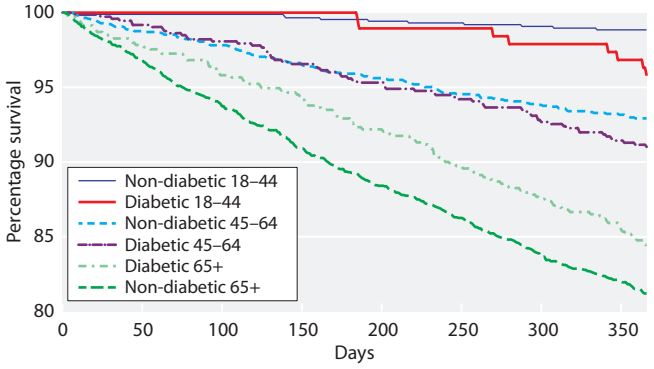

Fig. 5.18. Survival at one year after 90 days for incident diabetic and non-diabetic patients by age group for patients starting RRT, 2013 cohort

follow up until 2014. These data show large differences between diabetic and non-diabetic patient survival in the age groups 18–44 and 45–64 years. In age group 18–44, 89% of non-diabetic patients were alive five years after start of RRT compared to 71% for diabetic patients. In the age group 45–64, 68% of non-diabetic patients were alive five years after start of RRT compared to 51% for diabetic patients (figure 5.19). The initial survival difference where non-diabetic incident patients in the older age group (⩾65 years) have worse survival than incident diabetic patients in the same age group,

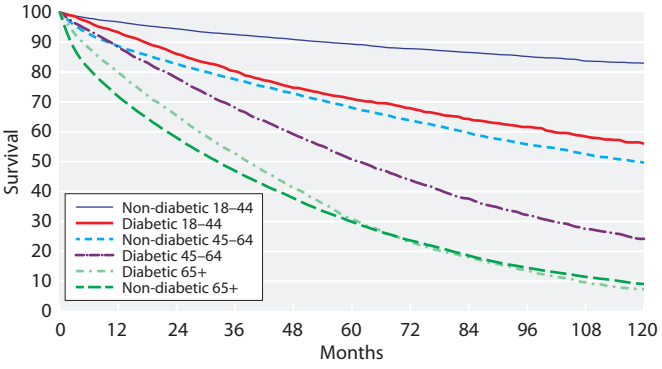

Fig. 5.19. Long term survival for incident diabetic and non-diabetic patients by age group, 2002–2011 cohort, followed up for a minimum of three years

diminished over the years until there was very little difference in five year survival between these patients.

Survival in prevalent dialysis patients

Overall survival

Table 5.11 shows the one year survival for prevalent patients on dialysis. One year age adjusted survival for prevalent dialysis patients decreased to 88.6% in the 2013 cohort compared to 89.3% in the 2012 cohort.

Survival by UK country

The one year death rate for prevalent dialysis patients in each UK country is shown in table 5.12 for the 2013 cohort and survival increased across all four UK nations compared to the previous year (2012 cohort). There was evidence that the one year death rate in Wales was significantly higher than in England: the higher median age in Wales compared to England and socio-economic factors such as life expectancy of the population and area deprivation, would affect the death rate in Wales. These results are unadjusted for age, primary renal diagnosis or comorbidity.

Table 5.11. One year survival of prevalent dialysis patients in the UK (unadjusted unless indicated otherwise)

Patient group	Patients	Deaths	Survival	*95% CI*
Dialysis patients 2013 cohort				
All	26,184	3,770	85.0	*84.5–85.4*
All – adjusted to age 60	26,184	3,770	88.6	*88.2–89.1*
2 year survival – dialysis patients				
All patients alive on 31/12/2012	26,060	6,667	72.1	*71.5–72.6*

Cohorts of patients alive on 31/12/2013 unless indicated otherwise

Table 5.12. One year death rate per 1,000 prevalent dialysis patient years in the 2013 cohort and median age of prevalent dialysis patients by country

	England	N Ireland	Scotland	Wales
Death rate	159	180	177	200
95% CI	*154–165*	*149–216*	*158–199*	*174–229*
Median age	66.6	68.9	65.9	68.6

One year survival of prevalent dialysis patients by centre

The age adjusted (adjusted to age 60) one year survival of dialysis patients by centre is illustrated in a funnel plot (figure 5.20). With 71 centres included in the analyses, it would be expected by chance that three centres would fall outside the 95% (1 in 20) confidence limits. The survival for one centre (Portsmouth) was below the 95% confidence limit, and for three centres (London St George's, Dorset, Stevenage) above the 95% confidence limits.

Case mix adjustment performed in a cohort of incident patients starting RRT in England from 2002 to 2006 and linked to the Hospital Episodes Statistics (HES) data, showed that the lower than expected survival in Portsmouth may be explained by case mix [10]. This study found that three of the four survival outliers were no longer outliers after adjustment for HES-derived case mix. It is not yet possible to routinely perform this adjustment using HES-linked data, but looking back at the 2002–2006 HES-linked data, there was a large improvement in survival at Portsmouth after case mix adjustment and the current outlier status at this centre may reflect a higher comorbid burden in prevalent dialysis patients at this centre.

The funnel plot analysis shows a decrease in the number of centres that were outliers below the 95% lower limits compared to last year (2012 cohort) when there were four outlying centres. The number of centres that were outliers above the 95% upper limit was the same as in the previous year (2012 cohort). Not censoring at transplantation did not change the results of the outlying centres.

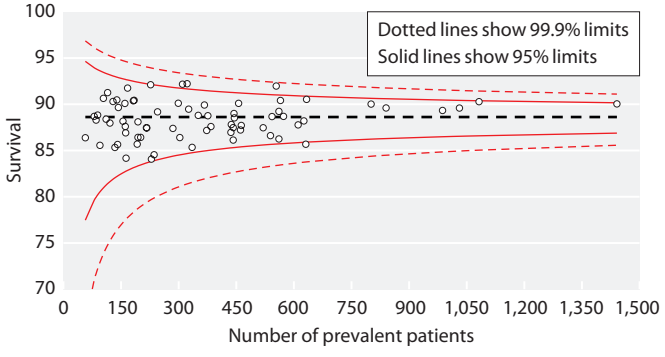

Fig. 5.20. One year survival funnel plot of prevalent dialysis patients by centre adjusted to age 60, 2013 cohort

Table 5.13 allows centres in figure 5.20 to be identified by finding the number of patients treated by the centre and the corresponding survival and then looking this up on the axes of the funnel plot.

One year survival of dialysis patients by centre is illustrated in figures 5.21 and 5.22 for patients aged <65 years and those aged ⩾65 years.

Survival by age group

Figure 5.23 shows the one year survival of prevalent dialysis patients who were alive and receiving dialysis on 31st December 2013, stratified by age group. There was a curvilinear decrease in survival with increasing age (figure 5.23).

One year death rate in prevalent dialysis patients in the 2013 cohort by age group

The death rates for prevalent patients on dialysis by age group are shown in figure 5.24. The younger patients included in this analysis are a selected higher risk group, as the similar aged transplanted patients have been excluded. The increase in the death rate was not linear with age; in younger patients (<55 years of age) a 10 year increase in age increased the death rate by about 25 deaths per 1,000 patient years compared with an increase of 88 deaths per 1,000 patient years in older patients (75+). There was evidence that the death rate in Wales was significantly higher compared to England, but there was no evidence that the apparent difference in the death rates between other UK countries were significant.

Time trends in survival, 2004 to 2013

Figure 5.25 illustrates that one year survival for prevalent dialysis patients in England gradually improved from 2004 to 2011 with a gradual decrease thereafter. In Northern Ireland and Wales the numbers of patients were much smaller than in England and survival was therefore more variable with very wide confidence intervals, making it difficult to draw conclusions on trends. The change in prevalent survival by centre over the cohort years 2004 to 2013 is included in appendix 1, table 5.26.

Survival in patients with diabetes

There was a large difference (8.3%) in one year survival in younger (aged <65 years) prevalent dialysis patients without diabetes compared to patients with diabetes,

Table 5.13. One year survival of prevalent dialysis patients in each centre (adjusted to age 60), 2013 cohort

