



## MANAGED CARE FOR THE MEDICAID DISABLED: EFFECT ON UTILIZATION AND COSTS

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**ABSTRACT** The objective of this study was to describe the effect on health care utilization and costs of a program of managed care for the Medicaid disabled. The study was designed as a pre/post enrollment cohort comparison and was carried out in three Ohio counties. The subjects were disabled Medicaid-insured patients who voluntarily enrolled in a managed care program for at least 6 months between July 1, 1995 and December 31, 1997, and who had (1) at least one Medicaid claim in the 24-months pre-enrollment period and (2) overall satisfactory postenrollment encounter-level data. Ohio Medicaid provided claims and reimbursements (costs) for the pre-enrollment period and encounter-level data for the postenrollment period. Postenrollment costs were estimated by applying category-specific average pre-enrollment costs to postenrollment utilization data. We measured the following per patient-month: (1) trends in category-specific utilization and costs for up to 24 months before and after enrollment, (2) differences in overall and category-specific costs 1 year before and after enrollment, and (3) changes in the distribution of services 1 year before and after enrollment. Utilization categories included inpatient care, outpatient hospital (including emergency department) care, physician services, prescription medications, durable medical equipment and supplies, and home health care. We found that satisfactory encounter data were available in two of three counties. Of 1,179 enrollees, 592 met all inclusion criteria. Before enrollment, utilization and costs were increasing significantly in four of six categories and were unchanging in two. Postenrollment, decreasing utilization was observed for three categories, one remained unchanged, and two were increasing, but from a lower "baseline." Except for physician services and home health care, there were lower utilization and estimated costs in all categories in the year after enrollment.

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Estimated inpatient and total costs declined by \$155/patient-month (44.9%) and \$210/patient-month (37.1%), respectively. Findings were similar across sites. Inpatient care, outpatient hospital care, and prescription medications accounted for 97% of the reductions in estimated costs in the postenrollment period. Among patients voluntarily enrolled for at least 6 months, managed care for the Medicaid disabled was associated with striking decreases in health care utilization and estimated costs. The effect of managed care on these patients' satisfaction, access to specialized services, quality of care, and health outcomes are understood incompletely.

**KEY WORDS** Costs, Disability, Health care utilization, Managed care, Medicaid, Outcomes.

### INTRODUCTION

The dramatic recent increase in programs of managed care for Medicaid patients has occurred within the numerically largest group of beneficiaries, those eligible through Aid for Dependent Children/Temporary Aid for Needy Families (ADC/TANF). Nonetheless, about 70% of Medicaid costs reside within the much smaller populations of aged persons and those with chronic illnesses or disabilities.<sup>1,2</sup> Despite great state interest in undertaking programs of managed care for these populations, however, very little is known about the impact of these programs on enrollees' access to care (especially specialized services), quality of care, or utilization and costs.<sup>1-3</sup> Because of this uncertainty, most states have elected to retain these groups in fee-for-service Medicaid.<sup>1,2</sup> Others have embarked on a wide variety of managed care systems that differ greatly in fundamental program elements, including the groups of eligible individuals who are covered, whether enrollment is voluntary or mandatory, methods for rate setting, and the nature of financial risk sharing between the states and their contractually linked managed care organizations and providers. Further, while managed care organizations initially were cautiously optimistic about engaging in Medicaid managed care in general, their recent reversals of fortune<sup>4</sup> have created a reluctant market, especially in the much higher cost and higher risk populations of persons with chronic illnesses and disabilities.

Given this programmatic variation and paucity of evidence, an assessment of the impact of managed care for these groups is quite difficult, and states have been ambivalent about embarking aggressively in this arena.<sup>2</sup> Consequently, a cautious approach adopted by several states has been to implement managed care for the disabled on a voluntary basis, permitting patients to remain in the fee-for-service sector or to enroll in managed care and to attempt incremental assessments that can guide future program changes.<sup>5</sup>

Two factors make the evaluation of voluntary programs especially challenging. First, because disabled patients frequently have established relationships with providers that they are reluctant to sever, voluntary programs of managed care

are especially vulnerable to small and biased enrollment.<sup>6</sup> It may be difficult under these circumstances even to establish confident estimates of health care utilization at a meaningful level, such as rates of hospitalization or use of durable medical supplies (wheelchairs, home oxygen, etc.), among relevant subgroups. It is far more challenging still to judge whether the observed utilization would have been different under a different system of care. Assessments of program impact on quality of care and access to care are similarly, if not even more, complex. Second, because current risk-adjustment systems are limited for predicting the trajectory of future utilization and costs in these populations,<sup>3,7</sup> it is difficult to accurately compare observed with predicted use and costs, another accepted approach to estimating program effect.

Compounding these measurement challenges is the historic absence of reportable encounter-level data from health maintenance organizations, which has been carried forward into the recent era of managed care.<sup>3</sup> While strides have been made in creating minimal data requirements for the purpose of assessing certain elements of quality of care,<sup>3</sup> few states require and enforce the provision of uniform, accurate, and detailed claims-level data in their contracts with managed care organizations.<sup>3</sup> Without such data, evidence regarding the effect of managed care necessarily will be limited.

In 1994, under the auspices of the Medicaid Working Group, along with three other states, Ohio initiated a voluntary demonstration program of managed care for noninstitutionalized chronically ill and disabled Medicaid patients in three large urban counties. One provider-managed care organization pair was selected to participate in each county. Rate setting was guided by a published system,<sup>8,9</sup> and financial risk to participants was limited by the establishment of a specific form of risk sharing.<sup>9</sup> A case management system of patient care was required of providers, although the specific approaches to case management, as well as utilization review procedures, were left to the discretion of the provider and insurance organizations in each county. As an element of each managed care organization's contract, Ohio Medicaid required the reporting of detailed encounter-level data for all enrollees. The first patients enrolled in the program in May 1995. This report summarizes the effect of managed care on enrollees' utilization and costs during the first 31 months of the program.

## **METHODS**

### **OVERALL DESIGN AND DATA SOURCES**

This investigation is a matched pre-enrollment/postenrollment study of changes in utilization and costs associated with enrollment in a voluntary program of

managed care for the Medicaid disabled in three Ohio counties between May 1, 1995, and December 31, 1997. We hypothesized a priori that enrollment in managed care would be associated with lower overall utilization and costs, and that there would be a change in the distribution of utilization by enrollees, with a preferential reduction in the most resource-intensive services.

