

Comparison of Alcohol Treatment and Costs After Implementation of Medicaid Managed Care

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Objective: To examine the impact of a mandatory managed care behavioral health program on utilization and cost of alcohol treatment services for high-risk Medicaid patients.

Study Design: Pre-post nonequivalent comparison group design to compare managed care clients with fee-for-service (FFS) clients in terms of behavioral treatment costs and use.

Methods: Study subjects were adult Medicaid enrollees diagnosed with alcohol abuse or alcohol dependence. Chi-square tests and analysis of variance were used to determine significant differences between managed care and FFS programs in characteristics of the subjects, service use rates, and intensity of care. A regression model was used to examine predisposing, enabling, and need factors that might explain cost differences between programs.

Results: The managed care site had reduced behavioral healthcare costs compared with the FFS site. However, the regression analysis, which explained 35% of the variance in behavioral health service cost per user, showed that treatment cost was not significantly lowered by the managed care intervention once predisposing and need factors were controlled for. Nineteen percent of the variance in cost was explained by increased mental health comorbidity and 12% by drug comorbidity.

Conclusion: Consistent with other studies, the results show lower behavioral healthcare costs after the managed care intervention because of changes in management practices, service substitution, and negotiation of lower hospital fees. However, the managed care influence was insignificant in explaining cost variation between sites due to higher morbidity in the FFS site post managed care.

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Alcohol dependence and abuse pose a major challenge to public health, especially within a restricted healthcare budget. To address the very real problems related to alcohol abuse and dependence, more specific information is needed beyond incidence and prevalence of the disorder. Regrettably, few research studies have addressed issues of service use and cost for individuals with alcohol problems.¹ Services research issues related to the growth of managed care (MC) and its effect on access to treatment for alcohol problems, especially among the welfare population, also have been insufficiently addressed.

The purpose of this paper is to examine the impact of a large-scale mandatory Medicaid MC behavioral health program in Pennsylvania on utilization and cost of alcohol treatment services for high-risk public-sector clients being treated for an alcohol abuse or dependence prob-

lem between 1995 and 1998. A pre-post study design with a comparison group was used to test the hypothesis that MC techniques (eg, prior authorization, utilization review, greater leverage with hospitals to negotiate bed day rates) will result in reductions in the frequency of visits and cost of care for individuals being treated for an alcohol problem in the MC program compared with the fee-for-service (FFS) system.

This subject is important because a majority of the Medicaid population is enrolled in mandatory managed behavioral healthcare programs nationally,^{2,3} and Medicaid is a sizable contributor of dollars for substance abuse treatment.⁴ Lowering costs is of utmost relevance for states because Medicaid programs throughout the country are in the midst of a cost crisis. These issues underscore the importance of studying the impact of MC because Medicaid provides an important social safety net for vulnerable population groups.

Prior empirical evidence is mixed regarding the effect of MC on utilization and cost of behavioral health services in the public sector. Several studies found stable or increased access to behavioral health services after implementation of an MC carve-out for public-sector patients,^{5,6} while others showed reductions in inpatient and outpatient visits.^{7,8} McLellan et al found decreases in the number of clients treated, and in the duration and scope of treatment, with increases in the severity of clients' problems after the introduction of MC.⁹ A 5-site national study that assessed the use and quality of services, satisfaction, symptoms, and functioning of Medicaid enrollees with serious mental illness found little difference between MC and FFS programs on most measures. Only inpatient use was significantly lower in the MC program.¹⁰

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A report to the American Society of Addiction Medicine in 1999 showed a large reduction in the frequency and duration of inpatient hospitalization for substance abuse services without a corresponding increase in outpatient care.¹¹ Results from the Brandeis Survey on Alcohol, Drug and Mental Health Services in 1999 found differences in commercial plans in the site of service provision, the type of service, and the provider of service, with less hospitalization and fewer intensive outpatient services in MC.¹² Additionally, MC organizations offered a shorter version of traditional treatment services than those in FFS delivery systems.

