Executive Summary

Since its creation in May 1988 the United States Renal Data System (USRDS) has pursued the collection and analysis of information on the incidence, prevalence, morbidity, and mortality of end-stage renal disease (ESRD) in the United States. The USRDS is operated by the Coordinating Center (CC) at The University of Michigan, and is funded by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health. The Health Care Financing Administration (HCFA), of the United States Department of Health and Human Services, participates with NIDDK on the project and supplies expertise and most of the original data to the USRDS.

The present USRDS *1995 Annual Data Report* is the seventh volume based on these ESRD data. The annual data reports represent one major vehicle for disseminating information from the USRDS.

The report addresses each of the six goals which are defined for the USRDS. The first three goals are addressed throughout the report: 1) to characterize the total renal patient population and describe the distribution of patients by sociodemographic variables across treatment modalities; 2) to report on the incidence, prevalence, mortality rates, and trends over time of renal disease by primary diagnosis, treatment modality, and other sociodemographic variables; and 3) to develop and analyze data on the effect of various modalities of treatment by disease and patient group categories.

The fourth goal is to identify problems and opportunities for more focused special studies of renal research issues. This goal has been addressed with seven special studies requiring new data collection. A description of these seven special studies is provided in Chapter XIII. Chapter X includes an analysis from the Case Mix Adequacy special study on hemodialysis vascular access problems, and Chapters II, IV and VIII also include data from the special studies. Data collection for the eighth special study, the Dialysis Morbidity and Mortality Study, began in March, 1995. This study is described in Chapter XIII on Research Studies.

Two additional goals were added to the USRDS's mission and were reflected in the *1994 ADR*. Goal five is to conduct economic cost effectiveness studies and other economic studies of ESRD. Chapter X presents an analysis of the costs relating to hemodialysis vascular access problems. The magnitude of the task of adding cost data to the USRDS database is illustrated by the fact that the sample of 1,700 patients from the Case Mix Adequacy study used for Chapter X generated more than 300,000 Medicare bills over 2.5 years.

Goal six puts new emphasis on supporting investigator-initiated projects to conduct biomedical and economic analyses of ESRD patients. Chapter I of this report describes the recently developed USRDS Standard Analysis Files. In the past year, files have been provided to 13 researchers. These files are also described in a separate publication, the *Researcher's Guide to the USRDS Database*, which is available through the USRDS Coordinating Center.

In October, 1994, a new dimension was added to the array of products of the USRDS when the Reference Tables from the *1994 ADR* became available electronically on the Internet. The next few months will see a substantial expansion of USRDS material available on-line via the World Wide Web.

Changes from Previous Reports and Continuing Notes of Importance

The USRDS has issued six previous reports, the most recent of which was published in 1994. The current report is based on an update from HCFA dated June 1994, which is 13 months later than the update file used for our previous (1994) report. The USRDS added 60,000 new patients since the last update. More than 1.2 million patient-based data records were added, and more than 4.4 million derived records were created to track treatment modality over time and to summarize patient status and hospitalization. The Medicare billing data which underlie much of the USRDS database consists of about 11 million billing records per year. Summary data on these bills are maintained on-line, with the

full set of data available on tape. Data records for more than 20,000 patients from the seven Special Studies are currently in the database.

The ESRD data in this report are current through 1992 for patient data, and through 1993 for ESRD providers and patient counts. For the first time this ADR selectively reports on data less than 15 months old. In the current case this will mean 1993 patient data. Patient-based data are an accumulation of many records for each patient from numerous sources. There is a variable lag time before the patient data are considered complete, and the USRDS generally does not emphasize patient data that occur less than 15 months from the last update. ESRD provider data, in contrast, are based primarily on one source, HCFA's Annual Facility Survey, which is completed within six months of the end of the calendar year. Thus, information from the Annual Facility Survey is one year more recent (end of 1993) than most other patient data in this report.

Our objective in preparing this report has been to present data for a span of 10 or more years, using consistent definitions, so that valid comparisons can be made across years and among subgroups in the database. Because of year-to-year changes in the data and in the methodologies used, comparisons of data between ADRs should be avoided. We attempt to alert the reader to those cases where changes in the data collection process over the years result in problems in making valid comparisons across years. These warnings appear in the text, in reference table footnotes, and in Chapter XIV, "Analytical Methods."

