
Public Policy Impact— Medicaid Issues

Impacts of Medicaid Managed Care on Children

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Objective. To assess the impact of switching from a fee-for-service (FFS) delivery system to managed care on access to, use of, and satisfaction with health care for children.

Data Sources/Study Setting. A 1998 survey of Medicaid recipients in rural Minnesota.

Study Design. Using a quasi-experimental framework, we compare the experiences of children on Medicaid living in counties that had switched to managed care with those of children living in counties operating under FFS Medicaid. We address the impact of Medicaid managed care (MMC) on access to, use of, and satisfaction with care.

Data Collection Methods. A stratified random sample of children on Medicaid was drawn based on Medicaid enrollment files. Telephone interviews were conducted with the child's parent or guardian between March and June 1998. An overall response rate of 70 percent was achieved, yielding a sample of 1,106 children (814 in MMC and 792 in Medicaid FFS).

Principal Findings. We find very few significant differences in access to, use of, or satisfaction with health care services for children under MMC relative to FFS. MMC did not change the patterns of health care service use or the location at which care is delivered, two major goals of MMC initiatives.

Conclusions. Our results suggest that the Medicaid program's shift from FFS to managed care had little impact on the pattern of children's health care use, the location at which they obtained care, or the satisfaction with the care they received.

Key Words. Managed care, Medicaid, access to care, satisfaction with care, children's health

Nearly one-fifth of children rely on Medicaid for their health care coverage.¹ For many children on Medicaid, managed care has become the norm as the share of the Medicaid population enrolled in managed care has increased from less than 10 percent in 1991 to over 50 percent in 1998. While the exact number of children enrolled in Medicaid managed care (MMC) is not

known, it is likely to be substantially more than 50 percent, given that children make up the bulk of the Temporary Assistance to Needy Families (TANF) program—the primary target of MMC to date. Further increases in the share of children in MMC are likely in response to the Balanced Budget Act (BBA) of 1997. Among other things, the BBA allows states to implement mandatory MMC programs without seeking a federal waiver and establishes the State Children's Health Insurance Program (SCHIP). As part of its expansion of health coverage for children, SCHIP allows states to extend Medicaid eligibility to new groups of children.

States have embraced MMC as a way to control Medicaid program costs while potentially improving beneficiaries' access to health care and quality of care. States hope that MMC will provide recipients with a medical home where preventive care is promoted and primary care is readily available. By having such care, it is hoped that recipients' continuity of care will improve, and their use of costly services, such as emergency rooms and inpatient hospital care, will decline. Managed care is not without risks, however, as it could diminish access to care, both because of its limits on choice of providers and its incentives to providers to reduce use (including the possibility of limiting needed medical services).

As mandatory managed care that capitates both acute and primary care becomes the dominant form of health care delivery for the Medicaid population, it is important to have a clear understanding of how this model of care affects children. Because childhood is a time of rapid growth and development, regular well-child and preventive care, along with appropriate care for common illnesses, are important for a child's normal growth and development. To date, much of the existing research on MMC has focused on adults or adults and children combined, providing little insight into the likely impact on children (Deal, Shiono, and Behrman 1998; Freund and Lewit 1993; Hurley, Freund, and Paul 1993). Furthermore, the literature on children that does exist is largely based on early "first-generation" models of MMC (e.g., primary care capitation models), often voluntary rather than mandatory managed care programs, and, all too often, weak study methodologies (see reviews in Hurley, Freund, and Paul 1993; Rowland et al. 1995; Hughes and

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Luft 1998; Lipson and Bernstein 1997; and Coughlin and Long 2000). Further, prior research on children that does examine mandatory MMC programs using either experimental or quasi-experimental designs provides mixed evidence on the impact on health care use (e.g., physician visits, emergency room visits, and hospital stays) and little information on differences in impact for children of different ages (see Freund, Rossiter, Fox, et al. 1989; McCall, Paringer, Crane, et al. 1989; Mauldon, Leibowitz, Buchanan, et al. 1994; and reviews by Freund and Lewit 1993 and Hughes and Luft 1998).

