Cost Shifting in a Mental Health Carve-Out for the AFDC Population

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This study tests whether the managed care vendor shifted costs to Medicaid-reimbursed medical care after the start of the mental health carve-out for the Aid to Families with Dependent Children (AFDC) population in Massachusetts. We used claims data over a 4-year period to estimate expenditures for four types of health services, two of which were paid for by the managed care vendor and two by Medicaid. Total per person public expenditures declined by only about 3 percent. Inpatient psychiatric services were replaced by outpatient psychiatric services and some pharmaceuticals, but overall there was little or no evidence of cost shifting to the medical sector. These results are in contrast to what was found in a sample of Medicaid beneficiaries eligible due to a mental health disability.

INTRODUCTION

Managed care is coming rapidly to Medicaid beneficiaries. States are enrolling Medicaid beneficiaries into various forms of managed care for basic medical benefits. Medicaid managed care enrollment increased by 140 percent from 1993 to 1995 (McGuire, 1996). Only two States have no operational Medicaid managed care plan or have no plans to implement one (Hegner, 1995). All but six States have applied for a 1915b waiver from HCFA to introduce some form of managed care for Medicaid beneficiaries. In addition, many States are using a carve-out program, which places behavioral health services under a separate insurance contract from other medical care (Frank, McGuire, and Newhouse, 1995). Eight States have a mental health and substance abuse carve-out, five more States have a carve-out for just mental health, and two additional States plan to start a carve-out program during 1997.

One reason for the expansion of managed care is that States believe that managed care will lower health care expenditures, or at least slow their growth. Carve-out programs for mental health and substance abuse services have an additional feature that raises further research questions beyond whether total expenditures decrease. Medicaid pays a per member per month fee to a managed care vendor, which then pays fee-for-service (FFS) only for psychiatric treatment. Carve-out programs are financially responsible at the margin for only part of all health care expenditures. Medical care and pharmaceuticals, which are not covered by carve-out programs, may be substitutes for mental health and substance abuse services. If, for example, new expensive drugs can be used to substitute for inpatient psychiatric care, then the managed care vendor has an incentive to encourage the use of pharmaceuticals,

thereby getting Medicaid to pay for treatment at the margin, even if the total expenditures remain the same. Therefore, we are interested in knowing not only whether total expenditures are reduced, but also whether cost shifting occurs between the carve-out program and the rest of Medicaid-reimbursed medical care. By cost shifting, we mean when one public agency can reduce its own expenditures by inducing another public agency to pay for similar services.

We address three primary questions by studying the change from FFS to a mental health carve-out in Massachusetts for the Medicaid beneficiaries eligible through AFDC. This change occurred in fiscal year (FY) 1993. First, we address whether total public expenditures rose or fell after 1993, which is clearly an important policy question. We estimated the effect of the carve-out on total public expenditures over a 4-year period, relying on a comparison of expenditures before the carve-out with after.

Second, we address whether there was a shift in the composition of expenditures from psychiatric to non-psychiatric care, which would imply that the managed care vendor shifted costs back to Medicaid. This is an important question for public policy because the point of creating a mental health carve-out is to place a managed care vendor at risk for all psychiatric expenditures, and not to allow the managed care vendor to cost-shift back to Medicaid. We estimated both expenditure models and two-part models for four types of services, two types of services covered by the managed care vendor and two covered by Medicaid, allowing us to test for cost shifting.

Third, we tested for whether the changes were more pronounced for the beneficiaries with major mental illness. These persons are likely to have higher utilization and spending, making cost shifting more appealing for the managed care vendor.

This study is important because, to our knowledge, it is the first to address the issues of cost shifting for the AFDC population. We have unique data because Massachusetts was the first State to implement a statewide Medicaid carve-out program for mental health and substance abuse services. This program has been under way for more than 3 years, providing enough time to conduct research on the changes. Furthermore, we were able to obtain claims data not only from Medicaid, but also from the managed care vendor and the Department of Mental Health (DMH). These data provide a complete picture of the mental health and substance abuse services provided. We also have worked closely with Medicaid, the managed care vendor, providers, and the DMH to understand the changes from the perspective of a case study. Our current study adds to the literature not only by estimating the effect of a mental health carve-out on total public expenditures for the large AFDC population, but also by addressing the issue of cost shifting across public payers. We compare our results with those of the Medicaid disabled population's experience with the same carve-out program (Norton, Lindrooth, and Dickey, 1997).