The primary methodological and data changes in this report are:

Projected 1993 Estimates of Prevalent Patient Counts and Incidence Rates. The most frequently asked question of the USRDS Coordinating Center is: How many ESRD patients are there? We have provided in Chapter II projected estimates for 1993 (one year beyond the patient data base of 1992 counts), based on the 10 prior years of exponential growth. Incidence projections are estimated in Chapter III.

Cause of death categories. HCFA introduced a new Death Notification Form in 1990 which used a new set of categories for cause of death. Because withdrawal from dialysis before death is now recorded separately from the cause of death, the categories are not consistent with the pre-1990 categories. In this report, cause of death data are reported only for 1991-1992 and use the new categories.

State and Network Rates. The new availability of a consistently defined series of Census Bureau data by state and county from 1981 allows incidence and prevalence rates by state and by ESRD Network to be computed for the past 10 years rather than just for the most recent year as in past reports.

Race code. The race code which is used by the Medicare system now includes a Hispanic category and creates an inconsistency with the race categories reported on the ESRD Medical Evidence Form. This will result in a slight increase in the number of patients classified as "Other" race.

Standard population for adjustment. The adjusted incidence, prevalence, survival, and death rates in this ADR now all use the most recent year as the standard population for adjustment. In the 1994 ADR, the 1990 Census population was used for adjusting incidence and prevalence rates, but 1991 ESRD population was used for adjusting survival rates.

Summary Statistics

Selected statistics for the ESRD program for 1992 are shown in Table ES-1. These data provide a succinct reference for information commonly requested of the USRDS.

Salient Trends; Notable Changes in Statistical Results

☑ Prevalence (Chapter II)

The ESRD population continues to increase both in counts and rates. Over 205,000 patients were treated in 1992 and the prevalence per million US residents continues to rise. In addition to the growth in overall patient numbers, changes are occurring within race and age subgroups which may affect the future treatment of ESRD patients. Asian/Pacific Island patients increased at an average of 20 percent per year between 1988-92 while Native Americans experienced a 16 percent increase over that same time period. These two racial subgroups contribute relatively small numbers to the overall total of ESRD

Summary Statistics on Reported ESRD Therapy in the U.S., 1992 [a]

Patient Characteristic	ESRD Incidence Count [b]	ESRD Incidence Adjusted Rate [c]	December 31 ESRD Point Prevalence Count [b]	December 31 ESRD Point Prevalence Adjusted Rate [c]	Counts By Modality [d] Dialysis	Counts By Modality [d] Tx	Medicare Kidney Tx Performed by Donor Type [e] CAD	Medicare Kidney Tx Performed by Donor Type [e] LRD	ESRD [f] Deaths
Age [g]									
0-19	832	11	4,201	57	1,600	2,603	306	322	93
20-44	10,121	99	60,167	584	31,387	28,797	3,643	1,336	3,622
45-64	18,351	426	76,545	1,732	55,661	20,956	2,747	570	10,824
65-74	15,376	920	42,168	2,560	39,428	2,762	345	49	12,524
75 plus	9,906	796	22,717	1,859	22,574	139	16	*	10,043
Race									
White	36,271	162	132,588	598	88,594	43,996	5,070	1881	25,845
Black	15,823	645	63,286	2,509	54,575	8,713	1,622	295	9,789
Asian/Pacific Islander	1,252	215	4,932	754	3,641	1,395	252	55	599
Native American	810	590	2,792	1,871	2,162	630	82	32	419
Other	395		1,937		1,678	527	30	15	354
Unknown	35		263				*	0	100
Sex									
Male	29,174	255	111,656	940	78,377	33,334	4,251	1,303	19,849
Female	25,412	178	94,142	669	72,273	21,927	2,806	975	17,257
Primary Disease									
Diabetes	19,790	77	56,059	216	45,943	10,168	1,649	445	13,219
Hypertension	16,206	63	49,438	191	42,989	6,470	1,195	268	11,133
Glomerulonephritis	5,979	23	36,973	142	21,648	15,337	1,714	630	3,775
Cystic Kidney Disease	1,532	6	9,984	39	5,818	4,169	633	121	823
Urologic Diseases	2,514	10	12,270	48	8,306	3,974	380	202	1,868
Other Known Cause	3,652	14	12,794	50	8,552	4,242	555	244	2,267
Unknown Cause	2,853	11	13,025	50	8,839	4,195	472	169	2,267
Missing Data	2,060	7	15,255	56	8,555	6,706	459	199	1,754
Total	**54,586**	**211**	**205,798**	**791**	**150,650**	**55,261**	**7,057**	**2,278**	**37,106**
		Unadjusted Rate [h] : 212		**794**			**All Tx [i] : 10,109**		

[a] USRDS Patient Database Updated from HCFA PMMIS May 1994, Quality Control Filters Applied. Includes only ESRD patients reported through HCFA as receiving renal replacement therapy for ESRD, or approximately 93 percent of the total number of U.S. ESRD patients. See Chapter XIII, "Analytical Methods: Technical Notes," for discussions of the database and of the methodologies used.

