

Health Care Financing Note

Acquired immunodeficiency syndrome in California's Medicaid program, 1981-84

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In this article, Medicaid enrollment, use, and expenditures for persons with acquired immunodeficiency syndrome in California from 1981-84 are examined. The data are from Tape-to-Tape, a person-level Medicaid enrollment and claims data base. It was found that expenditures per month of enrollment decreased as length of enrollment during the year increased. Average annual expenditures increased from 1982 to 1983 and then decreased in 1984. This decrease was most pronounced in hospital services with no indication of a substitution of ambulatory services. This decline is primarily a result of a decrease in hospital reimbursement per day as opposed to changes in use, because discharge rates decreased and length of stay increased.

Introduction

Medicaid plays a major role in financing the health care for persons with acquired immunodeficiency syndrome (AIDS). It is estimated that 40 percent of persons with AIDS will be enrolled in Medicaid during the course of their illness, and that about 25 percent of the health care costs for AIDS are paid for by Medicaid (Roper, 1987). The increasing incidence of AIDS expected in the near future will have a significant impact on the Medicaid program. As of May 1988, more than 60,000 Americans were reported to have had AIDS (Centers for Disease Control, 1988), and it is estimated that as many as 1.5 million Americans are infected with the human immunodeficiency virus (HIV) that causes AIDS (Institute of Medicine, 1986). Projections for the cumulative number of cases by 1991 vary with a conservative figure of 270,000 (Public Health Service, 1986) and a moderate estimate of 400,000 (Pascal, 1987).

Evidence also suggests that the percent of persons with AIDS enrolled in Medicaid is increasing over time. Kizer, Rodriguez, and McHolland (1987), in their study of AIDS in California, estimated that the proportion of AIDS cases in the State enrolled in Medicaid rose from 12 percent in 1985 to 20 percent in 1986. As the proportion of AIDS cases increases among intravenous drug abusers (IVDA's), their

sexual partners, and their children, who are generally poorer than the homosexual males who currently dominate the AIDS population, the proportion enrolled for Medicaid will likewise grow.

Because of the increasing role Medicaid will play in financing the care of patients with AIDS, a better understanding of the way Medicaid enrollees with AIDS utilize services and expend Medicaid dollars is important. To address this need, the Health Care Financing Administration (HCFA), through the Medicaid Tape-to-Tape project, funded an initial study of Medicaid enrollees with AIDS in California, the State with the second highest number of AIDS cases in the country. The purpose of the study was to develop a methodology using claims files to investigate AIDS and Medicaid and to provide an understanding of the use and expenditure patterns during the first years of the epidemic. This study is limited to an analysis of cross-sectional annual data. A longitudinal analysis of Medicaid enrollment, use and expenditures will be the topic of a future study.

Findings concerning Medicaid use and expenditures by enrollees with AIDS from 1981 to 1984 are contained in this article. Because of the difficulty in accessing data outside the hospital, most studies of use and costs of services for AIDS have been limited to inpatient hospital and hospital outpatient department services. However, changes in the use of both inpatient and outpatient services are examined during this time period because the Medicaid claims files contain use and expenditure information on the full range of health services covered by Medicaid.

The study should not be interpreted as a cost of illness study in that the expenditures shown are only the portion of costs paid for by Medicaid. The Medicaid enrollees may have had other health insurance or pay some portion of their costs out of pocket. Additionally, Medicaid reimbursements do not necessarily cover the entire costs of care. Because we are including all Medicaid expenditures for enrollees with AIDS during the time period, we may be including expenditures for services unrelated to the AIDS diagnosis.

Cost of health care

The most rigorous and comprehensive study to date sets national per person costs for medical expenses for AIDS at \$35,592 per year in 1986 and lifetime hospital costs at \$60,000 to \$75,000 in 1984 prices (Scitovsky and Rice, 1987). The Office of the Actuary in HCFA has made estimates of the costs of AIDS to the Federal Medicaid program based on Centers for Disease Control (CDC) projections of the AIDS population, the cost estimates of Scitovsky and her associates (1986), and the Medicaid reimbursement levels. The Federal expenditures for Medicaid for persons with AIDS are estimated to be \$130 million in fiscal year 1986 and projected to be \$1.2 billion by

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fiscal year 1992. HCFA estimates the cumulative total (Federal and State) from 1986 through 1991 to be \$7.6 billion (Office of the Actuary, 1987). Pascal (1987), using a different methodology, provides cumulative estimates of Medicaid costs for 1986 through 1991 at a low of \$2 billion and an intermediate estimate of \$10 billion.

