

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, treatment, 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. Much of the HCFA data and Special Study data are collected by the ESRD Networks.

The present USRDS *1996 Annual Data Report* is the eighth 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 eight special studies requiring new data collection. A description of these eight special studies is provided in Chapter I. Chapter IV also includes results from these special studies. Data collection for the eighth special study, the Dialysis Morbidity and Mortality Study, is ongoing having begun in March of 1995. This study is described in Chapter I, "The USRDS and Its Products." Early results of this study are presented in Chapter IV.

Two additional goals were added to the USRDS's mission and were reflected in the past two Annual Data Reports (*1994 and 1995*) and are also addressed here. Goal five is to conduct cost effectiveness

studies and other economic studies of ESRD. Chapter IX presents an analysis of the total resource spending for ESRD care in the U.S. Other economic analyses presented in Chapter IX include an analysis of Medicare spending by alternative modalities of treating ESRD (hemodialysis, CAPD and CCPD and kidney transplantation).

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 (SAFs) and for the first time their availability on CD-ROM. Since the mid 1994, when our Standard Analysis Files (SAFs) were first offered, we have supplied 9 researchers outside the USRDS with 15 requests. Another 10 requests are in progress. An additional 72 files have been provided to the 18 ESRD Networks.

These analysis files are also described in a separate publication, the *Researcher's Guide to the USRDS Database*, which is available through the USRDS Coordinating Center. Essential parts of the Researcher's Guide are available from the World Wide Web (<http://www.med.umich.edu/usrds/>).

Since October, 1994, a new dimension was added to the array of products of the USRDS when the Reference Tables became available electronically on the Internet. Since that time there has been a substantial expansion of USRDS material available on-line via the World Wide Web (<http://www.med.umich.edu/usrds/>). During the month of January, 1996, the USRDS Web Site was accessed over 400 times and over 40 megabytes of data was downloaded. This site is accessed from all around the U.S. and from many other countries.

We will also be providing, on an experimental basis, the complete version of the USRDS *1996 Annual Data Report* (including all reference tables) on CD-ROM. Please contact the USRDS CC for further information if you would like to request a copy of the 1996 ADR on CD-ROM.

Changes from Previous Reports and Continuing Notes of Importance

The USRDS has issued seven previous reports, the most recent of which was published in 1995. The current report is based on an update of biomedical information from HCFA dated June 1995, which is 13 months later than the update file used for our previous (1995) report. The USRDS added nearly 60,000 new patients since the last update. In addition to the biomedical information, the Medicare billing data incorporated into the USRDS for 1991-94, which underlie much of the current analyses of cost in Chapter IX, consists of over 180 million claims. All of these 1991-94 records are currently on-line, occupying over 20 billion bytes of computer disk storage. Data records for more than 30,000 patients from the eight Special Studies are currently in the database as well.

The ESRD data in this report are current through 1993 for all patient-specific, biomedical data; through 1994 for ESRD providers and Medicare payment information; and through 1995 for the most recent Special Study (DMMS, Chapter IV). 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 and much of the payment record data are generally completed within six months of the end of the calendar year.

Our objective in preparing this report has been to present data for a span of 10 or more years for biomedical information (4 years for cost information) 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 introductions and footnotes, and in Chapter XII, "Analytical Methods."

The primary methodological and data changes in this report include the following:

Data System Changes. HCFA is completing the implementation of a new data system which will substantially improve our ability to update and track information on a more timely basis. However 1993 may represent a transition year and some data may have idiosyncratic characteristics, some known at this point and some not. One specific problem we address below is the rate of growth in the count of incident patients for 1993. Some of the other issues suspected but not confirmed relate to the overall count of ESRD patients as revealed in the Medicare Claims data and measured hospitalization. Future experience may identify other issues.

Prevalent Dialysis Patient Mortality. One of the most important results in this chapter is that mortality rates are continuing to decrease based on adjusted mortality rates for incident patients. There was no decrease in mortality among prevalent patients in 1993 compared to 1992 however.