BACKGROUND

In 1992, Massachusetts received a 1915b waiver from HCFA (Dickey et al., 1995; Dickey et al., 1996). Under this plan all Medicaid beneficiaries were asked either to enroll in a local health maintenance organization (HMO) or to select a Medicaid-approved primary care clinician. Those who chose the HMO option received all medical, psychiatric, and

substance abuse treatment through the HMO and are not part of this study. Those who chose the primary care clinician had health care paid for by two different systems. For medical care, the primary care clinician served as a gatekeeper. The primary care clinician is paid on an FFS basis and has no direct financial incentives to limit medical care. All medical decisions are controlled by the primary care clinician, and there is an emphasis on preventive care. The primary care clinician provides medical care and referrals to medical specialists. In contrast, for psychiatric care no referral is needed for mental health and substance abuse treatment; beneficiaries may seek treatment directly from mental health providers in the vendor's network. The managed care vendor pays for psychiatric care on an FFS basis.

Medicaid contracted with a single proprietary vendor, Mental Health Management of America, a division of First Mental Health, to manage the delivery of mental health and substance-abuse benefits. The contract has financial incentives to reduce cost and access. The Division of Medical Assistance (DMA) paid a monthly capitated fee to the managed care vendor, who paid providers on an FFS basis. Frank, McGuire, and Newhouse (1995) describe this type of plan as a soft capitation contract. The DMA limited the vendor's financial liability through risk-sharing and budget caps. For example, in calendar year 1993 the vendor had a target budget. Any increase or decrease in expenditures compared with the target (up to $25 million) was shared, and Medicaid retained 92 percent and the vendor 8 percent. Therefore, the vendor could gain or lose up to $2 million and was not responsible at the margin outside of this $50 million risk corridor. The following year had expenditure sharing only for expenditures in excess of the target

because the DMA did not want to provide strong incentives to reduce expenditures after the first year. The details of the contract, which varied each year and sometimes included lump sum bonuses, are described by Frank and McGuire (1996).

The contract with the vendor was also notable for which types of services the vendor assumed financial responsibility. We focused in this study on the four types of services that are most important to the AFDC population—inpatient psychiatric care, outpatient psychiatric care, non-psychiatric medical care, and pharmacy. These four types of services make up 97 percent of total expenditures; the remaining 3 percent are mostly for dental and transportation. Prior to the mental health carve-out, Medicaid paid claims for all four types of services. The Federal Government reimbursed Medicaid at a rate of $.50 for each dollar spent. Therefore, the marginal cost of all care from Medicaid's point of view was at most one-half of the reimbursed cost. After the mental health carve-out, Medicaid paid the vendor a flat fee per member per month, and the vendor paid providers for inpatient and outpatient psychiatric care. Therefore, the managed care vendor assumed fiscal responsibility for only two of the four Medicaid services. The vendor was not financially responsible for non-psychiatric medical care or pharmaceuticals, that were still covered directly by Medicaid. In summary, the managed care vendor was responsible at the margin for acute inpatient and outpatient psychiatric and substance abuse care; Medicaid was responsible at the margin for medical care and pharmacy.

Few studies have examined how managed care affects cost and utilization for the AFDC population. Leibowitz, Buchanan, and Mann (1992) showed that selection is

an important factor when AFDC Medicaid beneficiaries can choose between an HMO or FFS care. They found that people who enroll in an HMO have lower health care use than those who choose FFS care. Numerous studies of the private sector have shown a pattern of reduced total costs when compared with FFS plans, but total costs growing over time at the same rate (e.g., Manning et al., 1984).

Although cost shifting has not been studied for the AFDC population, it has been studied for the persons eligible for Medicaid due to disability from a severe mental illness (Norton, Lindrooth, and Dickey, 1997). In that study, we analyzed 5 full years of data, 2 prior to the start of the mental health carve-out and 3 after, for a sample of almost 90,000 person-years. We tested for cost shifting not only from the managed care vendor to Medicaid, but also to the DMH, which provides inpatient care to many disabled persons on Medicaid. The statistical methods in that study were the same as in this study. Costs were shifted from the managed care vendor back to Medicaid after the start of the mental health carve-out, but not to the DMH. The amount of cost shifting was much higher for those beneficiaries in the top quartile of total expenditures. We want to know whether these results hold for the larger population of AFDC beneficiaries who received mental health and substance abuse treatment from the same private vendor.