Centre	*N*	Adjusted survival %	Limits for funnel plot	
			Lower 95% limit	Upper 95% limit
D & Gall	57	86.4	77.5	94.6
Inverns	80	88.7	79.6	94.0
Carlis	85	88.3	80.0	93.8
Clwyd	89	88.8	80.2	93.7
Bangor	95	85.6	80.5	93.6
Newry	104	90.6	81.0	93.5
Colchr	111	88.4	81.3	93.3
Ulster	115	91.3	81.4	93.3
Wrexm	121	88.0	81.6	93.2
Sthend	129	90.3	81.9	93.1
Antrim	134	85.3	82.1	93.0
Chelms	139	90.5	82.2	92.9
West NI	141	85.7	82.2	92.9
Ipswi	143	89.7	82.3	92.9
York	155	88.2	82.6	92.8
Truro	160	90.1	82.7	92.7
Liv Ain	161	87.6	82.7	92.7
Plymth	162	86.9	82.8	92.7
Krkcldy	163	84.2	82.8	92.7
Klmarnk	167	91.8	82.9	92.6
Dundee	182	90.4	83.1	92.5
Donc	184	90.4	83.2	92.5
Airdrie	192	85.7	83.3	92.4
Basldn	194	86.4	83.3	92.4
Sund	194	88.1	83.3	92.4
Shrew	201	86.4	83.4	92.3
Bradfd	216	87.5	83.7	92.2
Dudley	217	87.4	83.7	92.2
Glouc	227	92.1	83.8	92.2
Abrdn	229	84.1	83.8	92.1
Wirral	236	84.5	83.9	92.1
Belfast	245	89.2	84.0	92.0
Edinb	285	87.4	84.4	91.8
Derby	299	90.1	84.5	91.8
Newc	303	86.4	84.5	91.7
Dorset	310	92.2	84.6	91.7
L St.G	322	92.2	84.7	91.7
Redng	326	89.5	84.7	91.6
Middlbr	335	85.3	84.8	91.6
Norwch	351	88.8	84.9	91.6
Wolve	367	89.9	85.0	91.5
Swanse	373	87.2	85.0	91.5
Stoke	376	88.8	85.0	91.5
Hull	384	87.6	85.0	91.4
Liv Roy	436	87.0	85.3	91.3
Kent	437	87.8	85.3	91.3
Covnt	442	86.1	85.3	91.3
B Heart	442	87.5	85.3	91.3
Salford	444	89.0	85.3	91.3
Nottm	445	88.5	85.3	91.3
Exeter	456	90.1	85.4	91.2
Brightn	461	87.2	85.4	91.2
Camb	463	87.7	85.4	91.2
Oxford	520	87.5	85.6	91.1
Cardff	539	86.6	85.7	91.0
Leeds	543	88.7	85.7	91.0
Stevng	554	92.0	85.7	91.0
Bristol	561	89.2	85.7	91.0
M RI	561	86.3	85.7	91.0
L Kings	565	90.4	85.7	91.0
Prestn	573	88.7	85.8	91.0
Glasgw	611	87.8	85.9	90.9
Sheff	626	88.2	85.9	90.9
Ports	631	85.7	85.9	90.9
L Guys	633	90.5	85.9	90.9
L Rfree	801	90.0	86.2	90.6
Carsh	840	89.6	86.3	90.6
Leic	987	89.3	86.5	90.5
B QEH	1,031	89.6	86.5	90.4
L Barts	1,082	90.3	86.6	90.4
L West	1,441	90.0	86.9	90.2

whereas survival was very similar for non-diabetic compared with diabetic older (aged 65+ years) prevalent dialysis patients (2.4% difference, table 5.14). Similar findings were reported for incident RRT patients (see figures 5.17 to 5.19 and discussion).

Time trends in patients with a primary diagnosis of diabetes

The age adjusted one year survival for prevalent dialysis patients with diabetic primary renal disease in the UK are shown in table 5.15. The proportion of prevalent dialysis patients with diabetes surviving one year has been variable over the last ten years and has decreased slightly since 2012.

Death rate on RRT compared with the UK general population

The death rate of patients on RRT compared to the general population is shown in table 5.16. The relative risk of death on RRT decreased with age from a peak of more than 30 times that of the general population at

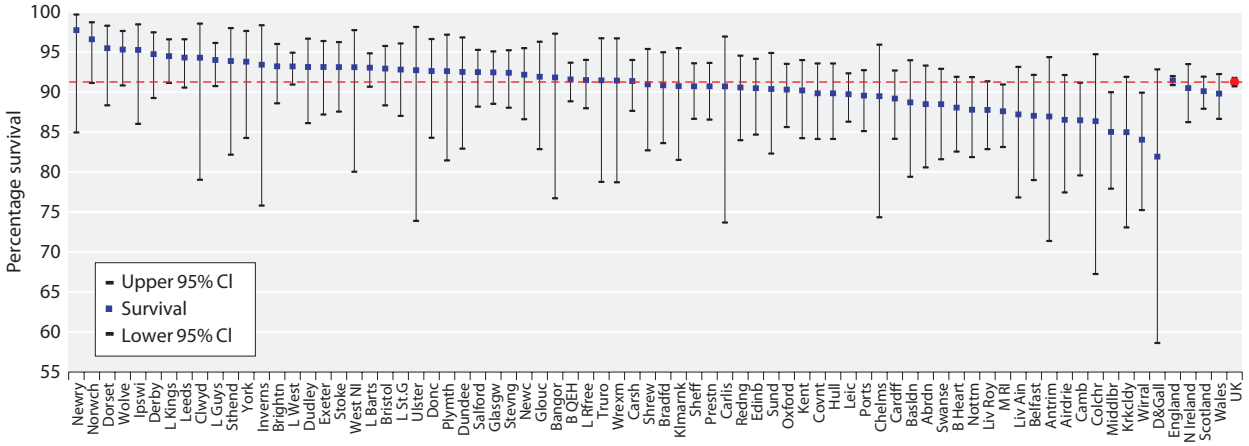

Fig. 5.21. One year survival of prevalent dialysis patients aged under 65 by centre, 2013 cohort

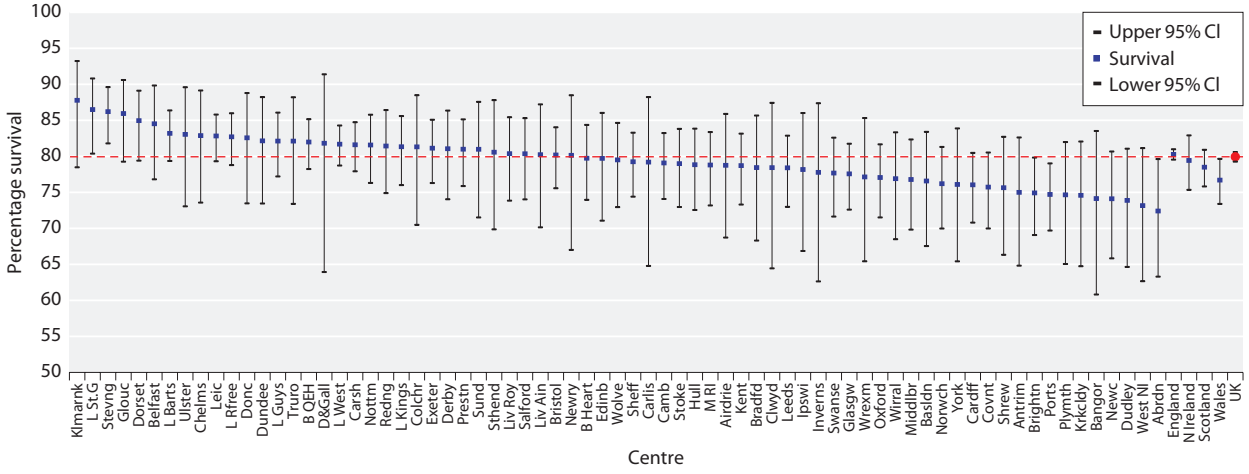

Fig. 5.22. One year survival of prevalent dialysis patients aged 65 years and over by centre, 2013 cohort

age 25–29 years to 2.6 times the general population at age 85 and over. Figure 5.26 shows that the relative risk of death has decreased substantially for the younger age groups (<50 years) whereas the relative risk of death in patients aged over 55 has not changed greatly compared to the relative risk of death in the 1998–2001 cohort. The overall relative risk of death at 6.2 in the 2013 cohort was similar to the death rate in the last three years (2012, 2011 and 2010 cohorts).

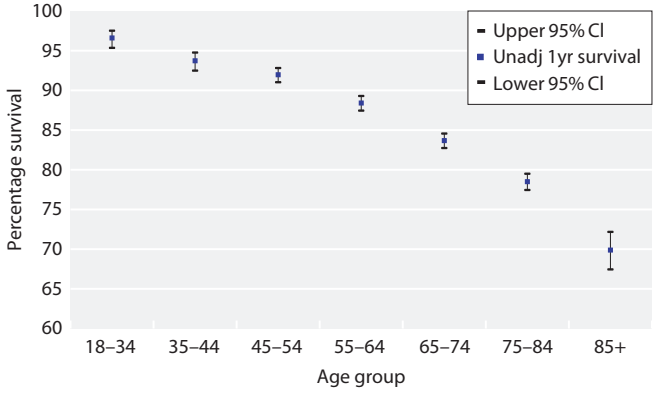

Fig. 5.23. One year survival of prevalent dialysis patients by age group, 2013 cohort

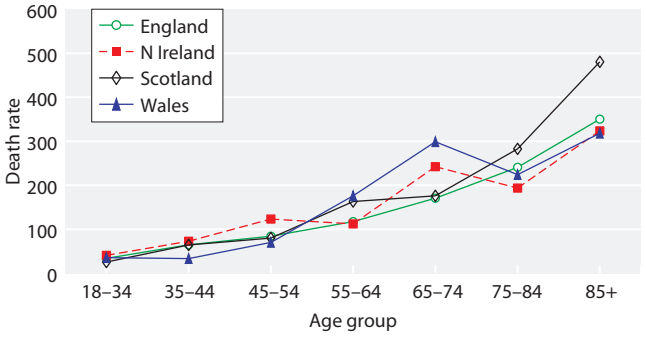

Fig. 5.24. One year death rate per 1,000 patient years by UK country and age group for prevalent dialysis patients, 2013 cohort

