
Medicaid TEFRA Option in Minnesota: Implications for Patient Rights

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This research studied a special-needs population under age 18 who had both private insurance and Medicaid coverage through the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) option. We found that children with managed care plans, particularly health maintenance organizations (HMOs), tended to incur higher total expenses to TEFRA than children with indemnity plans. Our findings also show that managed care in Minnesota tends to provide the same or marginally better coverage as indemnity plans do for core medical items but much less coverage for ancillary items such as home care, therapies, and durable medical equipment.

INTRODUCTION

It is believed that more than 80 percent of Minnesota's population today is enrolled in some form of managed care, which includes staff-model HMOs, loosely connected preferred provider organizations (PPOs), and point-of-service (POS) plans. Rising health care costs in Minnesota have been slowed down in recent years, and many attribute this to the managed care effect. A statewide survey of the general public conducted by the Minnesota Health Data Institute (1995) found that individuals

enrolled in managed care plans have a higher level of satisfaction than those with fee-for-service (FFS) plans.

However, there are concerns about how people with disabilities are treated under managed care. Legislation passed in Minnesota in 1995 required the Minnesota Health Care Commission (MHCC) to hold hearings at various sites in the State to take testimony from concerned citizens about the impact of managed care on persons with chronic illnesses or disabilities. (The MHCC was an advisory body to help Minnesota communities, providers, and consumers improve the affordability, quality, and accessibility of health care.) Three public hearings were conducted in the fall of 1996. In its report, the MHCC (1997) summarized the public testimony as follows:

"Perhaps not surprisingly, most testimony drew attention to actual or perceived problems, complaints, or concerns....some persons testified as to problems in obtaining particular services under their health coverage arrangement, particularly regarding durable medical equipment. A few cases of apparent poor customer service or poor quality of care were presented ..."

The testimony given at the public hearings helped illustrate a number of concerns of people with disabilities, and these concerns mirrored many of those voiced at the national level—for instance, the congressional testimony before the House Ways and Means Health Subcommittee by the Consortium for Citizens with Disabilities in 1995. How representative the testimony is to the special-needs

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population remains unknown. Are these unfavorable experiences simply rare cases or the “tip of the iceberg?” Are they perceptions or general facts? Many of the testified situations are not limited to managed care alone but exist in the FFS sector as well. How does the managed care sector compare with FFS?

After reviewing the literature on outcomes of managed care and traditional reimbursement for persons with chronic conditions, disability, or terminal illness, we concluded that the findings of managed care on vulnerable populations are generally mixed. This view is supported by a recent review of literature by Miller and Luft (1997). Updating their earlier literature review, these authors discussed studies published in peer-reviewed journals from the last quarter of 1993 to early 1997 and found that quality-of-care evidence from 15 studies showed an equal number of significantly better and worse HMO results, compared with non-HMO plans. However, the authors highlighted two research projects that indicated that quality of care may be worse in HMOs. Both studies examined Medicare HMO enrollees with chronic conditions and had exceptionally strong methodologies—the study of Medicare home health care (Shaughnessy, Schlenker, and Hittle, 1994, Schlenker, Shaughnessy, and Hittle, 1995) and the Medical Outcomes Study (Ware et al., 1996).

Miller and Luft (1997) concluded that more research and reporting are needed on the care process and outcome measures for the vulnerable population. The majority of research on the effects of managed care on vulnerable populations has focused on adults. Very few studies have examined the effect of managed care on children with chronic illness. In these studies, there is strong evidence for reduced use of specialty services under managed care, particularly for children enrolled in Medicaid, by

restricting the breadth and number of visits of specialty services, requiring prior authorization, or excluding them from the benefit packages (Reid, Hurtado, and Starfield, 1996; Rouilidis and Schulman, 1994; Fox, Wicks, and Newacheck, 1993; Horowitz and Stein, 1990).

This research explores a special-needs population in Minnesota under age 18 with private insurance and Medicaid coverage. The Medicaid coverage is available to this population through a Federal option called TEFRA. In many ways, the Medicaid TEFRA option has served privately insured children with special needs as a backup coverage. Our research attempts to answer the following questions:

- Does Medicaid in Minnesota absorb higher expenses from children under TEFRA with managed care health plans compared with their counterparts with indemnity plans?
- Which types of managed care plans tend to share more costs with Medicaid for their insured children who are also covered by TEFRA?
- Which services tend to be less likely to be covered under managed care but paid for by TEFRA?

TEFRA Option

The TEFRA option for children with disabilities is also known as the Katie Becket Option, named after the child whose situation prompted the change in Medicaid coverage. According to a 1996 survey by the State of Wisconsin (1996), 16 of 43 States responding provided services to children with disabilities under the TEFRA option. The Minnesota Department of Human Services implemented the TEFRA option in 1988, providing coverage for children under age 18 who have severe disabling conditions. Because of the substantial cost to families with special-needs children, TEFRA

has, for some, become a supplemental insurance policy covering the acute and chronic health care costs of children with severe disabilities and chronic illnesses.

