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Medicaid Managed Care and Cost Containment in the Adult Disabled Population

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Abstract

Background—Despite the increasing enrollment of adult disabled beneficiaries into Medicaid managed care organizations (MCOs) there is little evidence of its (hoped for) effectiveness at reducing Medicaid expenditures.

Objective—To evaluate the impact of Medicaid MCOs on health care expenditures for adults with disabilities.

Research Design—I employ a repeated observations design comparing individual monthly Medicaid expenditures across beneficiaries who reside in counties with mandatory, voluntary, and no MCOs. County-level Medicaid MCO program status for adults with disabilities was merged with the Medical Expenditure Panel Survey and the Area Resource File for 1996–2004. Two-part regression models are used to estimate the probability and level of Medicaid expenditure.

Subjects—Working age Medicaid beneficiaries who receive Supplement Security Income for disability comprise the sample of 1,613 individuals.

Measures—Outcome measures include total and service-specific Medicaid expenditures.

Results—On average, total monthly Medicaid expenditures per beneficiary do not differ between FFS and MCO counties although some service-specific spending differs. Relative to FFS counties, average monthly Medicaid spending per beneficiary is higher for prescription medications in voluntary (\$24) and mandatory (\$25) MCO counties. Average Medicaid monthly spending for other medical care and dental care is \$4 – \$11 higher per beneficiary in MCO relative to FFS counties.

Conclusions—Medicaid MCO programs as implemented are not associated with lower Medicaid spending; thus, state Medicaid programs should consider additional policy tools to contain health care expenditures in this population.

Introduction

Managed care has been deployed as a cost containment policy in the Medicaid program for more than thirty years. However, it is only in more recent years that states have extended it to the beneficiaries who incur the lion's share of Medicaid's health care expenditures, adults with disabilities.^{1, 2} Yet, while their enrollment into managed care grows, there is little evidence of its effectiveness at reducing their health care expenditures relative to the status quo, fee-for-service model (FFS) of care.³ The characteristics that make beneficiaries with disabilities expensive, their complex, chronic health conditions, have led to conflicting expectations about Medicaid managed care's potential to contain spending in this unique population.^{3, 4} In this paper, I offer one attempt to resolve these conflicts by comparing Medicaid health care

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expenditures for adults with disabilities (AWDs) across three Medicaid program types, FFS, mandatory managed care organizations (MCOs) and voluntary MCOs.

Three general hypotheses have been advanced regarding the effect of Medicaid MCOs on health care expenditures for AWDs. First, particularly due to the challenge of setting accurate capitation rates in this population, capitated reimbursement may provide a strong incentive to MCOs to reduce care provision in general.^{3, 5} Second, MCOs may reduce expenditures by improving access to relatively inexpensive services (e.g., home health), thereby decreasing the demand for expensive care (e.g., inpatient).⁶ Finally, care coordination and management strategies (costly in themselves), may increase Medicaid spending to the extent that previously overlooked or under-treated conditions are treated.^{2, 7, 8} While these arguments are not unique to AWDs, scholars suggest that their effects may be amplified in a population characterized by low socioeconomic status and substantial health care needs.

Amidst these different expectations, states have enrolled their disabled populations into Medicaid managed care (MMC). By 2002 approximately 75% of states operated MMC for AWDs in at least one county.⁹ For each county in a state, Medicaid programs choose from among three major MMC plan types (if any), and whether enrollment is voluntary or mandatory. Primary Care Case Management (PCCM) is a fee-for-service plan that provides comprehensive health care and case management of primary health care services. The Prepaid Health Plan (PHP) is a capitated plan that provides limited, or carved out, services such as dental or behavioral health care. The MCO is also capitated but provides comprehensive health care. The variation in MMC plan types both between- and within-states poses a challenge for evaluations of MMC that strive for generalizability beyond a given market or locality. Garrett and Davidoff's collection of county-level MMC data for non-disabled beneficiaries made possible some of the first national evaluations of MMC.¹⁰ Comparable evaluation for the disabled population has only begun to emerge¹¹ despite the population's disproportionate impact on state Medicaid budgets and relative sensitivity to the design and delivery of health care.¹²