To begin to fill this information gap, we examined the impacts of managed care on access, use, and satisfaction with care among children on Medicaid in rural Minnesota. Using data from a 1998 survey, we compared the experiences of children on Medicaid enrolled in Minnesota's Section 1115 managed care waiver demonstration project—the Prepaid Medical Assistance Program, or PMAP—to children in Minnesota's traditional fee-for-service (FFS) Medicaid program. Although we focus on a single state, the economic and health care environment in rural Minnesota is similar to that of other rural areas in the Midwest, which together represent about one-third of all rural counties in the United States.

MINNESOTA'S PREPAID MEDICAL ASSISTANCE PROGRAM

PMAP was one of the original Section 1115 Medicaid competition demonstration sites and initially operated in three counties (Heinen, Fox, and Anderson 1990, Freund, Rossiter, Fox, et al. 1989). Over the years, Minnesota slowly expanded PMAP into other counties, primarily those located in the Minneapolis/St. Paul metropolitan area. In 1995, Minnesota received another Section 1115 waiver, which, among other things, gave the state the authority to expand PMAP statewide. This expansion was primarily to rural counties, which, at the time, had limited commercial managed care penetration (Rural Health Research Center 1997). Enrollment in PMAP began in eight counties in the northeastern and central regions of the state in January 1996.

Statewide, nine health plans participate in the PMAP demonstration. Seven of the plans are HMOs, one is a health insuring organization, and one is a community integrated service network. By state law, all are nonprofit. Further, as a condition of health plan licensure, all health plans must bid to serve public populations in their service areas. Most of the PMAP plans serve both commercial and Medicaid populations; however, three are primarily

Medicaid plans. Most PMAP plans are loosely structured HMOs (independent practice association or network model HMOs); only two are staff model plans. Minnesota pays all plans on a prepaid, capitated basis. The state sets capitation rates 10 percent below what they estimate FFS costs would have been without PMAP. Plans are fully at-risk and are contracted to provide a broad range of services, including acute and primary care, preventive care (e.g., immunizations and well-child visits), prescription drugs, dental care, and mental health services. Plan payment methods vary by provider, by plan, and even within plan for the same types of providers.² As was true under MMC in many states, health plans under PMAP generally did not capitate providers. Instead, rural PMAP providers were paid discounted FFS.³

METHODS

Study Design

Because neither the random assignment of enrollees to managed care (versus FFS) nor the random assignment of Minnesota counties to implement PMAP (versus FFS Medicaid) was possible under this evaluation, we turned to a quasi-experimental evaluation design. Specifically, we use a comparison group (Medicaid enrollees in a group of rural counties operating a FFS Medicaid program) as the counterfactual, or nonequivalent control group, for Medicaid enrollees living in rural PMAP counties.⁴ Our goal in selecting the comparison group counties was to match as closely as possible those rural counties that had shifted to PMAP, drawing from among the rural counties that continued to operate FFS Medicaid at the time of our survey. To determine which FFS counties to include in the comparison, we matched various groups of rural FFS counties adjacent to the PMAP counties with the group of PMAP counties along several aggregate dimensions, including poverty rates, population density, and supply of health care providers.⁵ We selected 18 counties in the northwestern part of the state that were still in FFS Medicaid at the time of our survey as the comparison for the six counties in the northeastern part of the state that had switched to PMAP beginning in January 1996.⁶

To assess the quality of the county match, we compared the characteristics of child enrollees in PMAP counties to those of enrollees in FFS counties on a variety of measures that could affect their access to and use of health care services (Table 1). These measures reflect both the child's need for health care and the economic circumstances of the child and his or her family. Because