Eligibility for the program is based on the individual child's disability and the need for care at the same level or intensity that is typically provided in a hospital, intermediate care facility for the mental retarded, or nursing home. (As of June 30, 1995, a child's eligibility for TEFRA was determined principally by the Supplemental Security Income definition of disability.) Financial eligibility is based solely on the child's income and assets, not the family's. However, once a child is found eligible, the family's financial obligation is determined by a fee schedule based on family size and income. In 1995, there were about 3,800 children covered by the Minnesota TEFRA program.

TEFRA provides eligible children access to the standard list of services covered by Medicaid. TEFRA pays only for those services that, according to the Minnesota Health Programs Manual:

- Are determined to be medically necessary.
- Are effective for the medical needs of the recipient.
- Meet quality and timeliness standards.
- Are found to be the most cost-effective health service available for the medical needs of the recipient.

All the rules applicable to Medicaid recipients apply to TEFRA recipients, including use of Medicaid participating providers, obtaining prior authorization for certain services, and certification for inpatient hospital admissions.

Similarly, the rules for Medicaid providers also apply for TEFRA, including the following:

- Providers must accept Medicaid reimbursement as payment in full for covered services provided. A provider cannot

request or accept payment in addition to the amount allowed under the Medicaid program from the recipient or the recipient's relatives.

- If a child is covered by private insurance or an HMO, the private health plan is the primary payer and, in general, is billed first. Once the private health plan has reviewed the claim and met the financial obligation it has to the provider, the bill, along with an explanation of the payment made by the primary payer, is submitted to the Medicaid program.
- Medicaid pays the lowest of (a) the difference (if any) between what the provider has received from other third-party payers and the allowable Medicaid reimbursement rate for the service, or (b) the difference between the provider charge and the amount paid by all liable third-party payers, or (c) the total patient liability after the provider has accepted a reduced payment under an agreement with the insurer.

Although 75 percent of the children in Minnesota who are covered under TEFRA have private health insurance, health plans commonly include limitations on the benefits available to the insured. One limitation especially problematic for children with disabilities is the requirement that therapy service be used to restore lost functioning associated with an illness or injury. This requirement restricts coverage for children who need therapy to improve functioning appropriate to their age and for those whose congenital problems have prevented functioning from being established. Limitations on units, hours, or days of care and use of a specialist are common. Treatment related to mental health diagnoses is also often limited. Managed care plans may use techniques through providers such as utilization review and discounted fees to affect clinical practice. These techniques may discourage

providers from proposing appropriate care for which they expect the health plan will deny coverage (Remler et al., 1997). Because of these limitations in private health plans, the TEFRA program is an invaluable supplement to children with disabilities.

TEFRA RESEARCH PROJECT

Concern over TEFRA expenditures led the 1995 Minnesota legislature to more closely examine and evaluate eligibility and scope of payments of the program. During that time, a proposal to modify or eliminate the TEFRA option was debated. Throughout the deliberative process and discussion, it was evident that policymakers did not share a clear understanding of why families use TEFRA. To better understand the issues faced by children and families utilizing TEFRA, the Minnesota Children with Special Health Needs (MCSHN) Section of the Minnesota Department of Health was charged with conducting a survey of this population.

The TEFRA survey was developed by a team of MCSHN staff, largely by reference to other studies in the literature or conducted by other agencies. The survey was designed in an attempt to answer questions such as:

- Why do families use TEFRA?
- What are the characteristics of children and families using TEFRA?
- What types of services have these families and children used in the last 12 months?
- Who pays for these services?

The Minnesota Department of Human Services (MDHS) provided an address file of 3,770 children enrolled in the TEFRA program as of June 30, 1995. The address file contained only contact information, recipient identification number, and birth date. Approximately 2,000 children were

randomly selected from this address file to be subjects. Surveys were sent out in the first week of December 1995, and 959 questionnaires were returned. Of these, 10 were incomplete and were removed from the analysis. The final response rate was 47.2 percent ($n = 949$).

To conduct an analysis of respondents and non-respondents, MCSHN requested two additional data bases from MDHS in 1996—the 1996 recertification data and the 1994-1995 TEFRA cost summary file. The recertification data base provided demographic and disability information of all children recertified for TEFRA in 1996. Because the recertification data constituted a working data base and not all children under TEFRA in 1995 reapplied in the following year, only two-thirds of the survey sampling frame from the address file could be matched. Despite this limitation, the analysis of respondents and non-respondents based on the recertification data provided valuable information on the quality of the survey data.