This paper advances MMC research by providing the first national estimates of Medicaid health care expenditures associated with mandatory and voluntary Medicaid MCO programs relative to FFS programs for adults with disabilities. Medicaid MCOs merit particular attention because of their prominence in current and planned MMC expansions for AWDs¹³ and their promise of cost-containment.¹⁴ I specifically evaluate if, and how, Medicaid program expenditures differ on average by the county's MMC status. This so-called, program effect approach, estimates the effect of residing in a county with a particular Medicaid program type rather than the effect of being *enrolled* in a particular plan type.^{10, 11, 15, 16} Program effect models are thus less vulnerable to the individual selection effects that may arise from enrollment into, or exit from, Medicaid MCOs and FFS. Moreover, the program perspective is likely to be of particular interest to policy-makers because it captures the overall budgetary impact of this programmatic change including any potential spillover effects.¹⁷

Previous Research

The majority of research on Medicaid MCOs and health care resource use focuses on the non-disabled population of low-income women and children or Medicaid beneficiaries undifferentiated by eligibility subgroup.¹⁴ Among those studies that evaluate Medicaid managed care within the past 10 years, national research finds that the implementation of Medicaid MCOs is associated on average with a reduction in the level of health care use¹⁸ and total expenditures,¹⁹ although the experience of a single state may depart from these average results as Duggan observes for California.²⁰ It is unclear if these findings are applicable to adult beneficiaries with disabilities. The health profile and health care use of the disabled Medicaid population differs notably from this better-studied beneficiary group. Approximately

45% of adults eligible for Medicaid because of a disability have a physical disease as the primary disabling condition, 33% a mental disorder, and 22% mental retardation (SSA, 2004). Not surprisingly, their health care use relative to adult Medicaid beneficiaries without disabilities is substantially higher particularly for ambulatory care, inpatient visits, and prescription medications.²¹ Moreover, MMC appears to have different effects on care use in healthy and ill populations.^{17, 21}

The empirical research on MCO expenditure effects among AWDs consistently finds that Medicaid MCOs are associated with a reduction in the level of average total expenditures per beneficiary with magnitudes ranging from 9% to 37% per enrollee.^{8, 21–24} However, with one exception,²¹ each of these studies compares FFS enrollees to voluntary MCO enrollees. Favorable selection into voluntary MCOs has been sufficiently observed in other populations to suggest that these results may overstate the expenditure reductions attributable to Medicaid MCOs.²⁵ The single study of MCO effects on expenditures in AWDs that mitigates this type of bias compares mandatory MCO enrollees to FFS enrollees in two counties in California from 1989–1992.²¹ However, geographic variation in health care practice²⁶ and secular changes in MMC during the intervening 20 years may limit its generalizability to the larger AWD population in today's Medicaid program.

Methods

Empirical Approach

The objective of my empirical approach is to estimate the national average Medicaid expenditures associated with voluntary and mandatory Medicaid MCO programs relative to Medicaid FFS. I estimate models of the following form:

$$Y_{it} = f(\beta_0 + \beta_1 \text{MMCO}_{it} + \beta_2 \text{VMCO}_{it} + \beta_3 X_{it} + \beta_4 \text{GEO}_{it} + B_5 \text{STATE}_j + \beta_6 \text{YEAR}_t) + \varepsilon_{it}$$

where Y_{it} is the monthly expenditure outcome in year t , MMCO_{it} indicates that the county has mandatory MCO enrollment, VMCO_{it} indicates that the county has voluntary MCO enrollment, X_{it} is a vector of individual characteristics associated with the outcome, GEO_{it} is a vector of lagged and concurrent county characteristics associated with MCO implementation and/or the outcome, and STATE_k and YEAR_t are a set of dummy variables to control for state characteristics and secular events that may confound the relationship between plan type and expenditure. The reference group is Medicaid beneficiaries who reside in FFS counties.