California has produced two reports on Medicaid expenditures for AIDS in the State. Using data from Medi-Cal claims files and identifying AIDS patients through the State's registry and death certificates, the initial study (Kizer et al., 1986) found that AIDS patients had a lifetime cost to Medicaid of \$59,000. This varied by geographic location, with San Francisco averaging the lowest (\$52,000), Los Angeles the highest (\$70,000) and the rest of the State averaging \$65,000. The second study indicated that the lifetime costs to Medicaid had dropped to \$44,000 (Kizer, Rodriguez, and McHolland, 1987).

Because most studies of the costs of AIDS have focused on a point in time rather than longitudinally, it is unclear whether it is becoming cheaper or more expensive on a per capita basis to treat persons with AIDS and what factors are important in these changes. Although little data on changes in use patterns for AIDS patients have been published, many believe that use of hospital services has been declining. New York State reports that the average length of stay in New York hospitals has decreased almost 18 percent, from 23.4 days in 1983 to 19.2 days in 1986 (New York State Department of Health, 1988). This is in contrast to the 8-percent decline in average length of stay for all diagnoses nationwide during the same time period, from 6.9 days to 6.4 days (National Center for Health Statistics, 1987).

There are many factors that could affect trends in resource consumption. First, emphasis has been placed on substituting outpatient for inpatient hospital services for persons with AIDS for both cost and quality of life reasons. Changes in segments of the population contracting AIDS can also affect the case mix and level of need for services. For example, pneumocystis carinii pneumonia (PCP) occurs at a higher rate among IVDA's with AIDS than among the homosexual/bisexual males with AIDS. The latter group has a higher proportion of persons with Kaposi's sarcoma (KS). Because PCP generally results in greater use of hospital services and thus higher costs, as the proportion of IVDA's in the AIDS population increases, health care costs are likely to increase simply because of case-mix changes.

Technology changes and the development of new drugs have the potential of affecting trends in resource consumption in many ways. Newly developed drugs, for example, could prolong life, perhaps decreasing per person annual costs but increasing lifetime costs, or they could produce side effects that increase per person annual costs. On the other hand, drugs could be developed that decrease overall need for hospital care and decrease lifetime costs. Azidothymidine (AZT), for example, is reported to add 6 months to the life expectancy of a person with

AIDS (Okie, 1988).

Use of hospital and other services may be changing as the medical profession discovers the limits of existing treatments and changes its practice patterns. Researchers at the San Francisco General Hospital (Wachter et al., 1986) report that use of intensive care units (ICU's) for AIDS patients has decreased since mid-1984. Based on information they collected in a survey of physicians, Wachter and his associates attribute this decline to changes in physicians' attitudes about the efficacy of ICU treatments, and the concomitant changes in practice patterns.

Medicaid eligibility issues

Little data are available concerning the extent of Medicaid eligibility for persons with AIDS. Most estimates of the percentage of persons with AIDS receiving Medicaid coverage are based on the proportion of hospitalized AIDS patients whose care is paid for by Medicaid, rather than on enrollment data from Medicaid records. The proportion varies by State, depending on the income levels of the populations affected by AIDS and the State's Medicaid program eligibility requirements. In a study of hospital admissions to public and teaching hospitals for AIDS in 1985, Andrulis and associates (1987) found that the proportion of admissions paid for by Medicaid varied by region of the country—60 percent in the Northeast, 54 percent in the West, 36 percent in the Midwest, and 15 percent in the South. The State of California, using Medi-Cal enrollment records, reported that the proportion of persons with AIDS enrolled in Medicaid in the State was 12 percent in 1985 (Kizer et al., 1986), and 20 percent in 1986 (Kizer, Rodriguez, and McHolland, 1987).

The majority of persons with AIDS probably qualify for Medicaid through the Supplemental Security Income (SSI) disability program. As of September 1983, a person with a diagnosis of AIDS is considered presumptively disabled and is eligible for SSI, if the person satisfies SSI's income and financial criteria (which can vary by State because of differences in supplementation provisions). Many persons with AIDS meet the income criteria because they are no longer working. Without the income and health benefits associated with employment, their assets can be quickly exhausted in meeting health care expenses. Persons with AIDS whose income is too high for SSI cash assistance may also be eligible through a State's medically needy eligibility provisions. The 10 States with the highest number of persons with AIDS all have medically needy programs. Further, some disabled persons may have been eligible for Medicaid because of other disabling conditions prior to contracting AIDS. With the increase in the number of women and children with AIDS, large numbers will already be enrolled in Medicaid through Aid to Families with Dependent Children (AFDC) eligibility when they contract AIDS, or become eligible through AFDC after manifesting the illness.