METHODS

We first estimated the effect of managed care on total public expenditures, which includes all Medicaid expenditures and the few expenditures made by the DMH for inpatient psychiatric care. We regressed the logarithm of total expenditures on factors known to affect utilization and cost: whether the managed care program had

started, demographic characteristics, health status, and region of the State. Health status includes indicators for both cognitive and medical diagnoses, and are defined in the data section. Per person annual mental health expenditures are known to vary across Massachusetts by region (Dickey et al., 1996). The dependent variable is the logarithm of expenditures because expenditures have a highly skewed distribution and the logarithm provides a better fit of the data and reduces the influence of outliers. The model specification for an individual is

$$\ln(C) = \beta_0 + \beta_1 ManagedCare + Demographics\beta_2 + HealthStatus\beta_3 + Region\beta_4 + \varepsilon$$

where the βs are parameters to be estimated and ε is a random error. Demographic characteristics, health status, and region are modeled using several variables described in the data section. We estimated the models using ordinary least squares. The constant, β_0, represents the logarithm of total expenditures for a white female infant with no comorbidities treated in Boston prior to managed care.

The coefficient on the managed care dummy variable reflects differences in expenditures due to managed care after controlling for all observable characteristics. The managed care dummy variable also reflects contemporaneous time trends. Although it would be preferable to have a control group that did not experience the mental health carve-out, no such comparison group was available. However, we can cite evidence from a study of the private sector in Massachusetts done by Ma and McGuire (1997) over roughly the same time period. They found a time trend of a 15-percent reduction in total expenditures each year, with similar reductions in both inpatient and outpatient services for

mental health and substance abuse. They only analyzed mental health and substance abuse claims. Their findings imply that our results may overstate the effect of the mental health carve-out on reducing expenditures, at least for the inpatient and outpatient psychiatric care.

The other limitation of the study is that data are limited to one State, Massachusetts. However, because Massachusetts was the first State to implement a statewide mental health carve-out for Medicaid beneficiaries, we feel that our results are extremely timely and have important policy implications because it is the first to evaluate cost shifting in a mental health carve-out for the AFDC population.

Although beneficiary selection into an HMO is a potential design problem, we do not feel that it severely biases our study. People on AFDC in Massachusetts for years have had the option of joining an HMO for both medical care and their mental health and substance abuse treatment. If the composition of beneficiaries who choose the HMO option changes after managed care is introduced, then our pre/post-experimental design would not have a stable comparison group. The percentage who chose the HMO option remained the same after the start of the mental health carve-out. Particularly, in our sample of persons on AFDC with a major mental illness almost all chose the primary care clinician. Mental health agencies that were Medicaid providers strongly encouraged persons with major mental illness not to join the HMO. The providers posted signs, distributed informational brochures, and counseled individuals to choose the primary care clinician option because the general consensus was that the primary care clinicians would better meet the mental health needs of this population. Medicaid supported this policy. Therefore, for this population we do not feel that selection is a major problem.

We tested for cost shifting after the start of the mental health carve-out using two types of models run for each of the four major types of expenditures: inpatient psychiatric care, outpatient psychiatric care, non-psychiatric medical care, and pharmacy. First, we estimated four expenditure models using ordinary least squares. The dependent variables are expenditures spent on that type of service. We did not take the logarithm of the dependent variable, despite the skewed distribution, to make it easier to calculate the change in average per person expenditures. According to the cost–shifting hypothesis, we expect negative coefficients on the managed care variable in the inpatient and outpatient psychiatric care equations and positive coefficients in the other two equations.

The significance of the managed care parameter in the expenditure models is a necessary condition for cost shifting but is not a sufficient condition. Improvements in quality of care provide an alternative explanation of the same observed results. For example, improved diagnostic capabilities would increase the probability of receiving medical care. Improved drug efficacy would increase the probability of receiving pharmacy care and may increase the cost conditional on receiving drugs if the price also increased. To test these interpretations of the expenditure-share results, we also ran a two-part expenditure model to predict both the probability of expenditure on a service and the amount of expenditure conditional on any expenditure on that service (Duan et al., 1983; Duan et al., 1984). We can then distinguish between the effect of managed care on receiving a service and the extent of care given that the service is received. The covariates are the same in both the Probit and ordinary

least squares parts of the two-part model as in the regression of total expenditures.