Table 1: Characteristics of Children Enrolled in PMAP and Medicaid FFS

<i>Characteristic</i>	<i>PMAP</i>	<i>FFS</i>	<i>Difference</i>
Reported health status of child is fair/poor	4.6	6.7	-2.2
Child has one or more of selected health conditions (asthma, diabetes, heart disease, HIV, or cancer)	13.1	12.4	0.7
Child has an impairment or health problem that limits usual activities	10.1	10.2	-0.1
Child has an impairment or health problem that limits ability to perform in school	5.5	7.0	-1.5
Parent worries about health more than others	9.7	10.1	-0.4
Parent worries about health less than others	26.4	21.2	5.1*
Age of child (years)	7.6	7.3	0.3
Child is female	48.6	49.5	-0.9
Child is white	94.1	82.9	11.2**
Parent completed less than high school	8.5	15.4	-6.9**
Parent is a high school graduate only	46.6	46.4	0.2
Parent is married	46.7	47.4	-0.7
Parent has never married	19.6	24.9	-5.3*
Parent worked in past year	87.1	89.0	-2.0
Family income between \$10,000 and \$20,000	37.4	37.2	0.2
Family income greater than \$20,000	26.2	28.1	-1.9
Child is in adult-child Medicaid	57.5	58.8	-1.3
Family size	4.1	4.3	-0.2**
Proportion of months in past year child had Medicaid coverage	92.4	91.6	0.8
Proportion of months in past year child was uninsured	4.5	5.1	0.7
Distance from nearest teaching hospital (miles)	162.0	99.7	62.2**
Distance from nearest hospital trauma unit (miles)	29.5	40.9	-11.4**
Sample size	814	792	—

Source: Survey of Medicaid enrollees in PMAP and Medicaid FFS counties in Minnesota in spring 1998.

Note: Distance from residence to nearest hospital is calculated as the distance from the center of the zip code of the residential address to the center of the zip code in which the nearest hospital is located.

*Significant at at least the .05 level, using a two-tailed test; **significant at at least the .01 level, using a two-tailed test.

parents play a key role in obtaining health care for children, we also consider the characteristics of the child’s parents.

There were few significant differences between child Medicaid enrollees in the PMAP and FFS counties on measures of health needs and health attitudes. The two survey groups were equally likely to have fair or poor health and equally likely to have had a variety of health conditions and impairments or health problems that limit their activities. The only statistically significant

health difference between the PMAP and FFS enrollees was in the share of enrollees with parents who tended to worry about their health less than others. There was no difference in the share of parents reporting that they tended to worry about their health more than others.

There were more differences between the PMAP and FFS enrollees on socioeconomic measures. Children on Medicaid in PMAP counties were significantly more likely than those in FFS counties to be white and to come from somewhat smaller families.⁷ Relative to their FFS counterparts, the parents of PMAP children were more likely to have a high school education and less likely to have never been married. However, with respect to age,⁸ gender, months of Medicaid coverage, and months without insurance, the two groups of children were similar.

Finally, there were differences in distance from health care facilities between the two groups. The travel distance measures serve as proxies for the availability of health care services in the child's community. On average, PMAP enrollees were significantly closer to a hospital trauma center, but significantly more distant from a teaching hospital, than were the FFS enrollees.

Since the differences in the characteristics of the children on Medicaid in the PMAP and FFS counties could confound our estimates of the impact of managed care if not accounted for, we estimated regression-adjusted PMAP-FFS differences. The regression-adjusted differences are based on models that control for the range of child, parent, and family characteristics outlined in Table 1.

The Survey

To conduct the study, we fielded a survey of Minnesota Medicaid recipients. A sample of Medicaid cases was drawn from Minnesota Medicaid enrollment files. To be included in the sample, cases in both county groups met certain criteria: (1) active in Medicaid as of January 16, 1998, (2) living in one of the analysis counties (one of the PMAP counties or one of the matched FFS counties), and (3) eligible for Medicaid under TANF or Medicaid poverty-related criteria. We excluded cases that qualified for Medicaid because they were medically needy. Because we wanted to gather information from one adult (if present) and one child (if present) in the case, we undertook a stratified sampling process to ensure adequate samples of adults and children. Cases were stratified into three groups: (1) cases with both adult and child enrollees, (2) cases with only adult enrollees, and (3) cases with only child enrollees. Cases were selected using probability-proportionate-to-size sample selection procedures. Within a selected case, one adult and one child were selected at

random. The adult in the household who was most knowledgeable about the health care of the child served as the proxy respondent for the child. For 98 percent of the children, that person was the child's parent or guardian. For simplicity, we refer to the respondent for the child as the child's parent.