We used Medicaid claims data to identify all pre-enrollment utilization and costs and to estimate average costs of services in six exclusive categories of health care services: (1) inpatient hospital care, (2) outpatient hospital (which included emergency department) care, (3) physician services, (4) prescription medications, (5) durable medical equipment and supplies, and (6) home health care. Medicaid reimbursements were used to measure program costs.

We used Ohio Medicaid's enrollment files, along with encounter-level data provided to the state by the managed care organizations, to identify enrollment dates and patients' utilization while they were enrolled. Provider organizations (such as hospitals, clinics, and emergency departments) and group practices used customary procedures in this traditionally fee-for-service population to submit claims, called "pseudoclaims" within the program, to the relevant managed care company in their counties. Managed care identifiers for these pseudoclaims facilitated patient encounter-level reporting of utilization activity by the insurance company, analogous to conventional submission of claims. Subcontracts to the managed care company guided claims submission for home health care services, prescription medications, and durable medical equipment and supplies. All post-enrollment utilization was classified by Ohio Medicaid into utilization categories, including the six categories identified above. Costs for the postenrollment period were estimated by multiplying the average category-specific cost per claim (of enrollees) from the pre-enrollment period by the number of category-specific claims in the postenrollment period. Using prescription-level data and relevant National Drug Codes (NDC), separate analyses were undertaken to examine changes in prescription medication use (see Cost Analyses and Assumptions, below).

#### **STUDY COHORT**

Both children and adults under the age of 65 who resided in one of three urban Ohio counties could enroll in Ohio's program of managed care for the Medicaid disabled. To be eligible, the person must have been classified as disabled by the Ohio Department of Human Services; not dually eligible for Medicare, a Medicaid waiver program, or spend-down; have had no inpatient or outpatient claim with a principal diagnosis of psychosis or any diagnosis of mental retardation; and have

no Medicaid claim for an intermediate care facility for the mentally retarded or a nursing home. Details of the population are reported elsewhere.<sup>6,7</sup> We included all patients with at least 6 months of managed care enrollment in three urban Ohio counties between May 1, 1995, and December 31, 1997, who also had (1) at least one Medicaid claim in the 24-month pre-enrollment period; and (2) overall satisfactory postenrollment encounter-level data, as judged by preliminary analyses of the pseudoclaims. We included only patients with at least 6 months of postenrollment data because of evidence that the managed care "effect" on utilization requires at least this long to become evident. We excluded patients without at least one claim in the postenrollment period to avoid finding a falsely positive change that might result from under-reporting of utilization at the individual level (for whatever reason) in the postenrollment period.

#### ANALYSES

*Cohort description* Simple descriptive statistics were used to characterize the study cohort, including its demographic characteristics, duration of enrollment, and duration of pre-enrollment data available; to compare pre-enrollment features of cohort enrollees who had pseudoclaims with enrollees who did not; and to compare characteristics of the study cohort with enrollees who were excluded. Because demographic data were unavailable for noncohort subjects who lacked fee-for-service claims in the pre-enrollment period (N = 52; see Table I), these patients also were excluded from the comparisons of the cohort subjects with enrollees who were excluded.

*Effect of managed care on utilization and costs* We examined the effect of managed care on utilization and costs in three ways. First, we examined trends in utilization for the pre-enrollment period and for the postenrollment period. Separate analyses were conducted for each category of service, expressed as claims and as dollar costs. For these analyses, linear regression was used, with the utilization

**TABLE I** Study Cohort and Hierarchical Exclusions

Total enrollees	1,179
Exclusions	
No fee-for-service claims	52
Unsatisfactory postenrollment data	167
Enrolled less than 6 months	331
No postenrollment claims	37
Total	587
Cohort = Total enrollees - Exclusions	592

for each month regressed on total utilization (claims or costs). Each month was entered as a dummy variable in the regression models. The analyses examined time trends in claims or costs in a particular category per patient-month for up to 24 months in the pre-enrollment period and up to 24 months in the postenrollment period. Results are summarized as reflecting utilization that is increasing, unchanging, or decreasing, depending on whether the slope of the associated regression line was significantly greater than, no different from, or less than zero. Similar trend analyses were undertaken for total costs, which were simply the sum of costs associated with claims in all utilization categories.

Second, we computed differences in utilization and costs per patient-month for all eligible cohort patients during the 12 months before and after their enrollment. For these analyses, we used paired *t* tests and a two-sided hypothesis to test for significance of differences in the number of claims and in costs per patient-month. We also conducted similar analyses stratified by site and compared differences across sites in claims and costs, including total costs.

Finally, we estimated the effect of managed care on the distribution of utilization of health care services. To do this, we determined the proportion of total measured costs in the pre-enrollment period represented by each category of service (as measured per patient-month), and we compared that proportion with the analogous proportion in the postenrollment period.

*Cost analyses and assumptions* Costs for the postenrollment period were estimated by multiplying the category-specific average cost per claim from the pre-enrollment period by the number of category-specific claims in the postenrollment period. Category-specific average costs were calculated by dividing the total category-specific Medicaid reimbursements for our cohort's users of a given service over their 12 months before enrollment in managed care by the number of pre-enrollment claims for that category of service.

The validity of this method rests on the assumption that the within-category nature and intensity of resources used per claim remained similar before and after enrollment in managed care. This may not be true of hospitalization-related claims, for example, if the average resources used per hospital admission (e.g., length of stay) changed from the pre-enrollment to the postenrollment period or, relative to durable medical equipment, if arrangements with equipment suppliers under managed care were accompanied by lower average costs per claim. In each of these illustrations, there may be reasons to expect a reduction in the average cost (e.g., resources consumed) per claim in managed care and thus bias in our results toward underestimating cost reductions. However, there may have

been competing forces leading to increased intensity of resource use per claim in managed care, for example, as a result of shifting of care to the outpatient setting or reserving hospital care for generally sicker patients as compared to the pre-enrollment period. With the exception of the use of prescription medications, described below, we largely were unable to test these hypotheses with the available data.