Cost shifting may be easier for higher-expenditure patients who tend to receive a larger range of services at a higher cost. For example, only a person who is ill enough to be hospitalized has the choice between inpatient care and outpatient care. Therefore, the magnitude of the managed care coefficients may be higher among high-expenditure patients, so we also included the interaction between managed care and an indicator variable for major mental illness. Preliminary analysis showed that people with major mental illness had higher utilization and expenditures.

DATA

The sample is a 10-percent random sample of all Medicaid beneficiaries in Massachusetts not enrolled in an HMO who were eligible for Medicaid through the AFDC program and had at least one claim for mental health. This restriction to those with at least one mental health claim is to focus the sample on those who would potentially be affected by cost shifting across the two systems; a child with a cold is not of interest for this study. The 10-percent sample was drawn separately each year, so almost no person has multiple observations in our sample.

The data include all paid claims for Medicaid services and State hospital inpatient files from the DMH hospitals. The DMA and the DMH provided data. Medical data from FY 1993 were not available, so we have complete data for beneficiaries for FYs 1991, 1992, and 1994. The measure of the effect of managed care is over the relatively short period of 2 years. Other recent work in Massachusetts has shown that the first year of managed care had dramatically different patterns of eligibility, utilization, and expenditure,

which makes the loss of data from this period less important (Dickey et al., 1995; Dickey et al., 1996; Norton, Lindrooth, and Dickey, 1997). Sociodemographic data were merged from Medicaid membership files with the claims data. In the entire sample 15,714 persons fit the above criteria after the data were cleaned.

The dependent variables of interest are expenditures, which fall into five distinct categories: inpatient psychiatric care, outpatient psychiatric care, non-psychiatric medical care, and pharmacy. Inpatient psychiatric care includes both care provided in general hospitals and in DMH hospitals. Although the prior study (Norton, Lindrooth, and Dickey, 1997) separated the DMH from Medicaid and the managed care vendor, the DMH is not analyzed separately in this study for two reasons. First, the empirical evidence from the disabled sample showed that little or no cost shifting to the DMH occurred. Second, the AFDC population has very few stays in DMH hospitals, too few to identify a separate equation. Therefore, in this study psychiatric inpatient expenditures include stays in both general and DMH hospitals. Non-psychiatric medical claims are for services unrelated to mental health care and include both inpatient and outpatient care. Pharmacy includes outpatient medication only. For completeness, total expenditures include dental and transportation; however, dental and transportation were not studied separately because they comprise only 3 percent of total expenditures and are not substitutes for psychiatric care, thus there was no incentive to cost-shift.

With the exception of inpatient care in DMH hospitals, expenditures are based on paid claims and represent the actual amount reimbursed to the provider through Medicaid or to the managed care vendor. The dollar amount of each claim is summed over each year. The DMH expenditures

were calculated by dividing total annual expenditures for each State hospital by the number of annual patient days spent in each facility. The resulting per diem rate was then multiplied by the number of days each beneficiary spent at each DMH facility and aggregated by fiscal year. We calculated DMH expenditures this way because the DMH records only use services, not charges or episode payments.

Real average annual expenditures were about $4,198 per patient prior to managed care (Table 1). Managed care coincides with a decline of more than $500 in unadjusted total annual expenditures per patient. All expenditures are adjusted to 1994 dollars using the gross domestic product deflator. The cumulative inflation rates from 1991 and 1992 until 1994 were 7.1 percent and 4.1 percent, respectively. All years refer to the FY, which starts on July 1 of the preceding calendar year.

The expenditures also vary by type of service. The average expenditure on inpatient psychiatric care declined from $1,333 before managed care to $818 after managed care. The decline in inpatient psychiatric expenditures, however, was offset by increases in outpatient psychiatric and pharmaceutical expenditures. Outpatient psychiatric expenditures increased by $100 after managed care.

