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Do Profits Influence the Quality of Care Provided by Medicaid MCOs?

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1 Introduction

Of the approximately 45 million Americans in Medicaid, roughly two-thirds are enrolled in some sort of managed care. While the specifics vary across states, generally these Medicaid participants are enrolled in managed care organizations (MCOs) that are responsible for providing all of their health care needs. In return, the MCOs receive from the state a monthly payment for each enrollee, regardless of the costs incurred by the MCO in providing their care. The goal of the program is to harness the MCOs' desire to minimize costs to incentivize them to provide high quality care to enrollees.

However, even assuming that the long-run incentives for MCOs to provide high quality are sufficiently strong, short-run profit shocks may influence MCO behavior. Further, given their contracts with state Medicaid agencies, Medicaid MCOs typically have limited means by which they can respond to poor profits. Because their revenue is capitated, the only way the MCOs can increase per-member profits in the short run is by reducing costs. For instance, the MCOs may be able to exploit economies of scale by increasing enrollment. However, it is likely difficult for an MCO to increase enrollment in a relatively short period. A more direct means by which an MCO can reduce costs is by reducing the amount of services it provides to its enrollees, a practice known as service stinting.

This paper addresses the question of whether changes in profits influence the quality of care provided by Medicaid MCOs. A unique data set is employed that includes variables that measure the quality provided and the profits earned by each MCO in each geographic area (hereafter referred to as service delivery area, or SDA) in which it operates. Quality is defined here as the provision of eight types of preventive care received by enrollees. The types of care include screenings for children and women and the provision of asthma medications to those diagnosed as asthmatic. The data also include variables that control for demographic characteristics of enrollees, such as race

and gender. These data are then matched to financial measures for each MCO in each SDA that it serves.

Surprisingly, there has been scant research into whether the profits earned by MCOs have an effect on the quality of care that they provide. The only existing studies (to the authors' knowledge) involve commercial, rather than Medicaid, MCOs. One of these papers[1] finds that higher MCO profits are associated with higher quality of care in the following year, while the othersscbs2005 finds that including financial measures of HMOs does not alter the effects of ownership status on quality of care.

This paper adds to the existing literature in a number of significant dimensions. First, the use of panel data allows for an analysis of the effects of changes in profits, holding time-invariant factors constant. Earlier research on this topic is limited mostly to cross-sectional analyses, which may be subject to issues of simultaneity. Second, the data are disaggregated to the MCO-SDA level. As the operating environment may differ across the various regions within an MCO's service area, data at the MCO-SDA level can capture these potential differences in a way that studies performed at the MCO level cannot. Finally, as mentioned above, there is a dearth of research on this topic. Only two published papers have analyzed this question, and those are limited to commercial MCOs. This paper adds to the general literature on MCOs and may provide insights into Medicaid MCOs. This sector is important not only because of the large number of individuals who depend on Medicaid MCOs for their health care, but also because of the vulnerable nature of this population.

2 Methods

2.1 Data

The data is based on a large, diverse state with over 1.5 million Medicaid managed

care enrollees. The sample covers the period July 2003 through July 2006. The unit of observation is at the MCO-SDA-quarter level. The data cover nine MCOs and seven SDAs (most MCOs operate in multiple SDAs).

2.2 Study measures

The dependent variables used in the analysis are based on preventive health services utilization. These measures are among those defined in the Health Plan Employer Data and Information Set (HEDIS) specification system.[3] The services analyzed fall into three categories: child health screenings, women's health screenings, and the provision of asthma medications to those displaying symptoms of asthma. The child health screenings are broken down by the child's age: prenatal, less than 15 months, three to six years, and twelve to twenty-one years. The two women's screenings analyzed are post partum and breast cancer. Finally, the measures for asthma medications are for individuals five to nine years of age and ten to seventeen years of age.