I identify the relative expenditures associated with each program type from Medicaid program status variation within state-years, conditional on the observed personal and county characteristics. In any given year, there must then exist within-state variation in Medicaid program status. To check this assumption, I calculate the frequency of sample observations from states that vary the Medicaid plan type by county in the year of that observation. All states and the District of Columbia are represented in the study sample, and 29 states vary their Medicaid plans by county for adults with disabilities in at least one year (Figure 1). My estimates derive from a subset of these 29 states where the MEPS sample includes residents of the counties that vary by plan status, or approximately 41% of the sample observations from a total of 18 states. Indicator variables for each of these states are included in the model with the balance of the states grouped into 3 program-specific groups, states with FFS only, states with VMCO only, and states with MMCO only.²⁷

A potential threat to the validity of my models is county-level omitted variables bias. I considered several strategies to mitigate it. County-specific time trends are one possibility; however, even in large datasets it is often impractical to include them.¹⁰ Difference-

indifference models have been used in MMC studies of the non-disabled,^{10, 18, 27} but it is unclear that a relevant comparison group can be constructed for this population given its health status and very low income. My strategy addresses omitted variables bias by including lagged county variables to account for potential changes in county characteristics related to expenditures that may also influence the state's implementation of Medicaid MCOs.^{17, 28} Concurrent and time invariant county factors are used to address additional geographic and market characteristics that may modify the outcome, independent of the beneficiary's plan type.^{10, 27}

Data

I merge several datasets by the year and the subject's county of residence. The Medical Expenditure Panel Survey (MEPS) is the source of individual-level data for the study.¹⁵ The MEPS is a representative survey of the U.S. civilian non-institutionalized population. Its overlapping panel design consists of five in-person interviews over thirty months to yield health care use and expenditure data for two calendar years per household member. The Medical Provider and Pharmacy Provider components then survey providers identified by household respondents to capture more complete information on health care expenditures and payer sources. I pool these MEPS data from 1996–2004 to construct a dataset at the person-month level.

The Medicaid Managed Care Dataset (MMCD) identifies the presence, type and enrollment mechanism of Medicaid managed care plans for AWDs in each U.S. County between 1996–2004. The data collection protocol is based on methods developed by Garrett and Davidoff (2003) to construct a county level dataset of MMC status for low income women and children. I used the following data sources to define MMC plans, identify their service areas within states for AWDs, and identify whether enrollment is voluntary or mandatory: 1) U.S. Code of Federal Regulations;²⁹ 2) The National Summary of State Medicaid Managed Care Program reports;³⁰ 3) The Medicaid Managed Care Enrollment Report;³¹ and 4) State Medicaid and the Centers for Medicare and Medicaid website. Finally, The Area Resource File³² and U.S. Census data provide county-level geographic and market characteristics.

Sample

I identify my sample as individuals ages 18–64 who report enrollment in Medicaid and the federal cash assistance program for persons with disabilities, the Supplemental Security Income (SSI) program. Medicare beneficiaries are excluded from this study because they are not uniformly subject to the same requirements within Medicaid MCOs as are Medicaid-only beneficiaries.² Medicaid beneficiaries who participate in Medicaid home and community based waiver programs are also likely excluded from the sample as they are typically dually eligible for Medicare although I cannot verify this exclusion in the data. The total sample includes 29,256 person-months. Of these, 1,559 observations are excluded because the subject is not enrolled in Medicaid during that month. An additional 452 observations are excluded due to missing data. The resulting analytic sample includes 27,245 person-months from 1,613 unique individuals.

Variables

The study outcomes include the probability of any Medicaid health care expenditure and the level of Medicaid expenditure in the month. Both total and service-specific expenditures are assessed including inpatient, prescription medication, office visits, home health, outpatient, emergency room, dental, and other medical expenditures (e.g., medical supplies and equipment).

Control variables at the individual level include age, sex, race/ethnicity, highest degree earned, marital status, employment in the past twelve months, annual income, family size, residence in a metropolitan statistical area, and health status. The health status measures include global measures of self-reported physical and mental health and activity limitations. Self-reported measures of global health are commonly used risk adjusters alone and in combination with activity limitations in studies of Medicaid beneficiaries with disabilities.³³ At the county-level, I include the percent of all residents below the federal poverty level, the percent of adult residents with at least a high school education, the number of physicians per 10,000 residents, HMO penetration rate, and the percent of households with a SSI beneficiary. I also include indicator variables for the presence of a mandatory Medicaid PHP and a mandatory Medicaid PCCM. Beneficiaries in Medicaid FFS or MCOs may be dually enrolled in a PHP for a subset of their care (e.g., transportation, dental, behavioral health) as determined by the state Medicaid program. Additionally, PCCMs may be used within FFS counties or as an alternative to MCOs within voluntary MCO counties. Research has shown few differences in health care use among adults between PCCMs and FFS.^{10, 11, 18, 27} However, because the impact of PCCMs on intensity of use or expenditures for AWDs is unknown, a dummy variable is included to control for any potential confounding influence.