Table 1
Summary Statistics of Data for AFDC Population

Variables	Pre-Managed Care (1991-92)		Post-Managed Care (1994)	
	Annual per Person Expenditure	Standard Deviation	Annual per Person Expenditure	Standard Deviation
Expenditures				
Total (Including Other Expenditures)	$3,825	(8,974)	$2,971	(6,102)
Inpatient Psychiatric	779	(4,557)	374	(4,429)
Outpatient Psychiatric	831	(1,093)	960	(1,285)
Medical	1,864	(7,306)	1,321	(3,561)
Pharmacy	190	(392)	205	(456)

	Pre-Managed Care (1991-92)		Post-Managed Care (1994)	
	Number	Percent	Number	Percent
Health Status				
Major Mental Illness (Schizophrenia, Major Affective Disorders, Other Psychoses)	976	10	837	14
Substance Abuse (Drug or Alcohol Comorbidity)	1,365	14	933	16
Eligible for AFDC Through Medical Assistance Program	1,231	13	789	13
Demographic				
Age Splines				
1-4 Years	616	6	570	9
5-9 Years	1,562	16	1,050	17
10-14 Years	1,525	16	926	15
15-17 Years	649	7	433	7
18-19 Years	240	2	126	2
20-29 Years	2,223	23	1,155	19
30-39 Years	2,140	22	1,268	21
40-49 Years	641	7	417	7
50 Years or Over	104	1	69	1
Male	2,987	31	1,979	33
Non-White	3,015	31	1,767	29
N	9,700		6,013	

NOTE: AFDC is Aid to Families with Dependent Children.

SOURCE: Division of Medical Assistance: Medicaid paid claims; Department of Mental Health: State hospital inpatient files, 1991, 1992, and 1994.

Similarly, average pharmaceutical expenditures increased from $245 to $362.

We measured the effect of managed care with a dummy variable. The dummy variable equals one in FY 1994; the pre-managed care FYs 1991 and 1992 are the reference years.

People diagnosed with schizophrenia, major affective disorders, or other psychoses were classified as having a major mental illness. The vast majority of the sample (87 percent) had none of these three major mental diagnoses. We interacted this dummy variable with the managed care dummy variable to measure the effect of managed care separately for this population with much higher expenditures and utilization of inpatient care.

To measure the degree of substance abuse in our sample, we coded a person as having a comorbidity of substance abuse if any claim during the year had a primary or secondary diagnosis of alcohol or drug abuse, defined as an *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) code of 291, 292, 303.00, 303.90, 304, or 305 (16 percent of the sample). We also included dummy variables to control for other comorbidities using the 19 medical disease categories, as defined by ICD-9-CM codes. Only 15 dummy variables were included in the regressions, however, because of lack of variation. Three of the categories had almost no observations, and one category—mental health—had all observations. For each medical disease category, if a person had any diagnoses in that category on any claim during the year, then the corresponding dummy variable was coded 1.0. About 8 percent of the sample was eligible for Medicaid through the Medical Assistance criteria, which are specific to out-of-pocket health care expenditures rather than income level. Those who are eligible typically have serious and expensive health problems.

The sociodemographic structure remains remarkably constant over the study period. The age range is so broad, ranging from 0-64 years, that we included 8 age splines to allow for a fairly flexible effect of age. Age has a piecewise linear effect on the logarithm of expenditures. Preliminary analysis of total expenditures by age showed that cutoff points of ages 5, 10, 15, 20, 30, 40, and 50 were reasonable. Each of the eight spline coefficients refers to the marginal effect of each year in the age range and is not the average effect, as would be the case with a dummy variable. A majority of the beneficiaries in any given year are female and about 30 percent of all patients are non-white. Seven regional variables were constructed to control for regional variation in expenditures. Less than 2 percent of observations had missing data on sex or race. Instead of throwing away those observations, those with missing sex were included with the reference category of women, and those with missing race were included in other race. A separate dummy variable was defined for the 20 percent of observations with missing data on region.

RESULTS

Total per person public expenditures, including the four types of services studied plus dental and transportation, for the AFDC population (having at least one mental health claim) are significantly lower after the start of the mental health carve-out. Total per person public expenditures declined by about 3 percent, which is statistically significant at the 5-percent level (Table 2). So although this result is statistically significant, the absolute magnitude of the change is fairly small. However, the story for beneficiaries with a major mental illness is different. Those with a major mental illness had much lower total expenditures after the start of the carve-out, by about 17 percent,

which is statistically significant at the 1-percent level. This finding implies that the effect of managed care is strongest for those with high expenditures.

The experience of children and adults, however, was quite different from each other (Table 2). Expenditures for children increased by 7 percent after the start of the carve-out, while expenditures for adults decreased by about 14 percent. The interaction term between major mental illness and managed care was only statistically significant in the children's regression. Therefore, the results for the two samples are quite different.