No major differences were found by comparing respondents with non-respondents on most demographic characteristics. The respondents in the study sample may have been slightly younger and a bit underrepresented in the mental-health-diagnosis group, however, it is unlikely that these differences would have a major bearing on the survey findings. Respondents and non-respondents were also compared on the basis of the costs incurred by TEFRA. The 1994-1995 cost summary file was created by MDHS in early June 1995. The file has information on payments and payment (or claim) categories for the previous 12 months (May 1994-May 1995). Because the cost summary data file was developed a little earlier than the data file from which the survey sample was drawn, cost data on a few children in the survey study were not available. However, the matching rate was

high, and 93 percent of the survey cases ($n = 882$) were merged successfully for the analysis. Comparison of these data shows that the unadjusted average monthly TEFRA cost for respondents was \$755.30, and the cost for non-respondents was \$779.80. The difference between these two figures is not statistically significant.

Although we cannot state every finding of the research project in this article, it is necessary to present a profile of children using TEFRA for our research. (Findings from the TEFRA survey can be found in [Minnesota Department of Health, 1998].) Children under TEFRA are among the most disabled of Minnesota's children, and 80 percent have more than one diagnosis. Sixty-seven percent of the children require prescription drugs; the mean number of prescriptions per child was nearly three. More than one-quarter of the children were hospitalized in the year preceding the survey, and 82 percent require constant or frequent supervision beyond that required by same-aged peers. Forty-six percent of the children receive home care services, and 18 percent received mental health services. Nearly all of the children received care from a specialty physician in the year preceding the survey. In addition to their primary care physician, 21 percent saw one specialty physician, 24 percent saw two specialists, and 45 percent saw three or more.

In the survey, service questions were listed comprehensively (e.g., skilled nursing, personal care attendant, and home health aide) and grouped under each service category (e.g., home care). Parents were asked to identify the services received by their child and provide some estimates of the frequency of those services in the previous 12 months (November 1994–November 1995). Based on a set of assumptions, cost parameters (i.e., cost per unit or episode) were applied

to the parent-reported utilization data to provide gross cost estimates of services. (Greater detail of the derivation of cost estimates can be found in [Minnesota Department of Health, 1998].) Cost parameters were based on information available through a variety of sources, including provider billing information, vendor contracts, published literature, and unpublished survey results. However, where Medicaid is the primary payer for a service and where cost data were not available from other sources, Medicaid rate information was used. Every effort was made to obtain data specific both to pediatric care and to Minnesota. If neither criterion could be met, regional—and then national—cost information was used.

In Table 1, we present cost estimates for children with private health insurance. (Average monthly cost estimates of all respondents were published in [Minnesota Department of Health, 1998], and the estimates presented in Table 1 are similar to the published estimates for all respondents.) Average monthly costs for caring for a child with TEFRA and private insurance were estimated to be \$3,027.11 (\$36,325.32 annually). These are total costs to all payers, not just the costs to TEFRA. Breakdowns of the average monthly costs are listed in the table. Generally, families pay for all health-related costs, and the county picks up the cost of social services. Counties and TEFRA are the main payers for mental health services. The two most expensive items are therapy and home care, \$925.87 and \$761.05, respectively. It is important to note that our therapy cost estimate also includes costs to districts for providing therapy at school, such as speech and occupational therapies, which cost approximately \$174.04 monthly. The two next most expensive items are hospital care and med-

Table 1

Average Monthly Costs of TEFRA Population with Private Health Insurance:¹ Minnesota, 1995

Service	Average Monthly Cost
Total	\$3,027.11
Health-Related Items	2,886.91
Hospital/Emergency Care	556.27
Mental Health Services	57.04
Counseling	90.41
Primary Care/Specialty and Outpatient Care	74.64
Home Care	761.05
Medications and Special Diets	264.96
Therapy (Physical, Occupational, Speech, and Respiratory)	925.87
Equipment and Supplies	156.67
Related Costs ²	46.09
Social Services (Respite Care and Case Management)	94.11

¹ Regardless of payer.

² Examples of related costs include: replacement cost of non-medical equipment, modification cost of home or a vehicle for the child's special needs, and special clothing expense, etc.

NOTES: TEFRA is Tax Equity and Fiscal Responsibility Act of 1982.

SOURCE: (Minnesota Department of Health, 1998).

ications, \$556.27 and \$264.96, respectively. Primary care and specialty visits total \$74.64, approximately equivalent to one-half of a doctor visit monthly.

DATA AND METHODS

To address the questions posed earlier in this article, we conducted research using the cost summary file and the survey data. In addition to the total payment, the cost summary file also contained information on payment claim categories. Categories include inpatient care, psychiatric/mental health, nursing home care, outpatient care/physician visit, home care, medications, and miscellaneous services/items. The survey data provide a snapshot of the population in December 1995. The time lag between the cost summary data and the survey data is about 6 months, and the merged data set has 882 observations.