Finally, state dummy variables adjust for residual state-level characteristics that may influence the county's or individual's MCO status and the outcome such as the state's political environment, Medicaid program cost, public opinion, special interest group concerns, and industry factors.^{34, 35}

Analysis

To evaluate the level of health care expenditures, I use two-part models. The two-part model accommodates the large proportion of zero values in this person-month dataset by first modeling the probability of any expenditure, $\Pr(y_i > 0|x_i)$, with logit regression. The second part of the model then predicts the mean expenditures conditional on any expenditure, $E(y_i | x_i, y_i > 0)$, using a Gamma log generalized linear model. The overall predicted expense is obtained by multiplying the two-parts of the model, $E(y_i|x_i) = \Pr(y_i > 0|x_i) E(y_i|y > 0, x_i)$.³⁵ Standard errors are estimated using a Huber variance estimator³⁶ where observations are clustered by primary sampling unit to account for the complex survey design of the MEPS and within-person correlation over time. All analyses are weighted to reflect the civilian non-institutionalized, adult disabled Medicaid population in the United States. Dollars are inflated to 2004 using the average consumer price index for goods and services purchased in U.S. urban households.

Both regression coefficients and average partial effects are estimated. To obtain the average partial effects (δ), I estimate the partial effect of Medicaid plan status (x_j) on the conditional outcome $E[y|x]$ for each observation and average those estimates:

$$\delta(x_j) = 1/n \sum_{i=1}^N [\partial E(y|x) / \partial x_j].$$

In the context of a two-part model, the partial effect conveys the combined effect of both parts of the two-part model on monthly Medicaid expenditures such that

$$\begin{aligned} \partial E(y|x) / \partial x_{ij} = & \left[\pi(x_i \beta_1) * e^{x_i \beta_2} * \beta_{2i} \right] \\ & + \left[\beta_{2i} * \left(\pi(x_i \beta_1) * [\pi(x_i \beta_1)]^2 \right) * \beta_{1i} \right] \end{aligned}$$

where i is the i th observation, β_1 is the parameter estimate from the logit model, β_2 is the parameter estimate from the gamma log model, and $\pi(\cdot)$ is the predicted probability. Bootstrapped confidence intervals for the average partial effects are estimated around the mean of the bootstrap average partial estimates.

Results

Approximately 50% of sample observations derive from counties with FFS programs, 20% from MMCO counties, and 30% from VMCO counties (Table 1). On average, nearly 80% of the population has some Medicaid health care expenditure during the month. Unadjusted mean monthly expenditures range from approximately \$440 per beneficiary per month in FFS and MMCO programs to \$600 per beneficiary per month in VMCO programs ($p < 0.05$). On average VMCO beneficiaries have a lower probability of ER use, and a higher likelihood of outpatient, other medical, and dental care use in the month than FFS beneficiaries.

There are no significant differences between Medicaid programs in the regression-adjusted average probability of an expenditure in the month nor in the total monthly Medicaid expenditures (Table 2). Men, Black beneficiaries, and those from larger families were less likely to have a Medicaid expenditure in the month on average ($\beta = -0.75$ [.12]; $\beta = -0.35$ [.12]; $\beta = -0.14$ [.03] respectively). Married beneficiaries ($\beta = 0.36$ [.16]) and those who reported fair or poor physical ($\beta = 0.68$ [.13]) or mental health ($\beta = 0.25$ [.12]) were more likely to have a Medicaid expenditure in the month as were individuals with a limitation in the activities of daily living ($\beta = 0.53$ [.22]). Conditional on any Medicaid expenditure in the month, education beyond high school ($\beta = 0.88$ [.30]), fair or poor physical health ($\beta = 0.25$ [.08]), and a limitation in the ADLs or IADLs ($\beta = 0.68$ [.14], $\beta = 0.27$ [.11]) were associated with higher average expenditures. The county's HMO penetration rate ($\beta = -0.69$ [.33]) was associated with lower average Medicaid expenditures.

