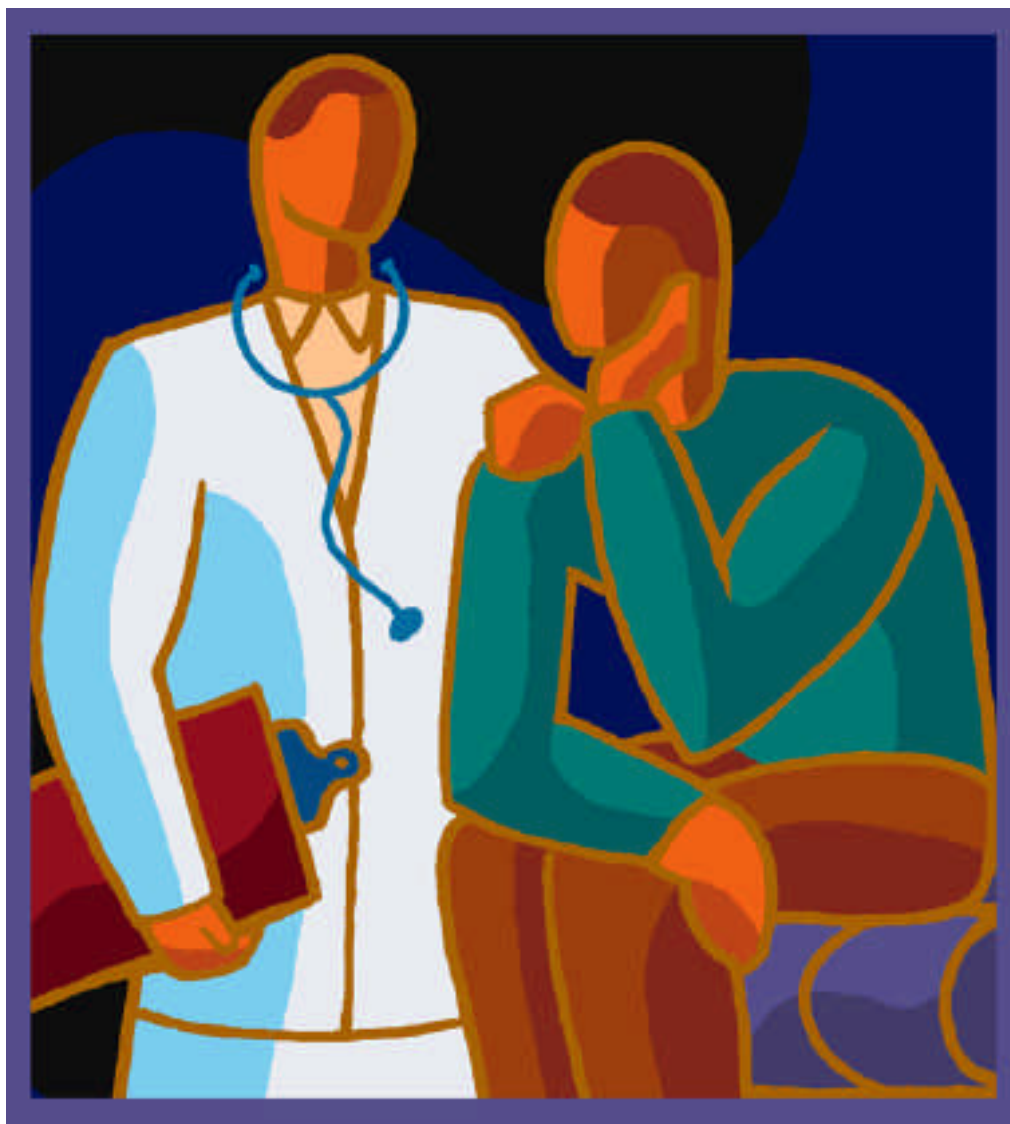




CALIFORNIA
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Preventing Unnecessary Hospitalizations in Medi-Cal:

Comparing Fee-for-Service with Managed Care

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Comparing Fee-for-Service with Managed Care

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About the Foundation

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Overview

IN THE 1990S, CALIFORNIA EXPANDED MEDI-CAL managed care enrollment with the stated goal of improving beneficiaries' access to health care. Unlike Medi-Cal fee-for-service, Medi-Cal managed care requires a beneficiary to select a primary care provider to serve as his or her usual source of care. One method of measuring access to care is through preventable hospitalization rates. Preventable hospitalizations are admissions for ambulatory conditions such as asthma, diabetes, and hypertension that can often be managed in an outpatient setting. Patients with these conditions who do not have adequate access to ambulatory care can experience a decline in their health, increasing the likelihood that they will need to be treated in a hospital.

This report summarizes the results of a study that used preventable hospitalization rates to compare ambulatory care delivery in Medi-Cal fee-for-service with Medi-Cal managed care. The results show that from 1994 to 1999 the preventable hospitalization rate was significantly lower for Medi-Cal beneficiaries enrolled in managed care than those using fee-for-service.

Key findings include:

- For the largest group of non-elderly beneficiaries who qualify for Medi-Cal—those eligible through the California Work Opportunity and Responsibility to Kids (CalWORKs) program—the average annual preventable hospitalization rate was more than a third lower in managed care than in fee-for-service. This suggests that managed care was associated with an average of more than 7,000 fewer hospitalizations per year, saving an estimated \$66 million in hospital charges.
- Among beneficiaries with disabilities who are eligible for Medi-Cal through Supplemental Security Income (SSI), the average annual preventable hospitalization rate was about one-quarter lower with managed care than with fee-for-service.
- Of the three types of Medi-Cal managed care models, the Two-Plan Model had the lowest overall rate of preventable hospitalization.

These findings suggest that the requirement of a usual source of care for Medi-Cal beneficiaries is associated with improvements in these patients' access to ambulatory care and their overall health. The large reductions in preventable hospitalizations for Medi-Cal beneficiaries in managed care suggests that there is an enormous opportunity to improve access to ambulatory care among Medi-Cal beneficiaries and reduce Medi-Cal expenditures for hospital care.

I. Background

MEDICAID ORIGINATED IN THE MID-1960S AS A jointly financed federal and state health insurance program for low-income, disabled, and elderly Americans. As of 2002, Medi-Cal, California's Medicaid program, was providing health insurance to roughly 6.5 million Californians at an estimated annual cost of more than \$29 billion, making it the largest state Medicaid program in the country. However, enrollment in the Medi-Cal program does not necessarily ensure access to health care services. Surveys of California physicians have found that a little more than half accept Medi-Cal patients¹ and that the supply of primary care physicians available to Medi-Cal beneficiaries is below recommended federal standards.² Correspondingly, a survey of Medi-Cal beneficiaries conducted in 1999 found that 56 percent of beneficiaries reported difficulty in finding doctors who were willing to treat Medi-Cal patients; 94 percent of beneficiaries stated that getting more doctors into the program was important.³

Between 1994 and 1999, California expanded Medi-Cal managed care enrollment from 16 percent of all Medi-Cal beneficiaries to 50 percent statewide. One of the stated goals of this expansion was to improve beneficiaries' access to care.⁴ Medi-Cal managed care was implemented county by county through a combination of voluntary and mandatory managed care programs. These programs mainly target beneficiaries (predominantly women and children) who are eligible for federal Temporary Assistance for Needy Families, which in California is referred to as the CalWORKs program. Unlike Medi-Cal fee-for-service, Medi-Cal managed care requires a beneficiary to select a primary care provider to serve as his or her usual source of care. Access to a primary care physician as a usual source of care can facilitate timely medical attention in an outpatient (ambulatory care) setting.

One measure of Medi-Cal beneficiaries' access to ambulatory care is preventable hospitalization rates. Preventable hospitalizations are admissions for ambulatory-care-sensitive conditions such as asthma, diabetes, and hypertension, which can often be managed with timely and effective treatment in an outpatient setting, thereby preventing hospitalization. Hospital admissions for these conditions reflect a decline in health status, and higher rates of admission for these conditions are associated with worse access to care.⁵ Numerous studies have found that pre-

preventable hospitalization rates are higher in the United States among low-income people, African Americans, Medicaid beneficiaries, and the uninsured.⁶ Medicaid patients who have more continuity of care from a usual source have been found to have lower rates of hospitalizations for ambulatory-care-sensitive conditions.⁷

There has been only limited study of the impact of Medicaid managed care on preventable hospitalization rates. Some policy analysts have been concerned that the resource limitations within managed care could result in an increase in preventable hospitalizations in Medicaid managed care programs. On the other hand, the requirement that beneficiaries have a regular source of care and the financial arrangements within Medi-Cal managed care would appear to create an incentive for reducing unnecessary hospitalizations. Medi-Cal managed care plans are paid a capitation rate from the state based on the number of beneficiaries who sign up with their plans on a monthly basis. The capitation payment is used to cover beneficiaries' inpatient and outpatient costs. Medi-Cal managed care plans are at risk for the cost of their patients' care, and they have a financial incentive to increase the use of less expensive outpatient treatment when doing so would reduce the use of expensive hospital-based care.