The studies done on Medicaid MC programs have found few adverse effects on substance abuse treatment. The Massachusetts MC behavioral health carve-out program showed that overall access improved while per-person cost dropped 40% as a result of substituting residential services for inpatient hospital care and by negotiating lower per diem rates.¹² The Iowa Medicaid MC program found an increase in service use and a decrease in cost for treatment of alcohol disorders after MC implementation.^{13,14} Maryland's MC program found that service use and outcomes were similar to those in FFS for new enrollees.¹⁵ Finally, the Medicaid MC program for behavioral health in Oregon found an increase in treatment of substance abuse compared with the FFS program.¹⁶

Pennsylvania's decision to manage Medicaid benefits through mandatory enrollment in MC programs follows a nationwide trend to use MC models to provide services to Medicaid enrollees. The Pennsylvania Medicaid system provides an excellent opportunity to examine alcohol treatment patterns and costs under MC for the following reasons: (1) the enrollee population was large (more than 500 000 enrollees were in the study sites); (2) the slow phase-in of mandatory MC by region provided a natural experiment to compare 2 populations under 2 different financing and organizational systems; (3) all enrollees were included in the MC program; (4) both mental health and substance abuse care were covered by the MC program; and (5) the percentage of disabled clients was comparable to the percentage in other areas of the country, making it more generalizable (ie, 1.9% of Philadelphia's entire city population of 1.6 million received Supplemental Security Income [SSI] benefits under Medicaid¹⁷).

METHODS

Description of Study Sites

Managed Care Site. In January 1998, approximately 400 000 residents of Philadelphia County were enrolled in the MC program. The county department of health

contracts with a not-for-profit 501c(3) corporation to manage the Medicaid benefit. This MC organization is a carve-out agency that receives a per-member per-month capitation fee from the state for providing behavioral health services to the entire enrollee population. The MC organization controls access to behavioral health services through preauthorization of inpatient admission, utilization review of all services, and restrictions on the provider network. Providers are paid on an FFS basis and are not at risk. The provider network includes 12 mental health clinics in geographically defined areas with approximately 100 agencies providing specialized care.

Fee-for-service Site. The comparison site in western Pennsylvania is the Allegheny County Mental Health and Mental Retardation Program. In January 1998, there were approximately 140 000 Medicaid enrollees in this Allegheny County FFS program. The structure of the public mental health system in Allegheny County is similar to that in Philadelphia in that the office contracts with 9 mental health clinics in geographical service areas and 21 specialized service agencies that offer a wide array of behavioral health services. Both study sites have extensive inpatient as well as outpatient provider networks. Furthermore, during the study period, the public substance abuse treatment systems in both sites were funded equally (\$150 vs \$156 per capita per enrollee in public dollars from Medicaid and drug and alcohol county program funds).

The major difference between the county Medicaid programs is the racial mix of enrollees, with a larger number of African American and Hispanic enrollees in Philadelphia (77%) than in Allegheny County (42.4%). This reflects the racial difference between the residential population in these counties. The majority of Allegheny County enrollees were in the FFS Medicaid program during the study period, although voluntary enrollment in HMOs was increasing. Under the FFS system, there was no risk sharing and no utilization management.

Study Subjects

Study subjects from Philadelphia and Allegheny counties represent an annual treated prevalence group of individuals that (1) were enrolled in the Medicaid program during some or all of the study period (1995 and 1998); (2) had at least 1 primary diagnosis related to treatment of an alcohol abuse or dependence problem during the year; and (3) were adults over the age of 18 and under the age of 65 years. All service information was derived from the state Medicaid claims files, which provide a record of reimbursed services. The annual prevalence sample offered a cross-sectional approach to

comparing utilization and intensity as well as cost across sites and between years. Based on this methodology, a study subject may be represented in 1 year only or in both years. Alcohol conditions were indicated by *International Classification of Diseases, Ninth Revision*, codes 291 (alcohol psychoses), 303 (alcohol dependence syndrome), and 305.0 (alcohol abuse). Users of alcohol treatment received outpatient services at specialty behavioral health providers and detoxification or rehabilitation treatment at hospital or nonhospital settings. Behavioral healthcare services provided by physicians in the general health sector were not included.

The selection of “treated” versus enrolled individuals as study subjects is a function of the lack of comparable data on the enrolled population during the pre-MC and post-MC periods. Because of transitions into and out of voluntary health maintenance organization (HMO) Medicaid programs and because HMOs were not required to report individual-level service use, the patterns of care of the treated population were considered more representative of system change than access and utilization by the enrolled population. The choice of study design, sample selection, and the statistical techniques used were intended to capture the effects of MC on cost variation between groups and time periods in the best way possible, given the dynamic nature of the system change.

Study Design

A pre-post study design with a nonequivalent comparison group was used to deal with historical threats to validity and examine changes in service patterns and costs in the MC intervention site compared with the FFS site. Regression models were used to reduce differences in case mix and practice patterns between sites.¹⁸ Alcohol treatment users were identified in 1995 (pre-MC period) and 1998 (post-MC period) in both the MC and FFS sites. The FFS site comparison was used to determine whether secular trends influenced changes in use and cost as opposed to the effect of MC. The mandatory MC program was not implemented in the control group (FFS) setting until 1999. It is important to note that welfare policy during 1996-1997 resulted in reducing the number of individuals with substance abuse problems who were in state-funded General Assistance categories from the Medicaid program by eliminating, as a criterion for eligibility, a problem with alcohol or drug addiction. The study design accounted for this change because both sites experienced the same condition.

