

# Two-Year Outcomes of Fee-for-Service and Capitated Medicaid Programs for People with Severe Mental Illness

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**Objective.** To examine the effects of two models of capitation on the clinical outcomes of Medicaid beneficiaries in the state of Colorado.

**Data Source.** A large sample of adult, Medicaid beneficiaries with severe mental illness drawn from regions where capitation contracts were (1) awarded to local community mental health agencies (direct capitation), (2) awarded to a joint venture between local community mental health agencies and a large, private managed behavioral health organization, and (3) not awarded and care continued to be reimbursed on a fee-for-service basis.

**Study Design.** The three samples were compared on treatment outcomes assessed over 2 years (total  $n = 591$ ).

**Data Collection Methods.** Study participants were interviewed by trained, clinical interviewers using a standardized protocol consisting of the GAF, BPRS, QOLI, and CAGE.

**Principal Findings.** Outcomes were comparable across most outcome measures. When outcome differences were evident, they tended to favor the capitation samples.

**Conclusions.** Medicaid capitation in Colorado does not appear to have negatively affected the outcomes of people with severe mental illness during the first 2 years of the program. Furthermore, the type of capitation model was unrelated to outcomes in this study.

**Key Words.** Severe mental illness, capitation, Medicaid, outcomes

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State mental health authorities have increasingly adopted capitated payment systems for Medicaid recipients. By doing so, states hope to provide incentives for cost-effective treatment by shifting some degree of financial risk for the delivery of care to providers. In capitated systems, providers agree to deliver a specified range of services to a specified group of clients for a fixed price and, therefore, come to share interest with the payer in delivering mental health care in a more stable and predictable budget (Mechanic and Aiken 1989).

The opportunities and risks of capitation of the severely mentally ill are well documented (Mechanic and Aiken 1989; Lehman 1987). Capitation affords opportunities for mental health systems to reduce costs through adoption of more cost-effective treatment, to operate within more stable and predictable budgets, to adopt early intervention and prevention strategies, and to integrate inpatient, outpatient, and intermediate levels of care. The primary risks of capitation are undertreatment, substitution of inadequate mental health services, cost shifting to other service systems, and poorer treatment outcomes resulting from financial risks and incentives placed on the contract agency (Mechanic and Aiken 1989).

States differ in the agency selected to receive capitated payments. Some states make per-capita Medicaid payments directly to mental health provider agencies, such as community mental health centers. Other states pay an intermediary agency such as a managed behavioral health organization (MBHO) or a health maintenance organization (HMO) on a per-capita basis. The MBHO or HMO may or may not pass on financial risk to providers. The growth of the managed behavioral health industry has afforded state Medicaid agencies the choice of making per-capita payments directly to a provider agency or to an intermediary agency. The relative effects of sharing risk directly with providers as opposed to through an intermediary organization has not been examined, although both have received some attention in controlled studies.

Several controlled studies of paying capitated Medicaid funds directly to mental health providers have been published. A study in Rochester (NY) showed that severely mentally ill individuals randomly assigned to capitated providers showed no differences in psychiatric symptoms and global ratings of functioning, but experienced fewer hospital days relative to noncapitated

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providers over the 2 years of the study (Cole, Reed, Babigian, et al. 1994). Capitated payment appeared to result in a favorable cost-benefit ratio and no deleterious outcomes (Reed et al. 1994). Another controlled study in New York found that paying an intensive case management program a capitated amount reduced face-to-face contact between case managers and consumers but increased the provision of ancillary services and reduced the amount of unmet service needs (Shern, Donahue, Felton, et al. 1995).

Utah contracted directly with mental health providers in geographic areas serving approximately one half of their Medicaid population. Results through the first 2 years of the demonstration showed that inpatient mental health admissions and expenditures were significantly reduced by capitating providers for a full range of mental health services (Christianson, Shepard, Beinecke, et al. 1995; Stoner, Manning, Christianson, et al. 1997). Outpatient expenditures were unaffected, and this may have been due to the fact that mental health providers were not at risk for outpatient expenditures until the 2nd year of the demonstration program (Stoner, Manning, Christianson, et al. 1997).