The dependent variable employed below is an aggregation of the individual level data. Specifically, the dependent variable is the proportion of individuals in that subgroup (e.g., child less than 15 months of age) that received the appropriate care from that MCO in that SDA during the previous twelve months. Table 1 describes the eight compliance rates analyzed. Prenatal screenings have the highest compliance rate in the sample, while well-child screenings for children aged 12 to 21 have the lowest.

The sample is limited by a number of restrictions. First, the observations for one of the MCOs were excluded because it entered the SDA roughly half way through the sample period and had extremely low compliance rates in the few periods for which the rates are available. Likewise, another MCO left an SDA one year into the sample period and was thus excluded. Also, the MCO-SDA was not included if the number of eligible members of the subgroup was less than 10. Further, the compliance rates are

based only on those with a CRG of one.[4] Another important restriction is that those enrollees who do not have a relatively stable membership in the MCO are not included in the sample. The HEDIS measures apply to only those who have been enrolled in that MCO for eleven of the previous twelve months.

The explanatory variable of primary interest is the profit of the MCO. In the state in question, Medicaid MCOs are required to report to the state insurance commissioner their financial data, by both product line (e.g., commercial, Medicaid) and geographic area (SDA). The specific profit measure used below is the net income or loss on underwriting activities. This measure reflects the operating profits of the MCO and does not include investment income or capital gains or losses. The regressions below are estimated using profits for both Medicaid operations only and for all of the MCO's product lines. Table 2 summarizes these data. Across all of the observations, the mean underwriting gain is slightly less than $4 per member per month (PMPM) for Medicaid operations and slightly greater than $3 PMPM for all operations. Table 2 also indicates that these profits vary significantly in the sample.

The remaining explanatory variables control for demographic characteristics of the eligible HEDIS population. These variables include the percentage of the population by age, race, and rural residence location and are summarized for three of the HEDIS measures in Table 3.

2.3 Statistical analysis

There are a number of complications in estimating the specified model. The first is due to the fact that profits would likely only influence preventive care with a lag. There are at least two reasons for the delayed response. The first arises from the information delay faced by MCO administrators. As financial results are only known with a lag (especially as the time period used in the analysis below is relatively frequent quarterly

data), the MCO cannot adjust its behavior until those results are available. Second, it is likely that a response by an MCO to profit information could only be implemented with a lag. To allow for these delayed effects, profits enter the model lagged one and two quarters.

Another complication is due to how the HEDIS compliance rates are measured. These measures are based on the provision of the service over the previous twelve months. Thus, the effects of changes in the explanatory variables will be muted, as effects due to changes in this quarter will only affect those individuals who were due to receive their preventive care in that quarter. To account for the slow movement of the compliance rate and the resulting potential for serial correlation in the error terms, the estimating equation is estimated in first differences.

Two regressions are estimated for each HEDIS measure: one based on the profits from all of the MCO's operations and one based on the profits from only the MCO's Medicaid operations. The error terms in the regressions clustered at the MCO-SDA level to account for the possibility that the error terms within each MCO-SDA are not independent.[5] The observations are weighted by the number of individuals in the subgroup being analyzed.

3 Results

3.1 Effects of profits

The coefficients of the profit terms from the regression analysis are displayed in Table 4. The first column indicates the dependent variable for that regression. The next three columns correspond to the regression where the profits from all of the MCO's operations is used as the explanatory variable, while the final three columns are the coefficients from the regressions when the profit variable is based only the MCO's

Medicaid operations. The "Total" columns are the sum of the coefficients of the two lags of income. This value can be thought of as the effect of a sustained $1 increase in PMPM income over two quarters.

A comparison of the results from the two profit measures suggest that the results differ little whether the profits are those from all product lines or only Medicaid operations. For four of the eight compliance rates, the sign of the total effects across the two profit measures are the same. While the signs differ for the remaining four compliance rates, the total effects are close to zero.