Measures

To assess case-mix differences in alcohol treatment

users, demographic data such as age, sex, and race were gathered, as well as information on diagnosis and comorbidity. In addition, the Medicaid eligibility category was included, grouped into SSI for disabled individuals; Temporary Assistance for Needy Families (TANF), formerly Aid to Families with Dependent Children (AFDC); General Assistance, a state category for those individuals with a temporary disability, limited income, or special circumstances; and others, a category consisting mostly of pregnant women and medically needy emergency cases. A measure denoting the number of months enrolled was constructed per subject and per group (most users were enrolled for 7-9 months per year).

Use of specialty outpatient and inpatient services for alcohol, drug, and psychiatric conditions was assessed in terms of the percentage of subjects who received each type of service, and the intensity or frequency of treatment. Finally, the amount of Medicaid reimbursement for each type of service received during the year was aggregated at the group level and divided by the number of users in each group to construct a per-user cost measure, which was the dependent variable in the regression analysis.

Data Sources

The sources of data were Medicaid eligibility files, administrative claims, and encounter data. The eligibility files were used to identify duration of time on Medicaid, Medicaid eligibility category, and demographic information. The administrative claims and encounter data were used to construct diagnosis, utilization, and cost variables on mental health and drug and alcohol treatment services for all providers of behavioral health services. The encounter data were similar to the FFS data with respect to cost because providers in the MC site continued to be paid on an FFS basis and because the state required that the MC program provide patient-specific utilization information on encounters, as had been done previously under the FFS system. FFS claims and eligibility data came from the Pennsylvania Department of Public Welfare. Encounter data were provided by the MC behavioral health program. Treatment by a general physician was not included as it was not available from encounter data files during this time period.

The validity of using claims data for diagnosis and comprehensiveness and accuracy of service information has been examined previously. Although limitations exist with these data, we found completion rates on relevant utilization and client-characteristic elements to be more than 90%. Lurie et al found that schizophrenia was diagnosed accurately on 87% of MC claims.¹⁹ Moreover, Cannon et al found a 75% diagnostic agree-

ment rate between Medicaid claims records and clinical files.²⁰ Because there is no reason to believe that under-reporting of a diagnosis of substance use differed between sites or time periods, comparisons between FFS and MC programs were considered to be accurate.

Analysis

Demographic and service use variables for the annual alcohol treatment user cohorts were compared before and after MC implementation for each program. Chi-square statistics were used to determine significant differences in the variables indicating the rates, and analysis of variance F statistics for the continuous variables, respectively, were used to assess significant differences in frequency and intensity of treatment among service users. Because practice patterns and case mix differed historically between sites to some degree, a within-program versus between-program comparison was done descriptively to test the hypothesis that because of organizational and financial modifications of practice, significant changes in service use and cost

were more likely to occur at the MC site than at the FFS site.

To account for differences between sites in population and practice characteristics, a regression analysis with pooled data from both sites and time periods was used with site and interaction terms between site and time. The model specifications were based on a help-seeking model that asserts that predisposing (ie, sex, race), enabling (ie, insurance, income status), and need (ie, drug or psychiatric comorbidity, SSI status, which denotes disability and chronicity) factors influence utilization and cost. Because enabling factors such as insurance and income status (poverty) were posited to be similar over time and between groups, they were not included in the regression model. Duration of Medicaid enrollment was a control variable to account for differences in the opportunity to use services during the prestudy and poststudy periods. Year 1998 was coded as a dummy variable with a 1 denoting the poststudy period.

Managed care was the healthcare system factor and intervention variable that we examined to determine

Table 1. Characteristics of Alcohol Treatment Users in 1995 and 1998

Characteristic	MC Site				F/Chi-square Statistics		
	1995 (n = 2867)		1998 (n = 3174)		df	Value	P
	Mean	SD	Mean	SD			
Age, y	37.4	9.1	39.3	9.1	6039	-8.08	.000
Female	No.	%	No.	%	1	89.49	.001
Race							
African American	1816	63	2206	70	2	29.02	.001
Caucasian	742	26	647	20	—	—	—
Other	309	11	321	10	—	—	—
Medicaid eligibility category							
Disabled (SSI)	692	24	805	25	1	1.21	.271
Needy families (TANF)	290	10	546	17	1	63.45	.001
Temporary disability (GA)	2043	71	2009	63	1	43.26	.001
Other	77	3	119	4	1	5.43	.020
	Mean	SD	Mean	SD			
Months enrolled in Medicaid	7.2	4.5	9.0	3.8	5581	-17.01	.000
Diagnosis	No.	%	No.	%			
Alcohol psychoses	372	13	196	6	1	81.77	.001
Alcohol dependence	2446	85	2809	89	1	13.50	.001
Alcohol abuse	257	9	301	9	1	0.48	.486
Comorbidity							
Drug	1017	35	1210	38	1	4.54	.033
Mental health	814	28	1241	39	1	76.93	.001