The survey, which built on the instruments used in other Section 1115 demonstration evaluations (e.g., Tennessee, Hawaii, Oregon), asked parents a range of questions about their child's recent health care experiences, including use of medical care services, access to care, and satisfaction with care. Questions about whether preventive care was received were also asked. In addition, the survey collected health status information and basic demographic and socioeconomic data. The survey instrument is available from the authors upon request.

All interviews were conducted using computer-assisted telephone interviewing between March and June 1998. Parents of child sample members were sent advance letters explaining the purpose of the survey and providing a toll-free telephone number that could be called to complete the interview. For individuals for whom telephone contact information was not available from the enrollment files, location information was sought through a variety of sources, including the post office, directory assistance, neighbors, and credit bureau services. An overall response rate of 70 percent was achieved, yielding data on 1,606 children (814 PMAP enrollees and 792 FFS enrollees).⁹

All of the estimates provided in this study have been generated using sample weights and adjusting for the stratified design of the survey. Those weights account for differences in the selection probabilities of the cases interviewed and for demographic and socioeconomic differences between the survey respondents and nonrespondents. The latter adjustment was possible since we had information on both the respondents and nonrespondents from the Medicaid enrollment files.

Access, Use, and Satisfaction Measures

We consider how access to, use of, and satisfaction with health care received under MMC compares to that received under traditional Medicaid FFS. Beginning with the framework developed by Andersen and Aday (1978), we define two broad categories of access to care: potential access and realized access (use). Potential access measures characteristics of the health care system and the population, such as the presence of a usual source (location) of care, continuity of care, convenience of care, availability of enabling services, and extent of unmet need. Realized access is measured by the actual use of health care services.

Our measures of utilization include visits to doctors and other health care providers, visits to specialists, preventive care visits, dental care visits, visits to emergency rooms, and hospital stays. These measures focus on two aspects of health care use—whether an encounter took place and the number of encounters. The survey did not capture the intensity or the number of services rendered in a particular encounter. Our analysis will not detect the extent to which service intensity has been affected by managed care. Further, we have made the implicit assumption that all health care use reported by respondents was paid for by Medicaid FFS or PMAP. Our data will not detect the extent to which source of payment has shifted under PMAP. For example, county public health departments and hospital emergency rooms report they are providing services to PMAP enrollees that are not being reimbursed by the plans.

Finally, in assessing the impact of MMC on satisfaction with care, we examine the parent's rating of their child's overall health care, as well as their rating of convenience of care and the characteristics of the child's care providers.

Data Analysis

Since all of our outcomes are binary dependent variables (e.g., whether the child had had a doctor visit in the past year), we estimate logit regressions models. Full regression results that underlie the estimates reported here are available from the authors upon request. We also explored the sensitivity of our results to alternative specifications of the model, including more parsimonious specifications, alternative specifications of the variables (e.g., including age and age squared in the model) and alternative samples (including children up to five years old, children 6 to 17, and the sample of white children). Alternative model specifications did not change the basic research findings.

To facilitate the presentation of the comparisons between the PMAP and FFS enrollees across outcomes, we calculate predicted levels for each of the outcome measures. The predicted levels of the outcome measures for PMAP enrollees were calculated from the regression models by assuming all the children in the sample were PMAP enrollees (regardless of their actual status). The predicted levels for the FFS enrollees were calculated by assuming all the children in the sample were FFS enrollees (regardless of their actual status). The difference between these two predicted levels is the impact of enrollment in PMAP on that measure. The predicted levels for the PMAP and FFS enrollees and the difference between them are what we present in the text.¹⁰

The study's statistical power—its ability to detect true differences between the PMAP and FFS enrollees—is a key ingredient in interpreting the findings. Prior to the data collection, we set a target of detecting differences between PMAP and FFS enrollees as small as 8 percentage points relative to an outcome measure that occurs for 50 percent of the sample (e.g., the percent with a doctor visit in the last three months), assuming a 10 percent level of significance and 80 percent power for two-tailed tests. Because the outcome measures are based on different sample sizes and there are different variances of the outcomes in the population, the associated minimum detectable differences vary across measures. In general, any failure to identify statistically significant differences in this study is likely due to the relatively small size of the differences rather than to lack of power.