With regard to claims for prescription medications, we hypothesized that policies established by the managed care organizations could affect the average cost per claim in two competing ways. By instituting formulary policies and obtaining medications from lower cost suppliers, it is possible that less-expensive medications might be used as substitutes for more expensive medications, with a change in the direction of lower actual costs per claim. We were unable to test this hypothesis, which would lead our analyses to bias our findings toward underestimating any drug-related cost savings under managed care. The second relevant policy related to the ability of providers under managed care to write prescriptions providing up to a 3-month supply of medications, as contrasted to the 1-month supply allowable under fee-for-service Medicaid in the pre-enrollment period. Thus, since each prescription represents a "claim," the formulary-related savings hypothesized above theoretically might be offset (at the level of cost per claim) if providers wrote prescriptions with more pills per prescription under managed care. We examined this hypothesis by obtaining the actual drug claims submitted by the host managed care organizations and determining the number of pills per prescription for the most common medications used in both the pre-enrollment and postenrollment periods. Specifically, using NDC, we rank-ordered the frequency of pre-enrollment medications that also were used during the postenrollment period, determined the number of pills per NDC-specific claim in both periods, and compared the frequencies of pills per claim before and after enrollment. The results provided little evidence for systematic increases in the duration of medication supplies prescribed in the postenrollment period (data available from the authors).

## RESULTS

### STUDY SAMPLE AND RESULTS PERTAINING TO DATA VALIDITY

Of 1,179 disabled Medicaid patients who enrolled at any point in any county between May 1, 1995, and December 31, 1997, there were 592 who met our inclusion criteria. Our hierarchical exclusions are identified in Table I. We excluded all patients enrolled in one county because of incomplete reporting of encounter data by the responsible managed care organization. In this county,

managed care claims were commingled with other Medicaid claims submitted to the state. Altogether, 167 (14.2%) of the patients were excluded due to unsatisfactory encounter-level data from this county. The largest category of exclusions (N = 331, 28.1%) was related to short (less than 6 months) enrollment in managed care.

Although 194 potentially eligible enrollees had no documented postenrollment encounter data, only 37 were excluded solely for this reason. We excluded these 194 patients to avoid reporting a spuriously high decrease in claims following enrollment because of concerns that they could have had unreported encounters during managed care. We nonetheless examined this possibility as well as the alternative explanation that these patients had historically low utilization and therefore plausibly had no encounters during their enrollment in managed care. To examine these possibilities, we compared the pre-enrollment utilization and costs of enrollees who did (N = 933) or did not (N = 194) have postenrollment claims data by category of utilization. In general, as shown in Table II, those

**TABLE II** Excluded Patients: Comparison of Pre-enrollment Year's Claims and Costs per Patient-Month Among Enrollees With or Without Claims After Enrollment

Utilization Category	Patients with Postenrollment Claims, N = 933	Patients Without Postenrollment Claims, N = 194	P
<b>Inpatient care</b>			
Claims	0.07	0.03	.0003
Costs, \$	345	383	.85
<b>Outpatient hospital</b>			
Claims	0.77	0.33	.0001
Costs, \$	90	32	.0001
<b>Physician services</b>			
Claims	1.12	0.59	.0001
Costs, \$	63	30	.006
<b>Prescription medications</b>			
Claims	2.51	1.01	.0001
Costs, \$	74	28	.0001
<b>Durable medical equipment</b>			
Claims	0.19	0.13	.34
Costs, \$	19	6	.0001
<b>Home health care</b>			
Claims	0.02	0.01	.028
Costs, \$	4.9	5.5	.89
Total costs, \$	596	485	.60



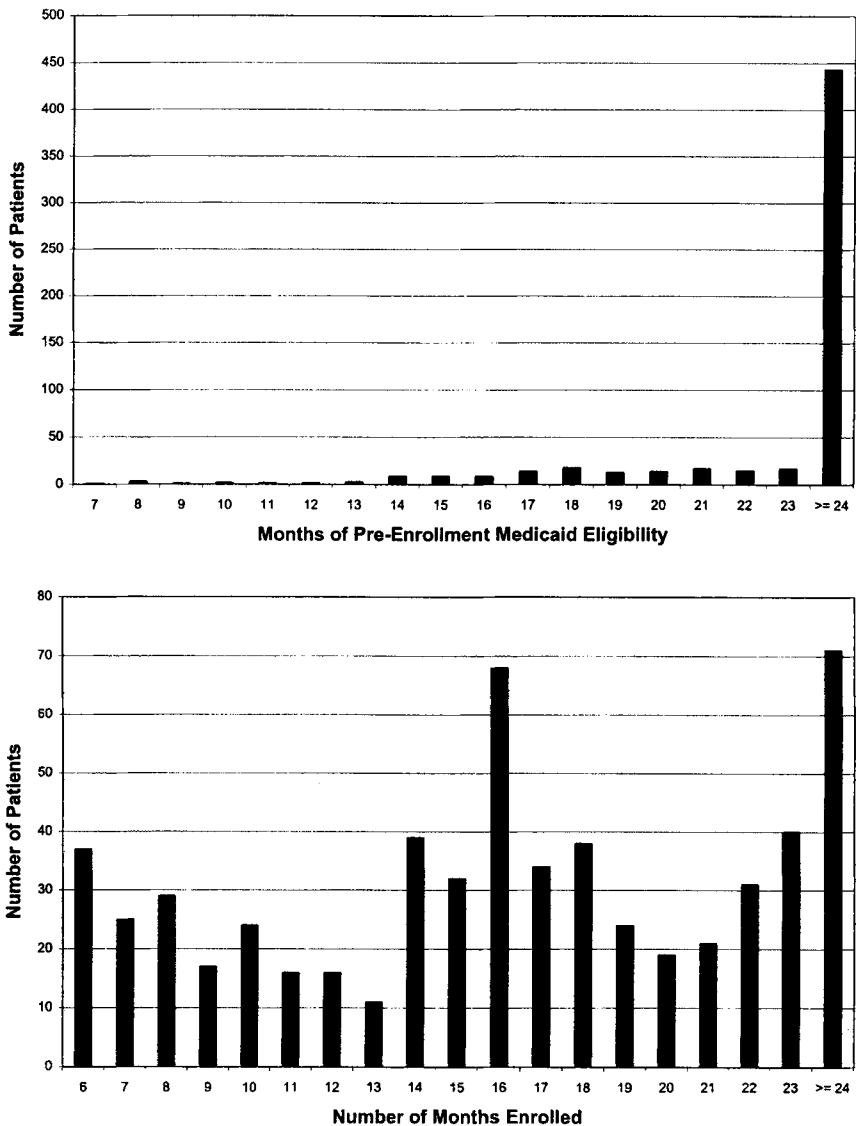
**TABLE III** Comparison of Cohort and Noncohort Subjects: Demographics and Pre-enrollment Year's Claims and Costs per Patient-Month (pt-month)