There are some differences in spending by program across specific service categories (Table 3). Beneficiaries in MMCO counties have, on average, a lower probability of any ER use during the month ($\beta = -0.59$ [.25]) and higher monthly Medicaid spending on dental care ($\beta = 1.04$ [.28] conditional on any such expenditures. Conditional on any expenditure for other medical services or dental care, VMCO beneficiaries incur higher average monthly other medical ($\beta = 1.05$ [.24]) and dental expenditures ($\beta = 0.63$ [.24]) than FFS program beneficiaries.

Two-part regression results tell us something about why expenditures may differ between plan types (e.g., a reduction in the probability of use, or the intensity or cost of care). However, they do not readily convey how much more or less the Medicaid program spends (if any) per beneficiary in an MCO program relative to FFS. The average partial effects provide such an estimate (Table 3). There are no between group differences in the average total Medicaid expenditures per month. Relative to beneficiaries in FFS counties, Medicaid spends on average \$25 more on prescription medications, \$6 more on other medical care, and \$6 more on dental care per beneficiary per month in MMCO counties. Average monthly Medicaid expenditures for prescription medications, other medical, and dental care are also higher per beneficiary in VMCO counties relative to FFS counties (\$24, \$11, and \$4 respectively).

Discussion

State Medicaid spending accounts for 22.9% of total state expenditures, now surpassing spending on elementary and secondary education.³⁷ To reduce the budgetary impact of the Medicaid program, states are increasingly implementing Medicaid MCOs for their more costly beneficiaries, adults with disabilities.^{38–39} This study's principal finding suggests that states consider additional policy tools to contain health care expenditures in this population. Relative

to FFS counties, average total per beneficiary Medicaid expenditures do not differ in mandatory or voluntary MCO counties.

The study's findings contrast with the small body of prior research on MMC and health care expenditures in this Medicaid beneficiary population. Relative to the majority of this research that examines VMCO enrollees relative to FFS enrollees, the differences may be explained by the likely presence of favorable selection into VMCOs. Yet, even the single study examining mandatory MCO and FFS enrollees observes relatively lower expenditures among MCO enrollees.²¹ There are several plausible explanations for the contrasting results presented here. I evaluate Medicaid MCOs and FFS from the perspective of the program rather than the enrollee. Beneficiaries who *reside* in MMCO counties may differ from MMCO *enrollees* because states must permit disenrollment from mandatory MCOs.²⁹ The proportion of beneficiaries in an MMCO county that deviates from the "program," and the characteristics associated with them (e.g., health status, age, care preferences, etc.) will then influence the direction and magnitude of difference in the program and enrollment effect results. Alternatively, variation in MCO characteristics and experience with the Medicaid program may explain the outcome differences between studies. The Lo Sasso and Freund study (2000) evaluates enrollees in one well-established California Medicaid health plan;²¹ whereas subjects in this study are likely to be enrolled in MCOs that represent a wide range of experience with the Medicaid program reflecting variation across markets.

Capitated managed care has generally been associated with reduced health care use for pediatric Medicaid beneficiaries with disabilities or chronic illnesses.⁴⁰⁻⁴² Scholars have questioned the generalizability of this research to adults given differences in their disabling conditions, their health service systems, and advocacy resources.³ This study's finding of no overall differences between FFS and MCO program expenditures appears to support this skepticism. Yet, there is intriguing common ground between this study and the pediatric research when one considers the binary outcome measures that are common to both including a reduced probability of emergency department visits associated with MMC. Different outcome measures may mask the similarities (or differences) between MMC's effects on adults and children with disabilities. Research that compares the relative effects of MMC on pediatric and adult disabled populations may identify opportunities to transfer the lessons learned from one population to the other in designing Medicaid programs.

Beyond FFS and MCO programs, states are also experimenting with a variety of care management strategies that have the potential to contain costs. The clinical diversity of this population, for example, has prompted states to design programs tailored to the medical and social needs of particular subgroups such as adults with physical disabilities⁴³ or particularly high cost beneficiaries.⁴⁴ Enhanced home and personal care services, for example, may obviate the need for downstream (expensive) care in a population that has mobility impairments; whereas, integration of social support services into health care delivery may be an effective strategy to reduce ED visits among socially isolated or mentally ill individuals. These small, but growing, programs may offer a fruitful alternative to population-wide care management strategies.