Methodology

Data source

The Medicaid enrollment, utilization, and expenditure data in this article were taken from the Medicaid Tape-to-Tape data base. This data base contains enrollment, claims, and provider data from the Medicaid Management Information Systems (MMIS) of the five States (California, Georgia, Michigan, New York, and Tennessee) participating in this innovative data collection effort sponsored by HCFA. Tape-to-Tape data include data for only Medicaid-covered services; data for Medicare-covered services for enrollees entitled to both Medicare and Medicaid are not included. Services for HMO enrollees are also not included in the Tape-to-Tape data base. HMO enrollees comprised 9 percent of all Medicaid enrollees and 2 percent of disabled Medicaid enrollees in California in 1984.

Identifying acquired immunodeficiency syndrome cases

A major barrier to health care cost and utilization research on AIDS is the lack of definitive ways to accurately identify AIDS patients in large clinical and claims data bases. Prior to October 1986, there were no unique codes for AIDS in the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). Although the use of unique codes for AIDS, AIDS-related complex (ARC), and HIV-positive patients was implemented in October 1986, there is concern that these codes may not be used with any degree of consistency. The first step in this study was to develop a clinical algorithm to overcome the lack of AIDS-specific codes, because the study period is prior to 1986.

Using ICD-9-CM codes representing immunodeficiencies and other AIDS manifestations, we developed an algorithm that identified a group of Medicaid recipients suspected of having AIDS. This group was subsequently restricted to disabled males between 18 and 50 years of age. These age limitations were used because the non-AIDS related incidence of some of the diagnoses in the algorithm is higher among children and older adults. For example, the ICD-9-CM code for Kaposi's sarcoma includes other skin cancers that occur with greater frequency in persons over the age of 50 than in younger persons. For this initial development of the methodology, the algorithm was not extended to females, children, or the older adults, as they accounted for less than 5 percent of the cumulative AIDS cases in California during our study period (Kizer, et al., 1986).

With the help of the State, which for a previous study had matched Medi-Cal claims files with the State's AIDS registry, we were able to verify some cases identified through our initial clinical algorithm as AIDS cases. We refined our algorithm by

eliminating ICD-9-CM codes that appeared to have a high false positive rate. We eliminated codes when the number of cases were not increasing in a manner similar to the rate of increase of AIDS in California, or when the nonverified outnumbered the verified. The resulting clinical algorithm was that persons would be included who had at least one claim coded as PCP or immunodeficiency. Cases were excluded where the immunodeficiency code was the only AIDS-related code and occurred only once on an outpatient claim. Such a unique occurrence of the immunodeficiency code might be just for HIV testing rather than for a diagnosis of HIV-positivity.

Using this refined algorithm, we compared Medicaid enrollment and demographic characteristics and Medicaid utilization and expenditures of the verified and nonverified groups and found that the two groups were remarkably similar. This refined algorithm identified approximately 85 percent of the Medicaid AIDS cases on the State's AIDS registry in 1983 or 1984. (As will be described, we added the additional 15 percent of enrollees on the registry to our study.) The algorithm also identified a number of Medicaid recipients with diagnoses indicative of AIDS (the nonverified cases) who had not been included in the State's Medi-Cal study. The methodology for identifying AIDS patients in claims files is presented in another paper (Keyes, Andrews, Pine et al., 1987).

Study population

Counts of all the enrollees who were identified through the above-described methodology, or through the State of California's matching of the AIDS registry with the Medi-Cal files (Kizer, Rodriguez, and McHolland, 1987) are shown in Table 1. Enrollees are included in the table for the first year that they have had an AIDS-related diagnosis (including any diagnosis from our original extensive list of AIDS-related diagnoses). This criterion was necessary because a number of enrollees appear to have been enrolled in Medicaid, sometimes for several years, before they develop AIDS. Excluded from the identified cases are persons whose care was funded entirely by the State (e.g., State general assistance recipients) because they are not Medicaid enrollees (they do not meet the categorical eligibility standards of Federal qualifications for Medicaid).