Table 2
Regression Analysis of Logarithm of Total Expenditures

Variable	Full Sample	Children (0-17 Years)	Adults (18-64 Years)
Constant	**6.512	6.46**	**6.63
	(0.094)	(0.10)	(0.15)
Managed Care	*-0.034	**0.072	**-0.148
	(0.017)	(0.024)	(0.024)
Health Status			
Major Mental Illness (Schizophrenia, Major Affective Disorders, Other	**0.578	**0.98	**0.448
Psychoses)	(0.038)	(0.12)	(0.036)
Major Mental Illness x	**-0.183	**-0.63	0.008
Managed Care	(0.052)	(0.15)	(0.055)
Substance Abuse (Drug	**0.471	**0.255	**0.508
or Alcohol Comorbidity)	(0.024)	(0.077)	(0.025)
Eligible for AFDC Through	**-0.066	**-0.121	-0.023
Medical Assistance Program	(0.024)	(0.036)	(0.032)
Other Comorbidities	Yes	Yes	Yes
Demographic			
Age Splines			
1-4 Years	-0.022	-0.022	—
	(0.025)	(0.025)	
5-9 Years	**0.0672	**0.0682	—
	(0.0086)	(0.0087)	
10-14 Years	-0.0123	-0.0106	—
	(0.0087)	(0.0087)	
15-17 Years	**-0.070	-0.053	—
	(0.021)	(0.020)	
18-19 Years	*-0.061	—	-0.126
	(0.028)		(0.078)
20-29 Years	**0.0174	—	**0.0194
	(0.0043)		(0.0043)
30-39 Years	0.0075	—	*0.0086
	(0.0039)		(0.0039)
40-49 Years	0.0034	—	0.0053
	(0.0066)		(0.0066)
50 Years or Over	**-0.049	—	**-0.049
	(0.017)		(0.016)
Male	0.036	**0.079	**-0.092
	(0.021)	(0.024)	(0.042)
Non-White	**-0.100	**-0.123	**-0.082
	(0.018)	(0.026)	(0.023)
Region Dummy Variables	Yes	Yes	Yes
Adjusted R2	0.37	0.26	0.43
N	15,713	7,331	8,382

*Statistically significant at the 5-percent level.
**Statistically significant at the 1-percent level.

NOTES: Standard errors are shown in parentheses. AFDC is Aid to Families with Dependent Children.

SOURCE: Division of Medical Assistance: Medicaid paid claims; Department of Mental Health: State hospital inpatient files, 1991, 1992, and 1994.

The parameters corresponding to the demographic and health variables have plausible values in the total expenditure regression. Total expenditures rise rapidly for young children, decline for teenagers, then rise through the 20s and plateau until age 50. This pattern mirrors the descriptive results found in preliminary studies. Adult males and white persons have higher expenditures than adult females and non-white persons. Expenditures for a person with substance abuse or a major mental illness were between 60 and 78 percent more than for a person without these problems. Eligibility for Medicaid through the Medical Assistance program is associated with higher expenditures, as expected, than for the categorically eligible by about 7 percent. The only substantive difference in the results between children and adults for demographic variables was for sex. Boys have higher expenditures than girls, while adult males have lower expenditures than adult females.

The results from the expenditure models do not indicate widespread cost shifting between the vendor and Medicaid for children or adults (Tables 3 and 4). For children, there were modest increases in expenditures on outpatient psychiatric care and pharmacy, and a similar, but statistically insignificant, decrease in expenditures on inpatient psychiatric care. If there was cost shifting, we would have expected to find decreases in expenditures on inpatient and outpatient psychiatric care, and increases in expenditures on medical and pharmacy. For adults, there was a decrease in expenditures on inpatient psychiatric care of $324. However, outpatient expenditures did not increase, and medical expenditures decreased by $182, although this was not statistically significant at the 5-percent level.

The results from the two-part model generally show that changes in expenditures are due to changes in both the probability of getting a type of service and the expenditure conditional on getting care. For example, expenditures on inpatient psychiatric care were lower for adults through a combination of fewer inpatient stays and shorter stays, according to the results of the two-part model (Table 4). The probability of an inpatient stay decreased after the start of the mental health carve-out. The expenditures were about 43 percent lower, conditional on having an inpatient stay. The probability of outpatient care increased, even though the percentage who received it prior to the carve-out was nearly 99 percent. The two-part model showed a different pattern for the effect of managed care on services controlled by the primary care clinician. Both medical care and pharmacy had a decrease in the probability of getting care for adults. The expenditures conditional on receiving pharmaceuticals increased by about 17 and 27 percent for adults and children. These results were statistically significant at the 1-percent level.