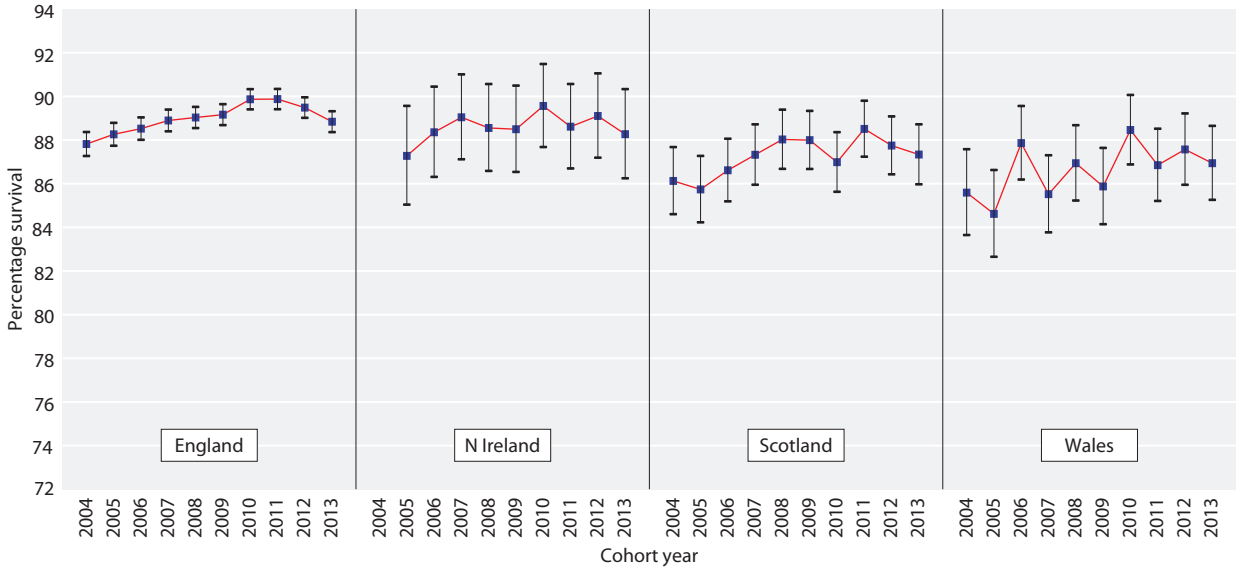

Fig. 5.25. Serial one year survival for prevalent dialysis patients by UK country, 2004 to 2013 cohort years, adjusted to age 60

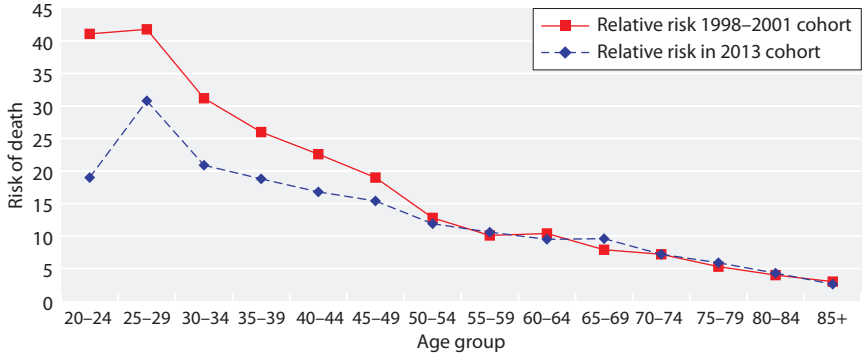

Fig. 5.26. Relative risk of death in prevalent RRT patients in the 2013 cohort compared to the 1998–2001 cohort

Table 5.14. One year survival of prevalent RRT patients in the UK by age group and diabetic status, 2013 cohort

Patient group	Patients	Deaths	Survival	*95% CI*
Dialysis patients 2013 cohort				
All, age <65	12,019	975	91.2	*90.7–91.8*
All, age 65+	14,165	2,795	79.9	*79.3–80.6*
Non-diabetic <65	9,369	592	93.1	*92.6–93.6*
Non-diabetic 65+	11,020	2,117	80.5	*79.7–81.2*
Diabetic <65	2,650	383	84.8	*83.3–86.1*
Diabetic 65+	3,145	678	78.1	*76.6–79.5*

Cohorts of patients alive on 31/12/2013

Causes of death

Data completeness

Completeness of cause of death data in the UK decreased to 64.8% in 2014 from 70.0% in 2013, although cause of death completeness improved in Northern Ireland and Wales (see appendix, table 5.27). Some centres consistently achieve a very high rate of data return for cause of death because a process is in place to ensure that cause of death data was entered. Several centres have shown substantial improvement in data returns

Table 5.15. Serial one year survival of prevalent dialysis patients with a primary diagnosis of diabetes, 2004–2013 cohort years

Survival	Year									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1 year survival %	82.9	82.6	84.9	83.5	83.7	83.2	84.9	85.1	84.6	83.2

Table 5.16. Death rate by age group for prevalent RRT patients, 2013 cohort, compared with the general population and with previous analyses in the 1998–2001 cohort

Age group	UK population mid 2014 (thousands)	UK deaths in 2014	Death rate per 1,000 population	Expected number of deaths in UKRR population	UKRR deaths in 2014	UKRR death rate per 1,000 prevalent RRT patients	Relative risk of death in 2014	Relative risk of death 1998–2001 cohort
20–24	4,313	1,605	0.4	0	7	7	19.0	41.1
25–29	4,391	2,037	0.5	1	22	14	30.8	41.8
30–34	4,356	2,762	0.6	1	30	13	20.9	31.2
35–39	3,994	3,756	0.9	3	49	18	18.8	26.0
40–44	4,391	6,327	1.4	6	102	24	16.8	22.6
45–49	4,673	9,758	2.1	12	177	32	15.4	19.0
50–54	4,458	13,876	3.1	19	230	37	11.9	12.8
55–59	3,843	18,897	4.9	30	311	52	10.6	10.1
60–64	3,512	27,708	7.9	45	432	75	9.5	10.4
65–69	3,562	42,444	11.9	72	688	114	9.6	7.9
70–74	2,634	52,572	20.0	97	692	143	7.2	7.2
75–79	2,140	72,014	33.7	139	824	200	5.9	5.3
80–84	1,568	94,419	60.2	157	671	258	4.3	4.0
85+	1,503	217,023	144.4	178	458	371	2.6	3.0
Total	**49,338**	**565,198**	**11.5**	**759**	**4,693**	**87**	**6.2**	**7.7**

(appendix 1, table 5.27), but there is still much variability between the centres regarding the completeness of cause of death with some centres returning no data and other centres having 100% completeness.

Causes of death in incident RRT patients

The number and proportion of patients with missing cause of death data in the cohort analysed is shown in the last row of each table for cause of death (tables 5.17 to 5.21).

Causes of death within the first 90 days

See table 5.17.

Causes of death within one year after 90 days

In both the first 90 days after start of RRT and the subsequent year, treatment withdrawal as a cause of death was more common in older patients (aged 65+) whereas malignancy and cardiac disease were more common in younger patients (<65 years old) (tables 5.17, 5.18). Infection as cause of death within the first 90 days was more common in older patients. Cardiac disease remained the leading cause of death both in the first 90 days and one year after the first 90 days in both the older (aged 65+) and younger age groups (aged <65 years). There has been an increasing trend of treatment withdrawal as cause of death at 90 days in older patients

Table 5.17. Causes of death in the first 90 days for incident patients by age group, 2000–2013 cohort

	All age groups		<65 years		⩾65 years	
Cause of death	*N*	%	*N*	%	*N*	%
Cardiac disease	785	26	185	29	600	26
Cerebrovascular disease	139	5	31	5	108	5
Infection	527	18	93	14	434	18
Malignancy	274	9	81	12	193	8
Treatment withdrawal	472	16	65	10	407	17
Other	673	22	167	26	506	22
Uncertain	126	4	25	4	101	4
Total	**2,996**		**647**		**2,349**	
No cause of death data	2,680	47	589	48	2,091	47

Table 5.18. Cause of death in one year after 90 days for incident patients by age group, 2000–2013 cohort

	All age groups		<65 years		⩾65 years	
Cause of death	*N*	%	*N*	%	*N*	%
Cardiac disease	1,234	22	393	25	841	21
Cerebrovascular disease	273	5	82	5	191	5
Infection	1,010	18	280	18	730	18
Malignancy	618	11	202	13	416	10
Treatment withdrawal	929	17	141	9	788	20
Other	1,168	21	359	23	809	20
Uncertain	310	6	88	6	222	6
Total	**5,542**		**1,545**		**3,997**	
No cause of death data	4,814	46.5	1,347	46.6	3,467	46.5

Table 5.19. Cause of death in prevalent RRT patients by modality, 2013 cohort

	All modalities		Dialysis		Transplant	
Causes of death	*N*	%	*N*	%	*N*	%
Cardiac disease	722	23	628	24	94	18
Cerebrovascular disease	136	4	112	4	24	5
Infection	622	20	498	19	124	24
Malignancy	350	11	214	8	136	26
Treatment withdrawal	504	16	490	19	14	3
Other	607	19	517	20	90	17
Uncertain	189	6	154	6	35	7
Total	**3,130**		**2,613**		**517**	
No cause of death data	1,564	33	1,313	33	251	33

(aged 65+) over the last four years. Cardiac disease as cause of death at one year after the first 90 days has decreased over time.

Cause of death in prevalent RRT patients in the 2013 cohort

Table 5.19 shows the cause of death for both prevalent dialysis and transplant patients in the 2013 cohort. Cardiac disease as a cause of death was less common in transplanted patients who were a pre-selected low-risk group of patients. Malignancy and infection were both responsible for a greater percentage of deaths in prevalent transplanted patients, with treatment withdrawal a more common cause of death in the prevalent dialysis population.

Table 5.20 shows the cause of death for prevalent dialysis patients in the 2013 cohort.