This study's findings should be interpreted in light of its strengths and limitations. It is challenging to obtain a sample that is both large and nationally representative because the working age SSI population represents less than 2% of the U.S. population.⁴⁵ The sample size coupled with the skewed nature of health care expenditures resulted in imprecise estimates of services such as inpatient care which drives total expenditures. Two important implications follow. The non-significant results may provide weak evidence of no relationship between Medicaid program type and expenditures, and the results do not address the relative efficiency of MCO and FFS programs. MCO programs may, for example, increase the provision of less

expensive care (e.g., prescription medications) in an effort to reduce the frequency and/or intensity of inpatient care use. Follow-up analyses of inpatient admissions and length of stay hint at this possibility with some evidence of reduced length of stay for MCO programs (results not shown). Future research with a larger national sample is ultimately necessary to confirm this study's findings and assess the efficiency of health service resource allocation in each program.

This study's estimates reflect average outcomes associated with Medicaid MCO programs as states have implemented them for the beneficiary population as a whole. I cannot rule out the possibility that some Medicaid MCOs are effective at reducing expenditures relative to Medicaid FFS for adults with disabilities or for clinical subgroups within this population. Nor, does this study address the potential effects of other types of MMC including primary care case management, carved out services, and combinations of these programs. The relative effects of PCCMs on expenditures among adults with disabilities has not yet been demonstrated suggesting an important area for future research.

Both the results and the limitations of this study suggest several possible extensions of this work to inform ongoing health care reform for adult beneficiaries with disabilities. Future research will ideally address both the heterogeneity of the adult disabled beneficiary population and the variety of care management strategies in place (or in development) to manage them. It is plausible that different models of care and financing may have differential effects depending on the beneficiary's disabling condition or cluster of co-morbidities. Thus, research that examines the trajectory of health outcomes and expenditures for clinically meaningful subgroups under different models of care is needed. Given the paucity of research in this population, one could approach this broad subject from many directions. There is room for case studies to unpack the "black box" of the MMC programs that Medicaid deploys for adults with disabilities, for methodological work to construct meaningful subgroups when the disabling condition is not present in the data, and for state-academic partnerships to take advantage of credible enrollment, encounter, and claims data to understand health care use patterns under different care structures.

Conclusion

This study speaks to an ongoing policy debate about the health care delivery systems and financing strategies that result in the most cost-effective care for adult Medicaid beneficiaries with disabilities. On average, I find that a shift from Medicaid FFS to Medicaid MCO care for adults with disabilities is not associated with a reduction in health care spending. Ideally, this finding will stimulate additional research on the relative effectiveness of Medicaid cost and care management strategies for this vulnerable and expensive population.

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Table 1

Weighted mean monthly Medicaid expenditures: U.S. working age Supplemental Security Income (SSI) / Medicaid beneficiaries (\$2004)

	FFS	MMCO	VMCO
Unique persons, unweighted*	848	326	506
Person months [%]	0.50	0.20	0.30
Total			
Any (%)	0.77	0.75	0.78
Amount	437	440	600 [†]
Inpatient			
Any (%)	0.02	0.02	0.03
Amount	139	133	229
Prescriptions			
Any (%)	0.72	0.68	0.69
Amount	135	137	131
Outpatient			
Any (%)	0.36	0.36	0.41 [†]
Amount	102	98	124
Home Health			
Any (%)	0.04	0.03	0.06
Amount	39	46	82
ER			
Any (%)	0.04	0.03	0.03 [†]
Amount	13	13	11
Other Medical			
Any (%)	0.07	0.09	0.09 [†]
Amount	5	8	15 [†]
Dental			
Any (%)	0.03	0.03	0.05 [†]
Amount	4	5	8 [†]

* The sum of the plan-specific unique persons will exceed 1,613 because 67 individuals were enrolled in more than one plan type over the 2 year period.