The number of AIDS cases identified in the Medicaid claims files rose dramatically from 11 in 1981, to 27 in 1982, to 137 in 1983, and 420 in 1984. Of these people, we included in this study all disabled males 18 to 50 years of age who were enrolled in Medicaid in California from 1981 to 1984, and who had no indication on MMIS of being eligible for Medicare.

Several groups of enrollees identified as AIDS cases were excluded from the study population for varying reasons. Enrollees who were dually eligible for Medicaid and Medicare (as indicated by a Medicare amount paid for any claim or an indicator of Medicare eligibility on the enrollee's Medicaid

eligibility record) were excluded because the Medicaid files do not contain complete information on the health care service use and costs of those enrollees also eligible for Medicare. Enrollees who were not in the disabled eligibility group, or who were adult females, children, or over 50 years of age were excluded for two reasons. First, AIDS cases among these populations have different health care use patterns than the disabled adult males we chose to include in the study, and it would be misleading to include them in this study without analyzing them separately. The number of enrollees in these populations was too small to perform a separate analysis. Second, as mentioned earlier, we did not extend our clinical algorithm to females, children, and older adults. They are, therefore, underrepresented in the identified population.

Findings

The distribution of age and Medicaid eligibility characteristics is presented in Table 2. The greatest percentage of enrollees in 1983 and 1984 fell into the 30 to 39 year age group. They comprised 46 percent (55 out of 121 enrollees) in 1983 and 56 percent (213 out of 378 enrollees) in 1984. All but one of the enrollees in 1981 and 1982 were categorically needy. In contrast, in 1983 and 1984, more than one-half of the enrollees were medically needy. In terms of length of enrollment, the vast majority of the enrollees in 1981 and 1982 were enrolled for 10 or more months during the year. This distribution dramatically changes by 1983, when only 31 percent (38 out of 121 enrollees) were enrolled for 10 to 12 months. In 1984, it fell to 23 percent (88 out of 378). In these 2 years, more than one-half of the enrollees were enrolled for 6 months or less. The change in the length of

enrollment could be related to the great amount of influx into the Medicaid program by persons with AIDS during the later years. With the dramatic rise in the number of persons with AIDS, it is reasonable to assume that many of them would be newly enrolled. It is also possible that there were a higher proportion of enrollees with AIDS in the early years who were already enrolled in Medicaid before they manifested AIDS.

Table 2
Demographic characteristics of Medicaid acquired immunodeficiency syndrome study population: California 1981-84

Demographic characteristic	1981	1982	1983	1984
Total number of enrollees	4	15	121	378
Age				
Under 18 years	0	1	1	0
18-19 years	3	3	0	3
20-29 years	0	6	33	79
30-39 years	1	2	55	213
40-49 years	0	3	31	80
50 years or over	0	0	1	3
Maintenance assistance status				
Categorically needy	4	14	53	182
Medically needy	0	1	68	196
Length of Medicaid enrollment during the year				
1-3 months	0	0	27	125
4-6 months	0	1	43	102
7-9 months	1	0	13	63
10-12 months	3	14	38	88

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data from the Medicaid Tape-to-Tape project.

Table 1
Number of Medicaid enrollees identified as acquired immunodeficiency syndrome cases included and excluded from the study: California 1981-84

Enrollee	1981	1982	1983	1984
Total	11	27	137	420
Enrollees included in the study ¹	4	15	121	378
Enrollees excluded from the study	7	12	16	42
Medicaid and Medicare	5	7	9	17
AFDC child	2	2	2	5
AFDC adult	0	1	2	6
Other eligibility groups	0	2	3	14

¹Disabled males 18-50 years of age during the study period with no indication of Medicare coverage in the Medicaid Management Information Systems.

NOTE: AFDC is Aid to Families with Dependent Children.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data from the Medicaid Tape-to-Tape project.

Table 3
Annual Medicaid expenditures for acquired immunodeficiency syndrome study population: California 1981-84

Statistic	1981	1982	1983	1984
Total expenditures	\$58,797	\$230,801	\$2,330,228	\$5,615,525
Expenditures per person	14,699	15,387	19,258	14,856
Standard deviation	19,451	22,200	28,546	17,337
Percentile:				
90th	42,839	64,894	40,545	34,587
75th	35,270	23,311	20,904	20,002
50th (median)	7,381	4,720	11,742	10,250
25th	1,447	798	3,860	2,418
Highest	42,839	67,791	192,389	116,762
Lowest	1,196	354	36	14
Number of enrollees	4	15	121	378

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data from the Medicaid Tape-to-Tape project.