The most striking aspect of the results is the lack of statistical and economic significance of the estimates. At a 95% confidence level, the only regression in which the profit variable is statistically significant is asthma for those aged 10 to 17. However, this effect is only statistically significant for income from all operations. In terms of economic significance, the average standard deviation of MCO income across the MCO-SDA combinations is $10. Thus, given the total effect estimate of 0.100, a one-standard deviation increase in MCO profits is associated with a 1 point increase in the compliance rate. Given the sample mean compliance rate for this HEDIS measure is 50, the economic significance of this effect is minimal.

Not only is the economic significance of overall profits in the asthma (ages 10 to 17) regression limited, there is even less economic significance of either profit measure in all of the other regressions. Outside of the asthma (ages 10 to 17) compliance rate, the next largest estimate of the total effect from profits is only one-third of the magnitude.

In summary, it appears that changes in MCO profits do not lead to changes in levels of preventive care. However, a possible confounding influence is the effect of changes in expenditures on efforts to increase preventive care utilization. For instance, an increase in outreach expenditures could be correlated with an increase in later preventive care utilization. Given the increased expenditures would lead to decreased profits, this would lead to a negative relationship between profits and preventive care utilization.

While the available data preclude a direct analysis of the effect of outreach expenditures, there are at least two factors that mitigate the concern over their influence on the results. First, outreach expenditures likely constitute a small proportion of expenditures. While the exact level of outreach expenditures are not reported in the data, they fall under Administration and Other Expenses. Administration and Other Expenses comprise on average only 15% of all expenses. Given outreach expenditures likely make up only a small fraction of Administration and Other Expenses, one would expect these expenditures to only slightly affect overall profits. Second, an additional set of regressions were estimated where the overall MCO profits were replaced by Administration and Other Expenditures. If the effects of outreach expenditures affected the overall relationship between profits and preventive care, one would expect a potentially negative association between Administration and Other Expenses and the HEDIS measures. However, only one measure (Cervical Cancer Screening) displayed a statistically negative association with these expenses. While it is impossible to reach a definitive conclusion, it appears unlikely that the effects of outreach expenditures negates the hypothesized impact of MCOs reacting to past profit levels.

3.2 Effects of other explanatory variables

Table 5 provides the coefficient estimates for the remaining explanatory variables. Each column corresponds to the regression for the compliance rate listed in the header, while each row corresponds to an explanatory variable included in the analysis. The results listed in this table correspond to the regressions where overall MCO profits is used as the profit measure.

The number of total enrollees appears to have a largely positive effect on the compliance rates. Of the four statistically significant coefficients, three are positive and are of a greater magnitude than the lone negative coefficient. Conversely, the coeffi-

cients on the number of Medicaid enrollees are all statistically indistinguishable from zero. These results suggest that increases in the number of commercial and other non-Medicaid enrollees have positive spillovers to Medicaid enrollees.

Gender appears to play an important role in the asthmatic compliance rates. Increases in the percent of male individuals in the HEDIS population lead to relatively large and highly statistically significant decreases in the compliance rate. Recall that compliance for this measure requires two things to occur: the doctor has to prescribe the appropriate medicine and the prescription must be filled. As such, it is not possible to determine whether the negative effect of the percent of males is due to the prescriptions not being made, not being filled, or some combination of the two.

In terms of racial effects, increases in the percent of Hispanic enrollees are associated with increases in two of the four child screenings compliance rate and in the breast cancer compliance rate. These results are consistent with earlier findings of a "Hispanic paradox", whereby Hispanics tend to have better health outcomes than their socioeconomic characteristics would otherwise predict.[6,7] However, the exceptions to these results are negative coefficients in the asthma (ages 5 to 9) and post-partum compliance rates. This negative effect on the postpartum compliance is also present for the percent black variable. The percent black variable also has a negative effect on the prenatal compliance rate. Taken together, these findings suggest a need for outreach to black and Hispanic mothers for increased preventive care before and after pregnancy.

4 Discussion

This paper examines data on Medicaid MCOs to determine if the quality of care that they provide is affected by changes in their profits. The results of the analysis indicate that no such linkage exists. Rather, the provision of preventive care appears

to increase with the number total MCO enrollees. Also, increases in the percent of male enrollees tends to lead to decreases in the use asthma medicine among young people, while increases in the percent of Hispanic and black enrollees is associated with decreased levels of postpartum care.

