

Chapter III

Prevalence and Cost of ESRD Therapy

Treatment for irreversible chronic renal failure has grown rapidly in the last decade and is now performed for hundreds of thousands of people worldwide. One likely explanation for this growth in many countries is that fewer people with chronic uremia remain untreated (see Chapter IV). However, other factors may explain some of the recent growth in the treated end-stage renal disease (ESRD) population, particularly in the United States. The composition of the underlying U.S. resident population now includes a growing fraction of people in older age groups and people with diabetes. The life expectancy of people receiving ESRD therapy has also improved in recent years (see Chapter VI for more details on this positive trend), allowing patients to remain in the ESRD program for longer periods of time.

This chapter presents an overview of the number of people receiving ESRD therapy in the United States and describes overall demographic trends in the treated ESRD population over the last decade. The social cost of ESRD is discussed in terms of the loss in the quality and duration of human lifetimes and the direct monetary cost of treating ESRD. Estimates of the total direct

monetary charges for ESRD during 1991 are presented and are compared with similar estimates for 1987-90.

The Medicare ESRD Program

Recent evidence suggests improved success with both major forms of ESRD therapy, maintenance dialysis and kidney transplantation (see Chapters VI and VIII). Despite these improvements, kidney failure is often associated with devastating medical, social and economic costs. The U.S. government has implemented several programs designed to improve access to quality treatment for ESRD and to alleviate the financial impact of ESRD on patients and their families. The most immediate and timely help comes through the direct provision and regulation of medical care to the patient and through financing much of the cost of this care. As part of the 1972 Amendments to the Social Security Act, Congress extended coverage under Medicare, the public insurance program funded by the Federal Government, to people with end-stage kidney failure (Fox, Rettig, HCFA 1993). Several legislative changes have occurred since 1973, including the 1978 Social Security Amendments, that have sought to encourage reduction in

treatment costs through shifts toward home dialysis and changes in payment methods (HCFA 1982, HCFA 1993). Medicare coverage for the ESRD program has been expanded to include immunosuppressive drugs administered to kidney transplant recipients during the first year and for erythropoietin therapy in dialysis patients (Erslev, HCFA 1993). Both of these programs provide coverage for outpatient drugs, and are exceptions to the general rules governing Medicare insurance.

Medicare now insures the vast majority of Americans treated for ESRD, providing coverage to over 92 percent of dialysis patients and 90 percent of kidney transplant recipients in 1991 (see discussion later in this chapter). The ESRD population represents a growing fraction of total Medicare beneficiaries, largely due to growth in the incidence of treated ESRD (see Chapter IV). Between 1976 and 1991, the ESRD portion of the total Medicare population increased five-fold, from 0.1 to 0.5 percent (MADRS).

How Many Americans Have ESRD?

During 1991, over 215,000 people in the 50 states and the District of Columbia were treated for end-stage renal disease under the Medicare program. This figure includes patients with current or past Medicare eligibility, including those with a functioning kidney transplant who have lost eligibility, but does not include those ESRD patients not in the USRDS data system (see Chapter XIV for details). When including patients not in the Medicare program, the 1991 ESRD period prevalence count, defined as the

number of people receiving treatment for ESRD sometime during the year, was likely over 230,000.

Figure III-1 illustrates the steady increase in the number of Medicare ESRD patients treated between 1982 and 1991. Estimated period prevalence counts and point prevalence counts (patients treated on 12/31 of the year) increased 11 and 12 percent, respectively, between 1990 and 1991. This continues a trend that has yielded a 9 to 13 percent increase in prevalence counts each year since 1984. Figure III-1 also illustrates trends in patient counts who are incident (i.e., new to ESRD), patients who have died and patients who are lost to follow-up. As shown in Figure III-1, there were 188,745 Medicare patients under treatment with all modalities on December 31, 1991. During 1991, there were 50,640 incident (i.e., new to ESRD) patients, 33,233 deaths among ESRD patients and 10,408 patients lost to follow-up (LFU). The number of new enrollees exceeded the number of patient deaths by an increasing amount during the 1980s, as the difference rose from 10,000 to 17,000 between 1982 and 1991.

As described in the last two Annual Data Reports (USRDS 1993, USRDS 1992) and also in Chapter XIV of this report, USRDS point prevalence estimates do not include dialysis patients who are lost to follow-up. Patients are considered lost to follow-up if there is no information in the USRDS patient database regarding dialysis, transplant, or death status for a period of one year or more as of 12/31 of the year. An exception is made during the first year following the reported date of first ESRD service, since many patients are

Treated Medicare ESRD Period and Point Prevalence, Incidence, Death and Lost-to-Followup Counts, 1982-91

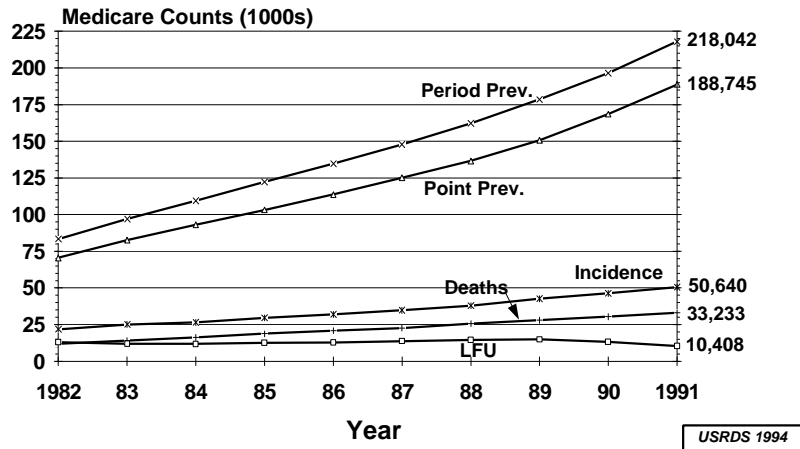


Figure III-1

Reported ESRD period prevalence counts (patients alive at any time during the year), point prevalence counts (patients alive on 12/31 of the year), incidence counts, patient deaths and patients lost to follow-up (see Chapter XIV for details). Point prevalence counts exclude patients lost to follow-up (LFU). Patients in Puerto Rico and U.S. Territories are included in all estimates. Medicare patients only. Source: Reference Tables B.1, B.3, A.1, D.1.

not yet eligible for Medicare or have other primary insurance coverage during the first year of ESRD (and up to 21 months from start of ESRD). Analyses of HCFA reimbursement data for patients identified as lost-to-follow-up suggest that less than ten percent of patients had sufficient Medicare spending to be receiving regular dialysis (USRDS 1992).

The exclusion of patients lost to follow-up reduces the effective 1991 ESRD point prevalence by over 10,408 patients, or 5.2 percent. The number of patients lost to follow-up fluctuated between 12,000 and 15,000 for most of the 1980s, but as a percentage of the total point prevalence has dropped from 10 percent to 5.2 percent since 1988. Further details regarding the lost-to-follow-up classification can be found in Chapter XIV of this report and in

Chapter XI of the 1992 ADR (USRDS 1992).