Characteristic	Cohort Subjects, N = 592	Non-Cohort Subjects, N = 535	P
<b>Demographics</b>			
Mean age (SD)	28.2 yrs (19.1)	29.3 yrs (19.2)	.31
Female, %	58.1	60.2	.48
Non-white, %	55.9	61.9	.26
<b>Inpatient care</b>			
Claims/pt-month	0.07	0.06	.32
Costs, \$/pt-month	345	359	.88
<b>Outpatient hospital</b>			
Claims/pt-month	0.77	0.62	.01
Costs, \$/pt-month	88	71	.04
<b>Physician services</b>			
Claims/pt-month	1.07	1.0	.31
Costs, \$/pt-month	53	62	.60
<b>Prescription medicines</b>			
Claims/pt-month	2.3	2.2	.60
Costs, \$/pt-month	60	73	.18
<b>Durable medical equipment</b>			
Claims/pt-month	0.17	0.19	.68
Costs, \$/pt-month	18	15	.54
<b>Home health care</b>			
Claims/pt-month	0.02	0.03	.33
Costs, \$/pt-month	3	8	.08
Total costs, \$/pt-mo	566	588	.84

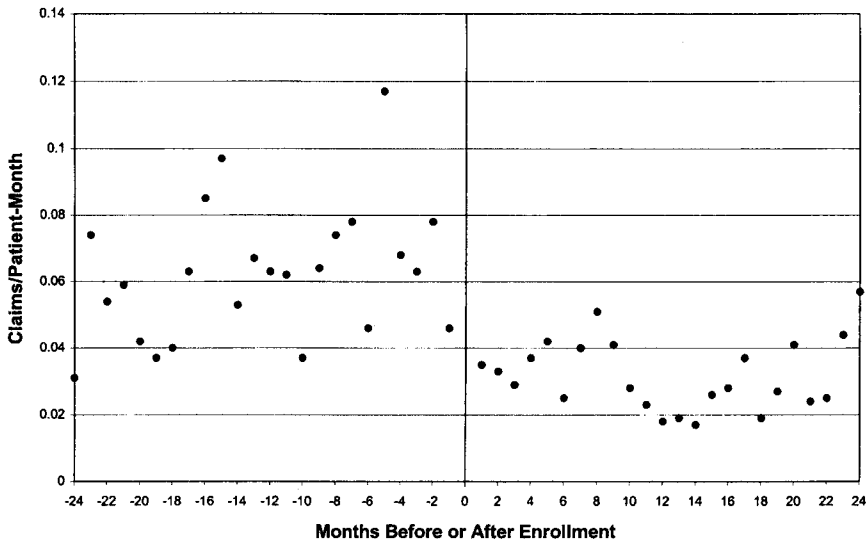
patients without postenrollment claims had historically low overall utilization in virtually all service categories, whether measured by numbers of claims per month or by the costs associated with those claims. Thus, although it seems quite possible that they had no postenrollment encounters, we elected to exclude them and assume a more conservative analysis.

We next examined the representativeness of our cohort to all enrollees. Table III compares the pre-enrollment utilization, costs, and demographics of our study cohort (N = 592) with excluded enrollees (N = 535). Although cohort patients appeared to have higher utilization rates and costs associated with pre-enrollment year outpatient hospital care, the cohort otherwise appeared fairly representative of enrollees. The average age of the cohort was 28.2 years (range 0–64 years), 344 (58%) were female, and 331 (56%) were non-white (Table III). Details of enrollees according to pre-enrollment utilization, cost, and distribution of chronic conditions is described elsewhere.<sup>6</sup>

Figure 1a displays the duration of pre-enrollment Medicaid eligibility of the study cohort; Figure 1b summarizes the cohort's duration of enrollment in managed care. Three-quarters of cohort patients were Medicaid eligible for at least 2 years prior to their enrollment in the managed care program for the disabled. Duration of their enrollment ranged from 6 months for 6% of patients (according to the inclusion criteria for these analyses, none of the cohort was enrolled for less than 6 months), to over 2 years for 12% of patients.



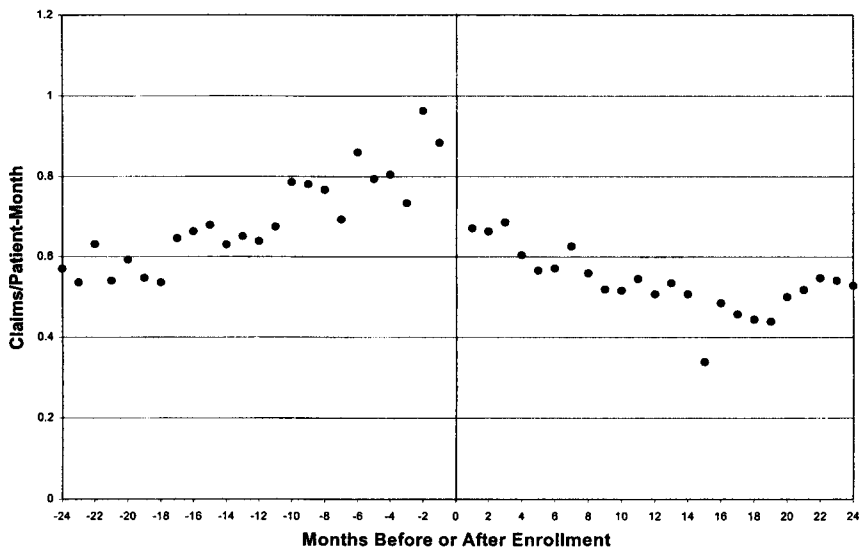
**FIGURE 1** (a) Distribution for the cohort of duration of Medicaid eligibility before enrollment in managed care. (b) Distribution for the cohort of duration of enrollment in managed care.