In a small study comparing two California counties, Lo Sasso et al, reported that preventable hospitalization rates increased over time in San Mateo's Medi-Cal managed care plan, compared with Ventura County's Medi-Cal fee-for-service program.⁸ One of the aims of this study was to determine whether the findings from these two counties could be generalized to the entire state of California and whether Medi-Cal managed care is associated with changes in preventable hospitalization rates.

The time frame of this project, 1994 through 1999, corresponds to the period of a "natural experiment" during which the use of managed care in the Medi-Cal program increased substantially. Prior to 1994, five of California's 58 counties participated in a demonstration project that required Medi-Cal beneficiaries to receive services through managed care. During the period of the study, most of the remaining large urban counties in the state (where about 80 percent of Medi-Cal beneficiaries in the state reside), began to require that all of their CalWORKs-eligible Medi-Cal beneficiaries receive services through managed care. The implementation of Medi-Cal managed care occurred on different dates within the study period and took somewhat different forms in the affected counties. One of the main differences was whether the managed care was provided by a county-operated health plan (County Organized Health System, or COHS), competing commercial health plans, or a local initiative health plan that in most counties was a public plan in competition with a commercial plan. The small number of counties that implemented Medi-Cal managed care using the COHS model required SSI-eligible beneficiaries with disabilities as well as CalWORKs-eligible Medi-Cal beneficiaries to use managed care.

II. Methodology

THIS STUDY USED PREVENTABLE HOSPITALIZATION rates to compare ambulatory care delivery with Medi-Cal fee-for-service compared to Medi-Cal managed care for CalWORKs-eligible and SSI-eligible beneficiaries. The analytic strategy assumed that if Medi-Cal managed care was having a positive effect on Medi-Cal beneficiaries' access to ambulatory care, then preventable hospitalization rates would be lower among Medi-Cal beneficiaries in managed care than among those in fee-for-service. It was conducted by linking Medi-Cal eligibility files from the California Department of Health Services (DHS) with hospital discharge data available from the California Office of Statewide Health Planning and Development (OSHPD). Because older Medi-Cal beneficiaries are also likely to have Medicare insurance, the analysis was limited to individuals under the age of 65. Preventable hospitalization rates for Medi-Cal beneficiaries eligible through the SSI program were analyzed separately from those in CalWORKs, in recognition that the former are eligible on the basis of a disability while a large proportion of the latter are generally healthy children or pregnant women—the group that accounted for most of the growth in Medi-Cal managed care. More information on the methodology of this study can be found in the Appendix.

III. Findings

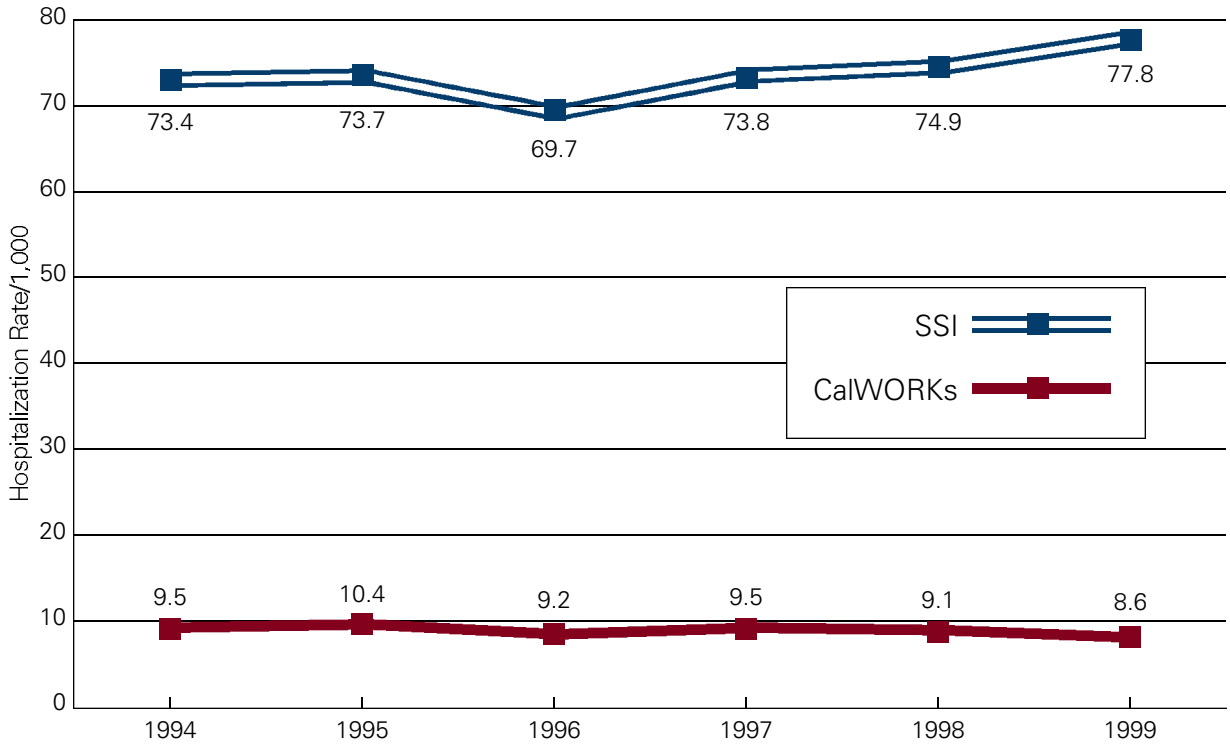
Preventable Hospitalization Rates in Medi-Cal

This study found clear trends in preventable hospitalization rates among people enrolled in Medi-Cal. Between 1994 and 1999, the annual preventable hospitalization rates for all Medi-Cal beneficiaries under age 65 increased slightly, rising from 18.2 hospitalizations per thousand beneficiaries to 18.6 per thousand. Because the number of preventable hospitalizations grew faster than the overall number of non-pregnancy-related hospitalizations among Medi-Cal beneficiaries, the rate of preventable hospitalizations as a percentage of total hospitalizations for this population increased from 22 percent to 25 percent over the same time period.

There were dramatically different rates of preventable hospitalizations among two large populations who receive Medi-Cal services, namely CalWORKs-eligible beneficiaries and those who qualify for Medi-Cal through a link with SSI. For example, between 1994 and 1999, the annual rate of preventable hospitalizations was nearly eight times higher among SSI-linked Medi-Cal beneficiaries (including beneficiaries dually eligible for Medi-Cal and Medicare) than among CalWORKs-linked beneficiaries (75.9 and 9.9 per 1,000, respectively). This is not entirely unexpected, given the vast difference in the underlying health status of these two groups, as well as differences in how they were incorporated into managed care.

In contrast to the results for the overall Medi-Cal population, the average annual preventable hospitalization rate among CalWORKs-eligible Medi-Cal beneficiaries decreased during the six-year study period, dropping from 9.5 to 8.6 per 1,000 (Figure 1). Among SSI-eligible Medi-Cal beneficiaries under age 65, the average annual admission rate increased from 73.4 to 77.8 per 1,000. Adjusting these rates for changes in the demographics of the beneficiaries during this time period did not have any appreciable effect on the results.

Figure 1: Unadjusted Average Annual Preventable Hospitalization Rates among Non-Elderly CalWORKs and SSI-Eligible Medi-Cal Beneficiaries



Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

For the population receiving CalWORKs, there was an approximately threefold range in the average annual preventable hospitalization rate across counties: from 5.4 per 1,000 in Del Norte to 15.2 per 1,000 in Imperial (Table 1). There was a similar range of difference across counties for the SSI population: from 32.6 per 1,000 in Marin to 89.9 per 1,000 in Riverside.

Table 1: Average Annual Preventable Hospitalization Rates among Non-Elderly Medi-Cal Beneficiaries by Eligibility Criteria and County 1994-1999

County	CalWORKs	SSI	All Medi-Cal
Alameda	12.6	71.2	25.0
Butte	8.5	58.3	18.3
Calaveras and Amador	8.9	61.8	17.8
Contra Costa	9.5	73.6	23.2
Del Norte	5.4	35.8	13.4
El Dorado	7.3	54.1	18.1
Fresno	9.2	58.2	16.2
Glenn and Colusa	7.4	61.8	15.1
Humboldt	10.5	50.7	20.9
Imperial	15.2	68.8	21.7
Inyo, Alpine, Mono, and Mariposa	9.9	56.5	16.2
Kern	8.5	79.4	18.6
Kings	13.9	87.7	22.6
Lake	8.5	52.9	19.5
Lassen and Modoc	9.0	55.0	16.3
Los Angeles	10.0	84.7	20.2
Madera	9.5	60.5	14.9
Marin	7.5	32.6	17.1
Mendocino	9.8	60.0	20.3
Merced	7.2	64.7	13.4
Monterey	10.1	70.1	17.5
Napa	8.8	47.0	19.1
Nevada, Sierra, and Plumas	11.2	77.0	25.9
Orange	7.1	60.6	15.8
Placer	7.7	55.1	19.0
Riverside	13.2	89.9	25.1
Sacramento	7.1	52.1	15.6
San Benito	8.6	72.8	15.6
San Bernardino	12.4	87.1	22.7
San Diego	9.1	62.2	18.2
San Francisco	11.3	79.9	33.7
San Joaquin	7.5	58.3	17.1
San Luis Obispo	9.0	57.3	20.6
San Mateo	8.3	52.5	17.4
Santa Barbara	7.1	51.4	14.3
Santa Clara	8.9	55.8	16.7
Santa Cruz	5.8	48.2	14.7
Shasta	9.1	56.2	19.9
Siskiyou and Trinity	8.8	46.3	18.9
Solano	7.0	49.0	14.8
Sonoma	7.1	48.6	17.4
Stanislaus	8.0	67.7	18.0
Sutter	11.3	72.0	21.4
Tehama	6.7	53.6	16.1
Tuolumne	7.5	74.6	15.7
Tulare	7.2	48.7	17.0
Ventura	9.3	59.8	17.5
Yolo	7.3	63.9	16.1
Yuba	10.1	75.8	21.9

Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

Note: All figures represent hospitalization rates per 1,000 beneficiaries.