We began our research by focusing on the children with private health insurance in the merged data set (692 observations). The survey asked families to give the exact name of the health plan as shown on the membership card. The name of a secondary private health plan was also request-

ed (only 12 percent of children in the merged data had a secondary plan). Based on an index of plan names from the Minnesota Department of Commerce, health plan names on the surveys were categorized into three groups: (1) indemnity plans ($n = 161$), (2) PPO and POS plans ($n = 253$), and (3) certified HMOs ($n = 121$). It was necessary to exclude 157 cases because health plan names could not be identified.

A substantial number of children with private insurance were excluded because of missing plan-type information, therefore, a comparison of children in identified and unidentified plans was conducted. The results are shown in Table 2. (We also compared privately insured children having both TEFRA cost and identifiable health plan information with children for whom at least one of these two pieces of information was also missing. The results of this comparison are similar to the results shown in Table 2.)

As was the case in the analysis of respondents and non-respondents, children in identified plans were slightly younger; however, diagnosis distribution between the identified and unidentified groups was similar. Sex distribution between the two

Table 2
Comparison of Children in Identified and Unidentified Health Plans: Minnesota, 1995

Characteristic	Unidentified Plans (n = 157)	Identified Plans (n = 535)	Test	p-value
Age	10.08	8.87	$t = 3.03$	0.00
Monthly TEFRA Payment	\$569.74	\$732.42	$t = -1.92$	0.06
Male	56.80	57.32	Chi ² = 0.01	0.91
Diagnosis Categories				
Multiple	46.50	42.64	—	—
Mental Health	12.74	10.99	—	—
Developmental Disability	7.76	8.75	—	—
Physical Disability	33.12	37.62	Chi ² = 1.59	0.66
Resident of Urban Areas	47.13	65.74	Chi ² = 17.75	0.00

NOTE: TEFRA is Tax Equity and Fiscal Responsibility Act of 1982.

SOURCE: Chan and Vanderburg, Chicago, 1999.

groups was essentially the same. The major difference between the two groups is urban or rural status, with children in the unidentified group being more likely to be residents of rural areas. It is possible that rural children's health plans were local policies, not registered at the State Department of Commerce. Given the low managed care penetration in rural Minnesota, rural plans tend to be of the indemnity type. The lower monthly TEFRA payments in the unidentified group may support this assertion. The comparison of monthly TEFRA payments between the identified and unidentified groups is marginally significant. Based on this finding, we conclude that the indemnity group may be slightly underrepresented in our study sample. Because of this limitation, we expect a weaker power to detect plan differences in our analysis.

After eliminating one outlier and observations with missing information on variables, the complete data set contained 511 observations, which represented 18 percent of the TEFRA population with private insurance. To be consistent with earlier findings, payment data were calculated in months for all analyses. Almost all (98.9 percent) children with TEFRA had incurred some expenses to the program. For this reason, there is no significant

problem modeling the total payment as a dependent variable due to the high frequency of zero utilization.

However, the monthly total payment variable is skewed to the right because of a few cases incurring high expenses to the program. For this reason, a one-part model was used (Duan et al., 1983). We took a logarithmic transformation of the total monthly payment to diminish the influence of the extreme values and analyzed the linear model on the log scale:

$$\log(\text{monthly total}_i + \$5) = x_i \beta + \varepsilon_i, \varepsilon_i \sim N(0, \sigma^2_\varepsilon) \text{ where } i = 1, \dots, n$$

The constant \$5 minimizes the skewness of residuals resulting from a few zero observations in the data. The expected monthly total payment was calculated for each insurance coverage using the following expression:

$$\phi \times \exp(x_i \beta) - \$5,$$

where ϕ is the smearing estimator (Duan et al., 1983).

For individual claim categories, high frequencies of zero utilization were expected for these categories. For each claim category, a two-part modeling was used as follows. First, a dichotomous variable was

Table 3
Explanatory Variables in Logit/OLS Models:¹ Minnesota, 1995

Variable	Mean	Standard Deviation
Preschool Age	0.29	0.45
Grade School Age	0.50	0.5
Male	0.57	0.5
Resident of Urban Counties	0.66	0.47
High Supervision Need	0.72	0.45
Excellent Health	0.14	0.35
Good Health	0.54	0.5
Fair Health	0.27	0.44
Preferred Provider Organization/Point of Service Plans	0.46	0.5
Health Maintenance Organization Plans	0.23	0.42
Household Income	\$45,337.83	\$34,501.27
Having a Second Health Plan	0.12	0.32
Number of Years with TEFRA	3.27	2.29
Mental Health	0.11	0.32
Developmental Disability	0.09	0.29
Physical Disability	0.36	0.48

¹ n = 511.

NOTES: OLS is ordinary least squares. TEFRA is Tax Equity and Fiscal Responsibility Act of 1982.