[b] Incidence = new patients starting ESRD therapy during 1992. Incidence and prevalence counts and rates include residents of the 50 states and the District of Columbia only. All other data in this table (modality, transplant, and death counts) include residents of Puerto Rico and U.S. Territories.

[c] Rates were adjusted for age, race, and/or sex using the July 1, 1991 U.S. resident population as the standard population. All rates are per million population. Rates by age were adjusted for race and sex. Rates by sex were adjusted for race and age. Rates by race were adjusted for age and sex. Rates by disease group and total adjusted rate were adjusted for age, race and sex. Adjusted rates do not include patients with other or unknown race.

[d] Patients were classified as receiving dialysis or with a functioning transplant. Those with treatment modality unknown on December 31 were assumed to be receiving dialysis.

[e] Kidney Tx Performed = number of transplants performed during 1992.

[f] Deaths = number of ESRD patient deaths during 1992.

[g] Age was computed at start of therapy for incidence, on 12/31 for point prevalence, at time of transplant for transplants, and on date of death for death.

[h] Unadjusted total rates include all ESRD patients in the 50 states and the District of Columbia.

[i] Source: 1993 HCFA Facility Survey. This total count of kidney transplants performed during 1992 includes 774 additional transplants not shown in the demographic categories from the patient database. These additional cases are generally not covered by Medicare.

Table ES-1

patients, but if trends continue they will both double in less than 5 years.

Data for the age breakdowns continue to reflect the demographic shift towards an older patient population with the fastest growing age group, both in actual numbers and in rates, being 75 years and older and the next fastest growing age group being the 65-74 year group. Given the growth of these age groups in the healthy population, and the reductions in mortality for all ESRD patients, we can only expect the trend of growing prevalence to continue. The USRDS is constantly analyzing data quality issues. A recent analysis of the Special Study of Case Mix Adequacy suggests that the Program Medical Management and Information System (PMMIS), which is the backbone of the USRDS, may understate Medicare dialysis patients by 5 to 6 percent. Our analysis of this issue is continuing.

☑ Incidence and Causes of ESRD (Chapter III)

There are 55,377 ESRD patients who were incident (newly developed ESRD) and who were reported to the USRDS registry for 1992. This estimate includes patients residing in the continental United States, Puerto Rico and US Territories who were treated for ESRD and who were covered by the Medicare ESRD program. The rate of new ESRD patients per million population appears to be growing exponentially, currently estimated at 8.7 percent annually. When accounting for the delay in receiving information about patients who may initially have medical insurance other than Medicare, we estimate the true incidence to be rising at a slightly higher rate of 9.1 percent per year and to reach over 62,000 patients in 1993.

There is rapid growth in treated ESRD incidence among patients who are older and whose ESRD is attributed to diabetes. Between 1984 and 1992 the median age at incidence rose from 59 to 63 years, while over the same time period the fraction of new patients with diabetic ESRD increased from 27 percent to 36 percent.

This year's chapter reports more detail by diagnosis and the interaction of diagnosis with other factors such as race, sex and age. ESRD attributed to hypertension or glomerulonephritis (GN) is nearly twice as common among males as among females. Rapid growth in incidence rates are observed for ESRD attributed to diabetes or hypertension among all race groups, ranging between 9 and 21 percent per year.

This is the first ADR to report longitudinal data on age, race and sex adjusted incidence rates by ESRD Network and by state (see Reference tables A.32-A.39). Recent trends in adjusted incidence rates by Network suggest that there are differences in the rate of treated ESRD that are relatively consistent over time.

☑ Methods of ESRD Treatment (Chapter IV)

The increase in prevalence of ESRD has led to an increase in the number of patients in all modalities except home-hemodialysis. The fraction of patients treated by CCPD has shown a gradual increase, while the fraction on all other modalities has remained fairly stable.