Table 5.20. Cause of death in prevalent dialysis patients by age group, 2013 cohort

	All age groups		<65 years		⩾65 years	
Cause of death	*N*	%	*N*	%	*N*	%
Cardiac disease	628	24	204	31	424	22
Cerebrovascular disease	112	4	42	6	70	4
Infection	498	19	123	19	375	19
Malignancy	214	8	52	8	162	8
Treatment withdrawal	490	19	77	12	413	21
Other	517	20	132	20	385	20
Uncertain	154	6	33	5	121	6
Total	**2,613**		**663**		**1,950**	
No cause of death data	1,313	33	353	33	960	0

Table 5.21. Cause of death in prevalent transplanted patients by age group, 2013 cohort

	All age groups		<65 years		⩾65 years	
Cause of death	*N*	%	*N*	%	*N*	%
Cardiac disease	94	18	42	18	52	19
Cerebrovascular disease	24	5	12	5	12	4
Infection	124	24	48	20	76	27
Malignancy	136	26	65	27	71	25
Treatment withdrawal	14	3	7	3	7	3
Other	90	17	47	20	43	15
Uncertain	35	7	17	7	18	6
Total	**517**		**238**		**279**	
No cause of death data	251	0	107	0	144	31

Prevalent dialysis patients aged ⩾65 years were substantially more likely to withdraw from treatment than younger patients (21% and 12% respectively) and cardiac disease represented a much higher proportion of all deaths (amongst those where cause of death was known) in younger (<65 years) dialysis patients, although the absolute number of cardiac deaths were higher amongst those aged ⩾65 years. Figure 5.27 shows cause of death for prevalent patients in the 2003 to 2013 cohort. Over time, cardiovascular disease as cause of death has decreased, treatment withdrawal has increased whilst infection as cause of death remained at a similar level over this period (figure 5.27).

Table 5.21 shows that malignancy was a slightly more common cause of death in younger (<65 years) prevalent transplanted patients, whereas infection was a more common cause in older transplanted patients.

Conclusion

Survival of incident patients on RRT at 90 days and one year after 90 days (adjusted to age 60) increased slightly in the 2013 cohort compared to the previous year (2012 cohort). Long term survival of incident patients on RRT continued to improve over time for one year up to 10 years post RRT start. Survival increased in both younger (aged <65 years) and older patients (aged ⩾65 years) for one year after 90 days survival. This year's survival chapter includes a new table (appendix 1, table 5.25) showing one to five year survival after the first 90 days of RRT for incident patients by centre, adjusted for age 60.

There was a difference in short term incident survival (90 days and one year after 90 days) by age group and diabetic status: diabetic patients aged <65 years have

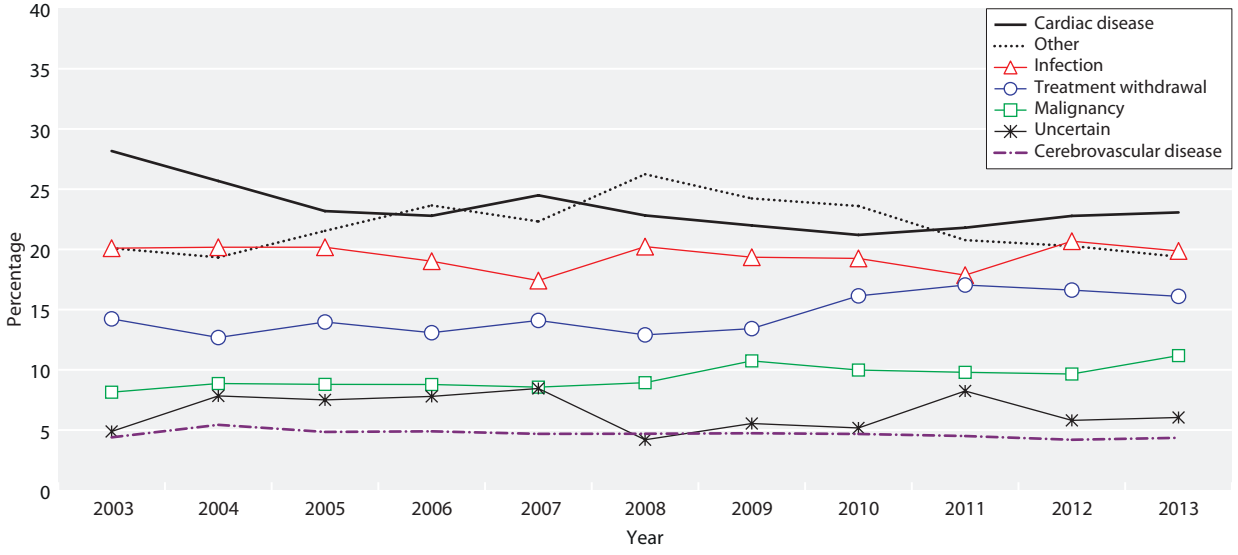

Fig. 5.27. Cause of death in prevalent RRT patients by cohort year

slightly worse survival than non-diabetic patients, but survival for older diabetic patients (⩾65 years) was significantly better than for non-diabetic patients. This initial survival difference in older incident patients diminished over time until there was very little difference in five year survival between diabetic and non-diabetic patients in the older age group (⩾65 years).

One year age adjusted survival for prevalent dialysis patients declined from 89.3% in the 2012 cohort to 88.6% in the 2013 cohort and prevalent dialysis patient survival in the UK seems to have peaked in 2010 and remains relatively stable or slightly lower in more recent years. The age adjusted one year survival for prevalent dialysis patients with diabetic primary renal disease in the UK has been decreasing slightly from 2012 onwards. The relative one year risk of death on RRT decreased with age from nearly 19 times that of the general population at age 35–39 years to 2.6 times at age 85 and over.

In the prevalent RRT dialysis population, cardiovascular disease was the most common cause of death accounting for 24% of deaths, infection accounted for 19% of deaths and treatment withdrawal for 19% of deaths. Trends in causes of death over time (2003–2013) show a decrease in cardiovascular disease, an increase in treatment withdrawal and a plateauing of infection.

Variability in survival between centres was still evident, with some centres appearing as outliers in the data (below the lower 95% and above the upper 95% confidence limits) in incident RRT and prevalent dialysis patient survival. The survival analyses in this chapter have not been adjusted for any case-mix factors except for age, and differences in primary renal diagnosis, ethnicity and comorbidity have not been considered due to low data completeness in some renal centres. Although research has suggested that adjustment for comorbidity only explains a modest part of the variance in ERF patient outcomes [11], at centre level, the prevalence of comorbidities could vary substantially between renal centres and it would be expected that adjustment for comorbidity may explain an increased amount of the variance in survival outcome. The UK Renal Registry regularly evaluates the effect of adjusting for primary renal diagnosis and comorbidity in addition to age in those centres returning ⩾85% of comorbidities and repeatedly shows that at centre level, there is clear benefit for some centres in adjusting for primary renal diagnosis and comorbidities. Research using comorbid conditions identified from hospital episode statistics (HES) data for England RRT patients showed that adjusting for HES-derived case-mix, including comorbid conditions, affected the position and outlying status of some renal centres on the funnel plot for incident patients and reduced outlying centres from four to one [10].

Routine linkage of the UK Renal Registry data with hospital admissions information in the UK will allow the UKRR to report on survival adjusted for case-mix (age, ethnicity, primary renal diagnosis and comorbidity) in future UKRR reports. This will provide a fairer comparison between centres and more accurate identification and location of outlying centres on funnel plots.

There is also much variability at centre level in the hazard of death in the first six months from start of RRT. The proportion of deaths in the first 90 days of starting RRT varies at centre level and in some centres the proportion is very low or even zero. This may be due to unreported deaths in patients that die within the first 90 days of starting RRT but may more likely be due to the exclusion of these patients as acute kidney injury (AKI) patients. The UKRR will in future be able to more accurately identify patients with AKI as opposed to people with chronic kidney disease (CKD) requiring RRT when data on patients with CKD stage four and AKI becomes available. This will result in an improvement in the accuracy of survival estimates for patients starting RRT in the UK.

Conflicts of interest: the authors declare no conflicts of interest

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Appendix 1: Survival tables

Table 5.22. One year after 90 day incident survival percentage by centre, 2013 cohort, unadjusted and adjusted to age 60