RESULTS

Utilization of Care

Overall, we find very few significant differences between children enrolled in PMAP and FFS in their use of health care services. As shown in Table 2, the shares of PMAP and FFS children with some type of health care encounter in the last year (either a visit to a doctor or other provider, an emergency room visit, or a hospital visit) were quite high and very similar (86.1 and 87.2 percent, respectively). Likewise, the shares of PMAP and FFS children with a doctor visit over the last 12 months were quite high and very similar (83.7 and 84.7 percent, respectively). The magnitude of the PMAP-FFS differences is greater when we consider visits to a doctor and preventive care visits in the last three months; nevertheless, those differences are not statistically significant. The PMAP-FFS differences in the share of children with a specialist visit and a dental visit are smaller and also not statistically significant.

Children enrolled in PMAP were less likely to have a hospital stay and less likely to have more than one hospital stay over the last 12 months, although only the latter finding is statistically significant. There are no significant differences between the PMAP and FFS children in terms of emergency room use overall or emergency room use for ambulatory care-sensitive conditions.

Access to Care

Having a usual, or constant source of care (other than the emergency room) helps ensure an ongoing relationship between a patient and a health care provider, thereby facilitating access to care. While the vast majority of both

Table 2: Regression-Adjusted Estimates of Health Care Use by Children on PMAP and Medicaid FFS

<i>Measure</i>	<i>PMAP</i>	<i>FFS</i>	<i>Difference</i>	<i>Sample Size</i> [†]
Had an encounter with a health care provider in the last 12 months [‡]	86.1	87.2	-1.1	1,594
Had doctor visit in last 12 months	83.7	84.7	-1.0	1,595
Had doctor visit in last three months	61.4	57.4	4.0	1,594
Had preventive care visit in last three months	36.9	31.3	5.5	1,589
Had specialist visit in last three months	8.8	8.7	0.2	1,592
Had dental visit in last two years (for children aged four and over)	93.1	90.7	2.5	1,059
Was hospital patient in last 12 months (excluding delivery)	4.3	7.4	-3.1	1,604
Had more than one hospital stay in last 12 months (excluding delivery)	0.6	2.4	-1.8**	1,604
Had emergency room (ER) visit in last 12 months (excluding falls and accidents)	22.0	23.2	-1.2	1,595
Had more than one ER visit in last 12 months (excluding falls and accidents)	9.6	9.5	0.1	1,591
Had ER visit related to selected health conditions in last 12 months (excluding falls and accidents) [¶]	1.8	2.5	-0.6	1,606

Source: Survey of Medicaid enrollees in PMAP and Medicaid FFS counties in Minnesota in spring 1998.

Note: Because the samples of PMAP and Medicaid FFS enrollees are not based on random assignment, we provide regression-adjusted estimates of the differences between PMAP and Medicaid FFS. Our regressions control for the characteristics of the child and his or her family as summarized in Table 1.

*Significant at at least the .10 level, using a two-tailed test; **significant at at least the .05 level, using a two-tailed test; ***significant at the .01 level, using a two-tailed test.

[†] Sample size varies because of missing data for the dependent variables for some observations.

[‡] This includes visits to a doctor or other health care providers, visits to the emergency room, and hospital stays.

[¶] ER visits for selected health conditions is a marker for ineffective or lack of ambulatory care because many visits could be avoided with adequate care. Because we do not have information on the circumstances of the visits, this comparison should be interpreted as suggestive of differences in inappropriate ER use.

PMAP and FFS children have a usual source of care that they turn to if they are sick or need advice about their health (95.0 and 98.3 percent, respectively), the PMAP children were significantly less likely to have a usual source of care (Table 3). However, for those with a usual source of care, the PMAP and FFS children were equally likely to have a private doctor's office/group practice or HMO facility as their usual source of care and to have a doctor as their usual health care provider. Finally, despite the greater likelihood that the PMAP

Table 3: Regression-Adjusted Estimates of Access to Care for Children on PMAP and Medicaid FFS