Changes between dialytic modalities are more likely to occur from PD to HD than from HD to PD. A higher delivered dose of hemodialysis (Kt/V) is associated with higher blood flows, longer treatment times, and synthetic membranes. Dialyzer reuse is more likely practiced with synthetic membranes. The use of erythropoietin has continued to increase reaching 90 percent in HD and 56.9 percent in PD patients in 1993. Vascular access use has gradually shifted from AV fistula towards PTFE grafts between 1986/87 and 1990.

☑ Patient Survival (Chapter V)

One of the most important results in this chapter is that mortality rates are continuing to decrease based on incident and prevalent adjusted mortality rates. We present first and second year death rates based on incident cohorts over the years 1983-1992, as opposed to the cumulative surviving proportions which were used in previous ADRs. This allows us to show the death rates during only the second year for those who survive the first. This makes it easier to assess the effect of year of therapy (vintage).

We present results from a special analysis using the incident cohorts of 1989-1991, followed through June 1993. In this special analysis we calculate first and second year death rates using a cross-classification of age, race, diabetes status, and dialytic modality. In the past, the only classifications of death rates for incident patients was by separate classifications of age, race, sex and diagnoses of ESRD.

We also include results from the USRDS Special Study, the Case Mix Adequacy (CMA) study population of prevalent patients. We present the crude relative mortality risk (RR) for each of the comorbid conditions that will be collected on the new

ESRD Medical Evidence Form. These RRs by comorbid condition are not adjusted for any other comorbid condition, but are adjusted for age, race, sex and diagnosis of ESRD.

We also expanded the section on expected remaining lifetimes from last year's ADR. In this edition we include a figure (previously Figure III-8 in the 1994 ADR) showing the expected remaining lifetime for ESRD population versus other diseases in the US population, including colon cancer, lung cancer and prostrate cancer. Also included is a figure showing the comparison of expected remaining lifetimes based on the healthiest 95th percentile of the CMA sample of hemodialysis patients, those based on the average patient in the CMA study, those based on all hemodialysis ESRD patients, and those based on the US general population.

☑ Causes of Death (Chapter VI)

As in prior reports, cardiovascular causes continue to dominate the reported "causes of death" among the ESRD population, accounting for 47 percent of all deaths (including cerebrovascular causes). The revised Death Notification Form has provided more detailed information on cardiac causes of death which is presented in this chapter. The majority of deaths in the large "other cardiac" category used in prior reports are attributed to "cardiac arrest, cause unknown," followed by cardiac arrhythmia, atherosclerotic heart disease and cardiomyopathy.

In comparison to previous years, this report presents cause-specific death rates adjusted for several demographic characteristics, allowing for more meaningful comparisons between patient subgroups by modality (PD and HD), race, gender, age and diabetes status. Death rates due to many causes were higher among PD than HD treated patients and higher among males than females. Death rates due to most reported causes were higher among blacks than whites and higher among diabetics than non-diabetics for all dialysis patients. Adjusted death rates presented in this chapter also allow comparisons of causes of death between patients with functioning and failed transplants.

The new Death Notification Form (adopted in 1990) has also allowed more detailed analysis of withdrawal from dialysis. Overall, approximately 17 percent of patients withdrew from dialysis prior to death. The percent of patients withdrawing from dialysis preceding death is higher among whites than blacks, females than males, and older than younger age groups. The majority of withdrawals are reported to be on account of chronic failure to thrive and acute medical complications. Malignancy, cachexia, dementia and hyperkalemia were more likely causes of death among patients who withdrew from dialysis prior to death than among those that did not.

These analyses of cause-specific mortality are important as they may promote the generation of hypotheses to explain and hopefully reduce the high mortality of the ESRD population.

☑ Transplant Outcomes (Chapter VII)

Organ donation rate per million population has remained relatively constant in the face of an ever increasing waiting list, leading to a gradual decline in the rate of first cadaveric transplantation in several demographic groups. The probability of receiving a kidney transplant varies by the ESRD Network of residence of ESRD patients. The HLA antigen mismatch at the HLA-A, B, and DR loci for first cadaveric transplants differs by recipient race groups with the mean number of HLA mismatches in each race group being constant between 1987 and 1993.

Patient survival of kidney transplant recipients continues to show a gradual improvement. In 1992, the one year survival was similar for diabetic and nondiabetic transplant recipients. Allograft outcome for both living-related and cadaveric donor transplantation also showed a sustained improvement for both diabetics and nondiabetics. Diabetic-ESRD patients represent an increasing fraction of kidney transplant recipients. Since 1989, the latter have experienced an adjusted one and two-year graft survival similar to the recipients in other primary disease groups. Although the overall improvement in graft survival is partly due to a significant reduction in the monthly rate of graft loss during the first post transplant year, a substantial reduction in the monthly rate of graft loss was also observed during the second post transplant year (50 percent reduction; 1.1 percent in 1983 vs 0.5 percent in 1992).