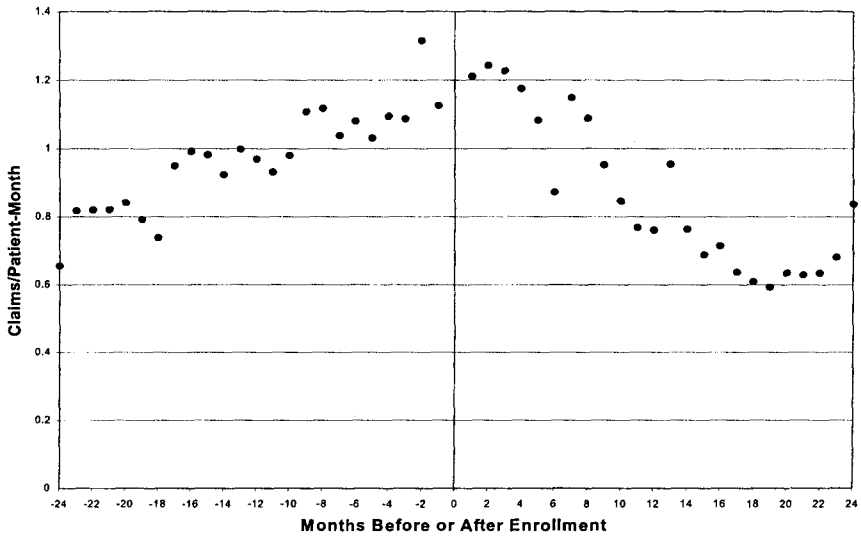
**FIGURE 2** Pre/post trends in claims for inpatient care.

**TRENDS IN UTILIZATION AND COSTS BEFORE AND AFTER ENROLLMENT**

Figures 2–7 graphically display trends in the cohort’s utilization, by category of service, in the 24 months before and after enrollment. Before enrollment, utilization was increasing in virtually every category, although the magnitude and statistical significance of these trends varied across categories. By type of service, there were significant increases in claims per patient-month for four of six services, including outpatient hospital care (1.5% increase in claims per patient-month,

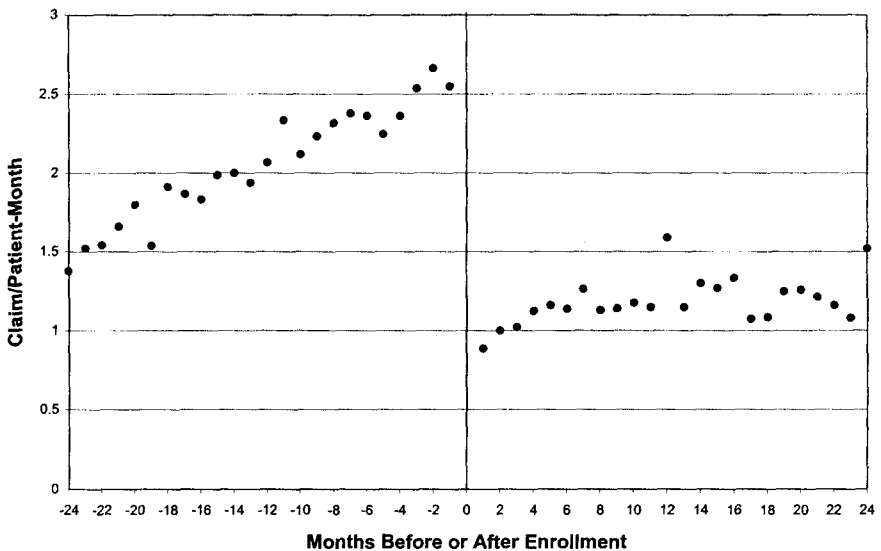


**FIGURE 3** Pre/post trends in claims for outpatient hospital services.

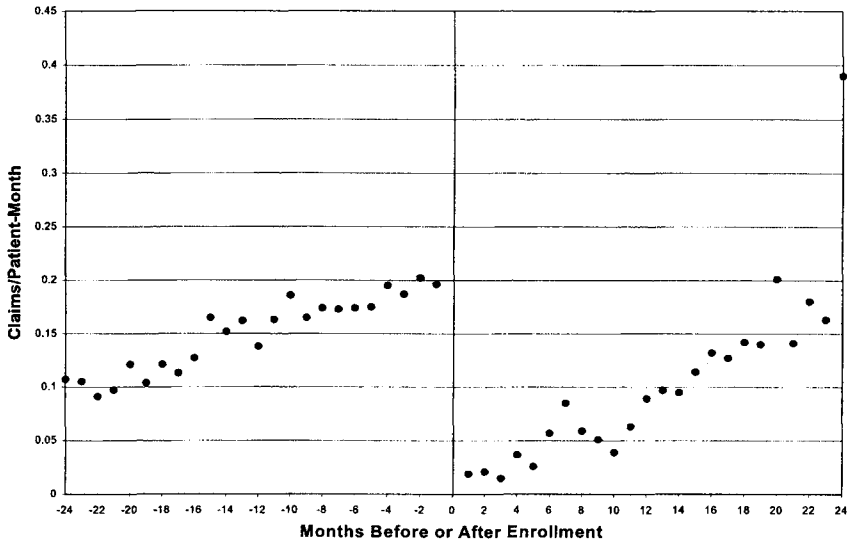


**FIGURE 4** Pre/post trends in claims for physician services.

$P < .001$ ), physician services (1.9% increase in claims per patient-month,  $P < .01$ ), drugs (5.0% increase in claims per patient-month,  $P < .001$ ), and durable medical equipment (0.5% increase in claims per patient-month,  $P < .001$ ). Analogous increases in costs were observed for these same services. Inpatient hospital and home health care utilization, which had the lowest overall rates of claims of all categories, had slopes that were not significantly different from zero.