SOURCE: (Minnesota Department of Health, 1998).

created based on the payment information, and a logit regression was fitted to determine the expected probability of filing claims to TEFRA. Second, a semi-log ordinary least-squares (OLS) regression model was applied to children who filed claims. The adjusted mean payment per month was figured for each insurance coverage (i.e., $\exp(x_i \beta)$). Then the expected monthly payment of the claim category was calculated by multiplying the expected probability (part 1), the adjusted mean payment (part 2), and the smearing estimator.

Variables of interest included in the regression models (logit and OLS) were the two dummy variables—PPO/POS plans and HMO plans, and the reference group was the indemnity plans. In addition, a set of covariates was included as control variables. All explanatory variables came from the survey instrument; their descriptive statistics are listed in Table 3. It should be noted that the reference group for the preschool/grade school age indicators was the high school age group; the reference category for the health-status indicators was poor health; household income served as a proxy for family socioeconom-

ic status, which may have implications for higher service utilization; number of years with TEFRA implied the intensity of the child's illness and family's familiarity with the claiming process; and a multiple-diagnosis group was the reference for the three disability categories listed.

FINDINGS

Monthly Total TEFRA Payment

The average monthly total TEFRA payment was \$740.52 (standard deviation = 1,294.69). Regression results of the logged total monthly payment are presented in Table 4. In general, regression coefficients are well within expectations. Among various explanatory variables, health status, PPO/POS coverage, HMO coverage, household income, and number of years with TEFRA were statistically significant in predicting the log of total monthly payment. Generally, children who have higher need for supervision, poor health, higher household income, longer tenure on TEFRA, and PPO, POS, or HMO coverage incur higher TEFRA payments. The

Table 4
Monthly Total TEFRA Payment (Logged) Analysis:¹ Minnesota, 1995

Variable	Beta	Standard Error of Beta	Student's <i>T</i>	Significance Level
Age Birth-6 Years	-0.2839	0.2196	-1.293	0.197
Age 7-12 Years	-0.0772	0.1832	-0.421	0.674
Male	-0.1227	0.1435	-0.855	0.393
Urban	0.2917	0.1533	1.903	0.058
High Supervision Need	1.2908	0.1703	7.58	0
Excellent Health	-0.7648	0.354	-2.16	0.031
Good Health	-0.7001	0.3182	-2.2	0.028
Fair Health	-0.5261	0.3345	-1.573	0.116
PPO/POS Plans	0.4791	0.1702	2.815	0.005
HMO Plans	0.6383	0.1976	3.231	0.001
Household Income	4.52E-06	1.98E-06	2.288	0.023
Second Plan	0.0053	0.2145	0.025	0.98
Years with TEFRA	0.0864	0.0341	2.535	0.012
Mental Health	-0.1746	0.2602	-0.671	0.502
Developmental Disability	-0.3219	0.2553	-1.261	0.208
Physical Disability	-0.2829	0.1696	-1.668	0.096
Constant	4.5723	0.4213	10.854	0

¹ $R^2 = 0.22$; $n = 511$.

NOTES: TEFRA is Tax Equity and Fiscal Responsibility Act of 1982. PPO is preferred provider organization. POS is point of service plan. HMO is health maintenance organization.

SOURCE: Chan and Vanderburg, Chicago, 1999.

expected monthly total TEFRA payments for children with indemnity, PPO/POS, and HMO coverages were calculated to be \$446.24, \$724.24, and \$850.77, respectively. These are adjusted mean scores after holding other covariates (i.e., age, health status, disability types) at their means in the model. The expected total monthly payment incurred by children with PPO/POS or HMO coverage is significantly higher than their counterparts with indemnity coverage.

There may be a selection-bias issue because of voluntary enrollment into health plans. Conventional wisdom suggests that there is favorable selection into managed care and adverse selection into FFS plans. In other words, children with disabilities voluntarily enrolled into managed care plans tend to have lower baseline use and fewer medical problems and functional impairments than their counterparts with indemnity coverage. Because of limitations on data, a more rigorous selection-corrected model was not feasible. Specifically, there was a problem of identification of the choice and utilization equations in selection modeling. However, as

one parent stated on the survey, “TEFRA helps level the playing field for us.” Acting as a backup insurance, TEFRA helps fill various gaps left by different types of health plans. This, in essence, blurs the differences between private health plans and removes motivation of selectivity to a certain extent. However, one cannot claim that this study is completely clear of the selectivity problem. For this reason, we should read the findings in the light of expected direction of potential bias. Following the logic of favorable or adverse selection, selectivity will wash out the (utilization) differences among sectors—a bias to null effect. Given the significant differences between indemnity and managed care plans, the “true” differences were supposed to be even greater in the presence of selectivity.