Comparisons of Standardized Mortality Ratios with Crude Mortality Measures by Dialysis Unit. Chapter IV contains an analysis of SMR mortality wherein the mortality is adjusted for patient age, race, sex, and cause of ESRD with crude mortality which is just the ratio of deaths during the year to a count of patients treated in the unit. These two measures generally classify 78 percent of the dialysis units in a similar fashion. However 22 percent of units are classified differently by these two methods.

Growth in Incident Patients. The USRDS reports modest growth in treated Medicare ESRD incidence counts (2.1 percent) between 1992 and 1993. In contrast, the Annual Facility Survey (AFS), which includes both Medicare and non-Medicare patients, suggests approximately 6.0 percent growth in incidence counts from 1992-93. The modest rise in USRDS incidence counts appears to be the result of a decline in Medical Evidence Forms filed with HCFA during the third quarter of 1993. However, the growth in incidence counts from the AFS (6 percent from 1992 to 93) is still lower than the nearly 9 percent average annual growth in incidence counts from 1984-92. These data suggest that the US is possibly seeing a reduction in the growth in the number of new ESRD patients starting in 1993.

Results from the Dialysis Morbidity and Mortality Study (DMMS), Wave I. Wave 1 of the USRDS Dialysis Morbidity and Mortality Study was completed in August 1995. This study encompassed data abstraction by dialysis facility staff of records

from a national random sample of almost 6,000 hemodialysis patients, who were prevalent on December 31, 1993 with followup to 1995. This report provides several interesting results regarding delivered dialysis dose, components of dialyzer prescription, dialyzer re-use, water treatment, vascular access, and anemia and its treatment. Additionally, we report comparative analyses with the earlier USRDS Case Mix Adequacy Study (1990) for some parameters. The strength of this study is that its random sample of patients provides a description of the national practice of hemodialysis.

Changes in the procedures regarding lost to followup status. In the past a dialysis patient was declared as lost to followup at the beginning of a 1-year period of no billing activity in the Medicare files. Starting with this 1996 report we have declared lost to followup status at the *end* of a patient's 1-year of no activity. This procedure has added more survival years to the calculation of prevalent mortality. This procedure change generally lowers mortality over all years by a small fraction. See Chapter XII for further details.

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 1991-1993 and use the new categories.

State and Network Rates. Starting with the 1995 ADR and continued in this report, the new availability of a consistently defined series of Census Bureau data by state and county from 1981 to 1993 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, graft survival and death rates in this ADR now all use the most recent year as the standard population for adjustment. For this 1996 ADR, the 1992 Census of

Population was used for adjusting incidence and prevalence rates for 1993; the 1992 ESRD population was used for adjusting survival rates; the 1991 and 1992 transplant population was used for adjusting graft survival rates.

Summary Statistics

Selected statistics for the ESRD program for 1993 are shown in Table ES-1. These data provide a succinct reference for information commonly requested of the USRDS.

Chapter I. The USRDS and Its Products

Regular readers of these Annual Data Reports will find this chapter a very familiar description of the USRDS and its products. It does discuss the following new features:

- Data from Medicare claims for 1989 to 1994 are now in the USRDS database.
- USRDS Standard Analysis Files now will be provided on CD-ROM
- USRDS Standard Analysis Files containing Medicare reimbursement data and additional detail on diagnosis and procedures are now available.
- The USRDS has produced facility specific mortality and hospitalization reports, which have been distributed to dialysis units through the ESRD Networks.

Chapter II. Incidence and Prevalence of ESRD

This ADR presents for the first time a combined chapter on the incidence and prevalence of ESRD. Many of the patterns in incidence and prevalence are by definition very similar, so it is logical that they be discussed in the same context. This was also done to make the information more accessible to readers who are not epidemiologists and may not already be familiar with some of the terminology that is used. The new combined chapter includes a section that defines in more detail many of the terms used frequently in the chapter and throughout the rest of the ADR.