MC indicates managed care; FFS, fee-for-service; df, degrees of freedom; SSI, Supplemental Security Income; TANF, Temporary Assistance for Needy Families; GA, General Assistance.

the extent to which it increased or reduced the cost of alcohol-related behavioral health treatment services for the Medicaid population. The log of total expenditures was used as a dependent variable because expenditure data are frequently skewed.

RESULTS

Sociodemographic and Clinical Profile

Table 1 presents the case-mix characteristics in the MC and FFS sites. The MC site group in 1998 was larger than the 1995 group, with a higher percentage of female, African American, and TANF recipients but fewer General Assistance recipients. The FFS site group in 1998 was much smaller than the 1995 group, with a smaller percentage of African American, TANF, and General Assistance recipients, but a greater percentage of SSI recipients. The smaller number of users in 1998 was a function of fewer enrollees in the FFS program.

The predominant diagnosis before and after the intervention in both sites continued to be alcohol

dependence. Psychiatric comorbidity showed large increases for alcohol treatment users in both sites from 28% (MC site) and 29% (FFS site) in 1995 to 39% (MC site) and 48% (FFS site) in 1998.

Service Use Trends

Alcohol and Drug Treatment. Table 2 and Table 3 show service utilization rates and intensity of treatment for those who received services for alcohol dependence and other comorbid conditions at the MC and FFS sites. Overnight (24-hour) treatment sites for persons diagnosed with alcohol disorders changed dramatically in the MC site. Use of general or rehabilitation/drug and alcohol (D&A) units in hospital settings showed sharp declines: 40% to 9% for detoxification and 24% to 4% for rehabilitative treatment. The reduction was replaced by use of 24-hour nonhospital sites for detoxification and nonhospital sites for residential rehabilitation in 1998. This change resulted in a higher rate of users in the 24-hour treatment programs in the post-MC period. The number of episodes of acute hospital detoxification pre- and post-MC also dropped, as did the annual detoxification days

		FFS Site				
1995 (n = 1411)		1998 (n = 625)		F/Chi-square Statistics		
Mean	SD	Mean	SD	df	Value	P
37.3	9.0	39.7	9.8	1103	-5.31	.000
No.	%	No.	%			
504	36	209	33	1	0.99	.320
620	44	201	32	2	25.04	.001
774	1	414	2	—	—	—
17	55	10	66	—	—	—
347	25	233	37	1	34.23	.001
273	19	90	14	1	7.24	.007
906	64	335	54	1	20.49	.001
43	3	41	7	1	13.51	.001
Mean	SD	Mean	SD			
9.2	3.6	8.3	4.1	1058	5.08	.000
No.	%	No.	%			
100	7	76	12	1	14.11	.001
1235	88	516	83	1	8.88	.003
133	9	77	12	1	3.92	.048
217	15	56	9	1	15.37	.001
413	29	303	48	1	70.11	.001

Table 2. Alcohol Treatment Use by Type and Intensity of Services in 1995 and 1998

Alcohol Treatment	MC Site				Statistics		
	1995 (n = 2867)		1998 (n = 3174)		df	Chi-square	P
	No.	%	No.	%			
Rate of use							
Hospital detoxification	1135	40	278	9	1	799	.001
Rehabilitation/D&A unit	684	24	136	4	1	491.9	.001
Nonhospital detoxification	—	—	914	29	—	—	—
Nonhospital rehabilitation	—	—	1335	42	—	—	—
Any overnight setting	1568	55	2035	64	1	55.57	.001
Outpatient	1504	52	1264	40	1	96.88	.001
Intensity/frequency*	Mean	SD	Mean	SD		F	
Hospital detoxification							
Total days	4.6	4.9	3.4	7.3	340	2.735	.007
No. of episodes	1.5	1.2	1.1	0.3	1408	11.65	.000
Rehabilitation/D&A unit							
Total days	14.8	11.5	17.0	32.7	142	-0.787	.433
No. of episodes	1.1	0.4	1.1	0.3	255	1.67	.096
Nonhospital detoxification							
Total days	—	—	3.0	17.2	—	—	—
No. of episodes	—	—	1.2	0.6	—	—	—
Nonhospital rehabilitation							
Total days	—	—	14.8	28.1	—	—	—
No. of episodes	—	—	1.2	0.6	—	—	—
No. of outpatient contacts	12.9	16.1	13.7	18.2	2542	-1.201	.230

MC indicates managed care; FFS, fee-for-service; df, degrees of freedom; D&A, drug and alcohol.