Monthly Payment by Claim Category

Descriptive information on payment claim categories in the complete data set ($n = 511$) is listed in Table 5. The two claim categories that most children filed claims

Table 5
Payments, by Claim Category:¹ Minnesota, 1995

Claim Category	Number of Children Who Filed Claims to TEFRA	Average Annual Payment of Children Who Filed Claims	Average Monthly Payment of Children Who Filed Claims
Inpatient Care	25	\$1,850.28	\$154.19
Psychiatric/Mental Health	139	141.24	11.77
Nursing Home	101	215.16	17.93
Outpatient/Physician Visits	104	256.20	21.35
Home Care	186	12,254.04	1,021.17
Medications	391	433.56	36.13
Miscellaneous	452	4,339.32	361.61

¹ *n* = 511.

NOTE: TEFRA is Tax Equity and Fiscal Responsibility Act of 1982.

SOURCE: Chan and Vanderburg, Chicago, 1999.

under were medications (391 children) and miscellaneous services/items (452 children). For those who filed, the average monthly costs per child for medications and miscellaneous were \$36.13 and \$361.61, respectively. A total of 186 children filed claims for home care services and, on average, each child incurred approximately \$1,021.17 per month under the program. Only 25 children filed claims under TEFRA for inpatient care, and the average annual cost per child who filed claims was \$1,850.28 (or \$154.19 monthly). Apparently, most inpatient care services were paid for by children's insurance. On average, 139 children seem to have some service or one visit (equivalent to \$141.24) to psychiatric or mental health providers in the previous 12 months that was not covered by their private insurance. Also 101 children and 104 children, on average, had some service from a nursing home (\$215.16) and one outpatient visit (\$256.20) in the past year, respectively, that were not covered by their insurance.

Table 6 summarizes the results of the two-part modeling for each claim category.¹ For each claim category, a logit regression (part 1) and a semi-log OLS regression (part 2) were run. The predicted probabilities of children filing claims for each insur-

ance type (part 1 results) and the adjusted average monthly payments of children who filed claims for each insurance type (part 2 results) are also shown in Table 6, along with the expected monthly payment of children with TEFRA by insurance type and claim category.

Table 6 shows that children in HMO plans tended to have a lower probability than their counterparts with indemnity plans of filing claims for psychiatric or mental health services, nursing home care, and outpatient visits. Children in PPO/POS plans were also found to have a lower probability of filing outpatient claims with TEFRA. However, children in HMOs have a significantly higher probability than children with indemnity insurance of filing home care claims. It is not surprising that the predicted probability of children filing claims for inpatient care is statistically insignificant, because these claims are so rare (*n* = 25) in our observations. It is, however, interesting that, comparing children across types of coverages, there is no significant difference in the probability of filing claims among coverages for medications and miscellaneous items. The number of children who filed claims in these two categories is more than 390 each out of 511 complete observations, and the probabilities of filing tend to be high (more than 0.75) across insurance types. Medications

¹ A copy of all seven sets of two-part regressions can be obtained from the principal author.

Table 6
Two-Part Model Analysis of Expected Monthly Payment by Category: Minnesota, 1995

Claim Category	Predicted Probability of Children Filing Claims	Adjusted Average Monthly Payment of Children Who Filed Claims	Expected Monthly Payment of Children with TEFRA
Inpatient Care			
Indemnity	0.04	¹ \$206.41	\$8.26
PPO/POS	0.04	171.76	2.87
HMO	0.02	1224.7	4.49
Psychiatric/Mental Health			
Indemnity	0.30	14.10	4.23
PPO/POS	0.27	9.54	2.58
HMO	***0.16	9.26	1.48
Nursing Home			
Indemnity	0.23	20.22	4.66
PPO/POS	0.16	15.93	2.55
HMO	*0.14	16.91	2.37
Outpatient/Physician Visits			
Indemnity	0.27	15.80	4.27
PPO/POS	***0.18	14.30	2.57
HMO	***0.12	20.09	2.41
Home Care			
Indemnity	0.27	963.70	257.31
PPO/POS	0.35	898.54	310.00
HMO	**0.42	1,188.89	494.58
Medications			
Indemnity	0.82	38.48	31.55
PPO/POS	0.78	31.82	24.82
HMO	0.75	***23.11	17.33
Miscellaneous			
Indemnity	0.94	181.71	170.63
PPO/POS	0.90	***412.57	371.32
HMO	0.90	***416.72	375.05

* Significant at the 0.1 level.

** Significant at the 0.05 level.

*** Significant at the 0.01 level.

¹ These are the unadjusted averages of children who filed inpatient claims to TEFRA. Because of the small number of observations, we did not model inpatient care in the second part.

NOTES: TEFRA is Tax Equity and Fiscal Responsibility Act of 1982. PPO is preferred provider organization. POS is point of service. HMO is health maintenance organization. All comparisons are made to the indemnity group.

SOURCE: Chan and Vanderburg, Chicago, 1999.

and miscellaneous items seem to be difficult areas for all health plans to provide comprehensive coverage.