Displayed in Table 3 are several statistics on the annual Medicaid expenditure for enrollees with AIDS (unadjusted for inflation). Total annual Medicaid expenditures for this AIDS study population rose from \$59,000 in 1981 to \$5.6 million in 1984. The other statistics in this table provide an understanding of the wide range of expenditures per enrollee. In 1984, for example, the mean expenditure was \$14,856, the median was \$10,250, and the standard deviation was \$17,337. Expenditures were \$20,082 or more for the top 25 percent of the enrollees, and \$2,418 or less for the bottom 25 percent. The highest expenditure was \$116,762 and the lowest was only \$14. Because enrollees had varying lengths of enrollment in Medicaid, it is quite possible that the lowest expenditures were for those enrolled for a short period of time during the year.

To account for differences in length of enrollment, both expenditures per enrollee and expenditures per month of enrollment (total expenditures for the group divided by total months enrolled for the group) are broken down by length of enrollment during the year (Table 4). Data for 1981 and 1982 were not included in the table because there was little variability in the length of enrollment. Expenditures per enrollee were more than \$10,000 for all categories of length of enrollment. The highest expenditure per enrollee was for those enrolled 7 to 9 months, \$25,054 in 1983 and \$24,692 in 1984.

It is interesting to compare the 1984 expenditures to those found by Scitovsky, Cline, and Lee (1986) for patients receiving all their hospital care at San Francisco General Hospital in 1984. The differences between the two studies should be kept in mind when making these comparisons. Scitovsky and associates were looking at charges for services provided at the hospital, and this study examined Medicaid expenditures for all Medicaid-covered services for those enrolled in Medicaid throughout the State. Those who were living with an AIDS diagnosis all 12 months in the Scitovsky, Cline, and Lee study had an

expenditure per person of \$7,026. The comparable group in our study, those enrolled 10 to 12 months, had more than twice the expenditure rate, \$15,022. The expenditure rate they found for those who died during the year (\$23,425) was most similar to the rate we found for those enrolled 7 to 9 months (\$24,692). The third group they examined, those who were diagnosed with AIDS during the year and who did not die, had an average cost of \$12,040. This corresponds closely with the expenditure rate we found for those on Medicaid 1 to 3 months or 4 to 6 months, \$10,065 and \$14,508 respectively.

Expenditures per month of enrollment was highest for those enrolled for the shortest amount of time (1 to 3 months)—\$6,917 in 1983 and \$4,821 in 1984. The expenditures per month generally decreased as length of enrollment increased, with enrollees who had the longest length of enrollment (10 to 12 months) having the lowest expenditure rate, \$1,292 in 1983 and \$1,311 in 1984. Because people enrolled for less than 3 months during the year are either newly enrolled or become disenrolled, their high expenditures per month indicate that enrollees with AIDS have heavy use of services at the beginning or end of their stays on Medicaid. The high expenditures per month for this group are consistent with the widespread view that costs for health services for a person with AIDS generally has two peaks—one at the beginning of the illness and one before death. Because this study analyzed annual cross-sectional data, we cannot distinguish between those who were newly enrolled and those who disenrolled.

The Medicaid expenditure rates for several categories of health services presented in Table 5 have been adjusted in 1984 dollars to eliminate the effect of

Table 4

Medicaid expenditures per person and per month of enrollment by length of enrollment during the year and for the year of the acquired immunodeficiency syndrome study population: California 1983-84

Length of enrollment during the year	1983		1984	
	Per person			
1-3 months	\$14,603		\$10,065	
4-6 months	24,166		14,508	
7-9 months	25,054		24,692	
10-12 months	15,029		15,022	
	Per month of enrollment			
1-3 months	6,917		4,821	
4-6 months	4,902		2,919	
7-9 months	2,961		3,155	
10-12 months	1,292		1,311	

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data from the Medicaid Tape-to-Tape project.

Table 5

Medicaid expenditures (in 1984 dollars) per person and per person month of enrollment, by health service and year for acquired immunodeficiency syndrome study population: California 1982-84

Health service	1982	1983	1984
	Per person		
Total	\$17,461	\$20,364	\$14,856
Inpatient hospital	14,827	18,152	13,033
Ambulatory visits	1,263	973	684
Prescription drugs	237	110	79
Long-term care	0	127	255
Other Medicaid services	1,134	1,002	805
	Per person month of enrollment		
Total	\$1,523	\$3,001	\$2,475
Inpatient hospital	1,293	2,675	2,171
Ambulatory visits	110	143	114
Prescription drugs	21	16	13
Long-term care	0	19	42
Other Medicaid services	99	148	135

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data from the Medicaid Tape-to-Tape project.