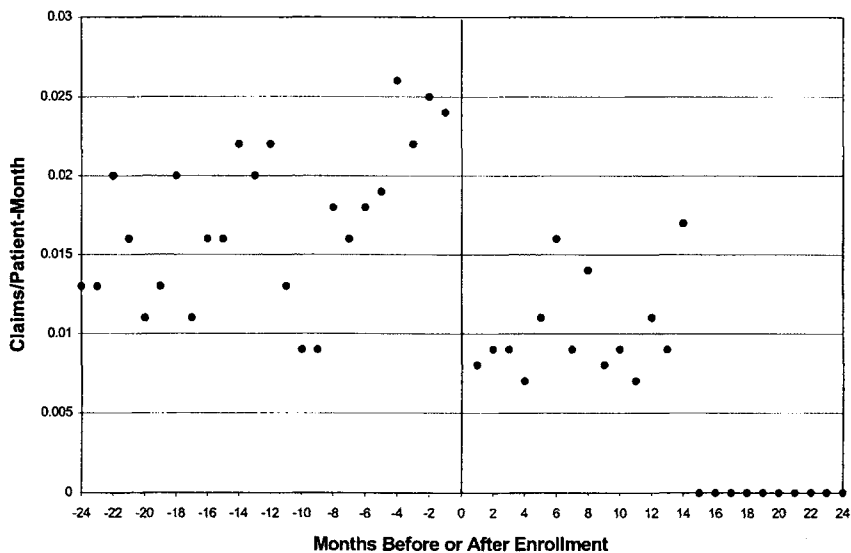


**FIGURE 5** Pre/post trends in claims for prescription medications.



**FIGURE 6** Pre/post trends in claims for durable medical equipment.

After enrollment, utilization decreased significantly for outpatient hospital (including emergency department) care (1.0% decrease in claims per patient-month,  $P < .001$ ), physician services (3.2% decrease in claims per patient-month,  $P < .001$ ), and home health care services (0.06% decrease in claims per patient-month,  $P < .05$ ). Increasing claims were observed within the postenrollment period for prescription medications (1.4% increase in claims per patient-month,



**FIGURE 7** Pre/post trends in claims for home health care.

$P < .05$ ) and durable medical equipment (0.9% increase in claims per patient-month,  $P = .013$ ), although these started at a substantially lower "baseline." Among the 15 most common prescriptions used both before and after enrollment, examination of NDC revealed no change in the mean number of pills per prescription claim for 13 of 15. Rates of inpatient hospital claims showed no significant change during the postenrollment period.

**DIFFERENCES IN UTILIZATION AND COSTS IN THE YEAR BEFORE AND AFTER ENROLLMENT**

Table IV summarizes category-specific utilization (claims per patient-month) and costs in the year before and year after enrollment. Significant decreases were observed in claims and estimated costs for inpatient care (42.9% and 44.9% for claims and costs, respectively), outpatient hospital (including emergency department) care (23.4% and 23.9%), prescription medications (52.2% and 45.0%), and durable medical equipment (70.6% and 77.8%) (all  $P$  values  $\leq .0004$ ). There were borderline decreases in claims and estimated costs for home health care (50.0%,  $P = .0005$ , and 33.3%,  $P = .68$ , respectively). No change was observed in

**TABLE IV** Cohort Utilization and Costs in the 12 Months Before and 12 Months After Enrollment

Utilization Category	Before Enrollment	After Enrollment	Difference, Claims or \$ (%)	$P$	Contribution to Total \$ Difference, %
<b>Inpatient care</b>					
Claims/-t-month	0.07	0.04	-0.03 (42.9)	.0001	—
Costs, \$/pt-month	345	190	-155 (44.9)	.0004	74
<b>Outpatient</b>					
Claims/pt-month	0.77	0.59	-0.18 (23.4)	.0001	—
Costs/ \$/pt-month	88	67	-21 (23.9)	.0001	10
<b>Physician services</b>					
Claims/pt-month	1.07	1.07	0.00 (0.00)	.98	—
Costs, \$/pt-month	53	59	+6 (11.3)	.09	-3
<b>Prescription medications</b>					
Claims/pt-month	2.3	1.1	-1.2 (52.2)	.0001	—
Costs, \$/pt-month	60	33	-27 (45.0)	.0001	13
<b>Durable medical equipment</b>					
Claims/pt-month	0.17	0.05	-0.12 (70.6)	.0001	—
Costs, \$/pt-month	18	4	-14 (77.8)	.0001	7
<b>Home health care</b>					
Claims/pt-month	0.02	0.01	-0.01 (50.0)	.05	—
Costs, \$/pt-month	3	2	-1 (33.3)	.68	1
Total costs \$/pt-month	566	355	-210 (37.1)	.0001	—

pt-month = patient-month.

**TABLE V** Cohort Utilization and Costs in the 12 Months Before and 12 Months After Enrollment, by Site

Utilization Category	County A (N = 464)			County B (N = 128)			Cross-Site Differences, <i>P</i>
	Before	After	Difference, Claims or \$ (%)	Before	After	Difference, Claims or \$ (%)	
<b>Inpatient care</b>							
Claims/pt-month	0.06	0.04	-0.02 (33.3)	0.09	0.04	-0.05 (55.6)	.05
Costs, \$/pt-month	310	190	-120 (38.7)	473	190	-283 (59.8)	.07
<b>Outpatient hospital</b>							
Claims/pt-month	0.80	0.52	-0.28 (35.0)	0.64	0.86	+0.22 (34.4)	.0001
Costs, \$/pt-month	90	59	-31 (34.4)	81	97	+16 (19.8)	.0001
<b>Physician services</b>							
Claims/pt-month	1.01	0.97	-0.04 (4.0)	1.29	1.44	+0.15 (11.6)	.35
Costs, \$/pt-month	48	54	+6 (12.5)	72	79	+7 (9.7)	.90
<b>Prescription medications</b>							
Claims/pt-month	2.15	1.20	-0.95 (44.1)	2.86	0.87	-1.99 (69.6)	.0057
Costs, \$/pt-month	54	35	-19 (35.2)	81	26	-55 (67.9)	.0027
<b>Durable medical equipment</b>							
Claims/pt-month	0.15	0.05	-0.10 (66.7)	0.27	0.05	-0.22 (81.5)	.02
Costs, \$/pt-month	14	4	-10 (71.4)	33	5	-28 (84.8)	.03
<b>Home health care</b>							
Claims/pt-month	0.01	0	-0.01 (100)	0.05	0.04	-0.01 (20.0)	.83
Costs, \$/pt-month	2	0	-2 (100)	6	10	+4 (66.7)	.29
<b>Total costs \$/pt-month</b>	<b>516</b>	<b>341</b>	<b>-175</b>	<b>746</b>	<b>406</b>	<b>-339</b>	<b>.10</b>

pt-month = patient-month.

claims for physician services. Overall estimated costs decreased by \$210 per patient-month or 37.1% ( $P = .0001$ ).