There are at least two broad explanations for why MCOs do not adjust quality in response to changes in profits. First, MCOs may not believe changing quality in response to changes in profits maximizes profits. MCOs may view the potential short-run gains from cutting back on preventive services as being outweighed by the long-run costs. These costs could include the loss of current members and perhaps future members due to negative perceptions among consumers. Another potentially important cost is the loss of bonus payments from the state for not meeting the specified HEDIS criteria set forth in the MCO's contracts with the state. In the state in question, if the MCO earns profits in excess of a reasonable amount (as defined by the state agency), the MCO can keep a portion of those profits as long as it meets certain quality thresholds put forth in the contract. Furthermore, one percent of the capitation payments that the MCO receives from the state are held in escrow. If the MCO does not meet the performance objectives, the escrow amount is returned to the state.

A second broad explanation for these results may be that MCOs simply do not have the ability to affect short-run changes in preventive care in response to changes in profits. For example, doctors in the MCO's network may not be influenced by MCOs when providing preventive care to members. Further, the state in question has a number of programs that are designed to ensure that Medicaid recipients receive preventive care. One such program allows for doctors to be reimbursed for well child visits even if they are not the member's primary care physician. These types of programs may counteract any attempts by MCOs to alter their costs by trying to change the extent of preventive care.

There are a number of extensions that could provide additional insight into these

issues. For instance, while MCO profits are used in this paper, an analysis of the effect of doctors' profits could be very illuminating. Doctors in the MCO networks are the gatekeepers of care, and changes in their profits may have an impact on the quality of care that they provide. Also, it would be interesting to investigate whether MCO profits affect other types of services, such as diagnostic services or hospital lengths of stay. Given these services are typically far more costly than preventive care, additional incentives may exist for MCOs to influence the provision of these types of care.

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Table 1: Summary Statistics - HEDIS Compliance Rates

Variable	**N**	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Asthma, Ages 5 - 9	141	47.0	9.7	21.4	80.0
Asthma, Ages 10 - 17	143	51.8	8.5	33.3	84.4
Prenatal	144	80.8	10.6	47.6	91.1
Well Child Visits, Ages 0 - 15 mths	132	41.6	11.1	2.5	60.4
Well Child Visits, Ages 3-6	144	61.6	6.7	29.1	71.3
Well Child Visits, Ages 12-21	144	39.9	7.2	19.7	54.7
Breast Cancer	137	44.1	11.4	16.7	75.9
Post Partum	144	53.0	5.6	32.0	60.5

Table 2: Summary Statistics - Underwriting Gains/Losses (PMPM)

Variable	**N**	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Medicaid Operations	144	\$3.84	\$8.06	\$-17.77	\$40.00
All Operations	144	\$3.19	\$9.75	\$-27.22	\$48.23

Table 3: Summary Statistics - Demographic Variables

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Well-Child Visits (3-6 years) (N=144)				
# Eligible	6175	3465	1126	14553
Male	50.1	0.7	48.3	52.5
White	11.9	6.6	2.8	28.0
Black	15.7	9.3	0.9	29.5
Hispanic	70.7	13.6	47.9	95.9
Other	1.8	1.2	0.1	4.1
Rural	5.7	9.0	0.1	35.6
Breast Cancer Screenings (N=137)				
# Eligible	129	117	11	483
White	33.6	13.6	12.9	75.0
Black	20.6	14.9	0.8	56.9
Hispanic	33.2	25.2	0.0	83.1
Other	12.7	8.9	0.0	42.9
Rural	9.4	16.5	0.0	78.6
Asthma Medication (5-9 years) (N=141)				
# Eligible	105	59	15	266
Male	42.9	6.5	20	57.7
White	13.7	8.6	0	38.1
Black	27.2	16.5	0.0	71.4
Hispanic	57.2	20.9	17.1	100.0
Other	1.8	2.1	0.0	9.4
Rural	5.6	9.4	0.0	44.7