Centre	Unadjusted one year after 90 days survival	Adjusted one year after 90 days survival	*Adjusted one year after 90 days 95% CI*
England			
B Heart	90.3	93.4	*89.2–97.9*
B QEH	88.9	91.6	*88.3–95.1*
Basldn	85.9	90.4	*82.9–98.7*
Bradfd	94.9	95.4	*90.4–100.0*
Brightn	82.5	87.1	*82.4–92.0*
Bristol	87.3	91.2	*87.7–94.9*
Camb	90.7	93.5	*90.0–97.1*
Carlis	94.6	95.6	*89.9–100.0*
Carsh	91.1	94.0	*91.3–96.7*
Chelms	84.6	92.1	*86.2–98.3*
Colchr	96.2	97.9	*93.9–100.0*
Covnt	86.1	90.8	*86.1–95.7*
Derby	89.0	91.1	*85.4–97.1*
Donc	88.7	92.2	*86.3–98.4*
Dorset	89.1	93.2	*88.5–98.2*
Dudley	90.0	93.7	*88.6–99.2*
Exeter	91.8	94.9	*91.7–98.2*
Glouc	94.7	96.7	*93.1–100.0*
Hull	89.5	91.9	*86.9–97.1*
Ipswi	82.6	86.7	*77.5–97.1*
Kent	86.8	90.9	*86.9–95.0*
L Barts	90.8	91.4	*88.1–94.7*
L Guys	93.4	94.3	*90.5–98.2*
L Kings	86.6	90.0	*85.9–94.4*
L Rfree	89.4	91.6	*88.3–95.0*
L St.G	89.7	92.2	*87.3–97.5*
L West	92.4	93.9	*91.5–96.4*
Leeds	89.0	91.3	*87.5–95.2*
Leic	87.6	90.7	*87.6–93.9*
Liv Ain	79.4	85.9	*78.2–94.3*
Liv Roy	92.9	91.4	*85.0–98.1*
M RI	88.2	90.2	*86.3–94.3*
Middlbr	89.2	92.1	*87.7–96.7*
Newc	90.6	92.8	*88.1–97.7*
Norwch	82.4	87.7	*81.7–94.2*
Nottm	90.7	93.2	*89.3–97.4*
Oxford	91.6	93.6	*90.4–96.9*
Plymth	90.0	94.4	*90.1–98.8*
Ports	87.6	91.4	*87.8–95.1*
Prestn	91.9	93.9	*90.5–97.3*
Redng	90.1	93.1	*89.1–97.3*
Salford	86.7	89.1	*84.1–94.3*
Sheff	88.7	91.9	*88.0–96.1*
Shrew	81.1	86.2	*78.3–94.9*
Stevng	88.1	90.6	*86.6–94.9*
Sthend	85.7	89.6	*82.2–97.7*
Stoke	82.3	88.4	*83.1–94.2*
Sund	84.0	88.6	*81.6–96.3*
Truro	92.9	95.4	*90.4–100.0*
Wirral	89.5	93.4	*88.4–98.6*
Wolve	85.9	88.8	*82.7–95.2*
York	83.3	87.5	*79.3–96.5*
N Ireland			
Antrim	88.5	92.4	*84.7–100.0*
Belfast	89.6	92.1	*87.0–97.5*
Newry	81.8	84.7	*72.3–99.2*
Ulster	76.9	88.3	*80.1–97.4*
West NI	92.4	93.8	*86.0–100.0*
Scotland			
Abrdn	96.1	97.1	*93.3–100.0*
Airdrie	92.7	95.0	*90.4–99.9*
Dundee	86.5	90.7	*83.5–98.7*
Edinb	83.9	81.5	*71.9–92.4*
Glasgw	87.5	89.8	*85.8–93.9*
Inverns	95.0	95.0	*86.2–100.0*
Klmarnk	77.8	83.3	*73.4–94.4*
Krkcldy	71.4	81.4	*71.7–92.4*
Wales			
Bangor	79.2	89.0	*80.5–98.4*
Cardff	85.0	89.0	*84.9–93.3*
Swanse	77.5	84.9	*79.4–90.7*
Wrexm	80.6	88.2	*80.4–96.7*
England	**89.0**	**91.8**	***91.0–92.6***
N Ireland	**87.0**	**90.8**	***87.2–94.5***
Scotland	**86.8**	**89.5**	***87.0–92.0***
Wales	**81.7**	**87.6**	***84.7–90.6***
UK	**88.4**	**91.4**	***90.6–92.2***

Excluded: centres with less than 20 patients (Clwyd, D & Gall)

Table 5.23. Ninety day incident survival percentage by centre, 2013 cohort, unadjusted and adjusted to age 60

Centre	Unadjusted 90 day survival	Adjusted 90 day survival	*Adjusted 90 day 95% CI*
England			
B Heart	87.5	93.0	*89.2–97.0*
B QEH	99.0	99.4	*98.5–100.0*
Basldn	97.4	98.5	*95.8–100.0*
Bradfd	96.8	97.3	*93.8–100.0*
Brightn	94.8	96.9	*94.8–99.1*
Bristol	97.1	98.3	*96.9–99.8*
Camb	97.0	98.2	*96.5–100.0*
Carsh	94.3	96.8	*95.0–98.6*
Chelms	95.1	98.0	*95.3–100.0*
Colchr	87.1	93.8	*88.1–99.8*
Covnt	94.0	96.7	*94.2–99.4*
Derby	97.3	98.2	*95.7–100.0*
Donc	86.9	92.6	*87.9–97.7*
Dorset	95.5	97.7	*95.1–100.0*
Dudley	98.0	99.0	*97.0–100.0*
Exeter	94.9	97.4	*95.3–99.5*
Glouc	96.6	98.2	*95.8–100.0*
Hull	98.9	99.3	*97.8–100.0*
Kent	95.9	97.5	*95.6–99.5*
L Barts	95.3	96.1	*94.0–98.2*
L Guys	96.9	97.7	*95.4–99.9*
L Rfree	96.9	97.9	*96.4–99.5*
L St.G	95.2	96.9	*94.0–99.9*
L West	98.4	98.9	*97.9–99.9*
Leeds	93.9	95.9	*93.5–98.3*
Leic	94.4	96.5	*94.7–98.3*
Liv Ain	79.4	88.2	*82.3–94.6*
Liv Roy	89.5	88.8	*82.5–95.5*
M RI	96.8	97.8	*96.0–99.6*
Middlbr	92.0	95.0	*91.8–98.3*
Newc	91.5	94.2	*90.4–98.2*
Norwch	94.9	97.2	*94.5–99.9*
Nottm	93.1	95.7	*92.9–98.7*
Oxford	96.6	97.8	*96.1–99.6*
Plymth	96.8	98.5	*96.5–100.0*
Ports	93.1	96.0	*93.8–98.3*
Prestn	94.3	96.2	*93.8–98.7*
Redng	92.9	95.8	*93.0–98.7*
Salford	97.6	98.3	*96.4–100.0*
Sheff	94.0	96.5	*94.2–99.0*
Shrew	88.9	93.5	*88.7–98.7*
Stevng	95.6	97.1	*95.0–99.2*
Sthend	97.7	98.7	*96.2–100.0*
Stoke	87.9	93.3	*89.6–97.1*
Sund	94.4	96.8	*93.2–100.0*
Truro	93.6	96.3	*92.3–100.0*
Wirral	87.9	93.5	*89.2–98.0*
Wolve	92.9	95.3	*91.6–99.0*
York	95.6	97.2	*93.5–100.0*
N Ireland			
Antrim	86.7	92.3	*85.6–99.6*
Belfast	97.5	98.4	*96.3–100.0*
Newry	95.7	96.8	*91.1–100.0*
Ulster	83.9	93.3	*87.9–99.2*
West NI	96.4	97.5	*93.0–100.0*
Scotland			
Abrdn	91.1	94.2	*89.4–99.2*
Edinb	95.4	95.1	*89.9–100.0*
Glasgw	97.8	98.5	*97.0–100.0*
Klmarnk	94.7	96.7	*92.4–100.0*
Krkcldy	89.7	94.7	*89.7–99.9*
Wales			
Bangor	88.9	95.2	*90.2–100.0*
Cardff	94.7	96.8	*94.7–98.9*
Swanse	91.5	95.5	*92.7–98.3*
Wrexm	95.0	97.4	*94.0–100.0*
England	**95.0**	**96.9**	***96.4–97.4***
N Ireland	**93.2**	**96.0**	***93.9–98.2***
Scotland	**96.4**	**97.5**	***96.4–98.7***
Wales	**93.5**	**96.5**	***95.0–97.9***
UK	**94.9**	**96.9**	***96.4–97.4***

Excluded: centres with less than 20 patients (Clwyd, D & Gall) and centres with no deaths recorded in the first 90 days of RRT (Ipswich, L Kings, Carlisle, Airdrie, Dundee, Inverness)

Table 5.24. One year after 90 day incident survival percentage by centre for incident cohort years 2004–2013, adjusted to age 60