In contrast to the findings of lower total expenditures for persons with a major mental illness, they did not seem to experience cost shifting. Nearly every interaction term with managed care was statistically insignificant in the two-part models. As before, the main effect of having a major mental illness generally was associated with higher expenditures, due to both greater probability of use and higher expenditures conditional on use.

DISCUSSION

The results found for the AFDC population can be contrasted with those found by Norton, Lindrooth, and Dickey (1997) for the disabled population. In that study, we found that the start of the mental health carve-out is associated with a 24-percent decline in annual per person expenditures

Table 3
Estimates of Expenditure Model and Two-Part Model, by Type of Service for Children

Variable	Expenditure Model	Two-Part Model	
		Probit	OLS
Inpatient Psychiatric			
Constant	-375	-3.76	**7.5
	(334)	(0.58)	(1.1)
Managed Care	-84	-0.111	**-0.46
	(107)	(0.071)	(0.16)
Major Mental Illness (Schizophrenia, Major	**8,856	**1.31	**0.82
Affective Disorders, Other Psychoses)	(1,449)	(0.11)	(0.15)
Major Mental Illness x Managed Care	**-7,913	**-0.61	-0.53
	(1,547)	(0.18)	(0.29)
Outpatient Psychiatric			
Constant	44	**2.07	**4.47
	(68)	(0.31)	(0.10)
Managed Care	*60	0.28	0.024
	(29)	(0.16)	(0.032)
Major Mental Illness (Schizophrenia, Major	**378	**-0.88	**0.422
Affective Disorders, Other Psychoses)	(88)	(0.20)	(0.092)
Major Mental Illness x Managed Care	92	0.26	-0.02
	(153)	(0.34)	(0.13)
Medical			
Constant	**5,677	-0.47	**5.60
	(1,914)	(0.32)	(0.11)
Managed Care	-11	0.124	**0.250
	(117)	(0.074)	(0.028)
Major Mental Illness (Schizophrenia, Major	110	-0.01	*0.25
Affective Disorders, Other Psychoses)	(292)	(0.33)	(0.10)
Major Mental Illness x Managed Care	-95	-0.14	-0.22
	(333)	(0.40)	(0.14)
Pharmacy			
Constant	**-53	**-0.85	**2.89
	(15)	(0.15)	(0.11)
Managed Care	**31.1	0.055	**0.237
	(5.0)	(0.037)	(0.036)
Major Mental Illness (Schizophrenia, Major	*28	*0.24	**0.32
Affective Disorders, Other Psychoses)	(12)	(0.12)	(0.11)
Major Mental Illness x Managed Care	12	-0.23	-0.09
	(25)	(0.16)	(0.17)

*Statistically significant at the 5 percent level.
**Statistically significant at the 1 percent level.

NOTES: Each model also includes health status, other comorbidities, demographics, and region dummy variables. The expenditure and Probit models have 7,331 observations. The OLS models with all observations have N= 266, 7,291, 6,306, and 5,086 for inpatient psychiatric, outpatient psychiatric, medical, and pharmacy, respectively. Standard errors are shown in parentheses. OLS is ordinary least squares.

SOURCE: Division of Medical Assistance: Medicaid paid claims; Department of Mental Health: State hospital inpatient files, 1991, 1992, and 1994.

in the first year. The effect of managed care was much weaker in the second year, being only about 8 percent lower than the original, baseline cost before the program was begun. The decline of only 3 percent in total expenditures for the AFDC population is smaller than that found for the disabled population. One reason is that for the AFDC population we did not have data for FY 1993, which had the largest decline in the disabled population. Our results are more conservative because they do not

pick up the first-year effect, which was expected to be larger than the long-run effect. Medicaid intentionally reduced the vendor's financial incentives after the first year of managed care to avoid squeezing the system too hard. The implication is that the carve-out did not dramatically reduce total expenditures.