The point prevalence of treated ESRD (the number of people receiving renal replacement therapy, RRT, on December 31) from 1982-91 is reported separately for dialysis patients with and without Medicare eligibility and for kidney transplant recipients in Figure III-2. Data are provided from two sources, the USRDS patient database and the HCFA Annual Facility Survey (AFS). The AFS is focused on dialysis facilities, and as such does not provide a count of prevalent kidney transplant recipients. The USRDS point prevalence count of dialysis patients who are (or will be) insured by Medicare was 138,277 after excluding patients lost to follow-up. This estimate is only slightly different from the count of Medicare dialysis patients from the AFS, varying by two

Reported ESRD Prevalence Counts by Data Source and Medicare Eligibility, 1982-91

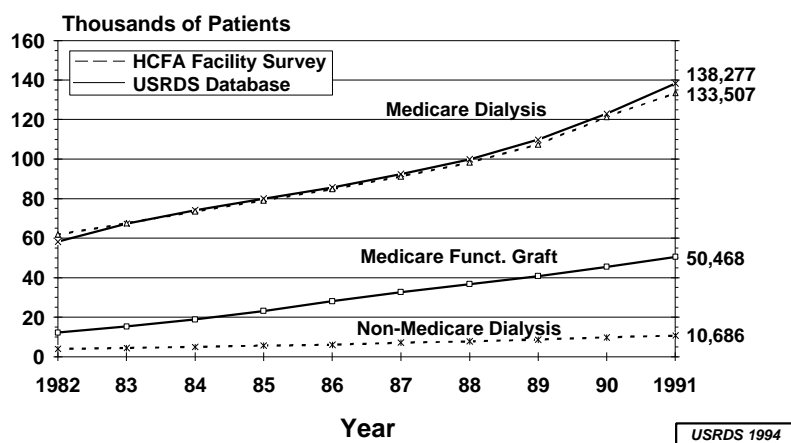


Figure III-2

Reported point prevalent counts on December 31 of each year from 1982-91 for: Medicare dialysis patients, including patients whose Medicare eligibility is current or pending (from HCFA 1993 Facility Survey, 1993 FS, and the USRDS database, DB); Medicare patients with a functioning kidney transplant (from USRDS DB); and dialysis patients not insured by Medicare (from 1993 FS). Prevalence counts also do not include approximately 1400 Department of Veteran Affairs (DVA) patients who are not counted by the FS. Counts of Medicare dialysis patients from the USRDS DB do not include patients lost to follow-up. All prevalence counts include patients in Puerto Rico and U.S. territories. Source: Reference Tables C.2, I.10.

percent or less of the AFS count for most of the 1982-91 period. These counts do not include dialysis patients who were not insured by Medicare (and are not included in the USRDS database), or 10,686 patients in 1991.

An additional 50,468 people with a functioning kidney transplant were reported alive according to the Medicare ESRD program in 1991. This estimate includes transplant recipients whose Medicare eligibility has been terminated. An analysis of patients who received a kidney transplant during 1983-86 and were Medicare eligible at time of transplant (USRDS 1993) shows that one third of recipients were no longer Medicare eligible at 3.5 years following transplant (Reference Table F.62). **Kidney transplant recipients who lose**

Medicare eligibility are included in all USRDS prevalence estimates throughout this report.

Prevalence data presented in this report for 1990 and earlier have changed only slightly since the 1993 report (USRDS 1993). This change reflects the most recent update of the USRDS database (July 1993) which updates information from previous years and allow us to report a new year of data (1991). The most recent update yielded estimates of patients lost-to-follow-up that are slightly lower (≤ 4 percent per year) and estimates of prevalence that are slightly higher (≤ 2 percent per year) in this report compared to data presented for corresponding years in the 1993 ADR.

Characteristics of the Prevalent ESRD Population

The characteristics of the Medicare ESRD patient population on December 31, 1991, are shown in Table III-1. The distribution of prevalent patients by age, sex, race and primary cause of renal failure shows that 31 percent of patients were 65 years of age and older at onset of ESRD, 46 percent were female, and 66 percent of patients were white and 31 percent were black. The percent of patients who were Asian/Pacific Islander or Native American was 2 percent and 1 percent, respectively. The primary diagnosis for 69 percent of patients was either diabetes (26 percent), hypertension (24 percent) or glomerulonephritis (19 percent).

The 1991 Medicare ESRD point prevalence rate was 721 per million U.S. resident population, or one patient per 1387 U.S. residents. Rates by age show that ESRD is more common with increasing age; it was four times as common among people 65 to 74 years of age compared to people 20 to 44 years of age. Treated ESRD is also slightly more common in males (860 patients per million, or ppm) than in females (607 ppm). Point prevalence rates adjusted for age and race (Reference Table B.16) show a nearly two-fold higher rate of renal failure caused by hypertension or

Treated Medicare ESRD Prevalence Counts and Rates¹ by Age, Sex, Race, and Primary Diagnosis, December 31, 1991

Characteristic ²	Count (n)	Percent of Total	Prevalence per Million ³ in Each Group
Age 0-19	4,008	2.2	55
Age 20-44	55,351	30.2	557
Age 45-64	67,718	36.9	1,576
Age 65-74	36,919	20.1	2,292
Age 75+	19,376	10.6	1,643
Female	83,686	45.6	607
Male	99,686	54.4	860
Asian/Pacific Islander	3,885	2.1	686
Black	56,508	30.8	2,298
Native American	2,272	1.2	1,571
White	120,707	65.8	547
Diabetes	47,897	26.1	188
Hypertension	43,478	23.7	171
Glomerulonephritis	33,958	18.5	134
Cystic Kidney	9,188	5.0	36
Total	183,372	100.0	721

¹Rates are adjusted for age, sex and race.

²Other and unknown race are not included. Other urologic, other, unknown and missing diagnoses are included in the total but are not shown.

³Counts and rates do not include patients from Puerto Rico or U.S. Territories.

Table III-1

glomerulonephritis in males compared to females. Prevalence rates by race indicate that blacks are overrepresented among patients with ESRD. Black Americans have a three- to four-fold higher rate (per million population) of renal failure compared to whites. Further details on these characteristics for incident patients are reported in Chapter IV.

As shown in Figure III-3, the number of Medicare ESRD patients treated on December 31, 1991 (183,372), represents a doubling in the point prevalence count since the end of 1984 (90,009). These estimates do not include patients in Puerto Rico and the U.S. Territories, for whom information about race in the resident population was not available. Point prevalent counts have at least doubled in the last eight years for all four race groups as shown in Figure III-3. Counts for Native Americans and Asian/Pacific Islanders have doubled since 1986 and 1987, respectively. Results from the USRDS Data Validation Special Study (USRDS 1992) indicated that Native Americans were often miscoded as white patients. Thus, the estimates in Figure III-3 may understate the true count of Native Americans in the Medicare ESRD population. Note that these trends in

point prevalence counts reflect both growth in the rate of treated Medicare ESRD patients per population and growth in the underlying U.S. resident population. Comparisons of adjusted point prevalence rates per million U.S. resident population (Reference Table B.8) reveal a more than doubling in the overall rate of treated Medicare ESRD between 1983 (348 patients per million) and 1991 (721 ppm).