Centre	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
England										
B Heart	86.5	83.6	88.5	93.5	93.6	83.7	92.0	94.4	86.9	93.4
B QEH	88.0	90.4	86.8	92.8	89.6	92.3	88.3	93.3	92.3	91.6
Basldn	92.4	92.9	90.8	89.9	89.3	86.9	85.7	91.6	89.6	90.4
Bradfd	80.7	86.2	81.3	83.8	84.2	91.6	87.8	88.9	86.7	95.4
Brightn	90.7	84.3	87.0	94.2	89.1	85.6	88.4	91.0	91.1	87.1
Bristol	88.1	82.9	92.4	91.4	84.0	89.2	88.9	94.5	88.1	91.2
Camb	87.0	89.8	90.7	93.4	91.1	87.3	89.5	91.8	92.5	93.5
Carlis	87.0	79.6	89.9	96.5	87.8	71.8	86.3	91.5		95.6
Carsh	85.9	90.6	88.2	87.1	86.6	88.0	89.9	94.3	89.5	94.0
Chelms	82.3	82.9	94.2	86.6	90.8	94.1	85.6	82.1	91.1	92.1
Colchr					85.0	86.3	93.9	84.1	82.6	97.9
Covnt	87.7	82.6	88.5	90.5	86.9	94.2	89.1	90.6	87.9	90.8
Derby	83.1	87.9	93.0	96.4	90.4	88.0	87.4	90.9	89.3	91.1
Donc					89.8	87.8	91.5	90.3	88.9	92.2
Dorset	91.4	82.6	86.2	90.4	93.5	92.4	87.5	88.2	90.2	93.2
Dudley	81.4	97.3	92.6	85.6	71.1	84.1	87.8	93.7	90.0	93.7
Exeter	88.7	86.2	88.7	86.3	87.0	89.1	95.3	88.5	92.9	94.9
Glouc	83.6	95.1	89.6	86.3	94.4	89.2	92.4	89.6	91.3	96.7
Hull	88.9	85.6	93.5	89.6	85.4	89.2	87.9	93.1	90.3	91.9
Ipswi	97.4	84.7	93.8	96.0	95.8	92.2	93.2	95.5	93.1	86.7
Kent				91.8	89.9	89.7	90.5	88.3	94.8	90.9
L Barts	87.1	91.1	93.9	86.4	92.5	90.8	91.7	93.7	90.8	91.4
L Guys	91.6	90.4	92.9	92.0	90.5	94.1	91.5	94.7	94.7	94.3
L Kings	86.9	91.7	84.5	87.5	89.6	85.5	89.7	90.8	89.8	90.0
L Rfree		93.3	89.7	94.4	95.2	89.1	90.3	90.9	93.5	91.6
L St.G				92.1	94.0	92.7	93.7	96.6	93.5	92.2
L West	92.5	94.1	92.8	92.8	94.2	93.1	88.8	90.7	92.5	93.9
Leeds	90.3	89.7	85.0	87.1	88.7	90.4	92.7	88.2	92.5	91.3
Leic	87.5	84.7	87.8	89.8	90.5	90.4	92.0	91.3	90.3	90.7
Liv Ain			86.9	82.8	78.5	82.7	89.0	86.3	95.1	85.9
Liv Roy	80.8	90.0	86.4	86.2	94.1	93.9	88.5	88.9	89.9	91.4
M RI				90.1	87.7	87.5	89.6	93.2	89.9	90.2
Middlbr	85.4	82.8	91.5	87.9	82.3	86.8	88.0	88.9	89.6	92.1
Newc	85.4	82.1	86.2	85.8	91.3	85.7	88.8	86.0	85.7	92.8
Norwch	84.7	90.7	86.4	91.0	89.0	89.7	92.2	89.5	88.2	87.7
Nottm	85.7	87.0	91.9	90.0	91.1	88.8	93.5	92.7	90.0	93.2
Oxford	87.9	87.9	89.9	89.2	87.1	91.6	90.6	88.8	93.9	93.6
Plymth	77.9	84.6	81.0	90.1	87.8	89.0	93.8	91.3	92.0	94.4
Ports	88.4	83.2	87.5	88.7	88.8	90.1	88.1	91.2	91.0	91.4
Prestn	87.4	88.5	83.6	91.4	82.1	87.5	87.6	91.8	92.8	93.9
Redng	91.0	89.7	91.3	90.1	95.3	89.0	93.0	93.0	96.0	93.1
Salford	84.8	88.3	90.5	89.2	86.0	89.1	86.4	91.9	89.0	89.1
Sheff	91.5	90.6	88.6	90.9	92.5	94.1	92.2	87.5	93.4	91.9
Shrew	87.5	86.2	87.7	91.8	92.9	84.7	86.9	91.7	85.0	86.2
Stevng	93.3	76.7	85.3	90.7	90.2	96.7	94.0	91.1	93.1	90.6
Sthend	90.5	91.1	94.8	91.8	86.2	91.5	82.0	94.3		89.6
Stoke				87.1	89.7	85.8	87.1	93.0	94.0	88.4
Sund	86.8	80.6	83.5	88.7	85.3	83.0	84.1	88.7	93.0	88.6
Truro	92.8	90.6	89.4	90.2	89.2	94.2	90.9	93.3	94.6	95.4
Wirral	85.4	87.0	85.9	88.9	90.4	84.8	93.0	86.7	86.1	93.4
Wolve	88.1	84.2	89.2	89.5	89.3	88.5	87.5	89.4	84.1	88.8
York	91.4	83.9	82.6	95.1	86.2	94.1	86.3	93.4	93.9	87.5

Table 5.24. Continued

Centre	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
N Ireland										
Antrim		85.0	93.9	85.2	88.6	97.4	85.9	85.9	86.6	92.4
Belfast		85.1	92.4	90.8	88.0	91.4	88.3	92.5	93.0	92.1
Newry		90.2					92.0	85.4	89.8	84.7
Ulster							90.9	86.3		88.3
West NI			90.1	97.3	93.1	97.6	91.4	95.8		93.8
Scotland										
Abrdn	88.8	84.2	84.6	86.0	86.9	88.8	85.4	92.8	91.5	97.1
Airdrie	86.2	75.1	80.7	76.7	88.3	94.2	82.1	84.0	92.0	95.0
D & Gall						84.0				
Dundee	80.5	84.4	89.2	82.4	85.2	87.7	90.2	90.5	93.4	90.7
Edinb	75.9	83.3	88.6	90.2	84.1	84.7	86.4	89.7	92.9	81.5
Glasgw	80.5	86.1	83.6	87.8	83.2	88.4	86.8	88.6	90.1	89.8
Inverns	89.3	84.3	83.8	90.6	87.1		96.7			95.0
Klmarnk	87.4	96.3	82.7	86.7	90.1	84.0	88.4	91.0	90.9	83.3
Krkcldy	80.5	78.3	80.1	87.4	86.6	90.7	93.6	92.4	97.3	81.4
Wales										
Bangor	81.0	82.3	81.4	92.2	87.8	87.3	89.1	94.3		89.0
Cardff	85.5	87.2	87.0	84.2	83.2	89.3	90.0	88.1	86.8	89.0
Clwyd		75.5	96.9			92.3				
Swanse	77.8	82.7	84.1	89.0	85.1	81.7	86.8	85.0	83.8	84.9
Wrexm	77.3	97.7	85.5	89.9			82.1	88.8	86.0	88.2
England	**87.9**	**87.9**	**88.9**	**90.2**	**89.5**	**89.8**	**89.9**	**91.1**	**91.2**	**91.8**
N Ireland		**87.7**	**91.1**	**90.2**	**87.8**	**92.1**	**89.2**	**89.9**	**93.0**	**90.8**
Scotland	**83.0**	**84.5**	**84.7**	**86.5**	**85.5**	**87.2**	**87.8**	**90.1**	**91.6**	**89.5**
Wales	**82.6**	**86.0**	**86.1**	**86.7**	**84.4**	**87.3**	**88.8**	**87.6**	**85.4**	**87.6**
UK	**87.0**	**87.4**	**88.4**	**89.6**	**88.9**	**89.5**	**89.7**	**90.8**	**91.0**	**91.4**

Blank cells: centres with either less than 20 patients, no deaths or no data contribution to the UKRR for that year

Table 5.25. Incident survival percentage after 90 days from start of RRT by centre for incident cohort years 2009–2013, adjusted to age 60

Centre	5 year survival 2009 cohort	4 year survival 2010 cohort	3 year survival 2011 cohort	2 year survival 2012 cohort	1 year survival 2013 cohort
England					
B Heart	49.3	63.1	79.1	82.4	93.4
B QEH	68.3	70.1	80.5	86.1	91.6
Basldn	57.5	69.1	82.8	81.0	90.4
Bradfd	60.0	67.4	70.8	82.1	95.4
Brightn	59.9	67.9	76.8	85.3	87.1
Bristol	58.6	69.0	82.7	81.8	91.2
Camb	66.4	69.7	77.9	84.3	93.5
Carlis	47.4	71.7	73.4		95.6
Carsh	64.9	69.1	82.5	82.4	94.0
Chelms	68.4	72.8	71.0	87.6	92.1
Colchr	65.3	71.7	68.9	70.4	97.9
Covnt	71.3	68.5	77.6	81.1	90.8
Derby	63.1	60.4	73.6	79.0	91.1
Donc	53.1	61.2	77.8	84.6	92.2
Dorset	63.6	61.1	76.2	83.7	93.2
Dudley	43.3	65.0	83.5	78.7	93.7
Exeter	56.2	72.8	72.0	87.7	94.9
Glouc	65.0	72.4	77.2	82.8	96.7
Hull	61.3	62.7	78.7	83.0	91.9
Ipswi	61.3	74.0	80.7	85.8	86.7
Kent	61.8	68.8	75.2	87.6	90.9
L Barts	65.4	73.4	79.4	83.2	91.4
L Guys	63.0	72.8	84.3	85.4	94.3
L Kings	56.4	72.7	80.3	80.6	90.0
L Rfree	62.5	69.8	78.3	88.5	91.6
L St.G	61.1	76.9	84.5	87.3	92.2
L West	64.4	72.3	78.4	83.9	93.9
Leeds	55.0	65.4	72.3	86.2	91.3
Leic	62.8	75.7	75.9	83.9	90.7
Liv Ain	57.7	47.1	66.5	85.3	85.9
Liv Roy	58.1	70.5	63.7	80.8	91.4
M RI	56.2	61.3	73.5	79.9	90.2
Middlbr	60.4	74.3	73.7	82.2	92.1
Newc	50.4	60.6	77.4	80.4	92.8
Norwch	64.8	69.7	76.1	83.3	87.7
Nottm	57.5	70.2	82.4	85.0	93.2
Oxford	66.3	66.7	74.2	87.7	93.6
Plymth	62.8	61.1	78.5	84.4	94.4
Ports	61.2	66.9	72.8	81.3	91.4
Prestn	57.1	60.3	78.5	85.7	93.9
Redng	62.2	73.2	79.3	88.9	93.1
Salford	49.1	59.5	77.6	79.9	89.1
Sheff	61.2	75.0	73.4	87.1	91.9
Shrew	53.5	56.8	72.7	77.2	86.2
Stevng	66.1	71.8	79.0	88.2	90.6
Sthend	74.7	71.7	82.0	86.3	89.6
Stoke	59.7	64.7	71.6	89.0	88.4
Sund	50.5	64.2	65.4	86.7	88.6
Truro	59.0	65.5	81.3	90.6	95.4
Wirral	54.0	73.9	75.9	78.4	93.4
Wolve	45.5	64.0	70.9	78.1	88.8
York	69.2	63.9	81.3	87.4	87.5