[†] Significantly different from Fee-for-Service (FFS), $p < 0.05$

Table 2

Mean monthly total Medicaid expenditures relative to FFS program: U.S. working age Supplemental Security Income/Medicaid beneficiaries, 1996 – 2004

	Logit (β)[se]	GLM (β)[se]
MMCO	0.22 [0.27]	-0.17 [0.18]
VMCO	0.24 [0.30]	0.05[0.18]
Age	0.03 [0.01]*	0.001 [0.004]
Male	-0.75 [0.12]*	-0.03 [0.08]
Hispanic	0.05 [0.17]	0.03 [0.14]
Black, not Hispanic	-0.35 [0.13]*	0.09 [0.09]
High School Diploma/GED	0.12 [0.12]	0.05 [0.08]
More than HS/GED	0.70 [0.53]	0.88 [0.30]*
Annual individual income, 1,000s	0.01 [0.01]	-0.01 [0.01]
Married	0.36 [0.16]*	0.08 [0.10]
Family size	-0.14 [0.03]*	-0.03 [0.03]
Employed in past 12 months	-0.15 [0.17]	-0.002 [0.14]
Fair/poor physical health	0.68 [0.13]*	0.25 [0.08]*
Fair/poor mental health	0.25 [0.12]*	-0.07 [0.07]
Any ADL Limitation	0.53 [0.22]*	0.68 [0.14]*
Any IADL Limitation	-0.16 [0.16]	0.27 [0.11]*
Any Activity Limitation	0.46 [0.12]*	0.18 [0.08]*
Any Walking Limitation	0.23 [0.13]	0.15 [0.09]
Metropolitan Statistical Area County	-0.19 [0.21]	-0.05 [0.12]
HMO penetration, 1998	0.15 [0.56]	-0.68[0.33]*
Percent of households with SSI recipient, 1999	1.96 [1.53]	1.26 [0.91]
Percent of persons > 25 yrs with HS/GED or more, 2000	0.02 [0.01]	0.01 [0.01]
Lagged active physicians/10,000 residents	-0.004 [0.004]	0.01 [0.004]*
Lagged percent of residents living in poverty	0.01 [0.02]	0.01 [0.01]
Mandatory PHP present	-0.11 [0.16]	0.05 [0.10]
Mandatory PCCM present	0.13 [0.15]	-0.06 [0.12]

* Significantly different from Fee-for-Service (FFS), $p \leq 0.05$; Year and state dummy variables suppressed.

Table 3

Mean monthly service-specific expenditures relative to FFS program: U.S. working age Supplemental Security Income/Medicaid beneficiaries, 1996 – 2004

	Logit (β)[se]	GLM (β)[se]	Average Partial Effect (\$)[95%CI]
MMCO			
Total	.22 [.27]	-.17 [.18]	-76 [-195, 48]
Inpatient	-.42 [.31]	.35 [.31]	-32 [-203, 118]
Prescription Medications	.24 [.27]	.13 [.17]	25 [8, 44]
Outpatient	.11 [.18]	-.26 [.20]	-22 [-56, 13]
Home health	-1.2 [.63]	.34 [.48]	-37 [-81, 4]
Emergency Department	-.59 [.25] *	.32 [.24]	-3 [-13, 6]
Other Medical	.21 [.26]	.51 [.35]	6 [2, 10]
Dental	.31 [.33]	1.04 [.28] *	6 [2, 10]
VMCO			
Total	.24 [.30]	.05 [.18]	43 [-87, 173]
Inpatient	-.02 [.26]	-.04 [.27]	-10 [-138, 117]
Prescription Medications	.10 [.28]	.15 [.17]	24 [8, 41]
Outpatient	.03 [.16]	-.25 [.18]	-28 [-59, 4]
Home health	.18 [.60]	.33 [.26]	28 [-1, 57]
Emergency Department	-.11 [.23]	.11 [.22]	-0.30 [-8, 8]
Other Medical	.28 [.25]	1.05 [.24] *	11 [7, 15]
Dental	.38 [.31]	.63 [.24] *	4 [1, 8]

* Significantly different from Fee-for-Service (FFS), $p \leq 0.05$

Adjusted for age, sex, race/ethnicity, educational attainment, personal income, marital status, family size, employed in past 12 months, self-reported physical and mental health status, activity limitations, metropolitan statistical area, presence of mandatory Medicaid Prepaid Health Plan (PHP), mandatory Primary Care Case Management (PCCM), county HMO penetration rate (1998), percentage of households that receive SSI in county (1999), percentage of county residents 25 years & older with HS/GED education (2000), lagged % living in poverty, and lagged active MDs in the county, state, year.