In Table 6, we report the adjusted average monthly payments for those who filed claims by insurance and claim category. Because there were too few inpatient care claims, the second part was not modeled. Hence, the unadjusted averages of these cases are reported in the table. For psychiatric or mental health care, nursing home services, outpatient and physician visits,

and medications, most of the adjusted monthly payment amounts are between \$10 and \$40 dollars, and they are not significantly different from the indemnity group, except medication claims, where children with HMO plans tended to have lower claims (\$23.11 a month). This may underscore the comprehensive coverage of Minnesota's HMOs in core medical items. This is also reflected well in several probability figures in Table 6. However, children with TEFRA coverage and HMO coverage

tended to have difficulty finding sufficient coverage from their insurance policies in home care and miscellaneous services and items. For those who filed home care claims, the average monthly payment was about \$1,000 dollars per child (Table 6). We find that children in HMOs tended to have higher TEFRA payments (\$1,188.89), although this is statistically insignificant. There is no difference across insurance types in predicting the chance of filing claims for miscellaneous items; however, we find that children with managed care plans tended to file claims under TEFRA that are two times higher than their counterparts in indemnity coverage (\$412.57 and \$416.72, compared with \$181.71).

Table 6 shows that, for the studied population, HMO plans (or managed care in general) provide marginally better or equal coverage to indemnity plans in medications, inpatient and outpatient care, nursing home, and psychiatric and mental health. (As stated earlier, counties and TEFRA are the key payers of mental health services for this population.) However, these claims tend to be small in amount (approximately \$40 per month altogether), and the difference between managed care and indemnity is no more than \$5 a month. Managed care, to a great extent, does not compare well with indemnity coverage in providing home care and miscellaneous items for this population. The expected difference between managed care and indemnity is approximately \$350 per month for these two areas, which are the main cost drivers of the monthly total payment of TEFRA.

DISCUSSION

Griss (1995) observed that “people with disabilities are a litmus test for managed care [because they]: (1) [are] most vulnerable to cost containment strategies without proper safeguards; (2) [are] most aware of

the limitations of acute care bias in [the] health care system; [and] (3) [have] the greatest potential for generating savings through prevention of secondary conditions.” Managed care has also been described as a source of both “potential and peril” (Miles, Weber, and Koeppe, 1995). Perhaps this study of a special population has revealed both sides of managed care in Minnesota.

Children with TEFRA coverage use an array of services and supplies to stay with their families and communities, and their expenses are paid by multiple payers—insurance, TEFRA, school, and family. The TEFRA cost summary data used in this research is just one piece of the puzzle. For this reason, it is important to discuss our findings by referring to the earlier findings of the TEFRA research project. Table 1 provides a rather complete picture of this population, although the information was estimated and did not come from exactly the same period as the cost summary file. Most of the items in Table 1 match with Table 6. However, nursing home care is not in Table 1 because this category was not in the TEFRA survey; thus, the total estimate in Table 1 is understated. Comparing information from these two tables, we can determine approximately how much private insurance had paid for and how much health care that was deemed medically necessary and picked up by Medicaid was excluded by health plans.

We do not have detail for the miscellaneous category in the cost summary file. However, it is assumed that the majority of miscellaneous items are therapies, equipment, and supplies (Table 1), given the substantial need of children under TEFRA to rely on these resources to help them stay at home.

In contrast to most comparison studies of managed care and FFS that have focused mainly on utilization rates and

quality measures, this study examines benefit limitations of various health plans in a special-needs population. This population has a greater need for inpatient care, however, private insurance plans do not seem to shy away from paying their hospital bills, which amount to approximately \$6,675.24 annually per child. Private insurance also seems to absorb the majority of cost of other medical items such as medications, and outpatient or specialty care. Unlike other groups, this population does not seem to have difficulty with access to and coverage for specialty care. This may be because of the severity of their illness and indisputable needs for specialty care. Managed care in Minnesota, particularly HMOs, tends to perform equally well or marginally better than indemnity plans in providing coverage in the medical core area. However, according to our findings, managed care, particularly HMOs, tends to have more exclusions in areas other than medical core.

Consumer advocates have cited anecdotes about delayed or restricted access or plan refusal to pay for certain services. Findings of this study may confirm some of these anecdotal cases but not all of them. We found that children under TEFRA with managed care plans, particularly HMO plans, tend to rely on Medicaid more than children with indemnity plans for needed health-related services and equipment. Without TEFRA, these children might have faced problems with accessing special treatments and ancillary or needed equipment, or being institutionalized. It is interesting to compare our findings with some of the key findings of the Minnesota Poll (Hamburger, Lerner, and Howatt, 1997). Their findings suggest most Minnesotans are distrustful of cost-conscious health plans, particularly the seriously and chronically ill. A substantial percentage of physicians, according to the

poll, are concerned that medically necessary care has been denied. In general, our findings match with the Minnesota poll in theme. However, we cannot find support for the notion that more core medical care is denied by managed care in our study population.