Table IV also summarizes the distribution of the contributions to total cost differences across categories of service, highlighting the measured services for which reductions had the greatest overall impact on total costs. Collectively, 86% of pre-enrollment costs were attributable to three categories of service: inpatient care (61%), outpatient hospital care (15%), and prescription medications (10%). In the year after enrollment, these service categories accounted for 82% of total estimated costs. As shown in Table IV, these three categories of service accounted for 97% of the estimated cost reductions observed after enrollment.

Table V summarizes category-specific changes in claims and costs, as well as total costs, by county. While over three-quarters of the cohort was enrolled in County A, pre-enrollment costs per patient-month were higher in County B. Changes in utilization and estimated costs after enrollment were in the same

direction across categories in both sites, except for outpatient hospital care, which decreased in County A and increased in County B. Total estimated costs decreased by \$175 (33.9%) and \$406 (54.4%) in Counties A and B, respectively ( $P = .10$  for cross-site differences; Table V).

## DISCUSSION

This report is the first to describe in detail the effect of a managed care program on the health care utilization and costs of a voluntarily enrolled population of disabled Medicaid recipients. Significant and meaningful decreases in utilization and costs in this voluntary program were observed across virtually all categories of measured services among patients enrolled for at least 6 months in two Ohio counties. Estimated cost reductions in the year after enrollment totaled \$210 per patient-month or 37.1% of these same individuals' costs in the year prior to their enrollment. The largest absolute decreases—representing over 90% of all cost reductions—were observed among service categories that were the most costly for these patients in the pre-enrollment period, including inpatient care, outpatient hospital (including emergency department) care, and prescription medications. Proportionately larger reductions were observed in claims and costs for durable medical equipment and supplies, but because the enrollees' pre-enrollment rate of use of these services was relatively low (less than 20 claims per 100 patients monthly), the decrease in costs for these services represented only 5% of the total cost reductions observed after enrollment. Similar effects were observed in claims and costs for home health care services, for which claims were infrequent (approximately 2 per 100 patients monthly) in the year prior to enrollment. Claims for physician services represented slightly less than 10% of the measured pre-enrollment year's Medicaid costs, and in contrast to virtually all other categories, there were no significant changes in these claims during the following year.

Over 75% of the study cohort had at least 2 years of pre-enrollment eligibility and fee-for-service Medicaid claims (Fig. 1a), highlighting the relative stability of this population compared with the more numerous, but transient, Medicaid populations supported under ADC/TANF. The stability of the disabled population enabled us to establish reasonably confident estimates of their utilization-related trajectories, and our trend analyses (Figs. 2–7) present a compelling argument that claims and costs were increasing steadily in the 2 years before enrollment. Further, because "time" in our analysis was relative to enrollment, which occurred gradually during the approximately 2.5 years of this investigation, it seems highly unlikely that the observed changes were due to secular



effects. This is especially true for the abrupt changes following enrollment that were observed in claims for prescription medications, durable medical equipment, and home health care services, discussed below.

We have no direct evidence to explain the patterns of changes in utilization; however, a description of certain elements of the programs and their oversight may be relevant to better understanding. There was a statewide steering committee for this demonstration program; the committee met quarterly to discuss successes and challenges to enrollment and effective program and patient management. Annual site visits to the provider organizations by representatives of the national Medicaid Working Group provided additional visibility to this initiative and established opportunities to reflect on experiences from other states and programs. The provider and managed care organizations in each county were required by the state to implement a case management approach for their enrollees, which in each of the counties was implemented under the guidance of medical codirectors responsible, respectively, for program implementation among children and adult patients. The approach to case management for children at one site is described elsewhere in detail.<sup>10</sup> Each provider-managed care company pair was required to undertake utilization review procedures, which varied somewhat across sites and over time, but were similar to other contracts within these organizations. In addition, enrollees were required to choose or be assigned a primary care physician who they were expected to visit within 30 days. Formularies were issued to guide physicians' selection of prescription medications, and the choice of pharmacies was limited. New policies permitted physicians to prescribe up to a 3-month (vs. 1-month) supply of medications. Vendors were selected by the managed care organizations to provide durable medical equipment and home health care services, and referrals to these services required preauthorization by the relevant utilization management authorities.

As described above, there were abrupt decreases after enrollment in claims for prescription medications, durable medical equipment, and home health care. It is plausible that these abrupt reductions were due to the initiation of new procedures and possible logistical "impediments" in receiving these services under managed care. The significant postenrollment trends toward increasing claims per patient-month for prescription medications and durable medical equipment are consistent with increasing familiarity with these new procedures; however, these trends also are consistent with an increasing need for these therapeutic supplies among patients with chronic and progressive illnesses. We examined whether the abrupt decrease in prescription claims could have been counterbalanced by an increasing frequency of prescriptions with larger supplies

(see Methods), but found little evidence to support this possibility. Claims for home health care services were infrequent in both the pre-enrollment and post-enrollment periods and were confined to a small number of patients. It is noteworthy that we observed no increase in home health care as a "substitute" for reduced use of higher cost services.

Claims for inpatient care, outpatient hospital services, and physician services exhibited more gradual changes from the pre-enrollment period. A plausible explanation for the relatively high, but decreasing, rates of claims for physician and outpatient hospital care was the expectation for early postenrollment physician visits under the managed care contracts with the state. That the observed rates for physician visits were not higher immediately after enrollment may have resulted from the disproportionate enrollment of patients who had pre-existing relationships with providers in the host institutions,<sup>6</sup> reducing the need for extensive initial evaluations.