The increase in point prevalence counts is shown by age at start of ESRD therapy in Figure III-4. Patients between 20 and 64 years of age continue to represent the majority of patients treated for ESRD in the U.S. However, prevalence rates have increased at a greater than average rate for patients in the 65-74 and 75 years and older age groups, a result of a growing incidence of treated ESRD among people 65 years and older (see Chapter IV). Between

Doubling of Number of Treated Medicare ESRD Patients, by Race, 1982-91

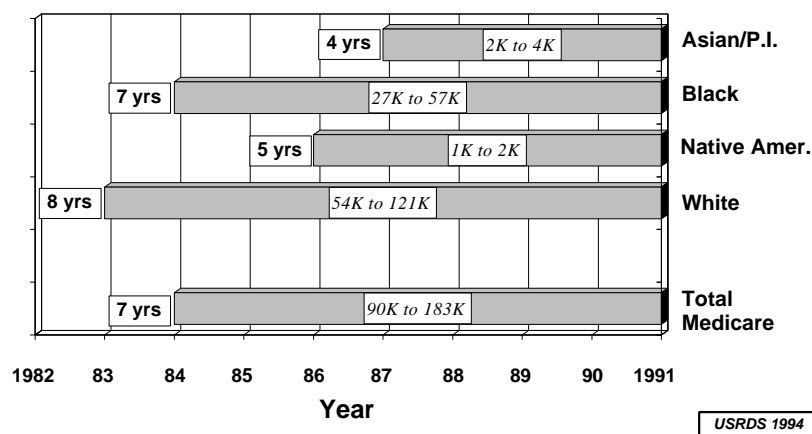


Figure III-3

Number of years required to double the reported ESRD point prevalence count by 12/31/91, by race. Point prevalence (in 1000s, or K) at beginning and end of time period shown in each bar. Patients of other or unknown race are not shown and are not included in the total. Excludes patients lost to follow-up. Patients in Puerto Rico and U.S. Territories are not included. Medicare patients only. Source: Reference Table B.6

Treated ESRD Point Prevalence Counts by Age, 1982-91

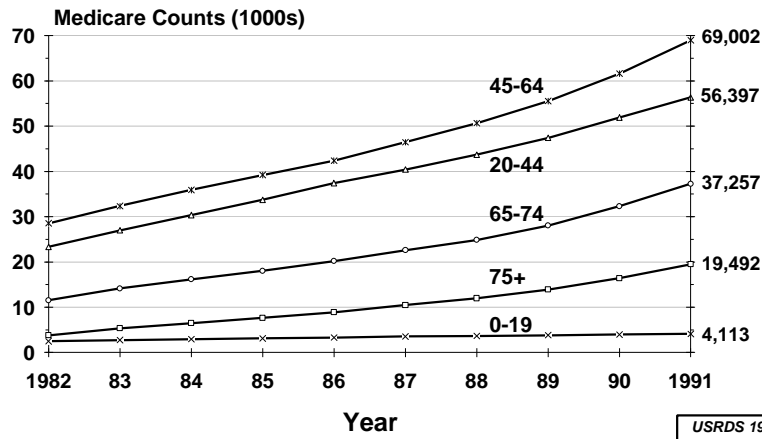


Figure III-4

Reported ESRD point prevalence counts (patients alive on December 31) by age at onset of ESRD and year, 1982-91. No adjustments over time for changes in demographic characteristics have been applied. Excludes patients lost to follow-up. Patients in Puerto Rico and U.S. Territories are not included. Medicare patients only. Source: Reference Table B.1

1987 and 1991, the percentage of patients 65 years of age and older increased from 27 to 31 percent. These trends indicate that the proportion of patients 65 years and older at onset of ESRD will likely grow during the 1990s.

The growth in point prevalence rates for each cause of ESRD during the 1987-91 time interval, expressed as the number of patients per million U.S. resident population and adjusted for age, sex and race, are shown in Figure III-5. Since 1987, the prevalence of ESRD due to diabetes, hypertension, and “other” diagnoses has increased at a greater than average rate. While the average compound annual growth in the adjusted ESRD prevalence rate was 9.3 percent per year, the rate of increase for diabetes, hypertension and “other” diagnoses was 15.7, 11.7, and 13.0 percent per year, respectively. Recent growth in the incidence of diabetic ESRD and

improved survival among diabetic patients, who had almost two-fold greater mortality than patients with other diagnoses in the mid-1980s, have contributed to the increase in the prevalence of diabetic ESRD. Greater than average growth among 1987-90 incident patients was also observed for “other causes”, which includes the following diagnoses in order of decreasing importance: interstitial nephritis, obstructive nephropathy, collagen vascular diseases, malignancies and congenital or other hereditary diseases. Further detail for these diagnoses for 1988-91 incident patients is shown in Table IV-3.

As indicated above, estimated prevalence counts from the USRDS patient database represent an undercount of the total number of Americans with ESRD because they include only those patients who are currently or previously

Annual Change in Adjusted ESRD Point Prevalence Rate, by Diagnosis, 1987-91

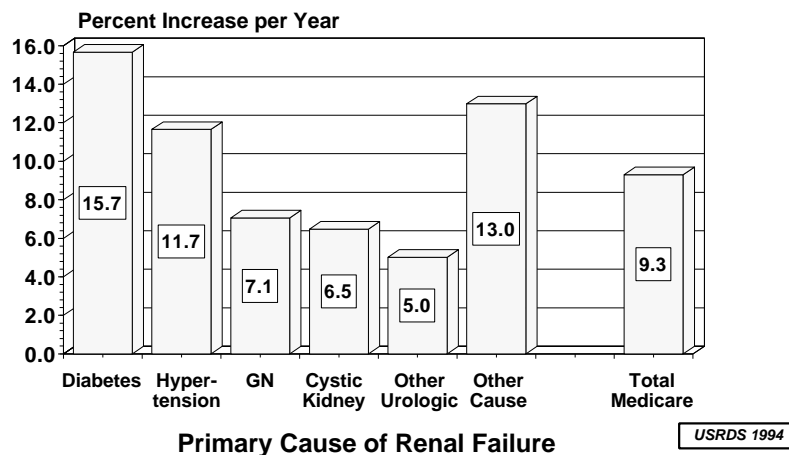


Figure III-5

Percent increase per year in reported ESRD point prevalence rate per million U.S. resident population between 1987 and 1991, by primary diagnosis. Annual compound rate of change. Prevalence rates are adjusted for age, sex and race using the 1990 U.S. resident population. Excludes patients lost to follow-up. Patients in Puerto Rico and U.S. Territories are not included. Medicare patients only. See Table IV-3 for more detail on the diagnoses included in the category for "Other Cause". Source: Reference Table B.8

Medicare eligible. The Annual Facility Survey, conducted by HCFA through the 18 ESRD Networks, provides an indication of the proportion of dialysis patients not covered by Medicare. (As reported in Chapter XIV, almost all patient-based data are believed to be generally complete through 1991, while the HCFA Annual Facility Survey, which reports on facility-based data, is current through 1992). In 1991, non-Medicare dialysis patients were estimated to be 7.8 percent of total dialysis patients in the United States, as shown in Figure III-6. This estimate is slightly higher than the 7.4 percent estimate for the previous year of 1990 (USRDS 1993).