Table 6

Medicaid utilization and expenditures (in 1984 dollars) for acquired immunodeficiency syndrome (AIDS) study population and comparison group of disabled enrollees, by health service and year: California 1982-84

Health service	Enrollees with AIDS			Comparison group of disabled enrollees ¹		
	1982	1983	1984	1982	1983	1984
Hospital						
Expenditures per enrollee	\$14,827	\$18,152	\$13,033	\$1,483	\$1,697	\$1,412
Expenditures per hospital day ²	\$765	\$716	\$571	\$535	\$575	\$540
Hospital discharges per enrollee	3.1	2.2	1.6	0.3	0.3	0.3
Number of hospital days ² per discharge	6.2	11.6	14.3	10.1	10.3	9.7
Ambulatory visits						
Expenditures per enrollee	\$1,263	\$973	\$684	\$355	\$432	\$272
Expenditures per visit	\$30	\$27	\$31	\$32	\$33	\$29
Number of ambulatory visits per enrollee	42.3	36.3	22.4	11.0	13.1	9.3

¹Includes disabled enrollees who were male, 18 to 50 years of age, noninstitutionalized during the year, and were not dually eligible for Medicare (based on Medicare eligibility flags in the Medicaid record).

²Includes all days in hospital stays for which there was some Medicaid payment. Some of these days were noncovered days.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data from the Medicaid Tape-to-Tape project.

inflation in the health care sector.¹ The data for 1981 are not included in this table or subsequent tables because of the small number of cases in that year. The two measures of expenditures examined, expenditures per enrollee and expenditures per month of enrollment, showed similar trends across the years. Medicaid expenditures per enrollee (in 1984 dollars) increased almost 17 percent between 1982 to 1983, from \$17,461 to \$20,364, then declined 27 percent in 1984 to \$14,856. Expenditures per month almost doubled from 1982 to 1983 (\$1,523 to \$3,001) and then declined in 1984 (to \$2,475).

The increase in expenditures per enrollee from 1982 to 1983 was only for inpatient hospital services (which represent about 80 percent of total expenditures). Between those 2 years, expenditures per enrollee increased from \$14,827 to \$18,152, although expenditures for all other categories of service declined. The increase from 1982 to 1983 in expenditures per month of enrollment occurred in all service categories except drugs. The decline in expenditures per enrollee and expenditures per month enrolled from 1983 to 1984 is seen for all service categories, except long-term care. The decline for hospital services was 28 percent for expenditures per enrollee (\$18,152 to \$13,033) and 21 percent for expenditures per month of enrollment (\$2,675 to \$2,171). Similar rates of decline are seen in expenditures for ambulatory visits, prescription drugs, and other services.

The Medicaid program in California, known as Medi-Cal, had substantial program changes during 1983, some of which could have affected the expenditure trends we are examining. The most substantial change, known as "selective contracting,"

¹The following market basket indices and components of the medical care consumer price index (MC-CPI) were used to inflate expenditures: HCFA hospital market basket for inpatient hospital services, the HCFA nursing home market basket for long-term care, MC-CPI physician services component for ambulatory visits, MC-CPI prescription drug component for prescription drugs, and MC-CPI other medical care component for other services.

was that the State entered into special negotiated contracts with selected hospitals to provide inpatient care at all-inclusive per diem rates. The assumption was that, through hospital competition for these contracts, the Medicaid program could save 15 or more percent on hospital expenditures. Other cost containment program changes that might have affected expenditure rates for enrollees with AIDS included an average 10-percent reduction in reimbursements for physician services and outpatient care.

We examined whether the changes observed in expenditure rates could be caused by changes in use or reimbursement rates related to Medicaid program changes, or to changes in treatment patterns for AIDS patients. We compared hospital and ambulatory visit use and expenditure rates for the enrollees with AIDS with a demographically similar group of disabled enrollees (Table 6). Included in this comparison group of Medicaid enrollees were males from 18 to 50 years of age who were disabled, not covered by Medicare, and noninstitutionalized during the year (few of the AIDS patients were institutionalized).