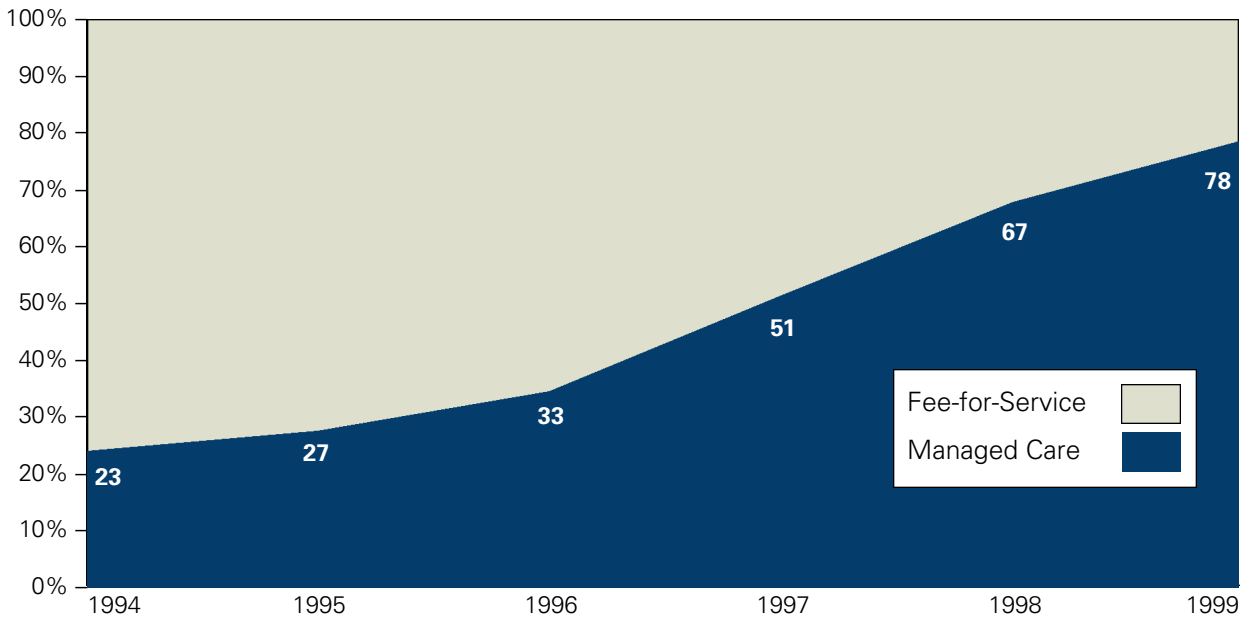
Medi-Cal Managed Care Versus Fee-for-Service

Enrollment in Managed Care

Enrollment in managed care by CalWORKs-eligible Medi-Cal beneficiaries grew dramatically from 1994 to 1999. In 1994, 23 percent of these beneficiaries were in managed care. By 1999 the proportion had reached 78 percent (Figure 2).

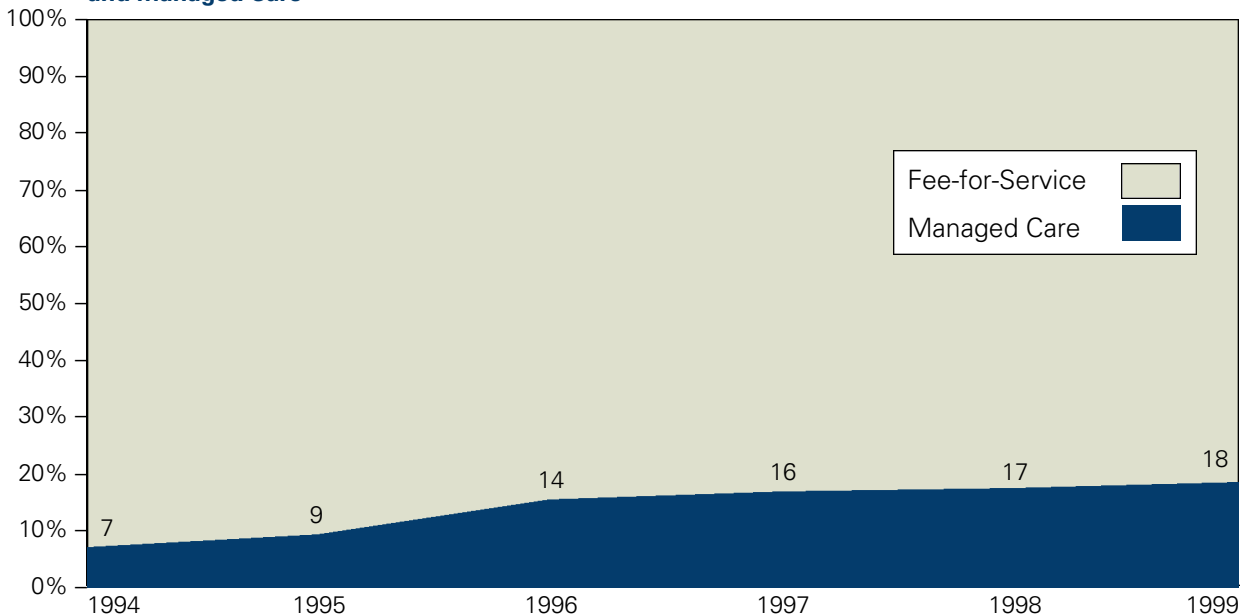
Compared with CalWORKs-eligible Medi-Cal beneficiaries, a much smaller percentage of SSI-eligible Medi-Cal beneficiaries were in managed care in 1994, and the rate of growth through 1999 was also much slower. In 1994, 7 percent of SSI-eligible Medi-Cal beneficiaries were in managed care. By 1999 this percentage reached 18 percent (Figure 3). SSI-eligible Medi-Cal beneficiaries were required to be in managed care only

Figure 2: Percentage of Non-Elderly CalWORKs-Eligible Medi-Cal Beneficiaries Enrolled in Fee-for-Service and Managed Care



Source: Department of Health Services 1994-1999

Figure 3: Percentage of Non-Elderly SSI-Eligible Medi-Cal Beneficiaries Enrolled in Fee-for-Service and Managed Care



Source: Department of Health Services 1994-1999

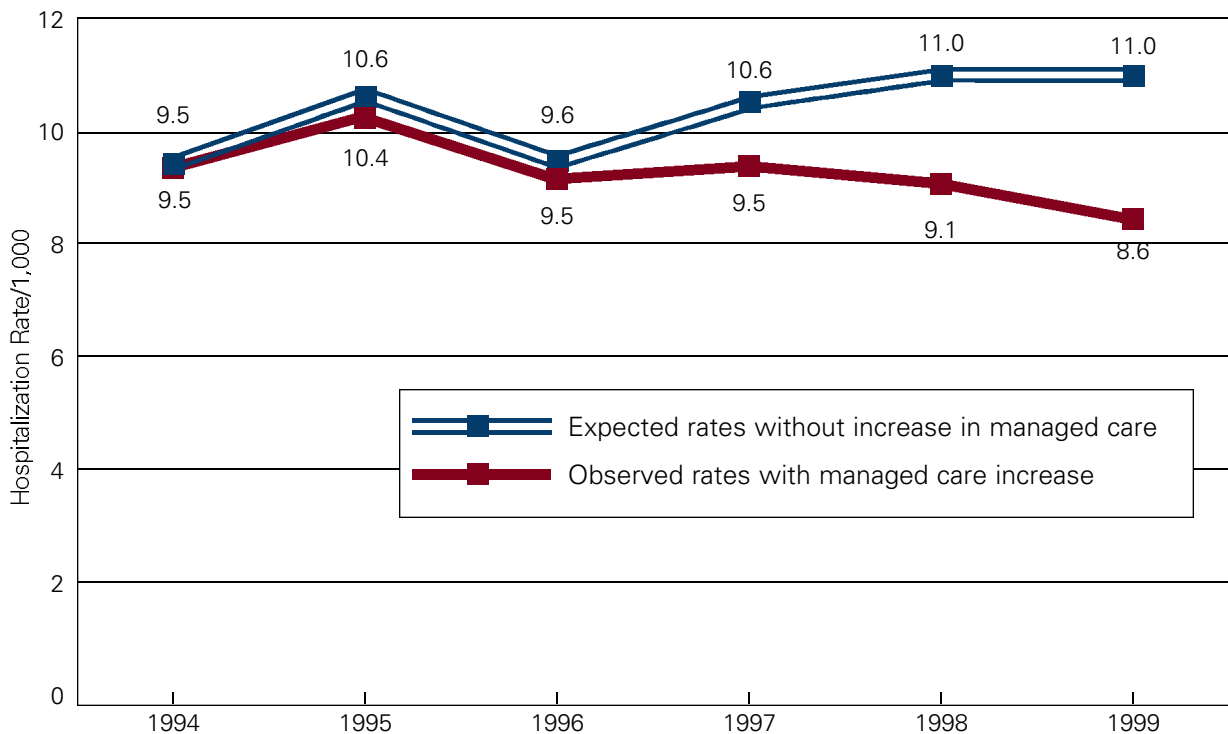
in the eight COHS counties, and most SSI-eligible Medi-Cal beneficiaries who were in managed care lived in those counties.