Comparable prevalence estimates for non-Medicare patients with a functioning kidney transplant are not available. However, of 10,095 kidney

transplants performed in the United States in 1992, 10.3 percent were performed for patients not insured by Medicare (Reference Table I.10), which suggests that non-Medicare patients may represent a slightly greater percentage of the prevalent population with a functioning transplant. This percentage is slightly higher than in previous years, in which non-Medicare transplants represented between 7 and 9 percent of the total number of kidney transplants. However, when excluding transplant recipients who were not U.S. residents (accounting for 15 percent of non-Medicare kidney transplants during 1992), the percentage of total kidney transplants performed among non-Medicare patients is reduced to 8.7 percent, which is similar to the corresponding figure (7.8 percent) for non-Medicare dialysis patients.

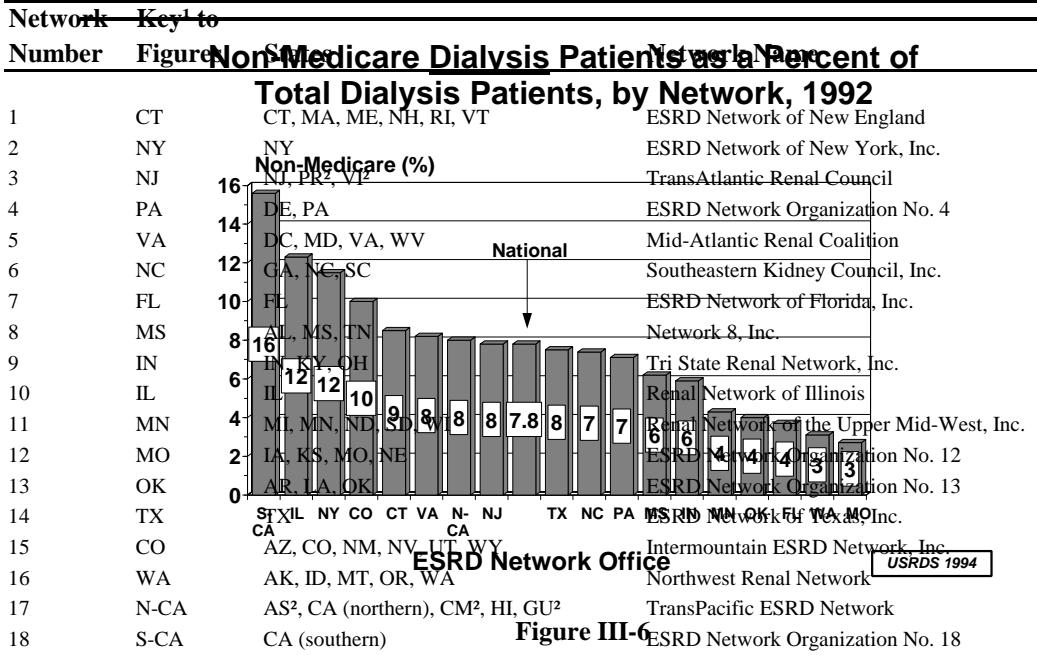
As shown in Figure III-6, the percent of non-Medicare dialysis patients varies by region in the United States. In 1992 there was a greater than five-fold difference in the proportion of dialysis

patients not insured by Medicare between the Southern California Network and the Missouri Network (S-CA vs. MO in Figure III-6).

Several analyses in this report, including the percent non-Medicare in Figure III-6, compare results by geographic region, represented by the 18 ESRD Networks under contract with HCFA. The Networks are responsible for quality assurance, data collection for HCFA and for a National Renal Registry and for adjudication of patient grievances. For figures and tables reporting data by ESRD Network, the

state in which the 'Network Office' is located is used to refer to a particular ESRD Network. Figure III-7 identifies the location of the states and other territories included in each of the 18 ESRD Networks, while Table III-2 includes the location of the Network Office and a list of the states and territories in each Network.. Figure III-7 and Table III-2 will be referred to frequently throughout this report.

ESRD Network Key, 1994



¹Location of Network Office. ²PR=Puerto Rico (NJ) and US Territories (Guam, N. CA)=Mexico. Decimal values not shown, were used in ranking percent non-Medicare by Network. See Figure III-7 and Table III-1 for a description of the Network areas. Source: 1992 HCFA Facility Survey.

The 18 ESRD Networks by State, 1994

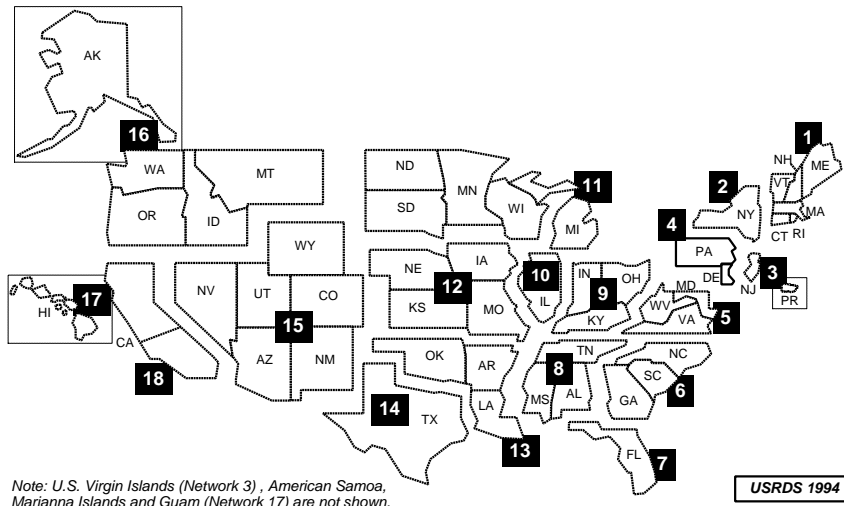


Figure III-7

Geographic location of the 18 ESRD Networks under contract with the Health Care Financing Administration of the U.S. Department of Health and Human Services. The Networks are frequently identified throughout this report by the location of each Network Office, as shown in Table III-2.

The Human Cost of ESRD

The life expectancy of people with irreversible kidney failure has been dramatically improved by kidney transplantation and maintenance dialysis (see Chapter V for a discussion of the methods of treating ESRD). Historically, death due to uremia was a certainty in the absence of RRT.

However, while treatment can prolong life substantially, ESRD remains a serious condition. This report documents the shortened lifetimes (Chapter VI) and frequent hospitalizations (Reference Tables, Section H) compared to the U.S. resident population.

The **1991 USRDS Annual Data Report** showed reduced employment during the year prior to start of ESRD therapy and at time of ESRD among incident patients aged 20 to 64 years (USRDS 1991). There are also many other difficulties confronted by patients and their families that are difficult to quantify. Patients face the need for continuing therapy and may also incur substantial medical costs, which may lead to feelings of dependency and vulnerability. In many cases patients experience further deterioration in health, and may not be able to return to work.