Findings from the Utah demonstration suggest that cost reductions achieved by capitating Medicaid payments to providers may have resulted in poorer outcomes (Manning, Liu, Stoner, et al. 1999). The Utah evaluation examined outcome measures for Medicaid beneficiaries with a diagnosis of schizophrenia over a 4-year period. Among persons with schizophrenia, capitated areas showed lower rates of improvement, as measured by the Brief Psychiatric Rating Scale (BPRS) and the Global Assessment Scale. Evidence for the lower improvement rates increased over the 4-year period. Taken together, the literature on direct capitation of Medicaid providers shows mixed results, with one large-scale study showing poorer outcomes in a segment of the Medicaid population.

Two studies have examined the effects of paying capitated Medicaid dollars to an intermediary MBHO or HMO. In Massachusetts, an MBHO (Options) accepted capitated payments to manage Medicaid mental health and substance abuse services. The MBHO did not subcapitate its providers but used concurrent review, case management, and a provider network to control costs. Because the Massachusetts' demonstration program was implemented state-wide, evaluation was limited to pre-post comparisons of expenditures and interviews with administrators, providers, and clients regarding qualitative changes to the system (Callahan, Shepard, Beinecke, et al. 1995; Frank and McGuire 1997; Beinecke et al. 1997; Dickey, Normand, Azeni, et al. 1996). Medicaid expenditures were lowered by 27 percent compared with levels expected based on prior trends. Providers reported that access to services was

unchanged relative to the time period before capitation but that administrative problems related to utilization review increased with the implementation of managed care.

In Hennepin County Minnesota, severely mentally ill individuals were randomized to either "mainstream" HMOs or fee-for-service (FFS) Medicaid. No consistent differences in utilization, symptoms, functioning, and health status were evident in the first 7 months of Minnesota's demonstration program (Lurie, Moscovie, Finch, et al. 1992; Christianson, Lurie, Finch, et al. 1992). The demonstration was terminated in the 7th month, when the largest capitated health plan withdrew because of problems with adverse selection of beneficiaries into health care plans. Nevertheless, results suggest that at least short-term outcomes of the severely mentally ill treated in HMO model care are not different than outcomes in traditional FFS Medicaid systems.

Comparisons among studies are difficult because capitation programs vary considerably in the populations studied, services for which providers are placed at risk, and the nature of the risk-sharing arrangements with providers. In this regard, the Colorado Medicaid Demonstration Program is particularly interesting because capitation contracts were awarded under one of two types of arrangements. In one arrangement, contracts were awarded directly to free-standing, not-for-profit community mental health provider agencies. Provider agencies were responsible for the management and delivery of care. In other areas of Colorado, contracts were awarded by the state to a joint venture between local community mental health provider agencies and a large MBHO. The MBHO conducted utilization review, contracted with providers, and administered other support functions for selected regions in Colorado. The MBHO shared financial risk with community mental health agencies through subcapitation contracts. The MBHO and local provider agencies jointly governed the Medicaid contract with the state. Finally, providers in selected regions of Colorado continued to be paid through the state's existing FFS Medicaid program.

The Colorado Medicaid Demonstration Program (CMDP) allows a comparison of direct capitation of Medicaid providers, capitation of an intermediary MBHO, and traditional FFS reimbursement of providers. This study is part of a larger research project that examines the effects of the CMDP on (1) clinical outcomes; (2) access, cost, and utilization of Medicaid mental health services; and (3) organizational adaptation, culture, and program development. This article focuses on the clinical outcomes achieved under

these models over a 2-year period and across a broad array of outcomes, including measures of mental health symptoms, functioning, and objective and subjective measures of quality of life.

## METHOD

### *Design Overview*

The study examines symptoms, functioning, quality of life, and public welfare in a prospective design comprised of three samples: (1) patients treated by FFS organizations ( $n = 175$ ), (2) patients treated by directly capitated (direct capitation), not-for-profit providers ( $n = 203$ ), and (3) patients treated by providers managed by a for-profit MBHO ( $n = 213$ ). Study participants were randomly selected from a stratification of the Medicaid population based on gender and the prior year's mental health service costs. Coincident with the onset of capitation or shortly thereafter, study participants received a baseline assessment consisting of symptom, functioning, and quality-of-life measures. Follow-up assessments occurred 6, 12, 18, and 24 months following the baseline assessment.