Under incentives to cut costs, managed care plans have strong disincentives to excel in serving the sickest and the most expensive users. Inadequate coverage may occur due to interpretation of unclear insurance policies, lack of specialists within the network, stringent gatekeepers with limited knowledge of rare diseases, or providers' financial incentives within health plans.

All of these issues suggest that reform is needed in consumer protection in the private insurance sector as well as the Medicaid managed care. Many States have introduced legislation designed to curb the perceived problems of managed care since 1995. At this writing, Federal policymakers are debating a patients' bill of rights. Most proposals include the right to external appeals of denied coverage, a "prudent layperson" standard for emergency care coverage, greater access to specialists, and a ban on so-called "gag clauses." All of these seem reasonable. In fact, many of these initiatives are already being implemented by some managed care organizations. Our findings suggest, however, that more attention should be paid to services and items that are not necessary in the medical core because these items are particularly important for people with disabilities and chronic illnesses who wish to avoid being institutionalized. Miller and Luft (1997) realized a simple, yet sometimes underemphasized truth in their review: "HMOs produce better, the same, and worse quality of care, depending on the particular organization and particular disease." The question is: How can we

help managed care organizations to provide better care to the special-needs population as well as the general public?

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REFERENCES

- Duan, N.H., Manning, W.G., Morris, C.M., and Newhouse, J.P.: A Comparison of Alternative Models for the Demand for Medical Care. *Journal of Business and Economic Statistics* 1(2):115-126, 1983.
- Fox, H.B., Wicks, L.B., and Newacheck, P.W.: State Medicaid Health Maintenance Organizations—Policies and Special Needs Children. *Health Care Financing Review* 15(1):25-37, 1993.
- Griss, B.: Presentation outline. Center on Disability and Health. Washington, DC. 1995.
- Hamburger, T., Lerner, M., and Howatt, G.: The Wellness Gap—Managing Managed Care. *Star Tribune*. P. A1, December 7, 1997.
- Horowitz, S.M., and Stein, R.E.K.: Health Maintenance Organizations versus Indemnity Insurance for Children with Chronic Illness. *American Journal of Diseases of Children* 144(5):581-586, 1990.
- Miles, S., Weber, E., and Koeppe, R.: End of Life Treatment in Managed Care: The Potential and the Peril. *The Western Journal of Medicine* 163(3):302-305, 1995.
- Miller, R., and Luft, H.: Does Managed Care Lead to Better or Worse Quality of Care? *Health Affairs* 16(5):7-25, Sept./Oct. 1997.
- Minnesota Department of Health: *Caring for Our Children: A Study of TEFRA in Minnesota*. Minnesota Children with Special Health Needs. Minneapolis, Minnesota. 1998.
- Minnesota Health Care Commission: *The Impact of Managed Care and Other Forms of Health Care for Persons with Chronic Conditions, Disability, or Terminal Illness*. Minneapolis, Minnesota. February 1997.
- Minnesota Health Data Institute: *You and Your Health Plan: 1995 Statewide Survey of Minnesota Consumers*. St. Paul, Minnesota. 1995.
- Reid, R.J., Hurtado, M.P., and Starfield, B.: Managed Care, Primary Care, and Quality for Children. *Current Opinion in Pediatrics* 8(2):164-170, 1996.
- Rouilidis, Z.C., and Schulman, K.A.: Physician Communication in Managed Care Organizations: Opinions of Primary Care Physicians. *Journal of Family Practice* 39(5):446-451, 1994.
- Remler, D.K., Donelan, K., Blendon, R.J., et al.: What Do Managed Care Plans Do to Affect Care? Results from a Survey of Physicians. *Inquiry* 34(3):196-204, Fall 1997.
- Schlenker, R.E., Shaughnessy, P.W., and Hittle, D.F.: Patient-Level Cost of Home Health Care Under Capitated and Fee-for-Service Payment. *Inquiry* 32(3):252-270, Fall 1995.
- Shaughnessy, P.W., Schlenker, R.E., and Hittle, D.F.: Home Health Care Outcomes under Capitated and Fee-for Service Payment. *Health Care Financing Review* 16(1):187-221, Fall 1994.
- State of Wisconsin: *Medical Home Care Options for Children with Severe Disabilities and Chronic Medical Needs*. State of Wisconsin. Department of Health and Social Services. Madison, Wisconsin. 1996.
- Ware, J.E., Bayliss, M.S., Rogers W.H., et al.: Difference in Four-Year Health Outcomes for Elderly and Poor Chronically Ill Patients Treated in HMO and Fee-for-Service Systems: Results from the Medical Outcomes Study. *Journal of the American Medical Association* 276(13):1039-1047, 1996.

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