The Influence of Managed Care

Preventable hospitalization rates for both CalWORKs and SSI beneficiaries were significantly lower among those enrolled in Medi-Cal managed care compared to those enrolled in fee-for-service. From 1994 to 1999, the average annual preventable hospitalization rate for CalWORKs-eligible Medi-Cal beneficiaries was more than a third lower in managed care than in fee-for-service: 7.2 preventable hospitalizations per 1,000 managed care enrollees versus 11.4 per 1,000 for fee-for-service enrollees. Had the penetration of Medi-Cal managed care been held stable at the 28 percent level observed in 1994, the average adjusted annual preventable hospitalization rate would have been expected to

increase, after adjusting for changes over time in beneficiaries' demographics, their county of residence and month of admission. (Figure 4). Instead, with the expansion of Medi-Cal managed care to 78 percent of the CALWORKs-eligible beneficiaries, the observed preventable hospitalization rate actually decreased over time to 8.6 per 1,000 beneficiaries in 1999. In other words, there were 22 percent fewer preventable hospitalizations associated with the growth of Medi-Cal managed care in 1999. Between 1994 and 1999, the growth of Medi-Cal managed care was associated with a reduction of an average of 7,000 hospitalizations per year. The average charge for these preventable hospitalizations was about \$9,500. Thus, the annual reduction of preventable hospitalization charges was more than \$66 million less in Medi-Cal managed care than it would have been in fee-for-service for CalWORKs.

Figure 4: Observed and Expected Average Adjusted* Annual Preventable Hospitalization Rates among Non-Elderly CalWORKs-Eligible Medi-Cal Beneficiaries



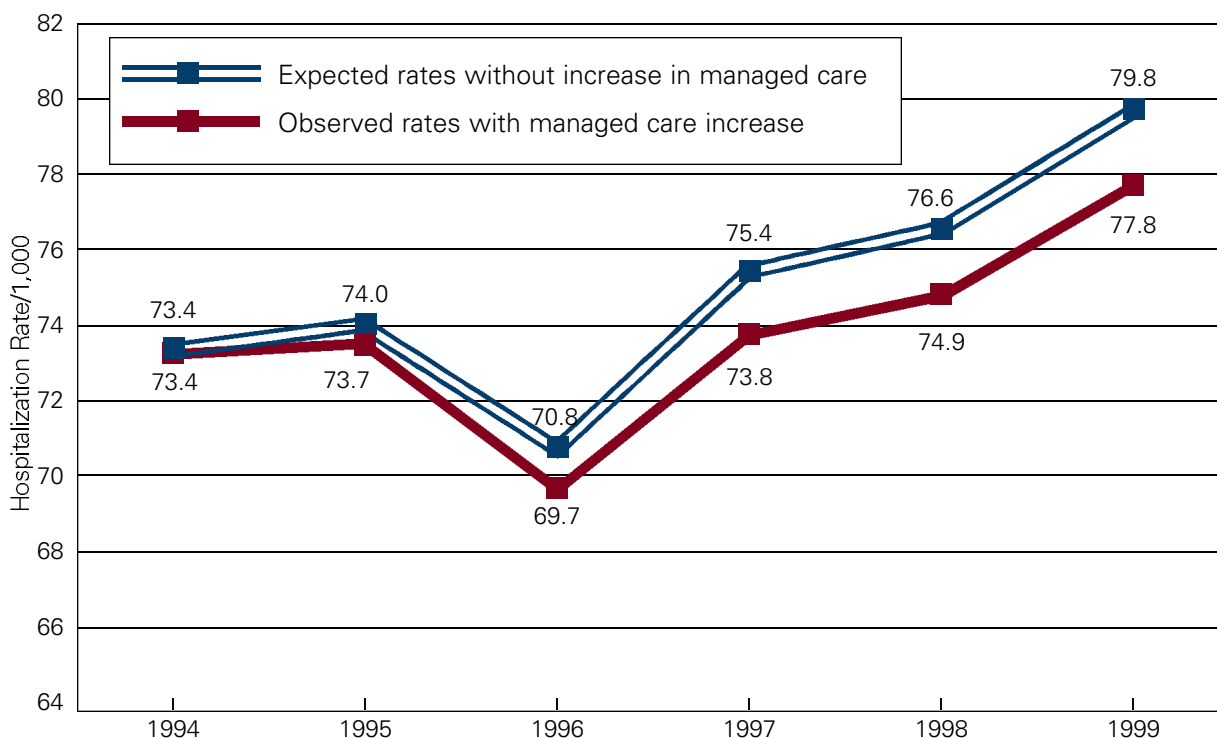
* Age, sex, race/ethnicity, county, and month of admission

Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

Among SSI-eligible Medi-Cal beneficiaries under age 65, the average adjusted annual rate of preventable hospitalization was almost a third higher in fee-for-service than in managed care: 76.4 per 1,000 beneficiaries versus 57.5 per 1,000 beneficiaries, respectively. The difference in admission rates for preventable hospitalizations between Medi-Cal beneficiaries in fee-for-service and managed care was similar for CalWORKs and SSI-eligible beneficiaries in percentage terms, even though the overall admission rate was substantially higher for SSI-eligible beneficiaries.

After adjusting for changes over time in beneficiaries' demographics, their county of residence and their month of admission and holding the penetration of Medi-Cal managed care stable at the 7 percent level observed in 1994, the annual preventable hospitalization rate would have been expected to have increased from 73.4 to 79.8 per 1,000 beneficiaries in 1999 (Figure 5). Instead, with the expansion of Medi-Cal managed care to 18 percent of the SSI-eligible beneficiaries, the observed preventable hospitalization rate actually rose only to 77.8 per 1,000 beneficiaries.

Figure 5: Observed and Expected Adjusted* Average Annual Preventable Hospitalization Rates among Non-Elderly SSI-Eligible Medi-Cal Beneficiaries



* Age, sex, race/ethnicity, county, and month of admission

Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

Medi-Cal Managed Care Models

The California Department of Health Services (DHS) contracts with 22 health plans to serve Medi-Cal beneficiaries. These health plans operate within a managed care system that is built primarily around three different organizing models.

- **Two-Plan Model** Under the Two-Plan Model, DHS contracts with one county-developed health plan, called a Local Initiative, and one commercial plan. Enrollment in the Two-Plan Model is mandatory for the CalWORKs-linked population. Voluntary enrollment of other Medi-Cal beneficiaries is permitted. Eleven health plans participate in the Two-Plan Model, which operates in 12 counties (Alameda, Contra Costa, Fresno, Kern, Los Angeles, Riverside, San Bernardino, San Francisco, San Joaquin, Santa Clara, Stanislaus, and Tulare).
- **Geographic Managed Care Model** The GMC Model allows many different health plans to operate within a designated county, similar to most other states' managed care programs. Beneficiary enrollment in a health plan is mandatory for the CalWORKs-linked population. Other categories of Medi-Cal beneficiaries may voluntarily join these plans. There are two GMC counties (Sacramento and San Diego) with a total of nine participating health plans.
- **County Organized Health System Model** The COHS Model is one in which counties operate a health plan. Counties negotiate their contract with the California Medical Assistance Commission. Enrollment in the COHS is mandatory for virtually the entire Medi-Cal population in that county and occurs concurrently with enrollment in the Medi-Cal. Five COHS plans service eight counties (Orange, Monterey/Santa Cruz, Santa Barbara, San Mateo, and Solano/Napa/Yolo).