Table 4: Effect of a Sustained $1 pmpm Increase in HMO Total and Medicaid Profits on HEDIS Compliance Rates

Dependent Variable:	Total Profits			Medicaid Profits		
HEDIS Compliance Rate	t-1	t-2	Total	t-1	t-2	Total
Asthma, Ages 5 - 9	.071	-.031	.040	.001	.005	.006
	(.077)	(.064)	(1.33)	(.051)	(.039)	(0.08)
Asthma, Ages 10 - 17	.200*	-.093	.107**	.126	-.055	.071
	(.097)	(.059)	(4.46)	(.094)	(.054)	(1.70)
Pre-natal	.048	-.019	.029*	.029	-.007	.023
	(.028)	(.018)	(4.48)	(.022)	(.012)	(2.71)
Well-Child Visits	.009	-.021*	-.011	.016	-.010	.006
Ages 0 - 15 months	(.023)	(.011)	(0.73)	(.025)	(.014)	(0.13)
Well-Child Visits	-.011	.013	.002	-.013	.005	-.008
Ages 3 - 6 years	(.018)	(.010)	(0.02)	(.015)	(.008)	(0.41)
Well-Child Visits	-.003	.003	.000	-.025	.019	-.006
Ages 12 - 21 years	(.019)	(.013)	(0.00)	(.018)	(.013)	(0.37)
Breast Cancer Screening	.012	-.038	-.026	-.025	.036	.011
	(.090)	(.049)	(0.20)	(.077)	(.040)	(0.05)
Post-Partum	-.009	-.006	-.015	-.017	-.009	-.027*
	(.019)	(.010)	(1.03)	(.014)	(.007)	(3.87)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Regressions are estimated in first-differences. Standard errors clustered by MCO and SDA are reported in parentheses. Additional explanatory variables include percentage of enrollees by race, rural residence, and gender (where applicable).

Table 5: Other Coefficient Estimates

	Dependent Variable							
	Asthma Medications		Child Screenings				Female Screenings	
Variable	5-9 Yrs	10-17 Yrs	Pre-Natal	0-15 Months	3-6 Yrs	12-21 Yrs	Breast Cancer	Post-Partum
Total	0.267***	-0.079	.000	0.083***	-0.005	-0.030**	0.133***	-0.023
Enrollees	(0.083)	(0.084)	(0.013)	(0.010)	(0.021)	(0.013)	(0.026)	(0.015)
Medicaid	-0.97	0.882	-0.128	-0.241	-0.027	0.132	0.602	0.196
Enrollees	(1.89)	(0.740)	(0.194)	(0.225)	(0.113)	(0.101)	(0.759)	(0.190)
% Male	-0.334**	-0.247**		0.070	-0.251	0.476		
	(0.136)	(0.101))		(0.183)	(0.232)	(0.271)		
% Hisp.	-0.275*	-0.097	0.068	-0.101	0.737***	0.329**	0.303*	-0.321*
	(0.149)	(0.189)	(0.225)	(0.459)	(0.201)	(0.150)	(0.143)	(0.166)
% Black	-0.142	-0.049	-0.756*	0.023	0.694	0.253	0.140	-0.734***
	(0.141)	(0.215)	(0.320)	(0.377)	(0.415)	(0.203)	(0.195)	(0.189)
% Other	-0.621**	-1.31**	0.193	-0.282	1.706*	0.295	0.514*	0.726
	(0.217)	(0.660)	(0.748)	(0.372)	(0.878)	(0.481)	(0.254)	(0.588)
% Rural	-0.663***	0.275	-0.165	0.217	0.020	0.595*	-0.067	-0.419
	(0.149)	(0.260)	(0.226)	(0.161)	(0.363)	(0.300)	(0.224)	(0.256)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Regressions are estimated in first-differences. Standard errors are clustered by MCO and SDA are reported in parentheses. Additional explanatory variables include profits lagged one and two quarters.