A total of 220,417 patients were reported as being treated for ESRD under the Medicare program as of 12/31/93. During 1993, a total of 57,384 Medicare

patients were reported as being newly treated for ESRD. This incidence count for 1993 is only 2 percent higher than the number of new patients reported for 1992 (56,243). As noted above, the 2 percent growth from 1992-93 compares to approximately 9.8 percent growth in incidence counts during the last decade. Based on investigations by both HCFA and the USRDS, this modest growth in incidence from 1992-93 appears to be the result of a temporary decline in Medical Evidence forms filed with HCFA.

An independent incidence count from the Annual Facility Survey, which includes both Medicare and non-Medicare patients, estimates the total growth in incidence counts to be closer to 6 percent between 1992 and 1993. The implications of the undercount in Medicare incidence for 1993 are discussed in further detail in Chapter II and also in Chapter XII. (As noted above, there may be some sign in these data that the rate of growth in incidence counts may have slowed).

Several comparisons are made between incident and prevalent patients. Incident patients tend to be older and are more likely to have ESRD attributed to diabetes, patterns that are influenced by both trends in incidence and patterns in patient survival. There are dramatic racial differences in the incidence of ESRD; diabetic ESRD is approximately four times as common among Blacks and nearly six times as common among Native Americans as among Whites. ESRD attributed to hypertension is six times as common among Blacks compared to Whites. There are other racial differences in ESRD cause-specific incidence rates that are less pronounced.

Chapter III. Treatment Modalities for ESRD Patients

The growth of the number of patients has been similar for each treatment modality so that the percent distribution of modalities has remained virtually constant. The one exception is that CCPD has continued to increase its share in recent years (1990-1993). The number of patients on the transplant waiting list continues to show a steep growth, while the number of cadaveric renal transplants performed per year has increased to a lesser degree. This has led to a widening gap between supply and demand. Treatment of anemia with human recombinant erythropoietin has continued to show an increase in dose and also in resultant hematocrit.

Chapter IV. The USRDS Dialysis Morbidity and Mortality Study (Wave 1)

The Dialysis Morbidity and Mortality Study (DMMS) is a USRDS special study which plans to collect data on 24,000 dialysis patients over 3 years, in 4 "waves" of data collection (approximately 6,000 patients each). A "core" data collection instrument will be used for all patients to address important research questions relating to adequacy of dialysis, membranes, dialyzer reuse etc. In addition, Waves II and III both include "non-core" components designed to address additional research questions. For example Wave 1, which included a sample of patients who were prevalent on December 31, 1993, also collected data on anemia, nutrition and vascular access. This chapter is a report of a number of descriptive analyses of data from Wave 1 of the DMMS, for which data collection was completed in August of 1995. Some of the main observations are highlighted:

The dose of hemodialysis among patients with ESRD for more than one year was compared for DMMS wave-1 (1993) with the Case Mix Adequacy Study (patients prevalent December 31, 1990). This analysis documented a clear improvement in delivered dose from a Kt/V of 1.11 to 1.22 and in URR from 59.8 to 63.2 percent. However, in 1993, almost fifty percent of patients received less than the recommended level of 1.2 Kt/V and 17 percent received a Kt/V less than 1.0. The use of synthetic membranes doubled during this interval (15 to 36 percent of dialyzers) with a smaller increase in modified cellulose membranes.

Dialyzers were reused in 71 percent of patients, more so with synthetic membrane dialyzers (88 percent) than with other dialyzers (near 60 percent). Of patients treated in reuse units, only 5.6 percent were not reusing dialyzers, two thirds of them for medical reasons and one third because of patient refusal.

Vascular access was studied and revealed that PTFE grafts were used more than twice as commonly as AV fistulas both among patients new to ESRD and for patients on dialysis for over one year. Among patients starting ESRD with hemodialysis during 1993, nearly one half (48 percent) had no access placed or attempted before onset of ESRD.