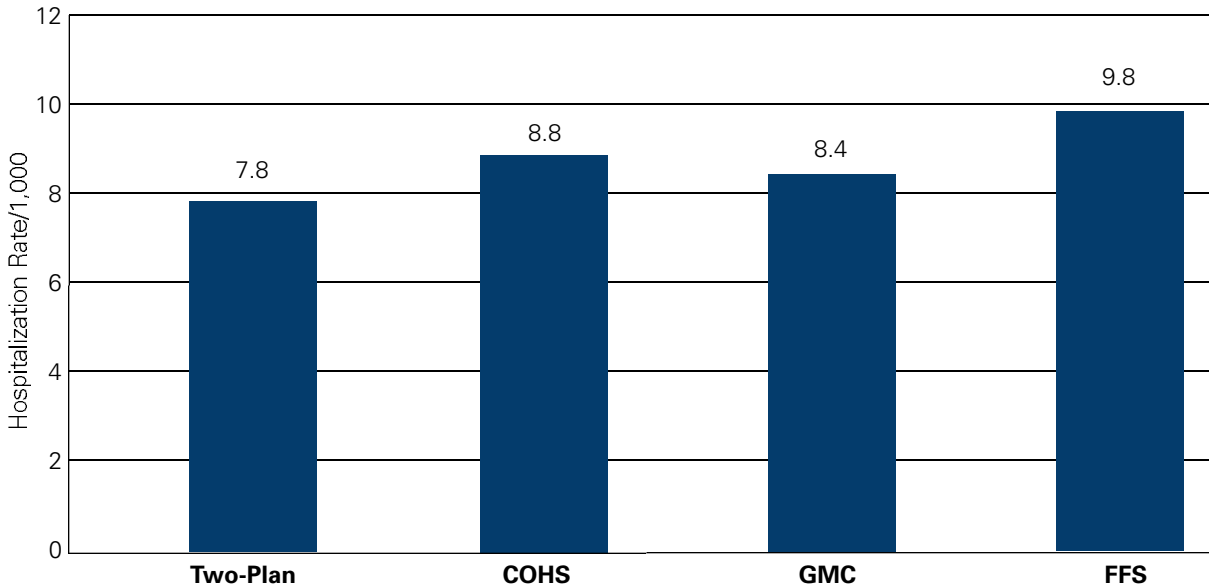
Comparing Managed Care Models

Variation among Models

Among the three types of Medi-Cal managed care models, the Two-Plan Model had the lowest overall rate of preventable hospitalization. Grouping the counties by Medi-Cal managed care model type (Two-Plan, COHS, GMC, or none [see sidebar]) revealed that CalWORKs-eligible Medi-Cal beneficiaries who lived in counties that implemented any of the three main models of Medi-Cal managed care had lower average adjusted annual rates of preventable hospitalizations between 1994 and 1999 than did CalWORKs-eligible Medi-Cal beneficiaries in fee-for-service counties (Figure 6). CalWORKs-eligible Medi-Cal beneficiaries in Two-Plan Model counties had the lowest average adjusted annual preventable hospitalization rates (7.8 per 1,000 beneficiaries), followed by those in GMC (8.4 per 1,000 beneficiaries) and COHS (8.8 per 1,000 beneficiaries) counties. The Two-Plan and GMC county preventable hospitalization rates were significantly lower than that for fee-for-service counties, but the observed difference between COHS counties and fee-for-service was not statistically significant.

CalWORKs-eligible Medi-Cal beneficiaries in managed care may receive that care through either public or commercial health plans depending upon their county's Medi-Cal managed care model type. In COHS counties, all CalWORKs-eligible Medi-Cal beneficiaries receive managed care through a public plan, and in Two-Plan counties they may choose between a local initiative and a commercial plan. Local initiative plans are required to contract with traditional Medi-Cal providers. In most Two-Plan counties, the local initiative plan is a public plan. One argument for the Two-Plan Model was to create competition that might improve managed care plan performance. Among CalWORKs-eligible Medi-Cal beneficiaries in public managed care plans, the average adjusted annual preventable hospitalization rate was lower in Two-Plan counties than

Figure 6: Average Adjusted* Annual Preventable Hospitalization Rates among Non-Elderly CalWORKs-Eligible Medi-Cal Beneficiaries by County Managed Care Model 1994-1999



* Age, sex, race/ethnicity, county, and month of admission

Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

in COHS counties (7.8 versus 8.8 per 1,000 beneficiaries), suggesting that perhaps the competition from the commercial plan exerted some positive effect on the performance of the public plan in Two-Plan counties.

An alternative explanation for the better performance of the public plan in Two-Plan counties compared to COHS counties might be that there was risk selection of healthier CalWORKs-eligible Medi-Cal beneficiaries to the public rather than the commercial plan in the Two-Plan counties. However, one would not expect that healthier beneficiaries would tend to choose a public over a commercial plan, and this hypothesis is also not supported by the finding that commercial plans in Two-Plan counties (which would have received the “sicker” Medi-Cal beneficiaries) also outperformed commercial plans in GMC counties. Taken as a whole, these findings suggest that competition between public and commercial plans has a mutually beneficial effect that is not achieved to the same degree by public plans alone or by having commercial plans in competition with one another. The average adjusted pre-

ventable hospitalization rate among CalWORKs-eligible Medi-Cal beneficiaries was lower in Two-Plan commercial plans (7.6 per 1,000 beneficiaries) than in GMC commercial plans (8.4 per 1,000 beneficiaries).

Variation within Models

During the study period, there was a wide range of variation in hospitalization rates for preventable conditions for CalWORKs-eligible Medi-Cal beneficiaries across counties that mandated Medi-Cal managed care in California, even within counties with the same managed care model. For example, in 1994 the preventable hospitalization rate in Alameda was almost twice that of Tulare (Table 2). In many but not all of the mandatory Medi-Cal managed care counties, the preventable hospitalization rate decreased over time, particularly after the implementation of Medi-Cal managed care. For example, in Los Angeles the admission rate for ambulatory-care-sensitive conditions decreased from 9.9 per 1,000 beneficiaries in 1994 to 7.9 per 1,000 beneficiaries in 1999.

Table 2: Average Adjusted* Annual Preventable Hospitalization Rates among Non-Elderly CalWORKs-Eligible Medi-Cal Beneficiaries by County, Managed Care Model, and Year

County	Managed Care Model	1994	1995	1996	1997	1998	1999
Alameda	Two-Plan	12.7	12.9	11.0 [†]	11.9	13.5	12.6
Butte	None	8.0	9.5	8.6	8.7	6.6	7.6
Calaveras and Amador	None	8.3	11.0	10.5	5.7	5.4	11.6
Contra Costa	Two-Plan	9.2	10.5	9.0	9.0 [†]	9.2	9.2
Del Norte	None	3.7	5.6	5.0	4.3	6.2	8.3
El Dorado	None	6.2	9.6	6.9	7.6	5.0	7.0
Fresno	Two-Plan	8.8	9.3	9.7	8.6 [†]	9.2	8.1
Glenn and Colusa	None	7.3	6.8	5.1	7.3	7.5	10.1
Humboldt	None	11.1	11.3	8.9	11.8	10.3	9.3
Imperial	None	16.9	16.8	13.0	15.7	13.1	14.0
Inyo, Alpine, Mono, and Mariposa	None	7.7	7.8	8.6	7.5	12.7	16.5
Kern	Two-Plan	7.9	8.8	7.8 [†]	8.3	8.1	8.9
Kings	None	11.5	14.2	13.0	15.4	12.7	14.5
Lake	None	6.8	7.2	7.6	8.6	11.7	10.3
Lassen and Modoc	None	12.7	7.5	8.3	11.3	5.9	7.3
Los Angeles	Two-Plan	9.9	10.9	10.3	10.4 [†]	9.2	7.9
Madera	None	10.7	10.8	8.1	8.3	9.6	9.1
Marin	None	7.6	6.9	8.5	6.3	9.4	6.3
Mendocino	None	10.1	10.7	10.9	7.4	9.0	9.0
Merced	None	7.7	9.2	7.0	7.5	6.3	5.4
Monterey	COHS	8.1	9.7	10.0	11.4	9.4	11.3 [†]
Napa	COHS	14.5	6.4	6.9	6.6	7.9 [†]	11.3
Nevada, Sierra, and Plumas	None	13.4	9.5	9.8	11.9	10.2	11.8
Orange	COHS	7.7	8.0 [†]	5.3	5.8	6.4	8.2
Placer	FFS/MC	7.3	8.5	6.3	7.6 [†]	6.9	9.0
Riverside	Two-Plan	13.5	14.8	11.2 [†]	12.5	12.4	12.9
Sacramento	GMC	6.5 [†]	7.4	7.7	6.8	6.7	6.4
San Benito	None	11.3	7.6	7.7	8.5	7.4	3.4
San Bernardino	Two-Plan	11.5	14.3	11.8 [†]	11.7	11.2	11.0
San Diego	GMC	9.2	10.0	8.5	8.7	8.5 [†]	8.1
San Francisco	Two-Plan	12.6	13.7	10.4 [†]	8.5	9.4	10.8
San Joaquin	Two-Plan	7.3	7.2	6.7 [†]	7.2	7.7	7.6
San Luis Obispo	None	7.2	12.2	9.7	7.1	7.9	8.4
San Mateo	COHS	8.1	8.1	7.3	8.4	8.2	9.2
Santa Barbara	COHS	7.4	7.6	6.1	6.4	7.2	5.9
Santa Clara	Two-Plan	9.1	9.3	8.3	8.3 [†]	8.8	7.9
Santa Cruz	COHS	6.8	5.4	5.2 [†]	4.6	5.9	6.3
Shasta	None	9.0	10.1	7.8	8.3	9.6	9.0
Siskiyou and Trinity	None	8.8	10.8	9.8	6.2	8.1	8.3
Solano	COHS	6.8 [†]	7.7	5.2	6.2	7.7	8.1
Sonoma	FFS/MC	6.3	8.1	6.7	5.9 [†]	7.7	8.0
Stanislaus	Two-Plan	7.3	8.5	7.2	7.8 [†]	8.9	7.0
Sutter	None	8.9	13.2	11.8	10.1	9.6	12.3
Tehama	None	7.6	5.0	6.2	5.8	8.6	6.2
Tuolumne	None	7.5	5.4	6.9	6.8	8.0	8.8
Tulare	Two-Plan	6.6	6.9	7.1	7.8	7.7	8.0 [†]
Ventura	None	7.6	8.8	9.3	9.9	10.2	9.1
Yolo	COHS	6.8	7.2	5.9	8.8	7.1	7.1
Yuba	None	8.1	11.4	9.6	9.1	9.7	11.7

Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

Note: All figures represent hospitalization rates per 1,000 beneficiaries.

* Adjusted for age, sex, race/ethnicity, and month of admission

[†] Year county transitioned to mandatory managed care. Counties with no [†] transitioned to mandatory managed care before 1994

Table 3: Average Adjusted* Annual Preventable Hospitalization Rates among Non-Elderly SSI-Eligible Medi-Cal Beneficiaries by County, Managed Care Model, and Year

County	Managed Care Model	1994	1995	1996	1997	1998	1999
Alameda	Two-Plan	76.2	71.8	72.1	76.7	79.7	78.4
Butte	None	53.9	56.9	68.5	55.4	66.0	71.5
Calaveras and Amador	None	62.2	69.4	64.3	58.0	52.8	69.2
Contra Costa	Two-Plan	76.4	74.7	79.4	76.9	82.5	74.5
Del Norte	None	46.3	34.9	44.4	22.1	36.0	40.6
El Dorado	None	54.5	55.8	67.2	54.1	52.0	42.0
Fresno	Two-Plan	58.6	59.9	71.5	60.9	67.8	67.5
Glenn and Colusa	None	66.9	67.0	63.9	48.5	72.3	67.0
Humboldt	None	62.9	48.7	51.7	56.0	63.9	57.5
Imperial	None	65.1	67.5	64.1	80.6	76.3	66.7
Inyo, Alpine, Mono, and Mariposa	None	47.9	59.7	66.6	72.4	63.8	57.2
Kern	Two-Plan	78.5	98.2	84.3	86.1	82.1	78.1
Kings	None	77.0	84.4	98.5	100.7	98.2	98.9
Lake	None	52.8	56.4	41.8	55.7	64.6	46.7
Lassen and Modoc	None	53.4	60.4	49.3	66.7	63.0	48.6
Los Angeles	Two-Plan	96.1	93.8	102.4	100.8	102.2	118.2
Madera	None	52.4	63.6	60.5	57.5	65.3	72.4
Marin	None	37.3	25.8	29.9	35.2	34.8	37.7
Mendocino	None	43.9	63.4	78.7	66.2	66.0	63.4
Merced	None	64.9	80.7	82.6	63.9	61.8	62.9
Monterey	COHS	81.7	72.3	82.4	68.8	75.2	68.52 [†]
Napa	COHS	52.0	48.5	40.6	51.7	40.8 [†]	51.0
Nevada, Sierra, and Plumas	None	67.1	58.4	69.1	91.3	89.4	93.0
Orange	COHS	74.3	66.1 [†]	64.2	64.8	66.6	66.7
Placer	FFS/MC	65.8	58.3	55.9	55.9	51.1	58.2
Riverside	Two-Plan	111.1	97.7	92.4	94.5	89.5	105.9
Sacramento	GMC	55.5	54.8	61.1	53.0	52.5	63.0
San Benito	None	81.7	86.9	68.0	70.5	76.7	54.1
San Bernardino	Two-Plan	101.8	98.2	105.9	105.1	105.7	111.6
San Diego	GMC	73.4	72.9	65.1	62.5	69.3	80.0
San Francisco	Two-Plan	98.2	87.6	81.5	82.2	80.9	90.6
San Joaquin	Two-Plan	63.4	60.9	56.5	57.9	66.8	64.2
San Luis Obispo	None	63.0	59.2	59.3	60.3	56.8	61.8
San Mateo	COHS	61.5	58.0	64.7	56.3	53.9	48.4
Santa Barbara	COHS	56.1	60.1	54.8	56.0	50.8	48.9
Santa Clara	Two-Plan	63.6	70.1	65.2	62.7	62.1	57.9
Santa Cruz	COHS	48.5	54.0	55.3 [†]	43.8	47.6	49.7
Shasta	None	66.8	63.8	63.9	49.7	58.1	61.5
Siskiyou and Trinity	None	48.6	54.6	45.1	55.4	39.1	43.2
Solano	COHS	43.9 [†]	49.9	48.6	45.5	51.7	56.3
Sonoma	FFS/MC	53.6	56.3	50.4	49.1	47.0	54.3
Stanislaus	Two-Plan	70.5	70.5	67.4	68.3	69.9	67.5
Sutter	None	51.8	58.3	88.6	78.4	85.8	81.2
Tehama	None	40.3	49.4	50.1	56.1	61.3	58.4
Tulare	None	73.7	71.4	75.7	76.9	84.8	86.0
Tuolumne	Two-Plan	45.5	44.8	56.2	51.3	47.9	58.3
Ventura	None	62.7	59.4	64.8	75.6	55.5	62.5
Yolo	COHS	75.2	77.4	61.3	62.4	62.0	57.5
Yuba	None	59.7	72.5	81.1	92.1	83.6	88.9

Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

Note: All figures represent hospitalization rates per 1,000 beneficiaries.

* Adjusted for age, sex, race/ethnicity, and month of admission

[†] Year county transitioned to mandatory managed care. Managed care counties with no [†] transitioned to mandatory managed care before 1994

A similarly wide variation occurred among counties in preventable hospitalization rates for SSI-eligible Medi-Cal beneficiaries. For example, in 1994 the average adjusted annual rate in counties ranged from 37.3 per 1,000 beneficiaries in Marin to 111.1 per 1,000 in Riverside (Table 3).

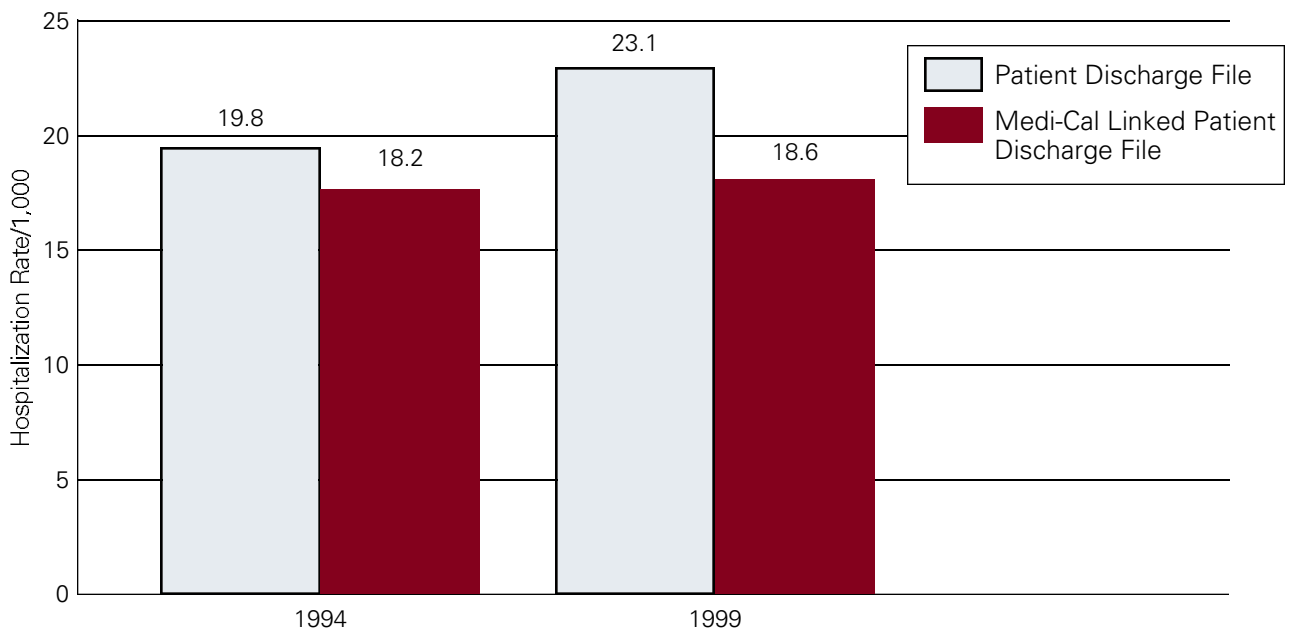
Comparisons by Insurance Type

Results linking lower rates of preventable hospitalizations and managed care in the Medi-Cal program raise the question of how those findings might compare with the experience of people with private insurance, as well as those who have no coverage at all. The availability of a special data set that linked hospital discharge data with Medi-Cal eligibility files made it possible to accurately describe preventable hospitalization rates in the Medi-Cal population over time. Unfortunately, no comparable eligibility files are available for the uninsured and privately insured populations to link with hospital discharge data to permit equally accurate estimates of preventable hospitalizations in these insurance groups.