<i>Measure</i>	<i>PMAP</i>	<i>FFS</i>	<i>Difference</i>	<i>Sample Size</i> [†]
Has usual source of care (excluding hospital emergency room)	95.0	98.3	-3.3*	1,601
Usual source of care is private doctor's office/group practice or HMO facility [‡]	15.5	13.6	1.9	1,565
Usual health care provider is a doctor [¶]	88.7	88.9	-0.2	1,339
Sees same doctor or health care professional at all or most visits [¶]	85.6	76.3	9.3**	1,343
Had ER visit in last 12 months (excluding falls or accidents)	22.0	23.2	-1.2	1,595
Travel time 30 minutes or more	25.9	20.2	5.7	1,341
Wait between appointment and visit for sick visit is more than three days	6.5	6.8	-0.3	1,218
Wait in office before seeing doctor is one hour or more	8.5	11.8	-3.3	1,333
Able to talk to medical professional right away when need medical advice	86.2	89.9	-3.7	1,320
Provider reminds when due for check-up	48.0	47.5	0.5	1,325

Source: Survey of Medicaid enrollees in PMAP and Medicaid FFS counties in Minnesota in spring 1998.

Note: Because the samples of PMAP and Medicaid FFS enrollees are not based on random assignment, we provide regression-adjusted estimates of the differences between PMAP and Medicaid FFS. Our regressions control for the characteristics of the child and his or her family as summarized in Table 1.

*Significant at at least the .10 level, using a two-tailed test; **significant at at least the .05 level, using a two-tailed test; ***significant at at least the .01 level, using a two-tailed test.

[†] Sample size varies because of observations with missing data for the dependent variables.

[‡] Sample limited to those reporting a usual source of care.

[¶] Sample limited to those reporting an outpatient visit in the last 12 months.

enrollees do not have a usual source of care, PMAP children are significantly more likely to see the same doctor or health care professional when they do receive care, an indication of greater continuity of care.

The ease with which care can be obtained can have a significant impact on access to care, as can the availability of enabling services. We found no evidence that managed care significantly increases the ease of obtaining care or significantly increases the availability of enabling services.

Finally, we consider two levels of unmet need: needing but not getting care and needing but delaying getting care. As shown in Table 4, we find that approximately one-quarter of both the PMAP and FFS children experience some level of unmet need, with the level somewhat higher for the PMAP

Table 4: Regression-Adjusted Estimates of Unmet Need for Children on PMAP and Medicaid FFS

<i>Measure</i>	<i>PMAP</i>	<i>FFS</i>	<i>Difference</i>	<i>Sample Size</i> [†]
Any unmet need in last 12 months [‡]	27.3	23.6	3.6	1,596
Did not get	21.0	18.4	2.5	1,599
Delayed getting	16.6	16.0	0.6	1,597
Unmet need related to hospital care in last 12 months	2.6	1.3	1.2	1,605
Did not get	2.3	1.1	1.2	1,605
Delayed getting	§	§	§	1,605
Unmet need related to doctor care in last 12 months	10.2	9.0	1.2	1,602
Did not see	5.0	6.0	-1.0	1,603
Delayed seeing	5.7	5.4	0.3	1,603
Unmet need related to specialist care in last 12 months	4.2	4.3	-0.1	1,604
Did not see	3.8	3.5	0.3	1,604
Delayed seeing	2.5	1.6	0.9	1,605
Unmet need related to dental care in last 12 months	16.7	14.8	1.9	1,601
Did not get	14.0	11.0	2.9	1,603
Delayed getting	10.7	10.0	0.6	1,600
Unmet need related to prescription medicine	4.7	2.3	2.4	1,605

Source: Survey of Medicaid enrollees in PMAP and Medicaid FFS counties in Minnesota in spring 1998.

Note: Because the samples of PMAP and Medicaid FFS enrollees are not based on random assignment, we provide regression-adjusted estimates of the differences between PMAP and Medicaid FFS. Our regressions control for the characteristics of the child and his or her family as summarized in Table 1.

*Significant at at least the .10 level, using a two-tailed test; **significant at at least the .05 level, using a two-tailed test; ***significant at at least the .01 level, using a two-tailed test.

[†] Sample size varies because of missing data for the dependent variables for some observations.

[‡] Also includes unmet need related to mental health care and drug or alcohol treatment.