Table 5.25. Continued

Centre	5 year survival 2009 cohort	4 year survival 2010 cohort	3 year survival 2011 cohort	2 year survival 2012 cohort	1 year survival 2013 cohort
N Ireland					
Antrim	46.7	51.6	76.0	86.4	92.4
Belfast	55.1	57.8	72.8	78.8	92.1
Newry			63.5	81.8	84.7
Ulster			80.0		88.3
West NI	68.4	64.0	84.1	94.7	93.8
Scotland					
Abrdn	57.0	63.4	74.7	87.8	97.1
Airdrie	66.0	53.2	71.7	76.7	95.0
D & Gall	57.5				
Dundee	56.1	69.2	76.6	87.9	90.7
Edinb	50.7	64.6	75.3	87.9	81.5
Glasgw	49.2	61.9	66.3	83.2	89.8
Inverns		77.9			95.0
Klmarnk	47.8	59.4	60.2	80.5	83.3
Krkcldy	62.5	66.1	59.9	80.0	81.4
Wales		64.5			
Bangor	65.0	59.4	64.7		89.0
Cardff	53.6	69.7	70.8	79.9	89.0
Clwyd	69.3	48.7			
Swanse	54.2	60.6	70.5	76.0	84.9
Wrexm		65.0	72.4	69.0	88.2
England	**60.8**	**68.8**	**77.0**	**84.0**	**91.8**
N Ireland	**56.8**	**63.8**	**75.2**	**85.0**	**90.8**
Scotland	**52.8**	**62.9**	**70.4**	**83.7**	**89.5**
Wales	**55.3**	**64.5**	**69.9**	**77.1**	**87.6**
UK	**59.9**	**67.9**	**76.0**	**83.6**	**91.4**

Blank cells: centres with less than 20 patients for that year

Table 5.26. One year prevalent patient survival percentage by centre for prevalent cohort years 2004–2013, adjusted to age 60

Centre	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
England										
B Heart	87.9	86.6	87.8	90.4	90.9	87.4	89.5	88.4	89.1	87.5
B QEH	89.0	88.2	88.0	88.3	89.9	89.3	91.0	91.5	91.8	89.6
Basldn	90.1	89.9	90.3	92.6	91.6	88.5	90.8	88.4	92.7	86.4
Bradfd	86.4	82.9	84.3	87.7	84.5	89.2	88.0	87.7	85.1	87.5
Brightn	84.4	87.6	87.2	88.7	87.4	89.9	88.2	89.4	88.3	87.2
Bristol	87.4	87.7	89.2	87.4	85.0	85.8	89.7	90.8	90.0	89.2
Camb	87.2	89.3	88.0	92.6	90.0	91.4	93.1	89.1	92.8	87.7
Carlis	83.7	83.9	85.8	87.0	80.3	80.5	93.2	88.9	82.9	88.3
Carsh	85.7	89.2	88.4	89.8	88.7	89.2	89.6	91.0	90.5	89.6
Chelms	82.9	85.6	87.5	85.1	86.1	89.6	84.1	91.6	90.7	90.5
Colchr					91.1	86.6	89.0	89.2	85.9	88.4
Covnt	89.3	84.8	87.2	87.3	90.9	90.2	91.0	91.9	90.6	86.1
Derby	87.4	88.5	86.9	90.3	90.4	90.0	89.8	89.8	88.2	90.1
Donc				88.8	83.9	88.9	91.8	91.5	82.8	90.4
Dorset	89.4	87.0	87.5	89.9	90.1	93.0	90.0	90.5	91.9	92.2
Dudley	85.9	87.3	87.2	88.8	88.8	90.8	87.7	91.5	86.8	87.4
Exeter	84.0	91.1	87.4	85.6	85.5	86.7	88.4	88.3	91.7	90.1
Glouc	88.2	91.1	88.2	86.3	91.7	92.1	89.5	90.7	89.7	92.1
Hull	84.3	85.8	89.9	86.7	87.7	87.5	89.8	90.9	88.5	87.6
Ipswi	85.6	84.2	86.1	93.1	84.4	87.5	91.8	90.3	88.0	89.6
Kent				86.3	87.9	90.4	89.7	89.1	87.8	87.8
L Barts	85.6	88.3	89.3	88.7	90.8	92.9	91.7	89.8	91.2	90.3
L Guys	89.3	87.3	90.5	90.3	91.4	91.0	93.9	91.2	90.9	90.5
L Kings	86.4	88.6	84.3	87.4	87.6	88.8	89.7	89.4	88.9	90.4
L Rfree		90.0	90.3	91.2	89.7	90.3	91.6	90.2	90.9	90.0
L St.G				94.3	89.2	90.8	91.9	88.4	91.7	92.2
L West	91.2	91.2	91.5	90.3	92.0	90.6	90.6	91.7	90.2	90.0
Leeds	88.9	88.4	88.2	87.3	88.8	90.8	88.9	86.6	88.3	88.7
Leic	86.6	84.4	89.7	89.5	88.6	90.4	89.8	90.3	89.0	89.3
Liv Ain	97.0	86.8	90.5	88.3	91.9	89.7	89.7	83.8	84.2	87.6
Liv Roy	83.6	87.6	84.4	86.4	89.1	88.9	90.5	88.5	87.8	87.0
M RI				86.3	87.6	86.9	88.5	90.7	86.1	86.3
Middlbr	86.0	85.0	87.1	86.8	86.4	83.3	93.0	88.5	88.7	85.3
Newc	85.9	83.7	86.0	86.3	87.0	86.1	85.0	89.2	84.4	86.4
Norwch	88.4	90.3	87.6	91.1	89.6	89.9	91.3	91.4	88.6	88.8
Nottm	84.8	83.2	89.5	88.3	88.0	89.6	89.9	88.9	90.5	88.5
Oxford	87.2	86.7	86.7	87.7	88.3	87.1	87.8	88.0	89.4	87.5
Plymth	87.8	83.8	82.8	88.1	85.9	85.3	89.9	84.8	89.9	86.9
Ports	86.0	85.2	89.8	88.5	89.2	88.4	88.3	90.0	90.3	85.7
Prestn	85.8	86.3	90.8	90.2	89.7	90.1	88.2	90.6	89.1	88.7
Redng	86.3	89.0	90.3	88.9	92.4	88.9	89.4	90.9	90.9	89.5
Salford	82.6	85.3	87.6	86.0	87.5	84.6	87.0	88.4	87.5	89.0
Sheff	86.9	89.2	88.8	88.8	89.7	89.6	88.7	89.0	91.4	88.2
Shrew	86.3	86.6	89.1	89.0	87.9	85.6	87.4	89.9	83.9	86.4
Stevng	88.8	89.4	89.8	92.5	90.5	90.0	92.8	92.1	89.1	92.0
Sthend	87.0	83.4	86.3	90.2	91.0	92.4	90.3	87.8	91.8	90.3
Stoke				87.4	88.4	86.9	90.6	90.5	91.6	88.8
Sund	86.4	79.4	83.7	87.5	85.3	84.8	83.8	86.6	84.9	88.1
Truro	84.9	91.8	89.3	89.5	89.0	90.7	89.1	89.7	88.9	90.1
Wirral	89.4	88.4	88.1	89.3	90.3	88.6	90.7	90.2	90.8	84.5
Wolve	86.5	89.3	87.9	92.6	89.5	87.4	89.3	88.8	89.0	89.9
York	89.4	84.0	88.5	87.8	88.9	90.0	84.2	88.7	91.5	88.2

Table 5.26. Continued

Centre	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
N Ireland										
Antrim		85.2	85.2	87.8	89.5	88.1	91.6	90.0	90.5	85.3
Belfast		89.5	89.5	87.8	87.0	87.4	87.3	87.7	85.2	89.2
Newry		87.3	87.3	89.1	91.5	86.6	91.1	81.5	90.0	90.6
Ulster		89.5	89.5	89.6	87.4	89.8	89.0	90.9	91.2	91.3
West NI		90.2	90.2	92.7	89.3	91.0	90.7	91.4	91.7	85.6
Scotland										
Abrdn	87.2	86.1	87.1	89.4	89.3	89.6	89.0	91.2	88.5	84.1
Airdrie	82.8	79.7	79.4	86.0	85.5	89.4	88.4	86.4	85.8	85.7
D & Gall	91.7	81.3	90.2	83.9	86.5	86.4	90.6	86.5	89.8	86.4
Dundee	86.4	86.6	82.6	82.6	93.0	86.9	86.9	91.1	88.5	90.4
Edinb	84.5	85.7	87.0	87.5	85.7	88.4	81.2	89.2	88.9	87.4
Glasgw	86.7	85.7	87.5	87.7	87.8	87.9	87.3	87.5	87.1	87.8
Inverns	85.5	85.6	93.4	88.6	91.7	88.3	85.9	87.1	86.3	88.7
Klmarnk	84.1	91.9	87.0	89.0	88.1	88.1	88.8	89.5	86.9	91.7
Krkcldy	89.0	87.4	87.6	89.9	85.0	86.2	89.0	86.9	90.5	84.2
Wales										
Bangor	86.6	88.5	81.5	88.7	85.1	85.5	86.9	89.9	84.5	85.6
Cardff	84.4	84.1	88.8	82.5	86.5	85.8	88.3	86.3	87.6	86.6
Clwyd	82.0	77.3	90.5	87.1	88.8	78.2	93.1	90.0	86.3	88.8
Swanse	89.0	85.4	88.0	89.4	87.3	87.4	89.0	86.2	88.4	87.2
Wrexm	82.1	85.1	87.6	85.1	89.0	86.7	85.8	87.3	89.3	88.0
England	**87.8**	**88.3**	**88.5**	**88.9**	**89.0**	**89.2**	**89.9**	**89.9**	**89.5**	**88.8**
N Ireland		**87.3**	**88.4**	**89.0**	**88.6**	**88.5**	**89.6**	**88.6**	**89.1**	**88.3**
Scotland	**86.1**	**85.7**	**86.6**	**87.3**	**88.0**	**88.0**	**87.0**	**88.5**	**87.7**	**87.3**
Wales	**85.6**	**84.6**	**87.9**	**85.5**	**86.9**	**85.9**	**88.5**	**86.8**	**87.6**	**86.9**
UK	**87.5**	**87.8**	**88.3**	**88.6**	**88.8**	**88.9**	**89.6**	**89.6**	**89.3**	**88.6**