The other reason for the larger decline in total expenditures for the disabled population is that the average per person expenditure was about three times larger

Table 4
Estimates of Expenditure Model and Two-Part Model, by Type of Service for Adults

Variable	Expenditure Model	Two-Part Model	
		Probit	OLS
Inpatient Psychiatric			
Constant	455	**-1.70	**8.53
	(431)	(0.32)	(0.50)
Managed Care	**-324	**-0.597	**-0.57
	(85)	(0.076)	(0.17)
Major Mental Illness (Schizophrenia, Major	**1,484	**0.832	**0.421
Affective Disorders, Other Psychoses)	(213)	(0.068)	(0.098)
Major Mental Illness x Managed Care	-457	**0.41	0.18
	(287)	(0.12)	(0.20)
Outpatient Psychiatric			
Constant	**821	**2.20	**5.90
	(135)	(0.46)	(0.20)
Managed Care	27	**0.83	0.051
	(30)	(0.14)	(0.035)
Major Mental Illness (Schizophrenia, Major	**355	-0.01	**0.612
Affective Disorders, Other Psychoses)	(49)	(0.14)	(0.049)
Major Mental Illness x Managed Care	80	-0.31	-0.014
	(80)	(0.30)	(0.072)
Medical			
Constant	-24	**-1.86	**5.05
	(487)	(0.61)	(0.17)
Managed Care	-182	**-0.357	**-0.126
	(101)	(0.077)	(0.029)
Major Mental Illness (Schizophrenia, Major	-133	0.06	0.038
Affective Disorders, Other Psychoses)	(191)	(0.14)	(0.042)
Major Mental Illness x Managed Care	-6	**-0.65	-0.057
	(196)	(0.19)	(0.063)
Pharmacy			
Constant	-19	-0.53	**3.66
	(36)	(0.29)	(0.17)
Managed Care	**45	**-0.153	**0.160
	(12)	(0.048)	(0.035)
Major Mental Illness (Schizophrenia, Major	**158	**0.402	**0.517
Affective Disorders, Other Psychoses)	(23)	(0.099)	(0.049)
Major Mental Illness x Managed Care	-17	**-0.37	0.033
	(34)	(0.13)	(0.077)

*Statistically significant at the 5 percent level.
**Statistically significant at the 1 percent level.

NOTES: Each model also includes health status, other comorbidities, demographics, and region dummy variables. The expenditure and Probit models have 8,382 observations. The OLS models with all observations have $N=$ 683, 8,228, 7,502, and 7,287 for inpatient psychiatric, outpatient psychiatric, medical, and pharmacy, respectively. Standard errors are shown in parentheses. OLS is ordinary least squares.

SOURCE: Division of Medical Assistance: Medicaid paid claims; Department of Mental Health: State hospital inpatient files, 1991, 1992, and 1994.

for the disabled than for the AFDC population, with a slightly larger percentage spent on inpatient psychiatric care. It is clearly easier to reduce expenditures on those persons and types of services with high expenditures. Inpatient psychiatric care showed the largest decrease in expenditures for the disabled population. The implication is that policies will be more effective at reducing expenditures when the targeted program has higher expenditures. Because the AFDC population has relatively low expenditures on mental

health, the mental health carve-out had less effect on total expenditures.

As for cost shifting, in the other study we found some evidence that the managed care vendor shifted expenditures away from types of services for which it bore financial risk (inpatient and outpatient psychiatric care) to those for which Medicaid retained financial risk (pharmacy and non-psychiatric care). The results also indicated that cost shifting may be related to improved access to medical care and increased pharmacy expenditures on new,

higher-priced antipsychotic medication. The patterns in the two-part model were consistent with improved access for a population traditionally underserved, and more prescriptions for new powerful drugs. In contrast to the finding about cost shifting in the disabled population, there appears to be little or no such effect for the AFDC population. The explanation for the lack of cost shifting may again be that the amount of money at stake is small. It is not possible to squeeze utilization if there is relatively little per person utilization to begin with, and the managed care vendor, which served both the AFDC and disabled populations, may have focused its cost-savings efforts on the disabled.

The strongest conclusion seems to be that the savings from managed care are achieved from those who are sickest. Our results for the interaction between major mental illness and managed care provide further evidence that cost shifting and cost reduction is less important for the AFDC population as a whole. Among those eligible for AFDC, those who also have a major mental illness had about a 17-percent decrease in total expenditures (all due to children), far greater than for those without a major mental illness. Furthermore, the changes found in this study are much smaller than for the prior study, which may be due to the AFDC population having lower expenditures. In summary, mental health carve-outs save more money on those who have the higher expenditures.

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