Figure III-8 compares the expected remaining lifetime, in years, for the total U.S. resident population, for ESRD patients and for people with each of several diagnosed cancers. Life expectancy estimates are provided for each population at age 49 and age 59. Age is computed at incidence of disease for the ESRD and cancer populations. The life expectancy of ESRD patients aged 49 and 59 years is estimated to be 6.8 and 4.4 years, respectively, or 75 to 80 percent lower than the U.S. resident population. These estimates correspond to an expected loss of 23 years of life for ESRD patients aged 49 and 17 years for patients aged 59 years. While the life expectancy of people diagnosed with prostate cancer or colon cancer is higher than for ESRD patients, the life expectancy of lung cancer patients is even lower, ranging from 2.6 to 2.7

years. Similar to the U.S. resident population, the life expectancy of ESRD patients at age 59 is lower than at age 49; however, this trend is not observed for the cancer populations being compared.

The populations being compared in Figure III-8 are probably not homogeneous with respect to various demographic characteristics and comorbid conditions that may be predictive of survival. For example, ESRD patient survival has been shown to vary by age, sex, race, primary cause of renal failure, comorbid conditions and other clinical indicators that would affect comparisons of survival between ESRD patients and other populations (Held 1994).

In addition to experiencing increased mortality compared to other populations, ESRD patients experience increased

Expected Remaining Lifetime for Selected U.S. Populations with a Chronic Disease at Age 49 and 59 Years, 1991

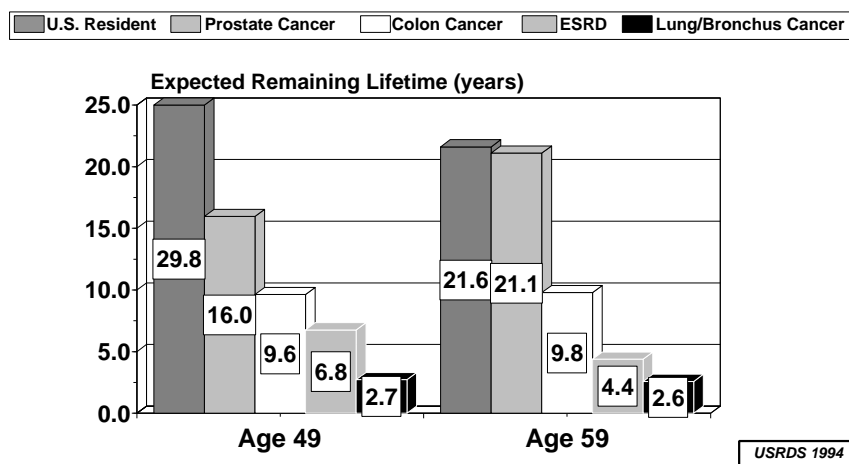


Figure III-8

Expected lifetime at age 49 and 59 for the U.S. resident population (1990) and selected U.S. sub-populations with chronic disease, including prostate cancer (1983-89), colon cancer (1983-89), end-stage renal disease (1991) and lung/bronchus cancer (1983-89). Age at incidence of disease (49 or 59 years) for cancer and ESRD populations. ESRD includes Medicare patients only. See Technical Notes, Chapter XV, for method used to calculate expected remaining lifetimes. Sources: Reference Table E.14, Miller, U.S. Census Bureau.

morbidity, including substantial loss in the quality of life. In 1986, for example, Medicare recipients 65 years of age and older (including non-ESRD) were hospitalized for an average of 2.8 days per year (U.S. Bureau of the Census). Dialysis patients 65 years of age and older at onset of ESRD were hospitalized on average of 17.9 days per year during the 1989-91 period, more than six times higher (see Reference Table H.2).

The Monetary Cost of ESRD

All methods of treating end-stage kidney failure involve regular therapy and diverse forms of medical care. Hospitalization is often necessary to insert access devices for dialysis patients and for the major surgeries required for a kidney transplant recipient (and in some cases the living donor). Dialysis treatments must be provided on a regular basis, either requiring several three to four hour sessions per week or several shorter sessions each day. Daily drug regimens such as erythropoietin, used to treat anemia in dialysis patients, and immunosuppression therapy, used to prevent rejection of a transplanted kidney, are used regularly in either preventing or treating complications of ESRD. The many dimensions of ESRD

therapy can result in substantial direct medical costs, many of them reimbursed (and consequently measurable) through the Medicare insurance program.

Estimated Medicare Expenditures for ESRD, 1991

As shown in both Table III-3 and Figure III-9, the total estimated direct medical charges for ESRD by public and private payers was \$8.59 billion during 1991. Approximately \$6.15 billion, or 72 percent of the total, was paid by the Federal government (MADRS). Patient and private obligations represented an additional estimated \$2.44 billion. Also shown in Table III-3 are the estimated numbers of Medicare eligible patients used to estimate charges per patient. A mid-year point prevalence estimate (July 1, 1991) was used to approximate the number of patients treated under the Medicare program during any week of the year in 1991.

As shown in Table III-3 and summarized in Figure III-10, the estimated Medicare payments (Federal only) per capita during 1991 averaged \$38,400. Patient and private insurance obligations represented an additional \$8,600 per patient, or 18.3 percent of the total per patient

While it is not known precisely how many of these patient obligations are paid, it is likely that the majority are paid by the patient or by an insurance company, either public or private. A portion of these charges are paid by the Federal government through Medicaid, a state program that insures medical care for the poor.

Results from the USRDS Casemix Severity Special Study of 1986-87 incident Medicare patients indicate that 69 percent of patients had either private or Medicaid insurance just before onset of ESRD (USRDS 1991). Medicare eligibility rules also may delay benefits during the first 21 months of therapy, particularly for patients under age 65 years.

The estimates shown in Table III-3 and in Figure III-9 and Figure III-10 do not include a number of direct cost items, some medical and some non-

medical. For example, patient travel costs, the cost of almost all outpatient drugs, lost labor production in and out of the home and some costs associated with the Department of Veterans Affairs are not included in these estimates. Also excluded from the charges estimated in Table III-3 are "transfer payments" such as Social Security payments.

Total Estimated Monetary Charges for ESRD in the U.S., 1991

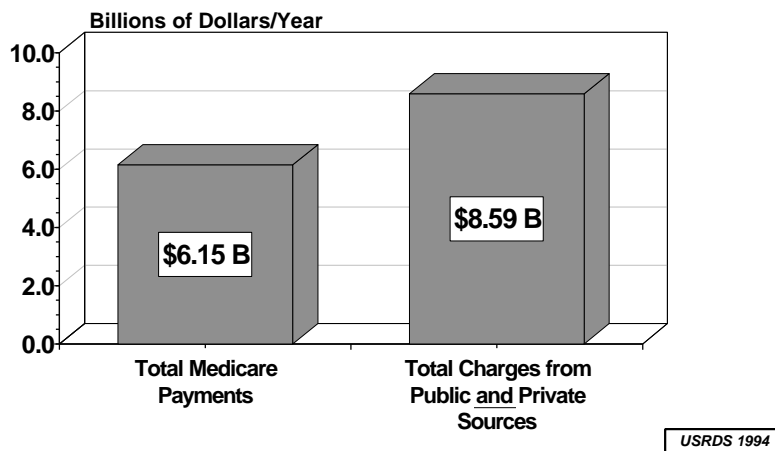


Figure III-9

Estimated monetary charges per Medicare ESRD patient, 1991. Includes Medicare, other public (e.g., Medicaid) and private obligations. See Table III-3 for methodology and original sources.