### *Description of the Colorado Pilot Program*

In 1991, Colorado legislated a capitated payment system for mental health services to its Medicaid population. In 1995, CMDP began paying organizations on a per-eligible-per-month basis to provide a comprehensive array of mental health services to persons meeting medical necessity criteria. Organizations assume responsibility for all mental health services for persons who meet medical necessity criteria for a mental health condition. Organizations were not responsible for state hospital and nursing home costs for persons between 21 and 65 years. Capitation contracts were awarded to agencies, referred to as mental health service agencies or MHASAs, which are responsible for 14 of the 17 geographical areas that were covered by community mental health centers that existed prior to the demonstration program. A large urban area (Denver, CO) and several rural counties continued to provide services to the Medicaid population on a FFS basis during the period of the demonstration. More details of the development and organization of CMDP appear in published sources (Bloom, Toerber, Hausman, et al. 1994; Dever 1997).

### *Sample Selection*

Patients were eligible for the study if they (1) were a current user of Medicaid mental health services; (2) had a diagnosis of schizophrenia, bipolar disorder, or any DSM-IV diagnosis and a 24-hour psychiatric hospitalization in the past year; and (3) were 18 years of age or older.

Patients meeting these criteria were identified from two sources. The primary source was a list of existing Medicaid mental health service users (fiscal year 1994 and 1995). A secondary source was a list of users who were newly enrolled (or re-enrolled) in the Medicaid Program and starting a new episode of care at a community mental health agency. The latter group comprised 23 percent ( $n = 144$ ) of the total sample. The sample of existing users was stratified on gender and their service costs in the prior year. Prior-year service costs were stratified by dividing eligible members into above median (high cost) and below median (low cost) groups. New users were stratified only on gender.

Geographic areas covered by capitated and the FFS models were examined for their equivalence on degree of rurality, poverty, ethnicity, historical level of mental health funding, and primary industry type using data from the 1990 U.S. Census on counties and census tracts in Colorado. Patients residing in counties or census tracts that were not demographically comparable to other counties in the FFS or capitated areas were excluded so that the inclusion of areas with unusual sociodemographic characteristics would not bias group comparisons. Several highly rural areas throughout Colorado were excluded based on these analyses. A separate analysis focusing on these rural areas was conducted concurrently with this study, and data on outcomes in these areas will be presented in subsequent reports. Portions of Denver were not sampled because of idiosyncrasies in the level of funding available to severely mentally ill patients in these areas.

### *Interviewing Procedures and Attrition*

Interviews were conducted by seven trained research interviewers with past experience in conducting semistructured interviews with mentally ill and other populations. Interviewers contacted sampled patients directly by phone or mail regarding their interest in participating in the study. Approximately 900 patients were randomly selected to obtain baseline interviews of 640 study participants (71 percent response rate).

Patients completing written informed consent were administered a baseline interview. Interrater reliability was checked and maintained by a field

Table 1: Characteristics of the FFS, Direct Capitation, and MBHO Samples

	<i>FFS</i>	<i>Direct Cap</i>	<i>MBHO</i>	$\chi^2$
Males (percent)	55.8	52.8	53.4	0.4
Age group (percent)				
18–35	34.7	36.3	28.2	6.8
36–50	45.3	40.1	42.9	
51 and older	20.0	23.6	29.0	
Ethnicity (percent)				
White	47.4	69.8	58.0	25.6**
Black	11.1	3.8	5.0	
Hispanic	14.2	7.6	12.2	
Other	27.4	18.9	24.8	
Service costs in prior year (percent)				
High cost	32.1	29.7	26.5	4.4
Low cost	29.5	30.2	26.1	
No prior costs	38.4	40.1	47.5	
Diagnosis (percent)				
Schizophrenia	58.4	54.7	52.1	19.6**
Bipolar disorder	22.6	32.1	20.2	
Other DSM-IV disorder	19.0	13.2	27.7	
Newly enrolled	13.1	23.1	39.4	16.1**
Participants ( <i>n</i> )				
Baseline	190	212	238	4.3
6-Month assessment	162	197	203	
12-Month assessment	149	186	188	
18-Month assessment	144	182	187	
24-Month assessment	126	173	152	

\*\* $p < 0.01$ .

supervisor who jointly rated 30 interviews with each interviewer being involved in three to five joint interviews.

Attrition from the study following the baseline assessment was extremely low overall. Table 1 contains the number of participants interviewed at the baseline and 6-, 12-, 18-, and 24-month assessments. A chi-square test (Table 1) shows that rates of participation did not differ between the FFS, Direct, and MBHO groups. Only 7.7 percent ( $n = 49$ ) of the sample had no follow-up measures and were dropped from the outcome analyses. Attrition, as measured by the lack of any follow-up measure, was somewhat greater in the MBHO group (10.5 percent) than in the FFS (7.9 percent) or the direct capitation group (4.3 percent,  $\chi^2[2] = 6.2, p < 0.05$ ). In order to gain more information about how differential attrition might have biased the analyses, we correlated attrition rates with subject demographic variables and the baseline measures of BPRS and Global Assessment of Functioning (GAF). Blacks, Hispanics, and those with bipolar disorder were less likely to terminate the study before completing at

least one follow-up assessment. Persons screening positive for alcohol abuse and of "other" ethnicity (e.g., Native American, Asian, Pacific Islander) were more likely to terminate without follow-up. Those who dropped out of the study were equivalent on age, sex, baseline BPRS score, and baseline GAF score.

### *Measures*

Psychiatric symptoms were measured using the 18-item, anchored version of the BPRS (Woerner, Mannuzza, and Kane 1988). BPRS items were rated on 7-point scales ranging from 0 (no symptoms) to 6 (very severe symptoms). Items were summed to form a total symptom score ranging from a minimum of 0 to a maximum of 107. In addition, one interview question patterned after the items on the BPRS was added to measure suicidality of the patient in the week prior to the interview. The intraclass correlation based on independent ratings in a joint interview situation was 0.95 for the BPRS total score and 0.98 for the one-item rating of suicidality. The CAGE was used to assess alcohol problems (Ewing 1984). The CAGE consists of four yes/no questions typically endorsed by persons abusing alcohol, such as whether the respondent felt that they needed to cut down on their drinking and whether they felt annoyed by others criticisms of their drinking. Other types of substance abuse were assessed by rewording the CAGE items slightly to refer to illicit and nonprescription drug problems (Drug-CAGE). Two or more yes responses to the CAGE and Drug-CAGE defined alcohol and drug abuse problems, respectively.

Global functioning was assessed in two ways. First, research assistants rated functioning at the end of each interview using the GAF scale (Endicott et al. 1976; Goldman, Skodol and Lave 1992). GAF ratings range from 0 to 99, and higher scores reflect higher functioning. The intraclass correlation for GAF ratings across raters was 0.83. Second, patient's rated their own functioning on a 4-point scale, including "excellent," "good," "fair," and "poor" response options. Higher scores reflect lower functioning.

Functioning in specific domains was measured through components of the Quality of Life Interview (QOLI) pertaining to daily activities, frequency of contact with friends, frequency of contact with family, and participation in work-related activities (Lehman 1983; Lehman 1988). Studies of the QOLI have shown it to yield reliable and valid estimates of functioning in persons with severe mental illnesses. Daily activities were measured as the number of daily activities (among 16 assessed by the QOLI) reported by the respondent in the week prior to the interview. Contact with friends and family was measured as self-reported frequency of contact rated on 5-point scales ranging from



1 (not at all) to 5 (at least once a day). Participation in work was measured as (1) the presence or absence of competitive employment, sheltered workshop employment, volunteer, and sporadic jobs in the 6 months prior to the interview and (2) the average number of hours spent in these activities.

The QOLI also measures two basic and necessary components of life: housing and finances. The first housing measure was the occurrence of homelessness, which was defined as having to spend one or more nights outside without shelter or using temporary housing arrangements such as cars, shelters, and abandoned buildings in the past 6 months. The second measure was simply the number of months that the respondent had lived at their current residence. Another housing measure was the number of appliances and basic comforts (out of 11 assessed by the QOLI) available to the respondent in their current residence. Finances were measured as self-reported monthly income in dollars from all sources, including government entitlements, employment, and family contributions. The QOLI also asks respondents if they have enough money each month to cover food, clothing, housing, medical expenses, travel, and social activities. The sums of the “yes” responses (2 points) and “sometimes” responses (1 point) were used to create a brief measure of the adequacy of finances from the respondent’s perspective.

Study participants also rated subjective quality of life in terms of general life satisfaction and satisfaction with housing, neighborhood, finances, personal safety, family relationships, friends, and physical health. Each subjective dimension on the QOLI is comprised of several items rated on 7-point scales ranging from 1 (terrible) to 7 (delighted) (Lehman 1983; Lehman 1988). Self-ratings were averaged across items within each area. Internal consistency ranged from 0.81 to 0.90 for the subjective quality of life ratings.

Finally, respondents were asked about behavior related to their public safety and public welfare. Respondents were asked if they had been arrested, put in jail, or victimized by violent or nonviolent crime in the 6 months prior to the interview.

### *Statistical Analyses*

Random regression models (RRMs) were used to test for differential change in outcomes as a function of capitation group (Gibbons, R. D. et al., 1993). RRM, sometimes referred to as growth curve models or hierarchical linear models, permit subjects with missing data and modeling of within-subject correlation.

Models included capitation group as a three level categorical variable (Cap), assessment interval as a linear measure of time (Time = 0, 1, 2, 3, or

4), and the interaction of capitation group and time (Cap  $\times$  Time). Second-order polynomial trends were also included in the model (Time<sup>2</sup>) along with the interaction of capitation group and polynomial trends (Cap  $\times$  Time<sup>2</sup>). Cubic and higher order time trends were not significant in the regression models and were dropped from the analysis. Covariates to the model are listed in Table 1. All outcome measures were compared at T = 0. No group differences were identified, suggesting that groups were comparable in terms of their baseline levels of symptoms, functioning, and quality of life.

Models also included random, person effects, and variance-covariance components arising from person-level variation in baseline scores (intercept), linear trends (Time), and polynomial trends (Time<sup>2</sup>) within capitation groups. Random error was specified as a first order autoregressive process.

When outcomes were binary, we modeled the probability of the outcome event (e.g., likelihood of homelessness, being arrested, being employed) using generalized linear models with a logit link function with the SAS GLIMMIX macro (Littell, R. C., Milliken, A. G., Stroup, W. W, and Wolfinger, R.D. 1996). Model specifications for binary outcomes were the same as that for continuous variables in terms of parameters, random effects, and error structure.

For a given outcome measure, the interaction between the capitation group and either the linear trend (Capitation  $\times$  Time) or the polynomial trend (Capitation  $\times$  Time<sup>2</sup>) indicates differential change in outcomes. When either interaction term was significant at the 0.05 level in the regression model, two planned contrasts were made at each assessment interval: MBHO versus FFS and direct capitation versus FFS. When interaction terms were not statistically significant, no post hoc comparisons were reported in order to reduce the likelihood of type I error. As a result, few post hoc comparisons were performed, and the actual risk of type I error in the study is nominally higher than 0.05.

## RESULTS

### *Characteristics of the Sample*

The demographic characteristics of the FFS, direct capitation, and MBHO samples are shown in Table 1 and suggest some differences between the samples. The FFS areas showed higher rates of schizophrenia and non-White patients compared with the capitated areas. Prior year service costs were equivalent across the study groups. In addition, more study participants in the MBHO cohort were from newly or re-enrolled Medicaid recipients starting a

new episode of treatment. The characteristics in Table 1 are covariates in regression models predicting change in outcomes, and the mean outcome scores presented in Tables 2 and 3 are adjusted for these covariates.

### *Symptom and Global Functioning*

Symptom and global functioning measures were largely equivalent under different reimbursement models. Means and test statistics are presented in Table 2. At baseline and all subsequent follow-up assessments, the FFS, direct capitation, and MBHO samples were equivalent on total BPRS score, interviewer-rated GAF, self-rated functioning, and alcohol abuse, as measured by the CAGE.

There was some evidence that ratings of suicidality in the week prior to the interview were lower in patients treated in the MBHO sample than in the FFS sample. Although equivalent at baseline, MBHO suicidality ratings were significantly lower at the 6-, 12-, and 18-month assessment periods but returned to the levels of the FFS sample at 24 months.

Trends in substance abuse problems, according to self-reports on the modified CAGE screening measure, were significantly different across the areas. Substance abuse problems decreased over the 2 years in the FFS and the MBHO groups, whereas rates of substance abuse problems increased temporarily in the direct capitation area, with the direct capitation group significantly different than the FFS group at the 6- and 12-month assessments.

### *Functioning in Specific Domains*

Changes in specific role functioning were assessed in several domains, including self-reported participation in work-related activities, daily activities, and frequency of contact with family and friends. In contrast to the FFS sample, the MBHO sample showed a pattern of increasing daily activity. Although equivalent at baseline, the number of daily activities increased from an average of 8.0 to 8.3 (out of 11 activities) in the MBHO sample but declined from 8.2 to 7.8 in the FFS sample (results are presented in Table 3).

Capitation groups did not differ in terms of their likelihood of work at any time during the study, the number of hours a week in work-related activities, or frequency of family contact or contact with close friends. However, slight differences emerged in frequency of other social contacts across the groups. The MBHO sample showed a tendency toward increased social contacts that was not seen in the FFS sample. Group comparisons at each assessment interval indicated that the difference was evident only at the 18-month assessment.

Table 2: Two-Year Symptom and Global Functioning Outcomes

Measure	Group	Adjusted Means						Model Details			
		B	6	12	18	24	Cap × Time	Cap × Time <sup>2</sup>	LR		
GAF	FFS	44.9	43.8	43.3	43.3	43.8	1.3	1.7	94**		
	Direct	46.9	44.9	43.8	43.5	44.1					
BPRS	MBHO	45.7	44.8	43.8	42.9	42.0	0.3	0.3	33**		
	FFS	34.9	34.8	34.8	34.9	35.0					
Suicide rating	Direct	35.3	35.2	35.3	35.6	36.2	0.8	6.2**	39**		
	MBHO	34.2	33.6	33.4	33.7	34.4					
Self-rated functioning	FFS	1.5	1.5	1.5	1.5	1.4	0.7	2.0	40**		
	Direct	1.5	1.6	1.5	1.5	1.4					
Alcohol abuse (percent) (CAGE)	MBHO	1.4	1.3 <sup>b</sup>	1.3 <sup>b</sup>	1.3 <sup>b</sup>	1.5	0.2	0.2	437**		
	FFS	2.5	2.4	2.3	2.3	2.4					
Substance abuse (percent) (Drug CAGE)	Direct	2.4	2.4	2.4	2.4	2.4	10.3**	6.6**	709		
	MBHO	2.4	2.4	2.4	2.4	2.3					
Alcohol abuse (percent) (CAGE)	FFS	25.5	21.1	20.1	19.3	16.1	0.2	0.2	437**		
	Direct	29.5	27.7	24.2	22.1	24.6					
Substance abuse (percent) (Drug CAGE)	MBHO	23.1	20.9	18.5	17.9	20.6	10.3**	6.6**	709		
	FFS	7.7	3.4	2.9	2.9	2.0					
Substance abuse (percent) (Drug CAGE)	Direct	3.7	7.9 <sup>a</sup>	6.1 <sup>a</sup>	3.8	3.3					
	MBHO	4.5	2.3	3.6	6.0	3.8					

Note: n = 591 participants for all analyses. LR, Likelihood Ratio Test.

<sup>a</sup>The direct capitation group is significantly different than the FFS group ( $p < 0.05$ ).

<sup>b</sup>The MBHO group is significantly different than the FFS group ( $p < 0.05$ ).

Table 3: Two-Year Outcomes for Other Measures of Quality of Life, Safety, and Welfare

Measure	Group	Adjusted Means						Model Details		
		B	6	12	18	24	Cap × Time	Cap × Time <sup>2</sup>	LR	
Daily activities	FFS	8.2	8.2	8.1	8.0	7.8	3.9*	0.7	83***	
	Direct	8.1	8.2	8.1	8.1	8.1				
	MBHO	8.0	7.9	8.0	8.1	8.3 <sup>b</sup>				
Frequency of other social contact	FFS	2.7	2.7	2.6	2.6	2.5	3.8*	1.2	81***	
	Direct	2.7	2.8	2.7	2.6	2.6				
	MBHO	2.6	2.6	2.7	2.8 <sup>b</sup>	2.6				
Percent homeless	FFS	1.0	0.9	0.7	0.7	0.7	2.5	6.3***	3039***	
	Direct	1.0	1.0	0.8	0.5	0.3 <sup>a</sup>				
	MBHO	1.2	0.6	0.4	0.4	0.5				
Percent arrested in last 6 months	FFS	2.9	2.0	1.6	1.6	2.2	1.0	7.32***	5677***	
	Direct	1.8	2.2	2.0	1.2	0.7 <sup>a</sup>				
	MBHO	2.4	2.4	2.2	1.8	1.5				

Note: n = 591 participants for all analyses. LR, Likelihood Ratio Test.

<sup>a</sup>Direct capitation is different than FFS (p < 0.05).

<sup>b</sup>Direct capitation is different than FFS (p < 0.05).

### *Quality of Life Outcomes*

This study also examined objective and subjective quality of life outcomes across the capitated groups. The capitation group  $\times$  polynomial trend interaction was significant in the RRM with regard to likelihood of homelessness (see Table 3 for results). Homelessness in the direct capitation and MBHO groups dropped over the course of the 2-year study period. By the 2-year follow-up assessment, rates of homelessness in the direct capitation group were lower than the FFS group by a statistically significant margin. Groups did not differ in the number of months residing in their current residence or in terms of the number of appliances and basic comforts available to them in their primary residence. Study participants had lived in their current residence between 45 and 50 months on average, regardless of capitation group, and reported that 9 out of 17 appliances and comforts assessed in this study were available to them.

Changes in subjective quality of life measures were also analyzed with RRMs. There was no evidence of differential change in overall life satisfaction or satisfaction with specific areas of one's life such as living arrangements, neighborhood, family relationships, relationships with friends, finances, personal safety, or one's health. Self-reported satisfaction with life tended to increase or remained stable over the 2-year study period, with no areas showing statistically significant declines.

### *Suicidality, Victimization, and Legal Problems*

Changes in self-reported likelihood of being arrested, put in jail, or victimized were compared across the study groups. The capitation group  $\times$  polynomial trend coefficient was significant in the regression model for self-reported arrests (details are presented in Table 3). The rate of self-reported arrests decreased significantly more in the direct capitation group than in the FFS group, and this difference was significantly different at the 2-year assessment. No group differences were found in the likelihood of a jail episode or of being the victim of a crime.

## DISCUSSION

A comparison of two models of state Medicaid capitation with that of FFS reimbursed mental health services found very few differences in symptom, functional, quality of life, and public welfare outcomes over 2 years for adults with severe mental illness. Where differences in outcomes were apparent, they

tended to reflect greater improvement in capitated areas. Only one measure reflected a poorer outcome in a capitated region. Self-reported substance abuse problems increased temporarily in the direct capitation sample relative to the FFS sample, although this tendency was only evident at the 6- and 12-month follow-ups.

These findings add to a small number of controlled studies of Medicaid capitation that have not found poorer outcomes when mental health providers have received capitated rather than FFS payments for service delivery (Reed Hennessy, Mitchell, et al. 1994; Shern, Donahue, Felton, et al. 1995; Lurie, Moscovie, Finch, et al. 1992; Christianson & Popkin 1992; Christianson, Lurie, Finch, et al. 1992). Taken together with analyses suggesting that capitation has resulted in reduced costs in Colorado's Medicaid program, results of this study suggest that capitation has resulted in more cost-effective delivery of care to the severely mentally ill (Bloom, Hu, Wallace, et al. 2002). The Colorado Medicaid program is able to operate within a more stable and predictable budget, and treatment outcomes do not appear to have declined in the first 2 years of the program.

Results also suggest that outcomes are comparable between regions in which Colorado made capitated payments directly to providers and areas in which payments were made to an MBHO. Outcome differences were as likely to favor the MBHO sample as the direct capitation sample. The MBHO sample showed relatively lower ratings of suicidality and substance abuse problems and higher levels of self-reported social contact and daily activities relative to the FFS sample. The direct capitation sample showed relatively lower rates of homelessness and fewer arrests relative to the FFS sample.

The pattern of outcomes observed in this study may result from particular strengths of the mental health programs operating in the capitated regions of Colorado during this study. Qualitative data on program development and organizational change have been collected by the study team and may help to identify characteristics predictive of these outcome differences. Of course, other factors unrelated to capitation or community program practices may account for the outcome differences observed in this study. The demonstration program did not allow for randomization of patients to capitation groups and unmeasured sample characteristics, community, or regional differences may have resulted in the findings observed in this study.

Two other aspects of the results add to the difficulty of interpreting the outcome differences. First, outcome differences between capitated and FFS areas were not observed to be stable and persisting phenomena in contrast to one prior study that showed increasing outcome differences favoring noncapi-

tated Medicaid providers (Manning, Liu, Stoner et al. 1999). Outcome differences either subsided before the end of the study or appeared only at the final assessment period.<sup>1</sup> Second, outcome differences were small in magnitude. For example, differences in ratings of suicide risk were observed; however, the MBHO sample was only 0.2 scale points less suicidal than the FFS sample. Of potentially greater concern was the near doubling of substance abuse prevalence 6 and 12 months following the demonstration program onset in the direct capitation sample. This outcome difference was not observed at 18 or 24 months.

Despite the encouraging nature of these results, some aspects of the Colorado experience and the research prevent us from concluding that capitated payment arrangements with providers or intermediary organizations do not have negative effects on the quality of mental health service delivery. Perhaps most importantly is that the state of Colorado engaged in a sound design and implementation process that averted or minimized problems that have occurred in other states (Eberle 1998). The research team observed that state mental health and Medicaid administrators obtained broad-based input on the design of the capitation program from community mental health program administrators and treatment providers, consumers and family organizations, and academically based consultants. The selection of contractors and implementation of the capitation scheme was open and engaged many stakeholder groups in the process of monitoring and evaluation of the postcapitation mental health delivery system. Furthermore, community provider agencies in the state had effective methods of communication with each other and with the state in all phases of the capitation demonstration. Florida, among other states, has implemented managed care arrangements with Medicaid providers that involve private, for-profit MBHOs (Ridgely, Giard, and Shern 1999). Whether capitation or other managed care arrangements will yield equally positive results in other environments is unknown and cannot be assumed.

Other limitations derive from the design of this study. Because capitation was expected to have the largest effects on the heaviest users of the system, the study focused on persons with severe mental illness. Unknown is how Medicaid capitation in Colorado has affected the treatment of less severe and chronically ill disorder groups, particularly if capitation has encouraged providers to focus their treatment efforts on the most resource intensive populations. In addition, this study is quasi-experimental in nature. The few outcome differences that emerged in this study are not necessarily the result of capitation but may result from other differences in the mental



health programs or communities from which the sample was drawn. Finally, the lack of outcome differences may have been due to the unreliability and insensitivity of mental health outcome measures particularly among the QOLI measures that have not shown the same sensitivity to change as measures of symptoms and functioning.

## CONCLUSION

The results of this study are consistent with the notion that capitated payment arrangements with Medicaid providers or intermediary organizations do not negatively affect the treatment outcomes of adult persons with severe mental illness. These conclusions are based on long-term observation of outcomes in large, representative samples of Medicaid recipients across a broad range of outcome domains, including symptoms, functioning, quality of life, and public welfare outcomes. Taken together analyses of treatment costs, results suggest that the capitated payment arrangements in Colorado have increased the cost-effectiveness of the treatment delivery system, at least when implemented in a state Medicaid program characterized by community participation, monitoring, and evaluation.

## NOTE

1. Other specifications for statistical models of repeated measures data are possible, such as dummy coding assessment periods and treating participants as fixed rather than random effects. None of these specifications altered the conclusion that outcomes were generally comparable across groups.

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