Despite the use of erythropoietin in over 80 percent of patients, 48 percent of patients had a hematocrit of less than 30 percent. Fifty-four percent

of all patients had a transferrin saturation of less than 20 percent and almost a quarter of the patients had values less than 10 percent. Serum ferritin was less than 200 in 58 percent of patients and less than 100 in 36 percent of patients. These data suggest that iron deficiency may in part explain the large proportion of patients with hematocrits less than 30 percent. Oral iron was reportedly used by 61 percent of patients sampled and parenteral iron by 26 percent.

As these DMMS-1 data are based on a national random sample of U.S. hemodialysis patients, the results presented in this chapter are a description of the actual practices regarding a number of important dialysis treatment parameters in the United States. More detailed analyses are planned to determine the relationships of these factors with patient outcomes.

Chapter V. Patient Mortality and Survival

One of the most important results in this chapter is that mortality rates are continuing to decrease based on incident adjusted mortality rates. There was no decrease in mortality among prevalent patients in 1993 compared to 1992 however.

We present projected expected remaining lifetimes for dialysis patients only in addition to presenting those for all ESRD patients and the U.S. population.

This year we include a section about facility-specific standardized mortality ratios (SMR). The USRDS distributed reports to each of the dialysis facilities in the United States for which sufficient data were available concerning hospitalization and mortality during 1991-1993. These reports included adjusted mortality rates based on the SMR that compares mortality at a facility to the norm of the death rates for all patients in the USRDS database. We present the distribution across facilities of several mortality measures including the SMR and show how they are related to each other.

Chapter VI. Causes of Death

The revised Death Notification Form, which has been in use since September 1990, has provided more detailed information on cause of death as it includes 59 rather than 22 cause of death categories. In comparison to last year's ADR, this current report now includes this more detailed data for 3 years, from 1991-1993.

Cardiovascular causes of death continue to dominate the reported "causes of death" among the ESRD population, accounting for almost 48 percent of all deaths (including cerebrovascular causes). "Cardiac arrest, cause unknown" is the most common reported cause of death, accounting for approximately 17 percent of all deaths. Acute myocardial infarction is the second most common reported cardiac cause of death, accounting for 10 percent of all deaths. Other reported cardiac causes include cardiac arrhythmia, atherosclerotic heart disease and cardiomyopathy in decreasing frequency. Valvular heart disease, pericarditis and pulmonary edema are uncommon reported causes of death. Deaths due to cerebrovascular causes accounted for 6 percent of all deaths.

Infection also continues to be a major cause of death accounting for 16 percent of deaths in the ESRD population. Deaths due to septicemia were the most common reported cause of infection. Malignancy was a relatively uncommon cause of death, accounting for approximately 4 percent of all deaths. Other known but uncommon causes were collapsed into a single category which accounted for approximately 18 percent of reported deaths. In 8 percent of deaths the cause was reported as unknown.

As in our previous report (1995 ADR), this report again presents cause-specific death rates for dialysis patients adjusted for several demographic characteristics, allowing comparisons between patient subgroups by modality (PD and HD), race, gender, age and diabetes status. For example, as in our previous report, death rates due to many causes were higher among PD than HD treated patients and among males than females. Death rates due to most reported causes were higher among Whites than Blacks and among diabetics than nondiabetics. Similarly, adjusted cause-specific death rates for transplant patients are presented.

Overall, 17.6 percent of dialysis 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.

Among pediatric patients, infection was the most common reported cause of death, followed by cardiac arrest, "other cardiac causes" (excluding acute myocardial infarction), cerebrovascular causes, and malignancy and myocardial infarction, which accounted for 2 percent of all reported deaths. "Other

known causes" accounted for 27 percent of deaths in this patient population.

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.