[§] Very rare event; occurred for less than one percent of sample.

children. However, that difference is not statistically significant, nor are the much smaller PMAP-FFS differences in other types of unmet need.

Satisfaction with Care

The parents of the PMAP and FFS children who had had a health care encounter in the past year were asked to rate selected aspects of their child's health care experiences using a five-point scale—poor, fair, good, very good, and excellent. We examine the impact of PMAP on the likelihood of a rating of good or better (as reflected in a response of good, very good, or excellent versus fair or poor). We found no significant differences between the PMAP and FFS children in their parent's ratings of their health care experiences

and their usual source of care (Table 5). In general, high shares (greater than 80 percent) of parents of both the PMAP and FFS children rate the different aspects of their child’s care as good, very good, or excellent.

DISCUSSION

Nearly one-fifth of children rely on Medicaid for health care coverage, with most in MMC. Both the share of children on Medicaid and the share in MMC are likely to increase over time as a result of the BBA of 1997, which eliminated the need for a waiver to implement mandatory MMC and established SCHIP. Despite the large numbers of Medicaid children in mandatory managed care,

Table 5: Regression-Adjusted Estimates of Satisfaction with Care for Children on PMAP and Medicaid FFS

<i>Measure</i>	<i>PMAP</i>	<i>FFS</i>	<i>Difference</i>	<i>Sample Size</i> [†]
Usual source of care is good, very good, or excellent	90.1	87.8	2.3	1,375
Convenience of location of health care is good, very good, or excellent	91.7	89.6	2.1	1,376
Wait between making appointment and visit is good, very good, or excellent	85.3	82.5	2.8	1,366
Wait in office when have an appointment is good, very good, or excellent	72.6	71.4	1.2	1,370
Ease of getting care during evenings/weekends is good, very good, or excellent	58.1	62.7	-4.6	1,259
Ease of getting emergency care is good, very good, or excellent	81.0	83.3	-2.3	1,285
Friendliness and courtesy of doctors is good, very good, or excellent	92.0	91.6	0.5	1,374
Amount of time with doctor and staff is good, very good, or excellent	89.0	85.6	3.4	1,373
Explanations of medical procedures/tests is good, very good, or excellent	84.8	87.6	-2.8	1,368

Source: Survey of Medicaid enrollees in PMAP and Medicaid FFS counties in Minnesota in spring 1998.

Note: Because the samples of PMAP and Medicaid FFS enrollees are not based on random assignment, we provide regression-adjusted estimates of the differences between PMAP and Medicaid FFS. Our regressions control for the characteristics of the child and his or her family as summarized in Table 1.

*Significant at at least the .10 level, using a two-tailed test; **significant at at least the .05 level, using a two-tailed test; ***significant at at least the .01 level, using a two-tailed test.

[†] The measures for this table are limited to children who had an encounter with a health care provider in the last 12 months.

very little is known about its impact. This report addresses that information gap by examining the impact of managed care on access, use, and satisfaction with care among children on Medicaid in rural Minnesota.

We find very few significant differences in access to, use of, or satisfaction with health care services for children under MMC relative to FFS. Minnesota's PMAP program did not change the patterns of health care service use or the location at which care is delivered.

The limited impact of MMC in Minnesota may reflect several aspects of the health care market in Minnesota. First, the general strength of the state's health infrastructure implies that a solid foundation may already have been in place under FFS Medicaid, and thus limited improvements in access, changes in use patterns, or both might be expected under MMC (Coughlin et al. 1997). Second, as in many states, the health plans in MMC in Minnesota generally pay providers on a discounted FFS basis. As a result, rural PMAP providers may have had little incentive to change their practice patterns and, in turn, change beneficiary use patterns. Further, the two plans with the biggest enrollment in the rural PMAP counties were loosely structured HMOs that might also provide limited incentives to change use patterns. Alternatively, the prevalence of managed care in urban areas in Minnesota may have led rural providers in the FFS counties to adjust their practice patterns in anticipation of the arrival of managed care to rural Minnesota (Abrams, Savelle, Trinity, et al. 1995; Hudson 1995). This would tend to reduce differences in practice patterns between the PMAP and FFS counties.