Estimated Monetary Charges for ESRD in the U.S., 1991

Number of ESRD Patients and Charges Per Year (\$), 1991	Medicare Eligibility			Never Eligible	Total
	Eligible	"Will Be"	"No Longer"		
Count of ESRD Patients (1000's)					
Mid-year Point Prevalence Counts	160.4 ^a	4.5 ^a	13.8 ^a	15.1 ^b	193.7
Charges Per ESRD Patient (\$1000's)					
Federal Payments	38.4 ^c	0.0	0.0	0.0	N.A.
Non-Federal Obligations ^d	8.6 ^e	53.7 ^f	7.9 ^g	46.9 ^h	12.6
All ⁱ	46.9 ⁱ	53.7 ^f	7.9 ^g	46.9 ^h	44.3
Total Charges (\$ Billions)					
Federal Payments	6.15 ^c	0.00	0.00	0.00	6.15
Non-Federal Obligations ^d	1.38	0.24	0.11	0.71	2.44
Total ⁱ	7.53	0.24	0.11	0.71	8.59

Note: The cells surrounded by a box indicate the primary data inputs that are used in all calculations in the above table. Note that the total estimated mid-year point prevalent count (178.6K, the sum of 160.4K + 4.5K + 13.8K above) is based on directly observed Medicare data, while the relative proportions in each category of currently, "will be" or "no longer" Medicare eligible are inferred (see footnote a). The total Medicare payments for ESRD (\$6.15 billion) originate from MADRS (see footnote c). All other values, e.g., estimates of patient obligations, are not directly observed. Instead, the limited data that are available (see footnotes a, b, e, f and g) are often used to make inferences about the number of patients and charges for each category of Medicare eligibility. All aggregate data on charges should therefore be interpreted as estimated values and not observed phenomenon.

- a. Based on a HCFA update file of May 1993. The mid-year 1991 point prevalence count of Medicare ESRD patients (178.6 K) was estimated as the mean of 12/31/90 and 12/31/91 point prevalence counts, for the 50 states, D.C., Puerto Rico and U.S. territories. These estimates do not include patients lost to follow-up (see Chapter XIV for details). Subtracting an estimated 10.2 percent of patients in the Medicare system who were either not yet Medicare eligible or were no longer Medicare eligible ("will be" and "no longer") from 178.6K yields 160.4K. The 10.2 percent estimate is based on a 12/31/90 calculation of prevalent ESRD patients who were not yet Medicare eligible or no longer Medicare eligible.
- b. Estimated as 7.8 percent of total dialysis patients and transplant recipients. This estimate is derived from the 1992 HCFA Facility Survey and is based on the ratio of non-Medicare to Medicare dialysis patients. It is assumed that the proportion of ESRD patients, including those with a functioning transplant, who are not insured by Medicare is similar to the proportion observed for dialysis patients. This estimate (15.3K) is based on the USRDS estimate of the total Medicare population (178.6K), including "will be" and "no longer" Medicare eligible patients.
- c. Unpublished data, Medicare Automated Data Retrieval System (MADRS), Bureau of Data Management and Strategy (BDMS), Health Care Financing Administration (HCFA). Dr. Paul Eggers, HCFA (personal correspondence, 3/10/94) estimates \$6.152 billion Medicare expenditures for the ESRD program for 1991. This estimate is divided by the 1991 mid-year point prevalent estimate of the Medicare eligible population (160.4K) to estimate Medicare expenditures per patient per year (\$38.4K).
- d. Non-Federal includes all patient obligations, including private payments and private and public insurance (e.g., Medicaid, a state program that insures medical care for the poor).
- e. Estimated as 22.4 percent of Medicare payments. The factor 22.4 percent is an estimate of patient obligations and private insurance obligations which has two components. The first component is Medicare coinsurance provisions, which is estimated to be 21.1 percent. The second component of the patient obligations is the Medicare Secondary Payor (MSP) provision, whereby private employer group health insurance becomes the primary insurer of medical care for an initial period (up to one year during 1989). This is estimated to be 1.3 percent of total HCFA reimbursements (see USRDS 1991 ADR for estimation). A recent General Accounting Office (GAO) report suggested that the increase in the time period for MSP from 12 months to 18 months shifted about one percent of costs to private group insurance. Extrapolation of this estimate to the period of 1 to 12 months indicates that the total shift of cost from Medicare to private group health insurance would be approximately three percent of total ESRD expenditures.
- f. Estimated as 140 percent of the average Medicare total payments (38.4K), i.e. Federal plus patient obligations. This estimate is based on results from HCFA Contract 500-90-0050 with the Urban Institute (Washington, D.C.) which showed that for patients 65 years of age and older, the payment rate per day during the first 90 days was 55 percent greater than during the remaining three quarters of the first year of eligibility. Average Medicare payments were assumed to be 40 percent greater because this estimate applies to patients less than 65 years of age, for whom HCFA has limited data during the first 90 days and who are assumed to have fewer and less severe complications than older patients.
- g. This estimate is based on results from HCFA Contract 500-90-0050 with the Urban Institute (Washington, D.C.) which showed that payments (Federal plus other) per day for maintenance of patients with a functioning kidney graft totals approximately \$20.
- h. Assumed to be the same as the average total charges for Medicare patients (46.9K). See footnotes c and d to this table.
- i. The sum of Federal and non-federal charges.

Table III-3

Estimated Medicare and Private Charges per Medicare ESRD Patient, 1991

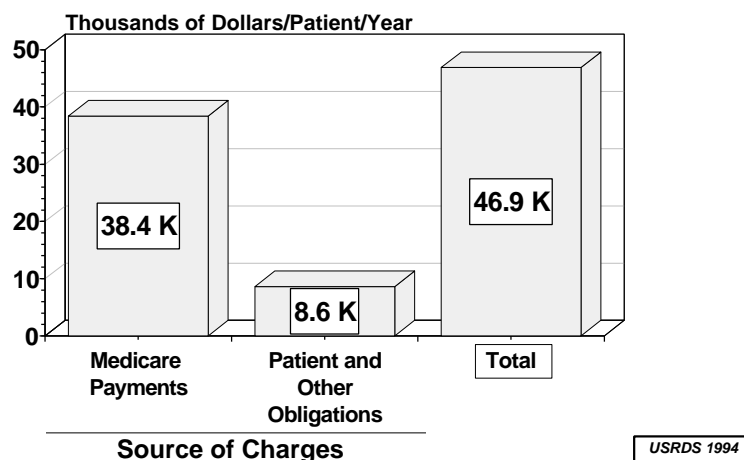


Figure III-10

Estimated monetary charges per Medicare ESRD patient, 1991. Includes Medicare, other public (e.g., Medicaid) and private obligations. See Table III-3 for methodology and original sources.