☑ Pediatric ESRD (Chapter VIII)

Incidence and prevalence estimates are similar to those reported in the 1994 ADR. Incidence rates have remained constant over the 10 years from 1982 through 1992. There was a small increase of 3 percent between 1991 and 1992 in the prevalence of ESRD in American children.

Children with ESRD continue to have very high rates of transplantation. In 1992, 82 percent of children between the ages of 5-9 had received at least

one kidney transplant. Living related transplants now dominate (1992) in every pediatric age group except 15-19. This is a trend that was first seen in last year's ADR (1991 data). Rates of pediatric transplantation by sex and race show substantial variance year by year with larger differences in rates by race than by sex. Pediatric cadaveric transplants per 100 dialysis patient years have been decreasing over the past five years but there is evidence that this rate of decline is no greater than that of adults between the ages of 20-29.

There is evidence that a majority of pediatric transplants are performed at transplant centers where experience with pediatric transplant surgery may be limited (<10 pediatric transplants performed in a four year period). Further investigation should focus on whether outcomes are different in these various groupings of transplant centers.

Pediatric survival remains relatively good compared to adult age groups, particularly children between the ages of 5-19. Two year survival for these children is in the range of 94 percent to 96 percent. However, substantial differences in survival exist between pediatric dialysis and transplant patients, with transplant patients having significantly lower death rates than dialysis patients.

Substantial differences in height between children with ESRD and children in the general population exist at all ages. Growth in children with ESRD is an important measure of physical and emotional well-being, and further investigation should focus on the relative benefits of dialysis versus transplantation for growth.

☑ Hospitalization (Chapter IX)

Hospitalization rates reflect a number of important aspects of ESRD therapy. Various factors often make it difficult to accurately measure and interpret data on hospitalization. Still, the ability to make meaningful aggregate comparisons has vastly improved since the last USRDS report on this subject in 1991 (Reference tables on hospitalization were included in the 1989 through the 1994 ADR). This chapter discusses the number of admissions and days spent in the hospital by dialysis patients as well as hospitalization rates of prevalent dialysis patients who have never been transplanted. It also introduces a new comparison measure called the standardized hospitalization rate (SHR). This rate is used to examine differences among the nine Census regions, differences due to dialysis unit size, and variation in hospitalization rates among different types of units.

The distributions of both the number of hospital admissions and days are positively skewed with more than a third of patients having zero in both cases. In examining admissions rates, females tend to be hospitalized more than males in general. Also interesting is the fact that blacks are hospitalized more than whites at younger ages, but the trend reverses as both groups move beyond the age of 45.

Our introduction of the concept of a standardized hospitalization ratio (SHR) has led to interesting comparisons in this chapter. The distribution of the SHR is especially stable over time for the larger dialysis units. As a result, those units with fewer than twenty expected admissions over a three year period are excluded from many of the analyses. These same units were also excluded in the comparisons of SHR with the standardized mortality ratio (SMR). In comparing the two ratios across the nine Census regions, the patterns look similar with a couple of exceptions; most notably, the Northeast has the lowest median SMR, but one of the highest median SHRs.

The differences in SHRs among the types of dialysis units are also interesting. Units that are free-standing and operate for-profit have somewhat higher hospitalization rates than do other types of dialysis units. Nonprofit freestanding and hospital units have lower rates. There is a long list of possible explanations for these findings. Turning to SMRs, the pattern is similar for free-standing units, but hospital units have a much higher mortality rate. It is unclear how one should interpret these findings since the meaning of a high hospitalization rate is vague. Does a high SHR indicate a more severe case mix of patients or better utilization of resources to produce good health? This question should be investigated further, especially given the downward trend of SHRs in general over the last three years.

☑ Cost Effectiveness of Alternative Types of Vascular Access and Cost of ESRD (Chapter X)

This is the first Annual Data Report to include empirical analyses of the cost-effectiveness of alternative therapies available for ESRD. This study combines data on patient outcomes and Medicare reimbursements by linking data from the Casemix Adequacy Special Study, the USRDS database and the Medicare inpatient and outpatient billing records. This chapter is intended primarily as an illustrative example of cost-effectiveness analyses of alternative therapies for ESRD, linking data from several sources to simultaneously consider patient outcomes and

direct medical costs (in this case, to Medicare). This study's specific quantitative results should be taken as descriptive and not causal given the small sample sizes and lack of appropriate controls for selection of particular patients to alternative vascular access devices.