*Mean and SD values reflect users in each treatment category.

(Table 2). Similar changes were found for service use patterns for drug-related conditions (Table 3).

The changes in alcohol treatment also were found in the FFS site. The percentage of users who had detoxification services provided at hospital settings declined from 48% to 31%. The rehabilitation/D&A unit admission rate was constant, but average length of stay declined (Table 2). The rate and intensity of inpatient treatment for drug conditions also declined (Table 3).

Psychiatric Treatment. Service use patterns for psychiatric conditions among alcohol treatment users also differed in the 2 sites pre- and post-MC. The rates of inpatient care among users increased in both sites, from 15% to 28% in the MC site and 21% to 35% in the FFS site. The rate of use of outpatient services increased significantly in the FFS site (16% to 29%), but not in the MC site. Annual psychiatric inpatient days per user declined in the MC site, while no significant difference was found in the FFS site (Table 3).

Service Costs

Per-person behavioral healthcare costs for treated

subjects declined from \$7662 to \$5664 in the MC site, whereas they increased from \$4871 to \$6449 in the FFS site (Figure 1 and Figure 2). For the MC site, reductions in alcohol and drug overnight treatment costs or daily reimbursement rates contributed to the overall reduction in the cost, with a \$1200 reduction for alcohol abuse treatment and a \$900 reduction for drug abuse treatment per subject. In contrast, the FFS site showed a small amount of reduction in alcohol costs (\$400 per subject) and drug costs (\$250 per subject) due to the use of nonhospital settings; however, these costs were overwhelmed by the large increase in psychiatric inpatient costs (\$2000 per subject) due to more psychiatric comorbidity, longer lengths of stay, and no pre-post change in daily psychiatric bed reimbursement rates. Conversely, although psychiatric comorbidity increased at the MC site as well, length of stay decreased and daily bed costs were reduced.

The regression analysis suggests that treatment cost was not significantly lowered by the MC intervention once we controlled for predisposing factors such as sex, race, and age, and need factors such as Medicaid status,

				FFS Site		
1995 (n = 1411)		1998 (n = 625)		Statistics		
No.	%	No.	%	df	Chi-square	P
678	48	192	31	1	53.16	.001
292	21	145	23	1	1.613	.204
—	—	—	—	—	—	—
—	—	—	—	—	—	—
880	62	306	49	1	32.02	.001
602	43	368	59	1	45.66	.001
Mean	SD	Mean	SD			
3.7	3.1	4.0	4.1	258	-0.805	.422
1.2	0.5	1.2	0.6	265	-1.297	.196
13.9	9.7	10.7	10.4	435	3.189	.002
1.1	0.4	1.2	0.5	221	-1.148	.252
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
11.2	14.2	11.3	13.7	968	-0.178	.859

drug and psychiatric comorbidity, and the number of months enrolled in the Medicaid program (Table 4). The model explains 35% of the variance in behavioral health service cost per user, and a stepwise regression showed that 19% of the variance in cost was explained by mental health comorbidity and 12% by drug comorbidity. It appears that alcohol and drug treatment costs were lower in 1998 in both the FFS and MC sites, as suggested by the descriptive analysis results in Figures 1 and 2; however, increased psychiatric comorbidity in the FFS site in 1998 raised the overall cost per user due to psychiatric inpatient care costs. Thus, the effect of the MC intervention was not significant when predisposing and need factors were controlled for.

DISCUSSION

The results from this study present a complicated picture of MC and its impact on utilization and cost because of the dynamic nature of systems change. At face value, the study shows that there were lower behav-

ioral healthcare costs per user after the MC intervention (\$7662 vs \$5664), compared with increased costs in the FFS program (\$4871 to \$6449). However, the rise in costs in the FFS site was primarily because of greater psychiatric hospital costs in the post-MC period, which reflected a greater percentage of alcohol users with comorbid psychiatric problems as well as an increase in length of stay. Although the MC site also experienced an increase in comorbid psychiatric problems in the user population, the MC program was able to keep psychiatric bed day costs down by negotiating lower per diem rates with inpatient facilities and by using utilization review to reduce bed length of stay. In addition, the MC site lowered alcohol and drug treatment costs more than the FFS site (\$2100 in MC vs \$650 in FFS) by using non-hospital facilities, which had cheaper per-day bed costs, as the sites of overnight or 24-hour treatment for both alcohol and drug disorders, as well as reducing the number of bed days. These cost differences appear to be a direct result of the MC intervention.