Chapter VII. Renal Transplantation: Access and Outcomes

Transplant data for pediatric and adult patients have been consolidated into one chapter (Chapter VII). Medicare and non-Medicare ESRD patients received a total of 10,954 kidney transplants in 1993, an 8 percent increase from 1992. Specifically, cadaveric donor transplants (CAD) increased by 7 percent and living related donor (LRD) transplants by 10.6 percent. Allografts from living biologically unrelated donors has increased from 0.6 percent of all kidney transplants in 1988 to 1.8 percent in 1993. Average adjusted one-year cadaveric renal allograft survival has remained stable at 83 percent since 1991. Race and gender disparities still exist in transplantation rates with Blacks having lower rates than Whites in the same age group, and females lower rates than males particularly among Whites.

Chapter VIII. Hospitalization

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 continued to improve in 1996 with the introduction of the HCFA Standard Analysis Files as the new source of data for capturing patient hospital stays. Prior to this year, hospitalization data have come from the PMMIS file, which was not as complete due to delays in reporting patient ESRD status to the PMMIS. Also, we have attempted to screen out patients for whom Medicare is likely to be a secondary payer by requiring that Medicare dialysis bills be received before a patient is eligible for entry into the study. With these improvements, we are now able to include both incident patients and dialysis patients previously transplanted.

This chapter discusses the number of admissions and days spent in the hospital by all dialysis patients, including incident and previously transplanted patients for the first time. It also introduces an

improved comparison measure based on first hospital admission rates. This is a different approach was taken in the 1995 ADR, where rates for calculating the standardized hospitalization ratio (SHR) included all admissions. Even with this change in methodology, comparisons of SHRs among the nine Census regions, the different dialysis unit sizes, and the types of units yield results similar to those reported in the 1995 ADR.

The distributions of both the number of hospital admissions and days are positively skewed with more patients having zero admissions and zero days than any other number. In examining total admissions rates, the most notable difference from last year is the higher rates observed in the 0-19 age group; this is most likely due to more complete reporting of hospitalizations among younger patients with the improved source of data.

We have used the new standardized hospitalization ratio (SHR) based on first admissions to make many of the same comparisons as we made last year. Once again, smaller units (those with fewer than 20 first admissions) are often excluded from analyses due to instability. The regional variation is almost exactly the same as it was using an SHR based on total admissions in the 1995 ADR. The Northeast still has a median SMR well below the national median, but one of the highest median SHRs.

It is interesting to note that free standing non-profit units have both a lower pooled SMR and SHR compared to the other types of dialysis units. Also interesting is the fact that SHR is highly correlated from year to year, whereas SMR is much less so. In other words, a unit that has a low SHR and SMR one year is likely to have a low SHR in subsequent years, but not necessarily a low SMR. Additionally, there may have been a marked decrease in hospitalization, both in terms of the number of admissions and the number of days, from 1992 to 1993. (But see the caution regarding 1993 data system issues discussed above).

Chapter IX. The Economic Cost of ESRD and Medicare Spending for Alternative Modalities of Treatment

Two separate analyses were performed. One focused on the total cost (public and private sources) for the US for ESRD in 1994. This total cost analysis did not provide estimates of cost per patient. A second analysis, provided considerable detail on Medicare spending for the 1991-93 period by patient

characteristic and is fundamentally focused on patterns of spending as they might affect the design of an ESRD capitation plan.

In 1994, the total resource cost to treat ESRD in the U.S. was estimated to be in excess of \$11.1 billion. This included Medicare payments of \$8.3 billion and \$1.8 billion for Medicare patients' obligations (usually paid by public and private insurance); another \$0.83 billion for non-Medicare patients, generally paid by private and public sources (e.g. Medicaid which is in part Federally funded).

A comparison of the components of the growth in total Medicare program spending continues to show that the growth in patient counts remains the primary driver of increased total costs. For the 1991-93 period, the rate of increase in spending per patient year was 4 to 5 percent. Depending on which Consumer Price Index one uses, the rate of increase in real spending i.e.; adjusted for inflation is either a positive 2 percent per year (General CPI) or a -2 percent per year (Medical CPI). In contrast during 1991, General Medicare spending per recipient was increasing at approximately 8 percent per year, or 5 percent real after adjustment for inflation (General CPI).