Blank cells: data not reported to the UKRR for that year or less than 20 patients in the year

Table 5.27. Percentage completeness of EDTA cause of death for prevalent patients by centre and year of death, 2005 to 2014

Centre	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
England										
B Heart	68.1	85.7	84.5	93.9	100.0	96.6	96.1	96.6	95.0	65.6
B QEH	60.0	4.7	7.0	5.8	0.7	1.7	2.0	2.1	61.9	90.4
Basldn	45.0	21.7	45.5	47.6	76.2	66.7	84.6	88.9	90.9	90.0
Bradfd	87.8	92.2	86.5	92.5	81.8	97.0	97.5	97.7	97.9	98.0
Brightn	0.0	0.0	11.9	0.0	1.1	2.4	1.1	1.1	0.0	0.9
Bristol	76.9	61.0	60.3	66.4	70.7	89.4	96.1	82.2	82.0	90.0
Camb	1.5	1.3	1.1	1.6	5.1	10.4	62.0	94.1	80.5	42.3
Carlis	91.3	91.3	73.9	47.6	80.6	100.0	92.9	94.7	92.3	92.0
Carsh	0.0	0.0	0.8	1.5	0.8	6.7	25.0	40.8	17.4	16.3
Chelms	68.6	64.0	76.5	71.4	86.7	86.7	87.0	96.3	92.3	85.7
Colchr				33.3	66.7	85.2	82.6	100.0	91.7	77.3
Covnt	0.0	0.0	0.0	1.2	1.8	0.0	1.4	33.3	70.5	6.7
Derby	77.6	75.6	83.3	97.8	73.5	91.2	88.5	86.9	88.7	73.7
Donc				100.0	94.3	90.9	91.7	92.6	100.0	96.8
Dorset	61.5	65.1	87.2	88.9	85.2	95.7	95.0	89.1	98.3	90.6
Dudley	14.3	5.9	6.1	5.3	0.0	94.4	88.1	91.2	94.0	95.5
Exeter	36.7	19.0	4.7	3.1	3.0	89.5	84.6	95.1	98.6	96.5
Glouc	64.5	61.1	77.8	70.8	68.4	97.2	93.6	91.5	100.0	88.1
Hull	81.5	76.0	76.5	52.7	18.7	92.0	93.5	96.9	86.8	91.7
Ipswi	10.3	21.9	35.5	13.6	18.8	73.3	77.8	77.4	78.8	83.3
Kent				61.7	92.8	89.0	96.2	94.9	81.4	86.6
L Barts	83.3	87.4	74.6	77.0	69.5	73.9	82.6	79.9	82.9	82.7
L Guys	0.0	0.0	3.5	0.0	0.0	67.6	84.2	58.2	1.1	0.0
L Kings	85.7	87.9	75.8	86.2	67.1	94.8	97.6	100.0	98.9	98.7
L Rfree		0.0	0.0	0.0	0.9	1.7	0.0	7.1	5.7	15.9
L St.G			16.7	17.9	21.4	77.6	47.9	42.4	62.5	57.1
L West	79.8	31.3	18.9	6.3	2.2	2.2	95.0	97.3	96.4	93.8
Leeds	69.3	66.7	29.6	30.1	34.5	100.0	99.1	97.7	98.3	99.2
Leic	72.5	76.9	65.5	69.5	69.8	74.5	61.7	94.1	80.0	55.2
Liv Ain	50.0	81.3	73.3	66.7	100.0	85.0	95.7	0.0	0.0	0.0
Liv Roy	41.5	66.3	76.8	75.8	82.1	71.6	76.4	2.8	33.7	19.0
M RI			4.0	0.9	1.0	4.7	3.1	10.0	0.8	1.4
Middlbr	79.4	63.5	57.5	26.0	52.0	89.2	97.5	94.9	81.3	95.1
Newc	20.8	29.8	48.7	35.7	40.8	14.0	45.0	16.9	23.6	51.8
Norwch	21.0	21.4	18.2	21.2	44.4	75.8	70.3	76.5	91.0	74.0
Nottm	97.0	87.5	87.0	98.8	97.1	98.8	100.0	100.0	97.6	98.9
Oxford	2.8	0.0	0.0	1.0	0.0	84.6	97.4	92.7	96.5	98.3
Plymth	51.4	45.8	56.7	70.7	47.5	80.9	43.6	41.2	100.0	24.5
Ports	21.5	12.8	21.4	6.9	44.5	68.7	23.3	19.8	40.7	38.8
Prestn	50.0	55.4	47.8	38.1	17.9	95.7	98.9	96.4	99.0	95.2
Redng	81.5	77.1	97.8	89.6	83.0	100.0	96.7	91.2	91.9	79.7
Salford	0.0	0.0	1.3	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Sheff	4.6	9.2	12.9	0.9	1.9	3.0	0.8	0.8	1.9	0.9
Shrew	66.7	53.1	89.3	62.5	20.5	46.0	0.0	7.9	17.7	0.0
Stevng	86.3	60.8	55.1	67.2	74.3	86.3	86.8	67.7	69.8	9.3
Sthend	39.4	9.4	3.2	57.7	75.0	92.3	90.0	100.0	100.0	95.7
Stoke			16.1	21.0	28.6	54.7	57.9	89.6	55.0	53.5
Sund	56.3	60.0	60.5	50.0	78.9	93.5	95.1	97.4	82.6	97.4
Truro	2.3	6.9	0.0	18.4	28.9	93.3	94.9	78.8	100.0	97.1
Wirral	31.3	94.1	84.6	96.9	84.8	86.5	0.0	2.6	25.8	68.5
Wolve	92.3	47.8	51.5	65.8	76.4	98.4	94.1	92.2	83.8	85.2
York	41.4	83.3	38.5	62.1	67.9	96.7	97.3	100.0	100.0	97.4

Table 5.27. Continued

Centre	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
N Ireland										
Antrim	4.0	10.0	8.6	3.4	26.9	96.8	95.2	100.0	93.1	100.0
Belfast	17.2	33.8	36.0	20.0	25.4	81.7	75.9	77.0	41.7	51.1
Newry	0.0	42.9	15.0	11.8	68.4	95.2	94.4	96.7	100.0	93.3
Ulster	100.0	85.7	92.9	69.2	75.0	95.0	90.9	100.0	95.7	90.0
West NI	40.0	57.7	35.0	22.2	45.8	92.3	80.0	96.6	96.2	93.9
Scotland										
Abrdn	2.8	0.0	2.1	100.0	100.0	100.0	100.0	97.1	90.7	67.7
Airdrie	40.0	26.3	100.0	100.0	100.0	100.0	97.0	93.9	100.0	97.6
D & Gall	80.0	76.9	100.0	93.3	94.4	100.0	100.0	87.5	100.0	100.0
Dundee	88.9	2.8	9.3	100.0	96.9	100.0	100.0	100.0	100.0	52.8
Edinb	52.5	29.3	48.3	100.0	97.5	100.0	98.8	100.0	96.4	96.2
Glasgw	45.9	55.1	59.1	100.0	97.8	97.1	99.3	99.2	98.7	100.0
Inverns	0.0	0.0	0.0	100.0	94.7	100.0	100.0	100.0	100.0	100.0
Klmarnk	0.0	11.1	15.6	100.0	96.7	97.0	100.0	100.0	100.0	100.0
Krkcldy	88.2	65.0	61.5	100.0	96.4	96.6	100.0	96.9	100.0	92.3
Wales										
Bangor	66.7	35.0	86.2	52.4	76.9	73.9	90.0	100.0	95.8	95.0
Cardff	4.3	2.9	4.9	0.0	2.4	6.7	7.9	0.6	73.5	96.7
Clwyd	5.9	11.1	45.5	84.2	83.3	100.0	85.7	89.5	83.3	90.0
Swanse	85.7	92.4	97.3	94.8	89.8	98.0	87.5	98.1	95.7	82.6
Wrexm	3.6	3.4	22.7	69.2	100.0	95.7	92.6	100.0	95.7	87.0
England	**47.7**	**41.5**	**37.9**	**36.9**	**39.0**	**58.8**	**63.5**	**64.4**	**64.7**	**60.1**
N Ireland	**19.5**	**38.7**	**31.7**	**20.4**	**40.8**	**89.9**	**84.0**	**90.7**	**75.2**	**81.5**
Scotland	**43.2**	**33.7**	**44.9**	**99.8**	**97.6**	**98.6**	**99.3**	**98.2**	**98.2**	**89.7**
Wales	**29.3**	**30.7**	**43.8**	**36.3**	**47.6**	**53.3**	**48.6**	**50.5**	**84.8**	**91.2**
UK	**45.2**	**39.9**	**38.7**	**42.2**	**44.9**	**62.9**	**66.6**	**67.1**	**69.0**	**64.8**

Blank cells: data not available for that year