However, the regression results tell a somewhat different story. Changes in comorbid case mix before and

Table 3. Use of Drug and Psychiatric Services Among Alcohol Treatment Users in 1995 and 1998

Type of Treatment	MC Site				Statistics		
	1995 (n = 2867)		1998 (n = 3174)		df	Value	P
Drug related							
Rate of use	No.	%	No.	%		Chi-square	
Inpatient general/rehabilitation	723	25	213	7	1	394.1	.001
Nonhospital detoxification	—	—	454	14	—	—	—
Nonhospital rehabilitation	—	—	659	21	—	—	—
Any overnight setting	723	25	934	29	1	13.4	.001
Outpatient	514	18	449	14	1	16.08	.001
Intensity/frequency*	Mean	SD	Mean	SD		F	
Inpatient general/rehabilitation							
Total days	15.5	13.3	5.6	6.0	789	15.5	.000
No. of episodes	2.2	2.2	1.3	0.7	931	9.171	.000
Nonhospital detoxification							
Total days	—	—	2.6	2.5	—	—	—
No. of episodes	—	—	1.5	1.0	—	—	—
Nonhospital rehabilitation							
Total days	—	—	24.6	38.7	—	—	—
No. of episodes	—	—	1.5	0.9	—	—	—
No. of outpatient contacts	10.6	15.6	14.7	30.2	652	-2.588	.010
Psychiatric related							
Rate of use	No.	%	No.	%		Chi-square	
Inpatient	425	15	885	28	1	151.3	.001
Outpatient	578	20	685	22	1	1.84	.175
Intensity/frequency*	Mean	SD	Mean	SD		F	
Total inpatient days	29.6	32.3	21.1	25.4	684	4.764	.000
No. of inpatient episodes	2.1	2.0	2.8	2.7	1104	-5.026	.000
No. of outpatient contacts	19.7	26.8	21.7	33.1	1259	-1.201	.230

MC indicates managed care; FFS indicates fee-for-service; df, degrees of freedom.

*Mean and SD values reflect users in each treatment category.

after the intervention both within and between sites explain the largest portion of the cost variation, so that MC, as an intervening variable, is not significant. On the other hand, lower costs are associated with the post-MC period (1998) once case mix and comorbidity are accounted for because both sites had lower drug and alcohol costs after the intervention. The results show how difficult it is to interpret the impact of major system change when so many competing practice and policy interventions occur at the same time.

Other relevant effects are suggested by this analysis. One in particular is the lack of increased outpatient care in the MC program to offset the reduction in bed days. The shift from inpatient to outpatient care is considered in many cases to be clinically appropriate for the treatment of alcohol problems based on the results of research studies looking at outcomes between the 2

modalities of care. The controversy is over outpatient treatment for individuals with comorbid problems and insufficient social support systems.²¹

Managed care organizations have used utilization management strategies to shift care away from inpatient or 24-hour care and decrease costs by reducing length of stay. Although this results in large initial cost reductions, further decreases may not be possible without sacrificing quality. Managed care plans that use a risk-sharing approach show the most substantial cost reductions for both inpatient and outpatient services, particularly for substance abuse. It is suggested that there may be more opportunity to reduce cost and services for substance abuse treatment because fewer guidelines or evidence-based treatment exists to support standard care.²² Physicians surveyed by the American Society of Addiction Medicine believe that treatment for substance

		FFS Site				Statistics	
1995 (n = 1411)		1998 (n = 625)		df	Value	P	
No.		No.			Chi-square		
140	10	36	6	1	9.501	.002	
—	—	—	—	—	—	—	
—	—	—	—	—	—	—	
—	—	—	—	—	—	—	
106	8	30	5	1	5.112	.024	
Mean	SD	Mean	SD		F		
11.0	9.7	6.4	7.5	174	2.673	.008	
1.4	0.8	1.4	1.3	42.9	-0.263	.794	
—	—	—	—	—	—	—	
—	—	—	—	—	—	—	
—	—	—	—	—	—	—	
—	—	—	—	—	—	—	
14.5	22.6	20.7	26.3	134	-1.294	.198	
No.		No.			Chi-square		
291	21	218	35	1	46.95	.001	
228	16	182	29	1	45.25	.001	
Mean	SD	Mean	SD		F		
13.6	16.4	16.2	18.2	507	-1.697	.090	
1.7	1.4	2.2	1.9	174	-0.336	.737	
23.5	43.0	25.0	29.8	400	-0.426	.671	

abuse services has been adversely affected by MC. Although they think that outpatient care is appropriate for uncomplicated cases, inpatient services may be required (but unavailable) for those with serious comorbidities. Also, corresponding increases in outpatient care have not necessarily occurred as a substitute.¹¹

Private-sector employers, however, found that their employees in managed behavioral care plans were satisfied with the quality of care even though the value of benefits for treatment has decreased markedly over the last decade.¹¹ Though intensity of care has decreased, there has been no indication of poorer outcomes.²³ Nonetheless, public-sector clients tend to have greater comorbidities and poorer environmental supports, meaning that the results may not translate to these individuals.