Comparison of USRDS and HCFA Estimated Medicare Payments and Counts of ESRD Patients

The HCFA also provides estimates of the count of ESRD patients and Medicare expenditures for treatment of ESRD patients (HCFA 1993). Since the USRDS data are primarily drawn from HCFA files, a reasonable question would be: how do the two sets of estimates (HCFA and USRDS) differ?

In one case the estimates are identical because they are literally the same data. Specifically the total amount of Medicare expenditures by year for all prevalent ESRD patients is the same in both reports; there is only one source of such a statistic, HCFA. Total Medicare payments for ESRD in 1991 were \$6.15 billion (see Table III-3).

The total count of Medicare eligible ESRD patients reported by USRDS and

HCFA is also from the same source and basically the counts estimated by USRDS and HCFA agree. Perhaps the most fundamental difference in the methods used to prepare the two estimates involves the use of the modality category of lost to follow-up (LFU). (See Chapter XIV for more details.) As reported in Figure III-1, the USRDS classified 10,408 (approximately 5 percent) prevalent Medicare ESRD patients as LFU, who are then excluded from the USRDS estimate of point prevalence. An additional estimated 10.2 percent of patients who either will be or are no longer Medicare eligible are then excluded in estimating Medicare expenditures per ESRD patient. HCFA uses a somewhat different approach by excluding patients who were Medicare eligible for one year or less as of January 1 of that year, effectively excluding patients with Medicare as secondary payer (HCFA 1993).

Both USRDS and HCFA methods yield an estimate of average Medicare expenditures for Medicare eligible ESRD patients, per full-time equivalent patient year. The USRDS estimate of Medicare expenditures per capita for 1991 (\$38.4K) is within one percent of the HCFA estimate (\$38.0K). The USRDS and HCFA methods also yield similar estimates for 1990 (\$36.7K and \$35.9K, respectively).

Changes in Medicare Expenditures, 1987-91

The change in USRDS estimates of mid-year prevalent ESRD patient counts and Medicare payments for ESRD from 1990-91 and 1987-91 are shown in Figures III-11, III-12 and III-13. Trends in aggregate Medicare expenditures and expenditures per capita were considered in both nominal terms (not adjusted for inflation) and in real terms (adjusted for inflation).

The adjustments for inflation account for the change in the purchasing power of a dollar that occurs as overall consumer price levels rise over time. The inflation-adjusted, or real, price level more accurately reflects the current value of goods and services than the nominal price level, and can then be compared with the estimated value of those same goods and services in earlier or later years. "Real" Medicare payments in each year were estimated by adjusting expenditures to the price level in an arbitrary baseline year, in this case 1990.

The inflation adjustments were performed using two separate measures of the change in consumer prices, the general (overall) Consumer Price Index (CPI) deflator for urban consumers and

the medical care component of the general CPI deflator (Bureau of Labor Statistics). At any point in time, the value of a set of goods and services is in theory determined by the opportunity cost of those resources, or the estimated value of alternative uses for those resources. The use of the general CPI deflator implicitly defines the opportunity cost of Medicare ESRD payments by the value of alternative uses for those resources in all sectors of the economy. The medical CPI deflator implicitly measures opportunity cost by the value of alternative uses for those goods and services in medical care, where price levels have been rising more rapidly in recent years. The average annual increase in the general and medical CPI deflators was 4.6 and 8.2 percent, respectively, from 1987-91. The general CPI deflator was used to estimate the change in Medicare ESRD payments in Figure III-11, and likely yields a lower-bound estimate of the opportunity cost of resources used in treating ESRD. Figure III-12 compares the trend in Medicare ESRD using both CPI deflators.

Trends in mid-year prevalent ESRD patient counts and Medicare payments for ESRD are measured over the longer 1987-91 time period in Figure III-13 and are compared with trends in the number of all non-ESRD Medicare beneficiaries and Medicare expenditures. Note that ESRD expenditures include all types and locations of services, not just dialysis. Figures III-11, III-12 and III-13 reveal several trends in nominal and real Medicare payments for ESRD and other Medicare beneficiaries from 1987-91.

The prevalence of treated ESRD is growing at approximately 11 percent

per year. As shown in Figure III-11, above, the mid-year point prevalence count in 1991 has risen 11.9 percent since 1990. Growth in the ESRD population has been sustained over the last several years at a compound annual average of 10.6 percent per year since 1987, or six times higher than the rate of increase in the number of non-ESRD Medicare beneficiaries (Figure III-13).

Per capita Medicare payments for ESRD are growing at approximately 5 percent per year in nominal dollars. However, per capita Medicare ESRD payments show little growth in real 1990 dollars, and may even be declining. Trends in per capita Medicare expenditures are shown in nominal terms (not adjusted for inflation) on the left side of Figure III-11

and in real terms (adjusted for inflation) on the right side of Figure III-11. Average payments per patient per year (without adjustment for inflation), calculated as the ratio of aggregate payments to the mid-year point prevalence count, increased from \$36,700 to \$38,400 between 1990 and 1991, or 4.5 percent per patient (Figure III-11). This rate of increase is similar to HCFA's estimates of the growth in Medicare ESRD expenditures from 1990-91 (5.8 percent; MADRS, HCFA 1993). USRDS estimates show similar growth in Medicare ESRD per capita expenditures over the 1987-91 period (4.6 percent per patient, not shown).

With adjustment for the overall change in consumer prices, per capita Medicare expenditures for ESRD

Estimated Change in Total Medicare Payments for ESRD, 1990 to 1991

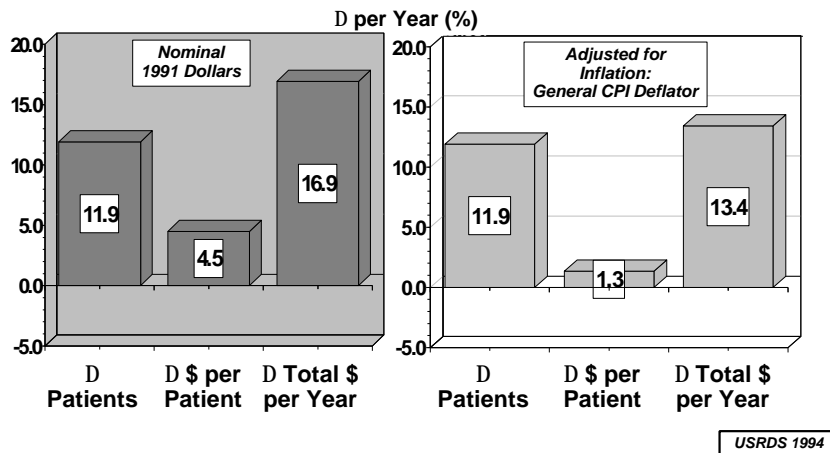


Figure III-11

Percent annual change in mid-year Medicare ESRD point prevalent counts (estimated as the average of counts on 12/31 of that year, e.g. 1990 and 1991, and the preceding year, e.g. 1989 and 1990), average Medicare payments per patient and total Medicare payments from 1990 to 1991. Medicare payments include all services provided in all locations. Changes in Medicare payments are expressed in nominal (i.e., without adjustment for inflation) and in real terms. The change in the CPI during 1991 (3.1 percent) was used to adjust 1991 Medicare payments to 1990 dollars. Prevalent counts exclude patients lost to follow-up but include patients in Puerto Rico and the U.S. Territories. Medicare patients only. Sources: Reference Table C.1, MADRS.