For enrollees with AIDS, expenditures per hospital day declined slightly (6.4 percent) from 1982 to 1983 and then fell by 20 percent from \$716 in 1983 to \$571 in 1984. During the 3-year period, discharges per enrollee were cut to nearly one-half, from 3.1 in 1982 to 1.6 in 1984. This was accompanied by an increase in the average length of stay from 6.2 days in 1982 to 14.3 days in 1984. In contrast, the comparison group showed a much more stable pattern during the 3 years. Expenditures per hospital day increased 7.5 percent from \$535 in 1982 to \$575 in 1983 and then fell 6.1 percent to \$540 in 1984. Discharges per enrollee remained the same during the 3-year period, but average length of stay increased slightly in 1983 from 10.1 days to 10.3 days and then declined in 1984 to 9.7 days.

As noted earlier, hospital expenditures per enrollee with AIDS increased almost 17 percent from 1982 to

1983, and then declined 27 percent in 1984. The data in Table 6 indicate that the initial increase and the later decrease were the result of different factors. The primary factor in the increased expenditures per enrollee in 1983 was a length-of-stay increase from 6.2 days to 11.6 days. The two other factors, expenditures per hospital day and discharges per enrollee, both declined from 1982 to 1983. Because the use rates for the comparison group did not change in this manner, the changes in the AIDS population probably reflect treatment changes as opposed to any Medicaid program changes.

The substantial decline in hospital expenditures per enrollee for AIDS patients in 1984 can largely be attributed to the 20-percent drop in Medicaid expenditures per hospital day, from \$716 in 1983 to \$571 in 1984. The decline in the Medicaid reimbursement per hospital day for the disabled comparison group was only 1.6 percent. Changes in hospital use were not an important factor in the decline in hospital expenditures per enrollee with AIDS, because the 27-percent drop in the discharges per enrollee (from 2.2 to 1.6) was accompanied by a 23-percent increase in the average length of stay (from 11.6 to 14.3 days) for enrollees with AIDS.

Before selective contracting, hospitals would have been reimbursed more per day for a high resource-intensive patient (such as an AIDS patient) than a low resource-intensive patient. After selective contracting, this differential disappeared for participating hospitals. How this affected reimbursement for AIDS patients is seen by comparing the expenditures per day for enrollees with AIDS with the comparison group. Expenditures per day for enrollees with AIDS and disabled enrollees were more similar in 1984 (\$571 versus \$540) than in 1983 (\$716 versus \$575).

The substantial decline in ambulatory visit expenditures per enrollee with AIDS from 1982 through 1984 is attributable to the decline in the number of visits per enrollee, as opposed to changes in reimbursements per visit. The mean number of visits declined 14 percent from 42.3 visits in 1982 to 36.3 visits in 1983 and another 38 percent, 22.4 visits in 1984. In contrast, the comparison group's average number of visits increased 19 percent from 11.0 in 1982 to 13.1 in 1983 and then declined 29 percent, to 9.3 visits in 1984.

One would surmise from this comparison that for the enrollees with AIDS, the decline in ambulatory visit expenditures per enrollee from 1982 to 1983 was not related to the State's changes in Medicaid reimbursement. On the other hand, because the comparison group's average number of visits also declined in 1984, it is unclear to what extent the 1984 decline for the enrollees with AIDS was affected by Medi-Cal's decreasing the reimbursement rates for physician and outpatient department visits. Expenditures per visit were not a factor in the decline in expenditures per enrollee. The per visit expenditure rate increased slightly for AIDS patients in 1984, whereas it decreased for the comparison group. Because visit rates are based on a fee schedule, the

difference in trends between the enrollees with AIDS and the disabled group probably reflects a proportionately greater use of the more costly services by enrollees with AIDS, such as outpatient hospital department as opposed to clinics or private physicians.

Table 7 presents information on the number of enrollees with AIDS and the expenditures per enrollee for AIDS-related diagnosis groups in order to analyze changes in case mix. Enrollees were categorized into one diagnosis group per year in a hierarchical fashion. Enrollees were categorized into the PCP group if they had any claims with this diagnosis, KS if they had KS but not PCP, immunodeficiency if they had an immunodeficiency but not KS or PCP, and other diagnoses. Enrollees in the study population could be placed in this last group in one of the following ways: They had one of the other three diagnoses in a previous year of the study, but not in the year observed, or they were included in the study because they had been matched between the AIDS registry and the Medi-Cal files for the State of California's study (Kizer, Rodriguez, and McHolland, 1987).