Managed care plans are not all the same, and consideration of the type of MC plan must be taken into

account when examining patterns of use. Weakly managed programs may be no different than unmanaged FFS programs. Sturm and Sherbourne found that access is better in MC, although delays in MC result in more unmet needs than in unmanaged programs, where services are provided in a more timely manner.²⁴ Lemak and Alexander found that plans with stringent management controls are associated with a fewer number of sessions per treatment episode.²⁵

Limitations

A number of study limitations should be addressed. The 2 sites examined in this study had, historically, different patterns of use and population case mix. In addition, other system changes that affected case mix over the study period occurred simultaneously at both sites. In particular, welfare changes between 1996 and 1998

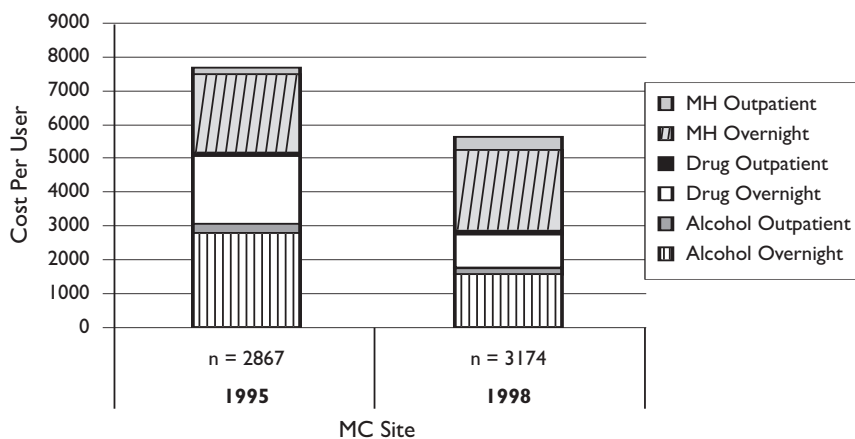
Table 4. Regression Model Predicting Factors Affecting Behavioral Health Treatment Costs After a Managed Care Intervention*

Variable	Parameter Estimate	t Statistic	P
Intercept	6.12679	67.27	<.0001
Predisposing factors			
Age, y	0.00023	0.12	.9065
Female	-0.22404	-5.51	<.0001
African American	0.27967	7.77	<.0001
Need factors			
Disabled recipient (SSI)	-0.1508	-3.52	.0004
Family assistance recipient (TANF)	-0.2887	-5.25	<.0001
Mental health comorbidity [†]	1.584	42.24	<.0001
Drug comorbidity [†]	1.3555	34.8	<.0001
Intervening factors			
MC site	-0.06052	-1.18	.2385
Post year 1998	-0.27899	-3.79	.0002
MC* year 1998	-0.00067	-0.01	.9936
Control factor			
No. of enrolled months	0.06599	14.4	<.0001

FFS indicates fee-for-service; MC, managed care; SSI, Supplemental Security Income; TANF, Temporary Assistance for Needy Families.

*Dependent variable is log of per-user cost. Number of observations = 8070. Included are person-level cost data at both sites (MC and FFS) for pre-MC (1995) and post-MC (1998) periods. $R^2 = .3521$; $df = 1$.

[†]Mental health and drug comorbidity = 1 if there was a psychiatric or drug-related treatment service.

Figure 1. Annual Behavioral Healthcare Costs for Alcohol Treatment Users in the MC Site

MC indicates managed care; MH, mental health.

reduced the number of individuals in the General Assistance population, leaving only individuals who had comorbid psychiatric, drug, or medical illnesses. Thus, able-bodied individuals with alcohol or drug problems who did not have comorbid psychiatric disorders were not eligible to receive Medicaid benefits as they had in the past. The increase in psychiatric treatment and

decrease in drug treatment in the alcohol group in both sites was likely attributable to welfare reform, not MC.