Nonetheless, it is possible to get a general sense of the magnitude of preventable hospitalization rates across insurance groups by combining counts of preventable hospitalizations by the expected payer source coded in the OSHPD hospital discharge file with the annual estimates from the Current Population Survey of the number of people who are covered by different types of health insurance.

One of the main limitations of this approach is that many uninsured people gain Medi-Cal benefits as a result of a hospitalization. Thus, preventable hospitalization rates for Medi-Cal beneficiaries calculated from routine hospital discharge data—which record the insurance status of the patient only at the time of hospitalization—may be biased upward while those for the uninsured are biased downward. In reality, preventable hospitalizations attributable to Medi-Cal may not be as high as routine hospital discharge data suggest, and those for the uninsured may not be so low. Another source of error is that some Medi-Cal beneficiaries in private managed care plans may be mistakenly categorized as privately insured.

Figure 7: Unadjusted Annual Preventable Hospitalization Rates among Medi-Cal Beneficiaries in 1994 and 1999



Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

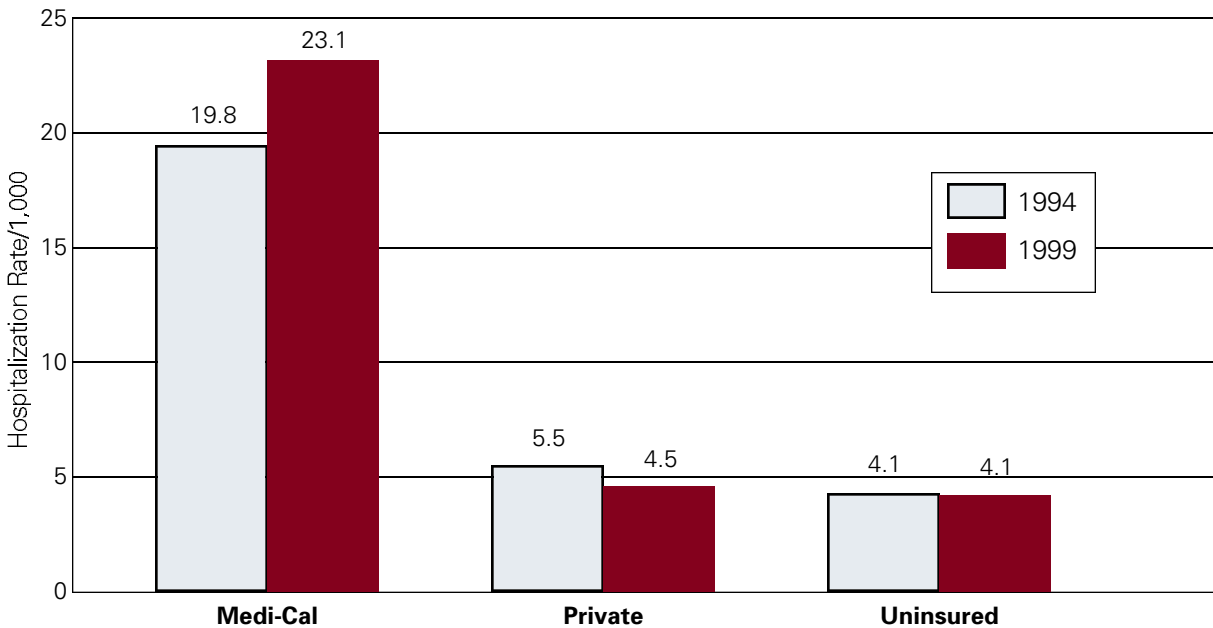
This would result in an underestimate among Medi-Cal beneficiaries and an overestimate among privately insured in their preventable hospitalization rates. Assuming that the linked OSHPD-Medi-Cal data provides the most accurate estimates, the error in Medi-Cal preventable hospitalization rates from routine OSHPD patient discharge data was greater in 1999 than in 1994 (Figure 7). This most likely reflects the growth over time in Medi-Cal managed care and the associated misattribution of Medi-Cal beneficiaries who were in private managed care plans to private insurance.

However, even if one assumes that the Medi-Cal and privately insured preventable hospitalization rates are lower than calculated from routine hospital discharge data, and the uninsured rates are higher, Medi-Cal beneficiaries appear to have a markedly higher rate of preventable hospitalization than individuals in other insurance groups

(Figure 8). For example, the data indicate that in 1994 the preventable hospitalization rates were about four times greater among Medi-Cal beneficiaries than among privately insured people (19.8 versus 5.5 per 1,000) and in 1999 they were more than five times greater (23.1 versus 4.5 per 1,000).

Given the misclassification error for some Medi-Cal managed care beneficiaries in private managed care plans, the true difference between Medi-Cal and privately insured preventable hospitalization rates may be even greater. The calculated differences between privately insured and uninsured preventable hospitalization rates appears to be small, but in reality the expected errors in calculating these rates for privately insured and uninsured people run in opposite directions, making it likely that the uninsured rate is truly higher than it is for those who are privately insured.

Figure 8: Unadjusted Annual Preventable Hospitalization Rates in California for the Non-Elderly, by Insurance Type, in 1994 and 1999



Source: Office of Statewide Health Planning and Development/Department of Health Services 1994-1999

IV. Conclusions

Summary

The rate of preventable hospitalizations among non-elderly beneficiaries was significantly lower in managed care than in fee-for-service. This difference in hospitalization rates between fee-for-service and managed care persists even after controlling for differences in the characteristics of patients and seasonal and secular trends, as well as county effects.

Among the three types of Medi-Cal managed care plans, the Two-Plan Model had the lowest overall rate of preventable hospitalization. Furthermore, the Two-Plan Model achieved this benefit by having lower admission rates for ambulatory-care-sensitive conditions in both the public and commercial plans, compared with the corresponding plans in the other county model types. Some caution should be used in interpreting the performance of the county model types and public and commercial plans because the type of model a county used to implement Medi-Cal managed care was not chosen at random, and unmeasured differences in the counties and their Medi-Cal beneficiaries may have confounded the results.

During the period of the study, there was much greater growth in the use of managed care among Medi-Cal beneficiaries who were CalWORKs-eligible than the SSI-eligible. Although there are fewer observations upon which to draw conclusions, the magnitude of the effect of managed care on lowering hospitalizations for ambulatory-care-sensitive conditions is similar among SSI-eligible beneficiaries as among CalWORKs-eligible beneficiaries in percentage terms. Because SSI-eligible beneficiaries are hospitalized at much higher rates than CalWORKs-eligible beneficiaries, many more Medi-Cal patients would be eligible for the potential health and utilization benefits of managed care if this program were further expanded among SSI-eligible beneficiaries. However, because SSI-eligible beneficiaries are a particularly vulnerable segment of the Medi-Cal population, appropriate standards and effective oversight would be necessary to ensure that these potential improvements were achieved and that unintended consequences were avoided if managed care were expanded for this population.

Medi-Cal beneficiaries have substantially higher rates of preventable hospitalization than do privately insured Californians and those without insurance. In 1999, one in nine Californians under the age of 65 was insured by Medi-Cal, yet more than one in three admissions for preventable conditions that year were for Medi-Cal beneficiaries. The higher rate of preventable hospitalizations for ambulatory-care-sensitive conditions among Medi-Cal beneficiaries is consistent with the high rate of California physicians who report they are unwilling to care for Medi-Cal patients, and Medi-Cal beneficiaries who report difficulties finding a doctor who will care for them. However, direct comparisons of the preventable hospitalization rates between Medi-Cal beneficiaries and either those with private insurance or the uninsured must be interpreted with caution. One reason is that many uninsured patients become covered by Medi-Cal when they are hospitalized, including some who were eligible for Medi-Cal before their hospitalization but were not enrolled. A second reason is that, particularly for adults, eligibility for Medi-Cal is linked to having a health condition. Thus, the lower preventable hospitalization rate for the uninsured compared to those in Medi-Cal is probably not the result of better health care service delivery to the uninsured but rather of Medi-Cal beneficiaries having poorer health. The annual Current Population Survey used to determine the size of the population in each insurance group at-risk for a preventable hospitalization does not provide information about patients' health status.