The study sample included patients between the ages of 65 and 79, and was stratified by diabetes status. Hemodialysis patients using either of the two primary types of vascular access, the arteriovenous (AV) fistula and the polytetrafluoroethylene (PTFE) graft, were compared for two outcomes, vascular access (revision-free) survival and patient survival. Medicare costs (reimbursements) corresponding to these survival periods were also estimated for the two access types. This information was then used to compare the relative cost effectiveness of the AV fistula and the PTFE graft.

The results for this preliminary study indicate longer access survival and greater cost effectiveness for the AV fistula compared to the PTFE graft among non-diabetic patients. Preliminary results for diabetic patients indicate slightly longer access survival with a fistula compared to a graft, but also shorter patient survival and relatively higher costs for patients with a fistula versus a graft. These seemingly inconsistent results on patient outcomes measured by this analysis overall tended to suggest greater cost effectiveness for the PTFE graft.

Analysis of the Cost of ESRD for both Medicare and non-Medicare patients indicates that the preliminary estimates of total expenditures for 1992 (including both Medicare and patient obligations) were $9.5 billion, up from $8.6 billion in 1991. This represents an increase of 10.5 percent between 1991 and 1992. Per capita costs in nominal (current) dollars for Medicare patients were minus 0.6 percent. As in previous years, the driving force for these increased total costs is growth in enrollments. When inflation is considered, the change in per capita costs from 1991 to 1992 was a negative 3.4 percent, indicating that real cost per ESRD patient continues to decline.

☑ The Annual Facility Survey of ESRD Providers (Chapter XI)

Over the five year period from 1988 to 1993, the number of dialysis units and transplant facilities continued to grow at a rate of 7 percent a year. The majority of this growth occurred in free standing units which treated over 70 percent of the dialysis population in 1993. Between 1992 and 1993 there were an additional 153 for-profit units and 10 not-for-profit units added to the Medicare list of approved providers. There was no growth in the number of kidney transplant centers between 1992 and 1993. In fact, the total number of Medicare-approved transplant centers dropped from 231 to 226.

☑ International Comparisons of ESRD (Chapter XII)

In all countries reported, the incidence of treated ESRD continues to again increase compared to the rates shown in previous reports. As in previous years, the US continues to have the highest incidence of ESRD treatment in the world. The mean age of new patients is higher in the United States than in all other countries, suggesting more liberal acceptance criteria to ESRD therapy for patients with renal failure.

There also continues to be wide differences in utilization of treatment modality internationally. For example, among dialysis patients, the utilization of CAPD/CCPD ranges from less than 1 percent in Argentina to almost 50 percent in the United Kingdom. Fourteen percent of dialysis patients in the US utilize PD. Transplantation rates also vary and were highest in the US in 1992; however, the percentage of ESRD patients with a functioning graft was substantially lower than in other countries, probably reflecting transplant practice and outcomes of prior years.

☑ Research Studies (Chapter XIII)

The USRDS is currently conducting a new special study, The Dialysis Morbidity and Mortality Study (DMMS), which calls for the collection of data on a sample of 24,000 patients over a period of two years. One of the primary goals of this study is to examine the relationship of dialyzer reuse to patient outcomes. The DMMS will be divided into four "waves" or phases of 6,000 patients each. In every phase, "core" data will be collected. Supplemental data will differ in each phase depending on the Special Studies that are designed in each of the waves. Plans for Wave I call for the collection of supplemental data on anemia, nutrition and vascular access.

Errata for the 1994 USRDS Annual Data Report

Chapter VI (Patient Survival) had two errors in the expected remaining lifetimes. 1) The title of Table VI-1 erroneously indicated that the remaining lifetimes were computed for all ESRD patients, when the calculations were actually for dialyzed patients.

2) A minor coding error in the calculations yielded expected lifetimes for ESRD patients that were up to 6% too small.

Chapter IX (Pediatric ESRD.) incorrectly reported pediatric cadaveric transplants as a percentage of total (adult and pediatric) transplants by age group (0-14 and 15-19 years of age). These estimates have been reported correctly this year and can be found in Figure VIII-11 for the years 1983-1992.