Also, case-mix changes in both sites were affected by the MC implementation itself, in that the 1995 population in Philadelphia had fewer AFDC/TANF users in FFS as the county was moving people on Medicaid into voluntary HMOs for health and mental health in anticipation of the mandated program. Thus, there were fewer Medicaid enrollees and users at the MC site in 1995 than in 1998, when all Medicaid enrollees were enrolled in the program. The opposite was true at the FFS site, where there were fewer enrollees left in the FFS system in 1998 than in 1995, because the county was gearing up for the mandated MC implementation in 1999. In addition, the proportion of SSI individuals appeared to be increasing, which is a national trend in the Medicaid population that is associated with welfare reform.

Finally, this study represents only 1 MC intervention and may not be generalizable, although many of the strategies are broadly used by the industry. Despite these limitations, which often are present in research involving dynamic system change, the study findings have important implications. The study clearly demonstrated that MC programs have the potential to offer new configurations of services and reduce financial burden.²⁶ The assumption implicit in MC is that a comprehensive array of services,

coupled with the flexibility to provide such services on the basis of individual medical and psychological necessity, produces better outcomes and better cost controls than traditional FFS financing, which is locked in by service or procedure.²⁷ Managed care produces its effects through utilization management techniques such as gatekeeping, preadmission screening, concurrent uti-

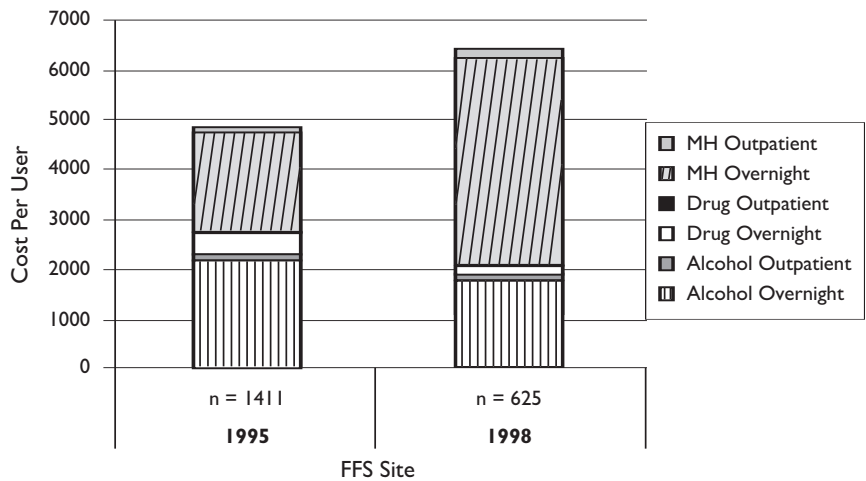
lization review, case management, telephone triage, negotiated rates with a limited group of network providers, and differential payment arrangements. These mechanisms affect access to and availability of services, which in turn affect service utilization and cost outcomes. Prices are reduced as MC organizations with large numbers of enrollees control the provider network, allowing them to negotiate lower fees for provider services.

CONCLUSIONS

Estimates of hospital admissions for alcohol-related problems range from 20% to 40%,²⁸ making it a high-cost disorder when traditional acute-care hospital detoxification models are used. Our results, which are consistent with those of other studies in behavioral healthcare, showed a reduction in costs in the MC program that was directly related to practices such as using nonhospital facilities for overnight or 24-hour treatment, negotiating lower per-day psychiatric bed costs, and reducing the number of bed days. The lack of significance of the MC intervention in the regression model was the result of increased psychiatric comorbidity and cost of inpatient care in the FFS site, where there was no opportunity to lower per diem rates under the FFS financing structure. Consequently, the cost variation was explained by the comorbidity factors, with no marginal significance attributed to the MC program per se.

One caveat is that unless there are efficiencies to be taken advantage of, the quality of behavioral health services (which is difficult to judge) may decline. Also, given the increased comorbid psychiatric problems of the alcohol group, it is doubtful that changes in the site of service and decreases in intensity of care at the MC site resulted in improved quality of care. For low-technology services like psychosocial treatment, reducing costs (other than through pharmacologic or genetic breakthroughs) can mainly be achieved by changing the site or locus of care to less expensive settings, reducing the intensity of service provision per client, or reducing access or substituting lower paid practitioners for higher paid personnel. Future research is needed to determine how the costs are being reduced and what the consequences are to outcomes. Also, greater scrutiny should be given to cost findings related to the implemen-

Figure 2. Annual Behavioral Healthcare Costs for Alcohol Treatment Users in the FFS Site



FFS indicates fee-for-service; MH, mental health.

tation of MC programs, especially statewide Medicaid systems, as case-mix differences rather than MC practices may account for increased or decreased cost effects.

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