In 1982 the majority of enrollees with AIDS had only immunodeficiencies coded on their claims. By 1984, this diagnosis group accounted for only 40.7 percent of the cases. On the other hand, the proportion of cases with PCP increased from 13.3 percent to 32.5 percent from 1982 to 1984 and the proportion of KS cases increased from 6.6 percent to 22 percent. We cannot ascertain from these data whether there was an actual change in case mix, or whether the changes are an artifact of changes in diagnosis coding conventions. In terms of expenditure rates, there was a decline in expenditures per person

Table 7
Distribution of enrollees and Medicaid expenditures (adjusted to 1984 dollars) per enrollee with AIDS, by AIDS-related diagnosis and year: California 1982-84

Diagnosis	1982	1983	1984
Total enrollees	15	121	378
Percent distribution of enrollees			
PCP	13.3	15.7	32.5
KS	6.6	28.1	22.0
Immunodeficiency	60.0	40.5	40.7
Other diagnoses	20.0	15.7	4.8
Expenditures per enrollee			
Total	\$17,461	\$20,364	\$14,856
PCP	¹	29,990	16,932
KS	¹	20,539	10,510
Immunodeficiency	18,704	20,400	16,526
Other diagnoses	¹	10,281	6,421

¹Number of cases is less than five.

NOTES: PCP is *Pneumocystis carinii* pneumonia (ICD-9-CM code 136.3). KS is Kaposi's sarcoma (ICD-9-CM code 173), excluding cases with PCP. Immunodeficiency (ICD-9-CM codes 279.1-279.9), excludes cases with PCP or KS. AIDS is acquired immunodeficiency syndrome.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data from the Medicaid Tape-to-Tape project.

from 1983 to 1984 for all diagnosis groups. The two most costly diagnoses in 1983, PCP and KS, declined almost 50 percent from 1983 to 1984. The overall decrease in expenditures per enrollee is even more striking when it is noted that 1984 had a greater percentage of the more costly PCP cases, and fewer of the less costly other diagnoses cases.

Discussion

The data highlight changes that occurred in Medicaid use and expenditure rates of persons with AIDS early in the epidemic. Hospital discharges per enrollee decreased substantially from 1982 to 1984, although length of stay increased. Although one might expect a substitution of outpatient for inpatient services under such a decline in hospital services, the average number of ambulatory visits also declined during this period. Expenditures per enrollee increased between 1982 and 1983 and then declined in 1984. The initial increase can largely be attributed to the increase in length of stay between 1982 and 1983. The decrease in 1984 was primarily a result of a drop in Medicaid expenditures per hospital day.

Unfortunately, these data do not fully answer the question of why changes in use patterns occurred. The changes in use from 1982 to 1984 could be the result of any one or a combination of the following:

- Health professionals may have developed a better understanding of the efficacy of various treatments, particularly hospitalization. With a greater understanding of the treatment needs of AIDS patients, perhaps care was being managed more efficiently. Possibly in 1984, hospitalizations were increasingly being reserved for the more severely ill.
- Because there was no substitution of ambulatory visits for hospital services, perhaps the shift was to non-Medicaid services such as those provided through local funding or volunteers.
- There is some research showing that hospitalized AIDS patients are more costly (Boufford, 1988) and require more resources (Peat, Marwick, Mitchell and Co., 1986) than other hospital patients. If the 1984 per diem rates were considered too low to cover the costs of caring for AIDS cases, there would be a financial incentive to decrease admissions of AIDS patients covered by Medicaid in order to defer losses.

Utilization patterns will continue to change with increased knowledge concerning the efficacy of treatment regimens, the development of new treatments such as AZT, the continued emphasis on decreasing use of hospital services for AIDS patients, and the extension of case management systems. Changes in the demographics and case mix of the AIDS population will also affect use patterns. For example, these data showed relatively little use of long-term care services. With the increasing number of people with AIDS manifesting dementia, one would expect an increase in the use of long-term care services.

The findings concerning the high expenditure rates per month of enrollment for those enrolled 3 months or less during the year raises questions concerning Medicaid enrollment patterns of persons with AIDS. For example, at what point in their illness do persons with AIDS become enrolled in Medicaid? Are these enrollees coming on or off Medicaid; are they newly diagnosed or dying? This study was unable to answer such questions because it was limited to cross-sectional annual data.

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