Discussion

The requirement of a primary care physician in Medi-Cal managed care may have contributed to the lower rates of preventable hospitalizations. Medicaid beneficiaries in other states have reported an increase in having a regular source of care after the implementation of Medicaid managed care.⁹⁻¹¹ There is no guarantee of access to primary care for Medi-Cal beneficiaries who receive their care through the fee-for-service system. In addition to requiring a regular source of care, Medi-Cal managed care plans have also sought to improve access to and quality of care by paying physicians above fee-for-service rates and by incorporating disease- and case-management strategies into their approach to health care delivery.¹²

One alternative explanation for the study's findings is that Medi-Cal managed care beneficiaries are healthier and therefore less in need of hospitalization than Medi-Cal fee-for-service beneficiaries. This study design makes that explanation unlikely. First, unlike most reported evaluations of Medicaid managed care, this study separated Medi-Cal beneficiaries by eligibility category, which provides somewhat of a proxy for patient health status. Second, most growth in Medi-Cal managed care was in mandatory managed care programs that would not be subject to selection bias.

Another interpretation of this study's findings is that the reduced rate of preventable hospitalizations in Medi-Cal managed care represents a decline in beneficiaries' access to hospital care. The hospital discharge records used in this study do not permit us to determine whether a higher admission threshold was applied to Medi-Cal managed care patients than to fee-for-service patients in California emergency rooms (through which the overwhelming majority of admissions for ambulatory-care-sensitive conditions occur). However, a national study of emergency departments did not find differences in admitting practices by patients' insurance status or race.¹³

The lower rate of preventable hospitalizations for Medi-Cal beneficiaries in managed care compared with fee-for-service suggests that the financing and organization of Medi-Cal is associated with beneficiaries' use of services. Judging by the reduction in preventable hospitalizations, the requirement of a regular source of care for Medi-Cal beneficiaries in managed care is associated with improvements in these patients' access to ambulatory care and health status. Nonetheless, even with the recent growth of Medi-Cal managed care, hospitalization rates for ambulatory-care-sensitive conditions remain much higher for the Medi-Cal population than the privately insured population. Although the difference in the health status of patients in different insurance groups most likely explains much of the difference, it would appear that there is an enormous opportunity for Medi-Cal to reduce hospital use and expenditures by expanding the access to and quality of ambulatory care.

Appendix: Methodology

TO CONDUCT DETAILED ANALYSES OF PREVENTABLE hospitalization rates for different groups of Medi-Cal beneficiaries, the annual California hospital discharge data available from the California Office of Statewide Health Planning and Development (OSHPD) was linked with the Medi-Cal eligibility files from the California Department of Health Services (DHS). The annual California hospital discharge record includes information about admission month and year, patient demographics, and diagnosis and procedure codes. This file also contains a field indicating the expected source of payment. By linking the information available in the annual California hospital discharge file with that available from DHS, it was possible to enhance the accuracy of whether a hospitalized individual was in fact a Medi-Cal beneficiary and to capture additional information for the entire year on patients' month-by-month Medi-Cal enrollment status, aid category, and health plan (where applicable).

These data elements combined with DHS-supplied information on the date in which a California county implemented mandatory Medi-Cal managed care enabled us to classify each hospitalization as occurring for a Medi-Cal beneficiary in fee-for-service or managed care as well as Medi-Cal beneficiaries under the COHS, GMC, and Two-Plan models of managed care. To correct for out-of-state hospitalizations of California residents, hospitalizations in states that border California were searched for patients with California ZIP codes in Oregon, Arizona, and Nevada hospital discharge abstracts records for the same time period. Preventable hospitalizations of California residents in these three states totaled to less than 0.2 percent of such hospitalizations within California.

Because this analysis used hospitalizations as an indicator of ambulatory care prior to the hospitalization, only those Medi-Cal hospitalizations in which an individual had Medi-Cal coverage in the month before hospitalization were counted. In this way, misclassification of an uninsured individual who gained Medi-Cal as a result of the hospitalization was avoided. However, this approach required that January admissions be excluded from the analysis because information about an individual's Medi-Cal eligi-

bility was available only for the calendar year, and it was not possible to determine whether someone with a January admission was a Medi-Cal beneficiary in the previous December. Also because the hospitalization discharge and enrollment files were linked to a calendar year, it was not possible to accurately calculate admission rates for hospital admissions that resulted in discharges in a different calendar year. Less than 1 percent of admissions had discharges in a subsequent year, and these were excluded from the analysis.

Data about number, demographics, eligibility category, and health plan type of the entire Medi-Cal population (not just those hospitalized) were obtained from the DHS Medi-Cal Monthly Eligibility File. The enrollment files for years prior to 1996 contained information only as of the first month of a quarter (January, April, July, and October). A linear interpolation method was used to obtain the estimates for the other eight months of those years.

A commonly accepted list of conditions defined with diagnostic codes for children and adults was used to calculate the number of preventable hospitalizations for Medi-Cal beneficiaries (Table 4).^{14,15} These codes generally rely on the primary diagnosis.

The analysis was limited to individuals who were younger than 65 because older individuals were likely to also have Medicare insurance. The analysis of preventable hospitalization rates among Medi-Cal beneficiaries included those who are eligible for both Medi-Cal and Medicare. These dually eligible patients accounted for 45 percent of non-elderly SSI-linked Medi-Cal beneficiaries. For these Medi-Cal beneficiaries, Medicare was the primary payer for hospital and ambulatory care services.

Recognizing that Medi-Cal eligibility categories reflect differences in beneficiaries' health status and that most growth in Medi-Cal managed care was among low-income women and children

who receive benefits through CalWORKs, preventable hospitalization rates for Medi-Cal beneficiaries who were eligible through CalWORKs versus the SSI program were analyzed separately. The numerator of the rate was the count of hospitalizations for the specified conditions in a given month. The denominator population for calculating the admission rate for each Medi-Cal delivery model was obtained from the Medi-Cal Monthly Eligibility File.

Also, recognizing that non-randomly distributed patient and county characteristics could confound our results, multivariate Poisson regression analysis was used to model the monthly preventable hospitalization rate as a function of the Medi-Cal delivery model (fee-for-service versus managed care or Two-Plan, COHS, GMC versus fee-for-service) controlling for admission month, admission year, patient age (0–17 versus 18–64 years), sex, race/ethnicity (African American, Asian and Pacific Islander, Hispanic, Non-Hispanic White, and Other), and county of residence. The use of an appropriate scale factor corrected for any remaining over-dispersion in our model.¹⁶ The independent variables were captured for each discharge and then aggregated to obtain the number of preventable hospitalizations for groups with each combination of characteristics. Such an approach can accommodate changes in individual characteristics over time, such as type of health plan held by a beneficiary as managed care or fee-for-service. Because the data from out of state admissions did not include information about Medi-Cal eligibility category, these were not included in the multivariate model. The denominator population for calculating the admission rate was obtained from the Medi-Cal Monthly Eligibility File, which had detailed information about each of the independent variables. The coefficient estimates from the Poisson regression model were used to obtain predicted rates standardized for differences in group composition.

To facilitate comparison of preventable hospitalization rates from different data sources, monthly admission rates were converted to annual rates. All comparisons highlighted in the text of the report are significant at least to the $p < .05$ level.

Table 4: Ambulatory-Care-Sensitive Conditions and ICD-9 Codes

Description	ICD-9 Code
Angina	4111, 4118, 413 Excludes cases with procedure codes [01-86.99]
Asthma	493
Bacterial pneumonia	481 4821, 4823, 4829, 483, 485-486 Excludes patients younger than 2 months and cases with secondary diagnosis of sickle cell [2826]
Bronchitis	4660 only if secondary diagnosis is 491, 492, 494, or 496
Cellulites	681, 682, 683, 686 Excludes cases with any procedure codes except 860 where it is the only procedure
Congenital syphilis	090 (secondary diagnosis for newborn only)
Congestive heart failure	428, 40201, 40211, 40291, 5184
COPD	491, 492, 494, 496, 492, 494, 496
Dehydration	2765
Dental condition	521-523, 525, 528
Diabetes	2500, 2501, 2502, 2503, 2508, 2509
Failure to thrive	7834
Gastroenteritis	5589
Grand mal seizure disorders	7803, 345
Hypertension	4010, 4019, 40200, 40210, 40290 Excludes cases with procedures 36.01, 36.02, 36.05, 36.1, 37.5, 37.7
Hypoglycemia	2512
Immunization preventable conditions (ages 1 to 5)	033, 390, 391, 037, 045, 3200 3202
Iron deficiency anemia (age less than 5 years)	2801, 2808, 2809
Kidney and urinary tract infection	590, 5990, 5999
Nutritional deficiency	260-262, 2680-2681
Pelvic inflammatory disease (women only)	614 (cases with surgical procedure of hysterectomy 683-688 excluded)
Ruptured appendix	5400-5401
Severe ENT infection	382 (excludes cases with procedure code 2001), 462, 463, 465, 4721
Skin graft with cellulites	DRG 263, 264 (excludes admission from SNF)
Tuberculosis	011-018

Endnotes

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