increased 1.3 percent per year from 1990-91 and by an annual average of 0.3 percent from 1987-91. When adjusting for medical care inflation, real Medicare ESRD expenditures per patient per year actually declined by 3.2 percent from 1990-91 (Figure III-12) and 2.9 percent per year from 1987-91 (not shown). Alternatively, the change in real per capita Medicare expenditures for non-ESRD beneficiaries (Figure III-13), adjusted for overall inflation, increased an average of 3.5 percent per year between 1987 and 1991.

Aggregate Medicare payments for ESRD are higher in both nominal dollars and in real 1990 dollars, primarily due to increasing numbers of treated patients. Without adjustment for inflation, total Medicare payments in

1991 (\$6.15 billion) were 16.9 percent higher than in 1990 (\$5.26 billion), and on average 15.6 percent higher per year from 1987-91 (not shown). Most of the increase in aggregate expenditures is due to growth in the ESRD population. Both aggregate and per capita nominal charges have been increasing steadily since 1987.

As shown in Figure III-11, inflation-adjusted total Medicare ESRD payments increased 13.4 percent from 1990-91 and an annual average of 10.9 percent from 1987-91. The increase in total Federal expenditures for ESRD occurred at more than twice the rate of increase in expenditures for non-ESRD beneficiaries. The change in total Medicare ESRD payments increased at a moderate 8.4 percent per year from 1990-91 when using the medical CPI

Estimated Change in Inflation-Adjusted Medicare Payments for ESRD, General versus Medical CPI Deflator, 1990 to 1991

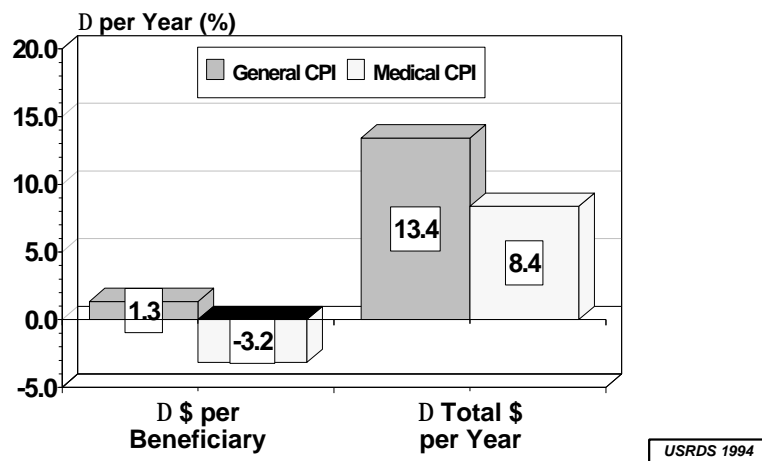


Figure III-12

Percent annual change in average Medicare payments per patient and total Medicare payments. Annual compound rate of change from 1990 to 1991. Medicare payments were adjusted for inflation using two separate measures of the change in consumer prices, the general CPI and the medical care component of the general CPI for urban consumers (Bureau of Labor Statistics). Medicare payments includes all services provided in all locations. The underlying mid-year ESRD point prevalence count excludes patients lost to follow-up, but includes patients in Puerto Rico and the U.S. Territories. Medicare patients only. Sources: Reference Table C.1, MADRS.

Estimated Change in Inflation-Adjusted Medicare Payments for ESRD and All Other Medicare Beneficiaries, 1987 to 1991

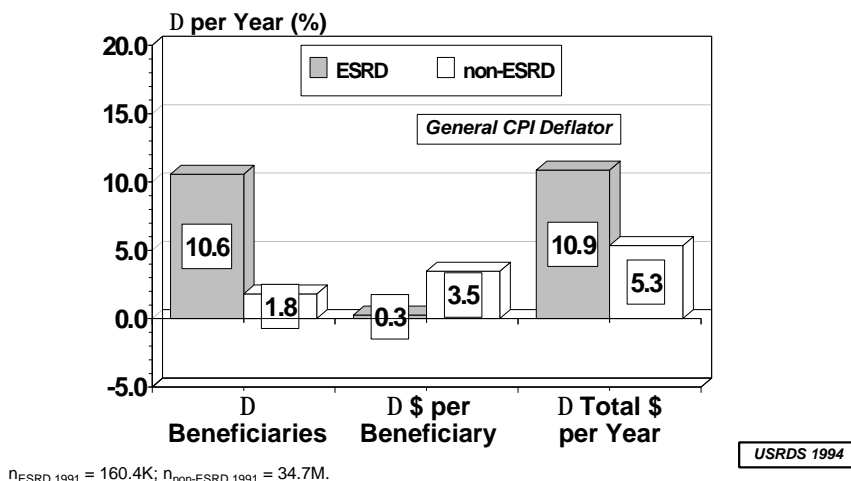


Figure III-13

Percent annual change in counts of Medicare beneficiaries, average Medicare payments per beneficiary and total Medicare payments from 1987 to 1991, for ESRD and all non-ESRD Medicare beneficiaries. The change in the general CPI each year from 1987 to 1991 was used to adjust all Medicare payments to 1990 dollars. Prevalent ESRD patient counts exclude patients lost to follow-up but include patients in Puerto Rico and the U.S. Territories. Medicare beneficiaries only. Source: Reference Table C.1, MADRS.

deflator (Figure III-12).

While real Medicare payments per year for ESRD continue to rise in response to a growing ESRD population, average payments per patient per year show little or no growth in the last five years. The real level of reimbursement per dialysis treatment, determined through the composite rate schedule, has been declining for almost two decades. However, outpatient services represent only one third of total Medicare expenditures for ESRD (HCFA 1993, Held 1992). Expenditures for other medical goods and services, including inpatient, physician and other supplier charges, are also reflected in total Medicare payments. This trend of little or no growth in “real” per capita Medicare payments for all ESRD patients is particularly surprising since Medicare coverage was recently

expanded to include EPO (9/89), which is now used in over 80 percent of center hemodialysis patients and over 50 percent of peritoneal dialysis patients in the U.S. (see Chapter V).

Summary

While total Medicare ESRD expenditures continue to increase in real terms, the growth is primarily due to growth in the number of treated ESRD patients. Growth in ESRD expenditures per patient has only just matched the rate of inflation and is markedly less than growth in expenditures for non-ESRD Medicare beneficiaries. Understanding the reasons for growth in the patient population is the key to understanding recent growth in aggregate ESRD expenditures.

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