The 37% reduction in the estimated costs of measured services after 1 year of managed care contrasts sharply with current expectations of savings, compared to fee-for-service care, which are on the order of 5–10%.<sup>1</sup> There is a plausible explanation and precedent for these differences. Expectations of lower savings derive primarily from experience with managed care among the much lower cost Medicaid populations enrolled through ADC/TANF. Opportunity for savings, as well as for large losses, is greater among the high-cost disabled Medicaid beneficiaries.<sup>1</sup> Similar reductions to those described here were ascribed to managed care for the disabled by McCall and colleagues<sup>11</sup> in their analyses of Arizona's Health Care Cost Containment System between 1983 and 1991, although their estimates were limited by using other states' fee-for-service experience for comparison purposes. Nonetheless, imputed savings in Arizona's disabled population were 45.5%, and total dollars saved were 50% higher among their disabled enrollees compared to their much more numerous ADC enrollees.<sup>11</sup> As cited by Iglehart,<sup>2</sup> the 1997 Medicaid acute care spending per disabled beneficiary was \$8,832, compared with \$1,810 for nondisabled adults and \$1,027 for children. Enrollees in the current investigation were more costly than their eligible, but nonenrolled, counterparts in their same counties,<sup>6</sup> with pre-enrollment year's total costs of \$8,514, raising the opportunity for relatively large cost reductions through aggressive case management. Indeed, in the current investigation, cost reductions appeared to be greater in the county with greater pre-enrollment year's costs. Finally, our cohort enrolled in managed care at a time of increasing utilization (Figs. 2–7), suggesting that marketing may have been either targeted

to or more effective among patients with more recent contacts with the health care system,<sup>6</sup> who perhaps would be more responsive to case management.

Two other possibilities must be considered that could lead to misestimating the cost reductions in the current investigation. The first (see Methods) relates to the methods for estimating costs in the postenrollment period. Since neither costs nor charges are reported by managed care organizations at a service level, we employed the Medicaid reimbursements of the pre-enrollment year, by service category, to calculate a monetary weight to apply to category-specific managed care claims. The validity of this method rests on the assumption that the within-category intensity of resources used per claim remained similar before and after enrollment in managed care. While we cannot confirm this assumption, we believe that the most likely bias introduced by this approach would be to underestimate cost reductions since systematic efforts were undertaken to reduce claims-level resource use. In addition, other evaluations of managed care generally have demonstrated not only reduced use of expensive resources, such as the hospital, but also reduced resource consumption within categories of services, as measured, for example, by lower lengths of stay in the hospital and the use of less-expensive medications.<sup>12</sup>

The second possible source of misestimation is potential under-reporting of claims during managed care. We cannot exclude this possibility, and we did not undertake a comprehensive audit at the medical records level to ascertain the validity and completeness of the claims data submitted to state Medicaid. We offer four types of evidence that lend credence to the data, however.

First, the state-level eligibility criteria excluded disabled Medicaid recipients who had dual eligibility for Medicare and those who were eligible for other governmental waiver programs. Thus, it seems unlikely that the lower observed utilization under managed care was due to missed utilization that was paid for by other forms of insurance or governmental aid.

Second, we took steps to minimize the likelihood of including patients in our sample whose claims files might be incomplete. We excluded all enrollees from one county rather than attempt a potentially incomplete reconstruction of encounter-level managed care files from the relevant insurance company's other claims to the state. We also excluded patients who had no claims submitted during managed care, even though that group likely represented a historically low-utilizing subgroup whose apparent inactivity in managed care probably was an accurate reflection of their nonuse of health care services.

Third, we accept as supporting evidence the remarkable similarity in utiliza-

tion rates for three important categories of services in the periods just before and after enrollment in managed care. As displayed in Figs. 2–7, claims for inpatient care, outpatient hospital services, and physician services were quite similar in the months immediately before and after enrollment. Since these services were relatively unaffected by utilization review procedures, they would not be expected to change precipitously after enrollment. Further, it would seem quite unlikely that postenrollment use rates, derived from diverse data sources (e.g., physician practice vs. hospital based) submitted over a 2-year interval, would match as closely as they do to fee-for-service Medicaid claims from the pre-enrollment period unless they were accurate.

Fourth, the likeness in cross-site changes in utilization (Table V), coming as they do from different provider organizations and insurance companies, are similarly improbable as chance occurrences. For the two counties combined, decreases in the “big three” utilization categories accounted for 97% of the estimated cost reductions observed in the year after enrollment—when examined by site, the figures were 97% and 95% for Counties A and B, respectively.

#### **GENERALIZABILITY AND POLICY IMPLICATIONS**

Our findings warrant cautious interpretation. The 592 managed care enrollees in our cohort represented a small and comparatively expensive subgroup of Ohio’s disabled Medicaid patients who were eligible for enrollment in managed care. In a previous report,<sup>6</sup> we described in detail the differences between those eligible patients who chose to enroll and those who did not. Relative to eligible nonenrollees in their same counties, enrollees had costs for the pre-enrollment year that were 20% higher. To the extent that cost reductions in managed care are proportional to pre-enrollment health care utilization,<sup>1,11</sup> the 37% estimated cost reductions observed in the present cohort probably reflect potential “savings” near the upper end of those achievable across the spectrum of disabled Medicaid beneficiaries. In addition, while those eligible for Ohio’s managed care program represent the vast majority of Medicaid recipients under its program for the aged, blind, and disabled, expensive and complex institutionalized patients and those with major psychiatric disabilities were excluded specifically from enrollment. Finally, the influence of specific programmatic features (such as steering committee oversight, case management, utilization review and pre-authorization procedures, early physician visits, etc.) is largely unknown, as are the characteristics of the provider organizations, which were large academic health systems with long-standing experience in the care of patients with chronic illnesses and disabilities.

It also is worthwhile to note that the realization to Medicaid of "potential savings," or to providers of "potential profits," depends also on the ability to spread risk through enrolling a sufficient number of patients to cover unexpected losses, as well as on the accuracy of rate setting and the extent of financial risk sharing between parties.<sup>23</sup> Similarly, our estimates of cost reductions did not include administrative costs either to Medicaid or to the managed care organizations responsible for program management.

Finally, these analyses do not address other features that are vital to the complete evaluation of this Medicaid managed care program for the disabled. At the extremes, it is reasonable to question whether these enrollees heavily overutilized in their pre-enrollment period, or alternatively, whether they were underserved seriously under managed care. Although we have reported encouraging findings about patient satisfaction and quality of care from one site,<sup>10</sup> little is known from other research about the effects of managed care on disabled persons' access to specialized services, their overall quality of care, their health outcomes, or their satisfaction. Until more is known about these other dimensions of effectiveness, both the promise and peril of managed care for this vulnerable population remain great.

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