An intent to treat analysis for the 1991-93 period carefully selected patients to avoid bias due to inclusion of patients with Medicare as Secondary Payer, and simultaneously counted time at risk as well as spending. In this analysis the Medicare payment per year at risk was estimated. For all Medicare services including inpatient, outpatient, physicians, and other suppliers the average Medicare payment (1991-93) was \$36,700 per year at risk. (Since not all patients are at risk for a full calendar year the spending per calendar year would be less). For all dialysis patients total Medicare payments (1991-93) were \$43,700 per year at risk while for transplant patients it was \$17,600 per year. (This transplant estimated payment includes the transplant but does not include organ acquisition costs). Patient obligations would increase these statistics by 18 percent to a total of \$51,600 for dialysis and \$20,800 for transplant respectively. CAPD Medicare payments were lower per year at risk (\$39,400) than were hemodialysis payments per year at risk (\$44,200).

A new set of reference tables (Section K) provides considerable detail on Medicare spending including a major section on the distribution of spending by patient characteristic and type of provider. This latter set of statistics are designed to provide an indication

of the financial risk facing a potential capitation plan. For example the 99th percentile of Medicare spending per calendar year includes a cell with \$244,000 per patient.

Chapter X. Annual Facility Survey of Providers of ESRD Therapy

Over the five year period from 1989 to 1994, the number of dialysis units and transplant facilities continued to grow at a rate of over 7 percent a year. The majority of this growth occurred in free standing for-profit units which treated almost 60 percent of the dialysis population in 1994. Between 1992 and 1993 there were an additional 152 for-profit units and another 134 were added by the end of 1994. Although there is some variation in the amount of growth among Networks, all eighteen Networks experienced at least a 50 percent increase in the number of patients from 1989 to 1994.

Chapter XI. International Comparisons of ESRD Therapy

Incidence rates of treated ESRD continue to rise in Europe and North America.

Japanese prevalence rate nearly hit 1000 pmp in 1993. (~1 in 1000 people in Japan is a treated dialysis patient.)

New figures are presented showing the change in the utilization of HHD and CAPD/CCPD between 1984 and 1993. Marked decline in use of HHD in the countries which predominantly used this modality in 1984.

Austria, Sweden, the United States, and Spain have the highest reported transplantation rates. Austria and Spain have been particularly successful at increasing their rates of transplantation, the reported rates have more than doubled in both countries since 1982. For Austria this dramatic increase may be related to an assumed consent law for cadaveric organ donation.

Important insights have already been learned from international comparisons. More could be learned from future comparative studies of different approaches, health systems, and ESRD prescriptions. Future international comparative studies of survival should have prospective data collection with close participation between collaborating registries, will require multi-variate analysis with adjustment for

patient characteristics, known risk factors and comorbid conditions.

Chapter XII. Analytical Methods

Chapter XII describes the technical details of the analytical methods used in this ADR. It also points out the areas in which the data or the methods have changed since the last ADR.

Conclusion

In summary, this eighth edition of the USRDS Annual Data Report for 1996 provides an ongoing and continuing status report on many dimensions of the incidence, prevalence, cost, treatment and outcomes of chronic renal failure in the U.S. Incidence of ESRD continues to grow but possibly with a lower growth rate starting in 1993. (We will have to wait for future years' data to be sure of this good news). Mortality of dialysis patients remains high by any standard, although there are some continuing signs of improved survival. Delivered hemodialysis dose appears to be higher than in past reports, but until we have a standardized method of drawing the post dialysis blood sample, even this positive indicator should be treated with caution. ESRD continues to be a disease which affects Blacks and Native Americans at a rate 4 to 5 times the rate of White Americans. ESRD remains very expensive to treat both on a per patient basis and a program basis. The medical, social and financial implications of this disease continue to make ESRD a major public health and public policy problem.

