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# Medicaid Providers of Children's Preventive and EPSDT Services, 1989 and 1992

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*In this study, the authors use 1989 and 1992 Medicaid Tape-to-Tape data from California, Georgia, Michigan, and Tennessee to examine changes in provider systems before and after enactment of the Omnibus Budget Reconciliation Act of 1989 (OBRA 89). Although all four study States' preventive and Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) services provider system grew, Michigan's growth was markedly higher. Growth occurred in the number of both office-based and clinic-based providers. However, this growth was outpaced by growth in enrollment, so that child/provider ratios were generally higher at the end of the study period.*

## INTRODUCTION

The provision of mainstream health care services through the Medicaid program depends to a great extent on the availability of providers willing to serve Medicaid enrollees on an ongoing basis. A sufficient supply of providers, including individual office-based physicians as well as those in group and clinic settings, is necessary for enrollees to have access in appropriate settings and to allow for continuity of care. This is especially true for children enrolled in Medicaid, as they have greater need for contact with the health care system in their developmental years. As the Medicaid pro-

gram continues to phase in newly eligible children residing in families with incomes below the poverty level and many States expand Medicaid coverage under the Child Health Insurance Program (CHIP), it is important to assess the availability of providers to serve these children.

Analysis of Medicaid provider supply and changes in this supply before and after enactment of OBRA 89 was a major part of a report (Adams, Chawla, and Graver, 1996) funded by HCFA. OBRA 89 contained several provisions that pertained to Medicaid and EPSDT providers. This act made revisions in the Medicaid and EPSDT program in an effort to bring all States up to their full potential for serving children's needs.

Although the EPSDT program is generally believed to be successful in identifying, diagnosing, and treating health problems, its great potential has not been realized through the years as a result of its inability to reach more than a small proportion of eligible children. Factors accounting for this inability include inadequate provider participation as well as other programmatic features and characteristics of the families served. Concern over low participation rates, coupled with evidence of deteriorating health status of the Nation's poor children, led Congress to enact a series of legislative initiatives during the late 1980s and early 1990s. In general, these initiatives were aimed at increasing Medicaid eligibility, availability of Medicaid-covered services, and participation in EPSDT.

The overall goal of this study of provider supply is to assess changes in the EPSDT

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provider supply system before and after the passage of OBRA 89. Specific goals include analysis of how the EPSDT provider system fits into the overall Medicaid provider system and an assessment of the changes in the number and types of providers of children's services.

This study uses Medicaid program data from 1989 and 1992 from four States: California, Georgia, Michigan, and Tennessee. These States were chosen in part because of the availability of Medicaid data edited and formatted for research purposes but also because they vary in geographic location and Medicaid policy.

These States' pre-expansion financial eligibility standards, for example, ranged from the highest to among the lowest in the Nation. Data in these States are used to examine the level of physician participation in Medicaid and physician involvement in providing children services, especially preventive care. Because preventive care can be provided to Medicaid children both within and/or outside the formal EPSDT program, we examine both. Provision of preventive care outside the EPSDT program is often referred to as the "shadow" preventive care program. Specific research questions include:

- What was the growth in the number of preventive care providers? EPSDT providers?
- Was there growth in the average amount of services for Medicaid children among pediatricians? Among primary care physicians? EPSDT participating physicians?
- Was there a corresponding change in "institutional" providers of services to Medicaid children with changes in office-based physician practices? In the "shadow" program?
- What was the impact of changes in physician supply on enrollee-to-provider ratios

in the study States before and after enactment of OBRA 89?

By examining both 1989 and 1992 data from four State Medicaid programs, we can observe patterns of change across broad geographic areas and in States with quite different responses to the provider-related provisions of OBRA 89.

## **BACKGROUND**

The major provisions of the OBRA 89 legislation that related specifically to Medicaid providers were that:

- States allow participation in EPSDT of providers who provide less than the full set of screening, diagnostic, and treatment services.
- States set payment rates to ensure that the availability of obstetrical and pediatric services for Medicaid recipients is comparable to that of the general population within the same geographic area.

The first provision was intended to encourage a larger number of pediatricians and more specialists, such as developmental psychologists, to participate in EPSDT. The second provision is often referred to as the "equal access" provision and was perhaps the most important part of the legislation affecting providers.

Although States no longer have to submit State plans specifically documenting obstetrical/pediatric access under the Balanced Budget Act (BBA) of 1997, they are still required to make payments sufficient to enlist providers so that services are available to the extent they are for the private population. That is, the "equal access" requirement is still in effect. It is important to discern: (1) if States increased Medicaid payments relative to private pay rates before and after enactment of OBRA 89; and (2) if changes in relative payment rates are related to physician

provision of services to Medicaid children. This is important information as States continue to implement or expand Medicaid managed care, because these delivery systems are critically dependent on the availability of primary care physicians willing to serve Medicaid enrollees within the geographic areas in which they reside.

A key question as we examine changes in provider supply is whether the study States responded to the OBRA 89 “equal access” mandate by raising fees. We used the Medicaid data to measure the change in a “representative”<sup>1</sup> set of Medicaid services as well as preventive care<sup>2</sup> services. The important question, however, is whether Medicaid fees for these services rose relative to private fee levels. To answer this question, we created an index of Medicaid to private levels of payment for the representative and preventive set of services to measure the change from 1989 to 1992 in each of the study States.

Other policy changes made in the States also affect the numbers seen here. Changes include the establishment of toll-free telephone lines to address provider questions and training of billing personnel in California (Adams, Chawla, and Graver, 1996; Hill and Zimmerman, 1995). