The Administrative Control System of Substance Abuse Managed Care

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Objective. This article searches for the dimensions of the administrative structures in outpatient substance abuse managed care that control the behavior of agency providers. It also ascertains how these dimensions, and several financial mechanisms, affect key aspects of the providers services: the average number of sessions of care that are delivered, the rate of completion of care, and the (estimated) rate at which clients control their substance use.

Data Sources. The data were collected in 1999 for this investigation.

Study Design. These data come from a nationally representative, cross-sectional sample of individual contracts between outpatient drug treatment providers and the Behavioral Health Managed Care Organizations (BHMCOs) that are empowered to regulate the delivery of services. Provider responses are analyzed here.

Data Collection Methods. Factor analyses at a contract level examine the structural dimensions of the control system. Multivariate analyses at the same level rely on generalized linear models to predict the dependent variables by the structural dimensions and financial mechanisms.

Findings. The factor analyses suggest that there are six multiple variable structural dimensions. The multivariate analyses suggest that the dimension that mandates follow-up of discharged clients tends to relate to more sessions of care and perhaps a higher rate of service completion. Most other dimensions are found to relate to fewer sessions of care, lower rates of service completion, or lower rates of control of substance abuse. No structural dimension relates to all dependent variables. Financial mechanisms evince varying relations to the sessions of care. They rarely relate to the other dependent variables.

Conclusion. The results generally suggest that providers, payers, or policymakers might affect service provision by selecting BHMCOs that stress particular structural dimensions and financial mechanisms. However, managed care contracts most heavily rely on structural dimensions that restrict treatment sessions and fail to predict superior client outcomes.

Key Words. Substance abuse services, managed care, treatment outcomes, service delivery

In substance abuse managed care, authorities use rules, standards, procedures, and financial incentives to control the nature and length of treatment (Mechanic, Schlesinger, and McAlpine 1995). Presently, slightly under 30 percent

of provider treatment episodes are thus controlled (Horgan et al. 2001). Managed care may also now cover a majority of the substance abuse services that are offered in private health care plans (Fox, Graves, and Garris 1999).

Much of the research on substance abuse managed care concerns one popular type of behavioral health (mental health and substance abuse) arrangement, the "carve-out" plan (Frank and McGuire 1997; Ma and McGuire 1998; Stein, Elaine, and Sturm 1999; Steenrod et al. 2001). This research finds that carve-outs are more restrictive than traditional insurance in some ways. They tend to reduce cost, all but eliminate inpatient services, but to differentially affect access to care, and the intensity of outpatient treatment. Other works consider the general tendency of substance abuse managed care to limit provider autonomy (Mechanic, Schlesinger, and McAlpine 1995; Schlesinger, Dorward, and Epstein. 1996; Alexander and Lemak 1997a; Beinecke 1998; Schwartz and Wetzler 1998). However, works do not yet clarify if, and how, managed care affects the outcomes of the outpatient providers who now dominate service provision.

So far, the literature at the provider level finds limited and complex relations (only some variable ranges are predictive) between the extent of reliance on managed care and average client lengths of stay, service breadth, and client access (Lemak 1998; Durkin, 2002; Alexander, Nahra, and Wheeler 2003). This may suggest that the implementation of managed care only mildly affects outpatient care. However, another possibility is that there is much *variation* (Wolff and Schlesinger 1998); the effects of managed care on service delivery may depend on the types of controls that are used. Indeed, it is known that, in varying managed care plans, providers are allowed client stays that vary from less than 10 days to many months (Lemak 1998; Liu, Sturm, and Cuffel 2000).

One somewhat pertinent work suggests that a few individual managed care rules and policies affect (usually negatively) provider perceptions of managed care (Alexander and Lemak 1997b). Another finds that some financial sanctions affect provider efficiency (Alexander et al. 1998). The most relevant investigation finds that only one measure of the controls (managed

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care stringency) affects the number of outpatient sessions that clients obtain in treatment, and to a limited degree (Lemak and Alexander 2001). However, all of these findings are preliminary. They stem from studies that use aggregate data, where outpatient providers' overall perceptions or service delivery patterns are related to summary measures of the controls used by all of the providers' managed care suppliers. Virtually all of the studies also either sample few of the control mechanisms used in managed care, or index the control mechanisms on nonempirical bases. More advanced methods may help to locate stronger and more subtle relationships between service delivery patterns and the controls.

Accordingly, the current work relies on a data set that contains information on the individual relations between agency-based outpatient substance abuse providers and managed care suppliers. It uses these data to empirically determine the patterns of control. It also relates measures of control to key service delivery outcomes. The results help to describe the controls that are commonly used in substance abuse managed care, and to consider how various patterns of control affect provider services, and thus service delivery goals.

BACKGROUND

For complex reasons (Sosin and D'Aunno 2001), substance abuse and mental health managed care tends to be separated from the remainder of the health care package in the United States (Mechanic, Schlesinger, and McAlpine 1995; Wolff and Schlesinger 1998). Behavioral Health Managed Care Organizations (BHMCOs) generally control the separated benefits. The BHMCOs may be free-standing organizations, wings of insurance companies, or representatives of provider groups. BHMCOs of all types usually administer plans of many payers under a single control system. For example, they might simultaneously administer insurance programs in which behavioral health is separated from the rest of the health care plan (carve-outs), subcontracts from health maintenance organizations or other providers who deliver health care services (carved-in), and stand-alone plans (Sosin and D'Aunno 2001). The provider relations examined here combine multiple plan types.

Financial Mechanisms and Structural Dimensions

Few BHMCOs capitate providers (providing them with a set fee per enrollee). Instead, the vast majority influence the services that providers deliver through administrative controls (Blue Cross and Blue Shield 1991; Sosin and D'Aunno

2001). Early work thus describes BHMCO controls involving utilization reviews, where BHMCOs dictate the length of stay for clients who already are in care, and comprehensive reviews, where BHMCOs dictate or influence many aspects of admissions, treatment, and discharge (Blue Cross and Blue Shield 1991; Fox, Graves, and Garriss 1999). But BHMCOs now control providers in varying degrees and ways.

Contemporary MCOs generally use at least two types of control *mechanisms*: financial and structural. Financial mechanisms provide monetary incentives to spur providers to obey BHMCO policies (through noncompliance penalties). They also increase the cost of providing expensive care (such as by setting a reimbursement rate). Structural mechanisms control BHMCO interactions with providers through rules, centralizing devices (such as by directly dictating treatment length in telephone conversations), and other techniques mentioned below (Weber 1947). Structures may be applied at various stages of processing cases or treating clients.

This work predicts service delivery patterns by various measures of financial and structural administrative controls. It treats the measures of financial mechanisms as discrete variables, but it analyzes the more complex structural regulations in another way. It first determines how structural measures combine into a smaller number of structural *dimensions*; it then uses the dimensions as independent variables in equations that predict service delivery patterns. These analyses are similar to those carried out in studies of the internal administration of complex organizations, which empirically derive structural dimensions that indicate basic control strategies, and use the dimensions to predict other phenomena (Meyer 1968; Pugh et al. 1968; Child 1973).

Treatment Practices and Proximate Client Outcomes

The dependent variables used here measure two concepts: the number of treatment sessions (length of client care) that the provider grants to clients, and “proximate” client outcomes. The latter more particularly include staff perceptions of the extent to which clients complete treatment, and the perceptions of the extent to which clients eliminate or control their drinking and drug use.

Working within the limits of a journal article, all of these dependent variables are selected because of their importance to service delivery. Treatment sessions are pivotal to treatment costs. They may also be the single most important indicator of the value of treatment. That is, evidence suggests that treatment success depends on the number of sessions that clients receive; evidence does not as clearly suggest that any particular modality of treatment

is more helpful (McLellan et al. 1997; Simpson 1997). Managed care administrative controls frequently directly monitor treatment sessions.

The proximate client outcomes are obviously substantively important. They may also be affected by managed care dimensions and mechanisms both indirectly, and directly. For example, structural dimensions may affect the length of treatment, and length may affect control of drinking and drug use. At the same time, structural dimensions may directly decrease the efficacy of control of drinking and drug use by distorting the match between clients and services. To be sure, one of the work's methodological limits is that it relies on provider reports of the outcomes. It also thereby relies on provider definitions of the rates of treatment completion.

METHODS

The analyses use a unique data set, which involves a random sample of formal contracts between BHMCOs on the one hand, and outpatient drug treatment agency providers, on the other. Formal contracts arise when BHMCOs and treatment providers sign (usually 1–3 years) agreements that establish the payment rate and the control system. They are analyzed here because they spur relationships with BHMCOs that are well understood and likely to significantly affect providers. While some contracts do not lead to many or any client referrals, those are not analyzed.

The data set summarizes reports from agency provider representatives concerning the nature of up to three of their contracts with BHMCOs (repeating the same questions). The responses describe the structural and financial mechanisms in each contract, as well as the contract-specific lengths of client stays, and proximate client outcomes. Use of the resulting data enables the current analyses to avoid the aggregation problems that characterize previous studies of managed care. In contrast, the only other known analysis of structural dimensions, which is in a dissertation, uses aggregate data; it analyzes measures summarizing characteristics of all of the managed care arrangements of each provider. It also determines structural dimensions from a factor analysis that combines financial and structural mechanisms across contracts (the two are separated here); uses only some of the available structural measures; and does not relate the uncovered dimensions to outcome variables (Lemak 1998).

Sample Development

The current sample of contracts was gathered in 1999 through a two-phase sampling plan. In phase one, a set of agency providers that had managed care

contracts was identified from the fourth (1995) wave of the random sample Drug Abuse Treatment System Survey. This wave provided the most representative available sample of outpatient drug treatment units (D'Aunno, Vaughn, and McElroy 1999). The providers' directors were asked to list the BHMCOs with which they had contracts. To exclude the underutilized contracts, directors were asked to only list contracts that served at least 10 clients (in 1998).

In phase two, project interviewers sampled and asked questions about up to three of these contracts per agency (fewer if the agency had fewer contracts). Sampling was random and proportional to size. The current analyses use sample weights to adjust for the proportional sampling.

In total, 204 treatment providers were eligible to be interviewed. Three of these were no longer engaged in outpatient drug abuse services and thus were dropped. Interviews were then completed with 174 directors and 169 supervisors, for respective response rates of 86.6 and 84.1 percent. This netted information on 186 individual managed care contracts with providers. The final number reflects the proportion of providers who had qualifying contracts, and the number of contracts with each provider. It also reflects the proportion of supervisors who were sufficiently knowledgeable to comment on the contracts that were identified by the directors; 54 contracts were dropped because of a lack of recognition. The low numbers of contracts in the sample may reflect an uneven distribution, where a small subset of the providers has many more than three contracts.

Variables

Using questions similar to those used in other waves of the relevant survey, respondents were asked a series of yes-no questions concerning whether each of 22 structural mechanisms is used in the given contract (see Table 2). The responses provide dichotomous (no is 0, yes is 1) variables that measure structure. These variables cover mechanisms involving precertification or intake reviews, where clients generally are assessed for service needs; concurrent or ongoing reviews, where clients are assessed for continuing needs for treatment sessions or other supportive services (Wells et al. 1995); discharge procedures; and control of the treatment process. The variables also cover different means of control. For example, they cover mandates that providers ask the permission of BHMCOs to treat each client, allow BHMCOs to conduct reviews on the basis of written records, cede to written standards that dictate which clients are eligible for services (for example, clients with previous treatment episodes may be allowed more sessions), or submit data on

case outcomes. Measures were developed from case studies and provider contacts.

The three variables measuring financial mechanisms also stem from contract-specific questions asked of supervisors. As Table 1 suggests, these dichotomous variables measure whether BHMCOs stop payments when care standards are not met in a contract (62 percent reportedly thus stop payments), disallow claims (73 percent), or reimburse providers for less than the cost of care (77 percent). The first two variables involve monetary incentives to obey BHMCO dictates. The third involves a way of increasing the cost of treatment to providers.

As also reported in Table 1, two dependent variables are supervisor reports of the length of care in the contract: the percent of clients who receive at least 10, and the proportion who receive at least 20 treatment sessions (averaging 63 and 32 percent, respectively). Such cut-off-based variables may be more accurate than reports of average times in care. More crucial, the cut-offs reveal how frequently the length of treatment meets clinical meaningful standards. Many contracts only allow 10 sessions, but the 20 session cut-off arguably represents treatment that is long enough to be particularly helpful (Miller and Hester 1986; McLellan et al. 1997; Simpson 1997).

Table 1: Control and Dependent Variables

	<i>Mean</i>	<i>Standard Deviation</i>	<i>n</i>
Financial mechanisms (dichotomies)			
BHMCO stops payments	0.616	0.493	173
BHMCO disallows claims	0.732	0.439	172
BHMCO reimburses for less than cost	0.772	0.420	170
Dependent variables			
Percent clients receiving at least 10 treatment sessions	63.49		165
Percent clients receiving at least 20 treatment sessions	32.20		166
Percent clients completing treatment	55.87		167
Percent clients substance abuse or controlled use	53.76		160
Control variables			
Provider lacks methadone treatment (dichotomy)	0.926	0.264	169
Staff size (number of staff)	14.96	14.14	160
Public auspices (dichotomy)	0.091	0.292	169
For-profit auspices (dichotomy)	0.299	0.463	169
Has parent organization (dichotomy)	0.851	0.360	168
Percent clients employed	68.52	23.45	152
Percent clients black	18.36	20.98	154

Note: Dichotomies are coded 0 (no), 1 (yes).

BHMCO = behavioral health managed care organization.

Table 2: Factor Analysis: Dimensions and Their Loadings

<i>Dimension and Item</i>	<i>Factor Loading</i>
(1) Review centralization	
Specify sessions: precertification	0.840
Require precertification	0.766
Require telephone precertification	0.709
Require telephone authorization: on-going	0.690
(2) Review formalization	
Require written precertification	0.897
Require written authorization for further treatment	0.820
Provide precertification forms	0.693
Specify maximum number of sessions: precertification	0.531
(3) Criteria control	
Use criteria in client progress review	0.888
Use criteria in precertification	0.867
Specify treatment protocol	0.710
Conduct retrospective review	0.661
Conduct review of client progress	0.657
(4) Treatment specification	
Changes treatment plan, on-going	0.946
Specify treatment plan, precertification	0.860
Specify content of treatment plan, on-going	0.764
Mandates being informed about discharge	0.681
(5) Communication specification	
Specify primary clinician correspondence, precertification	0.938
Specify clinician correspondence, precertification	0.893
(6) Discharge specialization	
Require client follow-up	− 0.888
Inform provider of client outcome	− 0.794

The two other dependent variables stem from supervisor assessments of proximate client outcomes for the contract: the proportion (percent) of clients who complete treatment, and the proportion who reportedly are either alcohol and drug free, or in control of their alcohol and drug use. Table 2 suggests that 56 percent of clients are estimated to complete treatment in the average contract, and 54 percent are judged to be substance abuse free or to have substance use controlled.

Other variables described in Table 1 act as statistical controls in the equations that predict the dependent variables by the structural dimensions and financial mechanisms. These control variables are measured at the provider level. They stem from director reports. They measure client characteristics that are believed to affect outcomes, and provider characteristics that are believed to affect the behavior of agencies: the proportion of provider clients

who are black, the proportion of clients who are unemployed, the size of the provider (measured in number of full-time staff equivalents), whether the provider is under public or for-profit auspices (the excluded category is not-for-profit), whether the provider has a parent organization, and whether the agency delivers methadone services (measured as whether the agency does not have these services, which structure providers in special ways).

One analysis limit is that the dependent variables stem from provider reports. However, officials were asked to prepare the statistics in advance of interviews. They often used objective data to do so. Many keep separate statistics concerning each BHMCO contract. While measures of structure and financial mechanisms similarly stem from supervisors who are subjects of control, the respondents should be relatively accurate reporters; they merely are asked about the controls that they are required to follow. Analyses of other waves of the survey suggest that aggregate frequencies gathered in this way usually are consistent with frequencies found in other studies (D'Aunno, Vaughn, and McElroy 1999).

Analysis Methods

Dimensions of Structure. In this work, a factor analysis of the structural items determines the dimensions of structure. It relies on a varimax rotation of a principal components analysis. To match the statistical assumptions of the technique, the dichotomous structural measures are treated as manifestations of latent continuous variables. The software package is the M-plus program (Muthen and Muthen 1998).

The number of dimensions is established using the traditional eigenvalue cut-off of one. Variables are considered to be part of a dimension when their highest factor loading is on that dimension. As will be noted, one dimension is dropped because it contains only a single measure. One variable is dropped because it does not load on any dimension at (or near) the conventional 0.40 level.

Some of the analyzed items are interdependent. For example, a telephone-based precertification review only occurs if a precertification review is required. But interdependent variables will not necessarily load on the same factor. Moreover, the multivariate analyses used here control for the correlation between possibly nonindependent summary measures by analyzing all scales at once.

Implications of Structure and Financial Mechanisms. The independent variables measuring structural dimensions are scale scores. They measure the average

number of affirmative responses to the items that load heavily on each factor. These scores join the measures of financial mechanisms as the independent variables in a set of four multivariate regressions. Two regressions predict treatment sessions under the contract (there are two measures). The other two predict the proximate client outcomes. Each contract is a distinct case in the regressions.

All regressions include the previously described control variables. The two regressions that predict proximate client outcomes also include the proportion of cases in care for at least 10 treatment sessions. (The proportion of clients in care for at least 20 sessions demonstrates virtually no predictive power.) The measure of sessions may be thought of as a control variable, but it also helps test whether structural dimensions and financial mechanisms affect the outcomes indirectly (by affecting the amount of treatment that clients receive).

Because a provider can have up to three contracts, the independence assumption of ordinary least squares regressions may be violated in the contract-specific regressions; unmeasured features of a given provider may systematically affect the statistical relations involving all three of its contracts (depending on the dependent variable, there are 81–85 relevant providers). Accordingly, regressions use a version of generalized linear modeling (McCullagh and Nelder 1989), that controls for the common variance that might exist among multiple responses from one individual. The regressions rely on a linear specification.

RESULTS

Dimensions of Structure

The factor analysis locates seven factors involving structural variables. A one-item factor is dropped. It only includes the variable measuring BHMCO specification of treatment sequencing. The variable measuring BHMCO reliance on a regulator group's (ASAM) criteria at precertification does not load on any factor at the 0.40 level (in retrospect, it is not a behaviorally specific measure), and is not further discussed. The six multiple variable factors, and the loadings for items except the dropped one, are reported in Table 2 in a logical order. The factors are treated as measures of structural dimensions.

Structural Factors. As Table 2 suggests, the first dimension is called *review centralization*. The dimension's high-loading items involve mandates for

providers to seek oral permission from BHMCOs before providing care at two review stages. Centralization is defined to exist when authorities heavily rely on *oral* orders (Blau 1968). The high-loading items include contract-specific requirements for: a precertification review, telephone authorization for that review, setting a number of sessions at that review, and telephone authorization during a concurrent (on-going) review. The second dimension, *review formalization*, tends to include items suggesting mandating *written* permissions or related rules to keep control of case processing. Organizational theorists call control by written rules “formalization” (Blau 1968). The high-loading items include: requiring a written precertification review, providing forms for precertification, specifying a maximum number of initially authorized sessions, and requiring written authorization for further treatment (at concurrent reviews).

The third dimension, called *criteria specification*, is heavily populated by mechanisms that concern or allow the use of criteria. The high-loading items, which cover many aspects of the case processing and treatment technology, represent: use of criteria to select (accept) clients at precertification, use of concurrent reviews of cases, use of criteria in the concurrent reviews, use of retrospective reviews, and specification of a treatment protocol (which perhaps is criteria-based). The fourth dimension is called *treatment specification*, because the highly loading items primarily represent orders and rules that concern the treatment aspect of control. These items include: specifying the treatment plan at admission, specifying the content of the plan for clients who are in treatment, making changes in the treatment plan, and demanding being informed when providers discharge cases from treatment. Perhaps the high loading for the last item suggests that discharges are based on completion of stages of treatment.

The measures loading the fifth, more specialized *communication specialization* dimension are BHMCO requirements for correspondence with the clinician, and with the primary clinician, for the concurrent review. The dimension further specifies the nature of the review by mandating specialist reports. The last dimension, *discharge specialization*, includes items that indicate that BHMCOs establish discharge evaluation criteria. The measures loading heavily on the dimension indicate that the BHMCO requires reports on clients after they are discharged, and that the BHMCO informs the provider about client outcomes after discharge. A bit awkwardly, the factor analysis identifies the last dimension by negative loadings for the two items.

Properties of the Dimensions and Financial Mechanisms. Factor score means, which are not reported in a table, can vary from zero (use of none of the items in the dimension within a contract) to one (use of all items in the dimension). The highest mean scores are achieved by review centralization (0.78), which involves telephone-based reviews. The second highest are achieved by the criteria specification dimension (0.67), which involves control over which clients are eligible for services. Moderate mean scores are achieved by the communication specialization (0.58) and review formalization dimensions (0.49). The lowest mean scores are achieved by treatment specification (0.39) and discharge specialization (0.09).

Further analyses, which are not reported in a table, suggest that financial mechanisms and structural dimensions usually are moderately and positively correlated with each other. According to the largest statistically significant relation, stopping payments is correlated with review centralization ($r = 0.43$). Other relations between financial mechanisms and structural dimensions are at or below 0.3. The one negative relation suggests that disallowing claims after service completion relates to discharge specialization ($r = -0.19$). The structural dimensions, which take high-loading items from orthogonal dimensions, generally correlate with each other at or below the 0.3 level. The exception is a 0.45 correlation between review centralization and criteria specification. In general, then, the measures are only mildly correlated to each other, and thus appear to represent largely independent means of control.

Dimensions and Treatment Practices

The first two columns of Table 3 report results of the equations that predict the proportion of clients receiving at least 10, and at least 20, treatment sessions under a contract. Statistically significant relations involving structural dimensions suggest that the proportion of cases receiving at least 10 sessions is lower when the criteria specification dimension is more heavily stressed. It is lower to a borderline degree ($p < .10$ in a two-tailed test) when the review centralization dimension is more heavily stressed. This proportion is statistically significantly higher when the discharge specialization dimension is more heavily stressed. Statistically significant results involving financial mechanisms suggest that the proportion of cases receiving at least 10 treatment sessions under a contract is lower when BHMCOs stop payments and thus place on providers the financial risks associated with longer stays. The proportion is estimated to be higher when BHMCOs later disallow claims. Perhaps disallowing claims often occurs in retrospective financial reviews (reviews that

Table 3: Determinants of Client Outcomes: GLMs Coefficients and Standard Error

	<i>Proportion in Care 10 Sessions</i>	<i>Proportion in Care 20 Sessions</i>	<i>Proportion Completing Care</i>	<i>Proportion Abuse Free or Controlled</i>
Structural dimensions				
Review centralization	−0.208 (0.115)*	−0.282 (0.090)**	0.052 (0.073)	−0.049 (0.077)
Review formalization	0.052 (0.069)	−0.028 (0.056)	0.030 (0.064)	0.038 (0.042)
Criteria control	−0.219 (0.109)***	0.062 (0.084)	−0.304 (0.112)**	0.105 (0.098)
Treatment specification	0.104 (0.105)	0.012 (0.043)	0.055 (0.080)	−0.221 (0.096)***
Communication specialization	0.004 (0.060)	0.024 (0.044)	−0.032 (0.051)	−0.037 (0.060)
Discharge specialization	0.316 (0.107)**	0.212 (0.107)***	0.143 (0.082)*	0.015 (0.110)
Financial mechanisms				
BHMC stops payment	−0.126 (0.042)**	−0.122 (0.043)**	0.091 (0.044)***	−0.022 (0.040)
BHMC disallows claims	0.118 (0.049)***	0.005 (0.039)	−0.105 (0.126)	0.042 (0.060)
BHMC reimburses for less than cost	−0.063 (0.073)	−0.135 (0.052)***	−0.126 (0.140)	−0.102 (0.066)
Control variables				
Proportion in care ten sessions	—	—	−0.017 (0.113)	0.244 (0.105)***
No methadone treatment	−0.406 (0.114)**	−0.387 (0.106)**	0.234 (0.296)	0.368 (0.110)**
Size (staff)	−0.008 (0.002)**	−0.005 (0.002)**	0.007 (0.014)	−0.000 (0.002)
Public auspices	−0.056 (0.114)	−0.043 (0.102)	0.434 (0.299)	−0.183 (0.107)
For-profit auspices	0.179 (0.097)	0.141 (0.111)	0.783 (0.213)**	−0.095 (0.122)
Has parent organization	−0.070 (0.100)	−0.097 (0.103)	0.040 (0.220)	−0.133 (0.121)
Percent clients employed	−0.003 (0.002)	−0.008 (0.001)**	−0.018 (0.008)***	0.003 (0.002)
Percent clients black	−0.002 (0.002)	0.001 (0.002)	−0.021 (0.009)***	−0.002 (0.002)
Intercept	1.626 (0.232)**	1.438 (0.211)**	1.619 (1.023)	0.0921 (0.283)
Person χ^2	10.016	7.979	5.753	10.548
N	137	137	135	131

* $p < .05$, one tailed test, structural variables.

** $p < .01$;

*** $p < .05$.

BHMC = behavioral health managed care organization; GLM = generalized linear modeling.

occur after treatment is completed). The financial aspects of these reviews may not be very constraining.

As reported in the second column of Table 3, statistically significant coefficients suggest that the proportion of cases receiving at least 20 treatment sessions under a contract is also lower when the review centralization dimension is more heavily stressed, and that it is higher when the discharge specialization dimension is more heavily stressed. The coefficient attached to the criteria specification dimension does not reach the predetermined level of statistical significance. Other statistically significant coefficients suggest that the proportion of clients receiving at least 20 treatment sessions under a contract is lower when BHMCOs either stop payments or reimburse providers for less than costs. The last two measures are correlated ($r = 0.40$).

In brief, the statistically significant relations involving control variables suggest that the proportion of cases in care for at least 10 sessions is lower when providers do not serve methadone clients, and when providers are larger. Relations similarly link the proportion receiving at least 20 treatment sessions to these two control variables. Another statistically significant relation suggests that the percent of clients receiving at least 20 treatment sessions is lower when a greater proportion of a provider's clients is employed. Given that employed clients are believed to respond better to treatment, this relation may indicate that treatment is longer in units in which clients need more help.

Structural Dimensions and Proximate Client Outcomes

The results in the third column of Table 3 suggest that the proportion of clients completing treatment under a contract is lower when the criteria specification dimension is more heavily stressed. According to a borderline relation (statistically significant at the .10 level), the proportion completing treatment is higher when the discharge specialization dimension is more heavily stressed. Another relation suggests that the proportion of cases completing treatment is higher when BHMCOs stop payments. Perhaps this last, anomalous relation occurs because stopping payments encourages providers to re-think the appropriate completion date.

The results in the final column suggest that the proportion of cases reported to be substance free or to control substance use under a contract is lower when the treatment specification dimension is more heavily stressed. This proximate outcome is not related to a statistically significant degree to any other structural dimension or financial mechanism. As might be expected, the outcome is rated higher when a larger proportion of clients complete at least 10 treatment sessions.

To again briefly consider relations with control variables, statistically significant relations indicate that the proportion of cases completing care is higher in for-profit providers. The proportion is statistically significantly lower when a larger proportion of clients is black or when a larger percent of the clients is employed (perhaps employed clients who are making progress believe that they no longer need treatment, or that they cannot afford to continue to balance work and treatment). The proportion of clients reported to be substance free or to control substance use is higher (to a statistically significant degree) when providers do not serve methadone clients.

In general, results are robust to several specifications. For example, the statistical significance of each coefficient in every equation remains unchanged when logging the measure of provider size. If the relative size of the managed care contract is added as a further control in the analyses, its coefficient does not reach statistical significance. Other results are minimally affected.

However, when using a logit rather than a linear specification for the regressions, two of the four equations (those predicting the proportion of clients in care for at least 20 sessions, and the proportion who complete treatment) do not converge. In the other two, logit results suggest the same statistically significant coefficients for structural variables as do linear results. Use of logits changes relations involving financial mechanisms in two ways. A relation between disallowing costs and the proportion in care for at least 10 sessions is lost; a negative borderline relation between reimbursing for less than costs and the proportion controlling substance use emerges.

DISCUSSION

At the most general level, these analyses suggest that substance abuse managed care is controlled in a multidimensional way. There are at least six structural dimensions; these dimensions are found to be only moderately related to financial mechanisms. The various dimensions and financial mechanisms are found to differ in their relationships to the length of care and to the measured proximate client outcomes. The BHMCO contracts apparently involve complex control systems.

The results also provide evidence that various dimensions and mechanisms achieve control in complicated ways. For example, results suggest that the most heavily stressed dimension of structural control is review centralization, through which BHMCO contracts mandate that providers orally

obtain permission to begin or continue to treat clients. Statistically significant relations suggest that stress on this dimension has a negative relation to the proportion of clients who receive at least 10 treatment sessions. It also bears a negative relation to the proportion of clients who receive at least 20 sessions. The coefficients indicate that moving from no to full stress on the dimension (from a score of 0 to a score of 1) alters the proportion of cases receiving at least 10 and 20 sessions by 20 and 28 percent points, respectively. There is thus evidence that BHMCO contracts that stress centralized decisions are more restrictive than average. There is also evidence that review centralization has an indirect negative relation to client cessation or control of substance use, as it bears a negative relation to the number of treatment sessions under a contract (which in turn relates to the outcome).

Still, there is no evidence that the dimension directly affects proximate client outcomes. This may occur because MCO decisions on average make little difference in proximate outcomes. But if it is assumed that outcomes are superior when providers have the autonomy to fully match clients to treatment, and that MCOs are not that capable by themselves, the lack of a relation may suggest that centralization spurs a high level of communication between providers and BHMCOs, which allows providers to supply information to, or negotiate with, MCOs. This might allow some matching of treatment to client needs that neutralizes the effects of central decisions (Beinecke 1998). Similarly, one reason the communication specialization dimension may not be related to the length of stay and measured proximate outcomes is that it balances the high level of control of clinicians with clinician input.

The criteria specification dimension, which mandates that care is distributed according to particular objective client characteristics or circumstances, is negatively related to the proportion of cases that are in care for at least 10 treatment sessions ($b = -0.22$). A subtlety in this case is that the dimension does not relate to a statistically significant degree to the proportion of clients in care for at least 20 sessions. This may occur because criteria specification most fully “weeds out” those clients who are deemed least needy at an early stage; when BHMCO contracts establish criteria for more lengthy (20 session) treatment, a fair proportion of clients may meet the standard.

Moreover, stress on the criteria dimension is found to negatively and directly predict ($b = -0.30$) the rate of reported service completion. It thus may be that the reliance on criteria control makes it more difficult for providers to accurately target care to clients who are more likely to be service completers. Criteria may be rigid, or they may limit what

typically is called client creaming. One finding that may similarly reflect the consequences of rigidity is that stress on treatment specification relates negatively to the proportion of clients who are substance free or control their substance use.

One set of results suggests that MCO control can be positive: discharge specialization is found to be positively related to the length of care, and to the rate of treatment completion. Perhaps these results occur because the rarely stressed discharge specialization dimension encourages workers to pay more attention to outcomes (the dimension mandates measuring outcomes). Its use thus may spur providers to deliver potentially helpful client services, or to try harder to keep clients in care. One complication here is that the dimension is found to be only indirectly related to the reported proportion of clients who are substance free or control their substance use (through its relation to the proportion of cases in care for at least 10 treatment sessions). Perhaps information on outcomes encourages providers to care for clients longer, but does not spur them to use other methods that ensure better outcomes.

Results involving the financial mechanisms include BHMCOs that stop payments, reimburse for less than cost, and deliver fewer treatment sessions under a contract. Results also suggest that the tendency to later disallow claims bears a positive relation to the proportion of cases that remain in care for at least 10 sessions. The most interesting complexity here is that financial mechanisms are neutrally or (in one case) directly positively associated with proximate client outcomes. This may suggest that providers can flexibly adjust their treatment system to financial controls, so that proximate outcomes are not affected (except through limits to the length of care). However, as mentioned above, coefficients involving financial mechanisms are sensitive to equation specification.

CONCLUSION

This analysis represents an early, limited step in understanding the administration of substance abuse managed care. For example, the works rely on supervisor reports. This suggests applying caution in interpreting the analyses concerning proximate client outcomes. Nevertheless, the findings, taken as a whole, are suggestive.

For example, findings do tend to confirm the introduction's suggestion that there are multiple BHMCO control strategies; multiple, largely

independent, structural dimensions and financial mechanisms are uncovered, and many bear relations to measured aspects of service delivery. Accordingly, there indeed is evidence that the nature of treatment delivery at an outpatient provider depends not merely on whether the provider is subject to managed care but also on the details of the managed care system to which the provider is exposed.

The results also suggest that substance abuse managed care dimensions and mechanisms operate in complicated ways, leading to subtle control patterns. For example, results suggest that review centralization bears a negative relation to sessions, but not to the proportion of clients who receive longer stays in care; financial mechanisms often negatively relate to time in care, but bear other relations that suggest that they might allow providers some leeway concerning how they treat clients. Criteria and treatment specialization seem to lead to the most rigidity.

Such results might be used by representatives of providers, payers, or policymaking bodies to determine whether a given regulatory system is compatible with their preferences. That is, the findings at least begin to suggest which structures and financial mechanisms support specific client length of stay and proximate outcome targets. For example, if an official desires a system that achieves a limited proportion of cases in care for at least 20 sessions, but a high proportion of clients completing care, the results point that person to a contract that maximizes review centralization and discharge specialization (for this simple example, the other dimensions and mechanisms are ignored). Working through the direct and indirect coefficients listed in Table 3, complete stress on the two dimensions is calculated to reduce the proportion of clients in care for at least 20 sessions by 7.0 percent, and to increase the proportion of clients who complete care by 19.3 percent. Indeed, future research might consider whether BHMCOs consciously use structural dimensions and financial mechanisms in contracts to help attract payers with particular preferences for the length of stay or other outcomes (Sosin 2002).

Nevertheless, results suggest that the least highly stressed dimension, discharge specialization, is the least constraining. It is also selectively supportive of superior proximate client outcomes. The most highly stressed dimensions, like review centralization, are negatively related to the length of care or (in some ways) to proximate client outcomes. In other words, there is evidence that the more restrictive administrative controls in substance abuse managed care are more heavily stressed.

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