Another major goal of MMC is to limit the growth of Medicaid expenditures. Under PMAP, Minnesota sets plan capitation rates 10 percent below the estimates of what FFS costs would have been in the absence of managed care. Our estimates suggest that these cost savings may be the real impact of the PMAP program, as the savings were realized without reducing Medicaid beneficiaries' use of, access to, or satisfaction with their health care relative to FFS Medicaid. However, there is some suggestion that at least part of these savings have been achieved by shifting the payment source from Medicaid to other funds. Further, to the extent that any cost savings under MMC leads to changes in the health care market in the long run (e.g., a reduction in physicians located in rural areas), greater PMAP impact on access, use, and satisfaction may be observed over time.

Finally, we acknowledge that our study has some shortcomings. First, we used a quasi-experimental design to assess how managed care affects beneficiaries. However, we sought to minimize any biases introduced by our method by carefully matching the counties used in the comparison, exploring

the use of alternative groups of counties, and using multivariate techniques to control for differences between Medicaid enrollees in the two groups of counties. Second, the sample size for our survey was intended to allow us to detect reasonably small changes; program impacts below those levels will not be detected by this study. Finally, we focus on a single state's experience with managed care, which means our results may not be generalizable to other states. However, as noted earlier, the economic and health care environment of rural Minnesota is similar to that of the remainder of the rural Midwest.

ACKNOWLEDGMENTS

A number of people contributed to this study. The help of many officials at Minnesota's Department of Health is most appreciated. The survey of Minnesota Medicaid beneficiaries was conducted by Mathematica Policy Research under the direction of Anne Ciemnecki and Karen CyBulski. The assistance of Shruti Rajan in the preparation of enrollment files for sampling is greatly appreciated. We also thank Christine Arriola and Stephanie Kendall for their excellent support on the study. Special recognition also goes to James Hadley and Paul Boben of the Health Care Financing Administration, who served as our project officers. Finally, we are indebted to John Holahan and two anonymous reviewers for their comments on this article.

NOTES

1. Tabulations were derived by The Urban Institute from the National Survey of America's Families (NSAF), a nationally representative survey of families in the United States.
2. In 1998, a national survey of HMOs found that most reported using multiple methods to reimburse primary care physicians. Altogether, 79 percent of HMOs reported paying primary care physicians under capitation arrangements and 70 percent under FFS (InterStudy 1999).
3. The tendency of managed care organizations to pay providers on a discounted FFS basis is common in rural areas, both as a mechanism to persuade providers to sign up with the plan and as a means of providing gradual exposure to managed care (Felt-Lisk et al. 1999).
4. The nonequivalent control group approximates the control group that would have been obtained if random assignment were possible. This framework has been successfully used in other research studies on managed care impacts (e.g., Freund, Rossiter, Fox, et al. 1989; Oleske, Branca, Schmidt, et al. 1998).
5. Because the matched group of counties was not randomly selected, we explored the sensitivity of our findings to the particular set of counties included in the

- comparison group. Sensitivity analysis showed that the basic findings did not change when the county grouping was altered.
6. In order to focus on the experience of MMC in rural areas, we excluded recipients who resided in zip code areas in or adjacent to Duluth, Minnesota. Duluth, which is part of a metropolitan statistical area, is located in the southern portion of one of the PMAP counties.
 7. The nonwhite members of our sample in both the PMAP and FFS counties were primarily Native American.
 8. The PMAP and FFS samples are also similar if we compare the age distribution of the children. About 9 percent of the children in both samples are less than one year old, 36 percent are aged one to five, and 55 percent are aged 6 to 17. Within the older age group, children on PMAP are somewhat less likely to be aged 6 to 12 (34 percent versus 37 percent) and somewhat more likely to be aged 13 to 17 (21 percent versus 18 percent).
 9. In a recent review of surveys, Massey, O'Connor, and Krotki (1997) found that the median reported response rate was between 60 and 64 percent, with fewer than 20 percent of the surveys reporting response rates of 70 percent or higher.
 10. Although not reported in the tables, we also calculated the Wald test statistic to assess the overall explanatory power of the full model. In general, that statistic was significant at at least the .05 level across the equations.

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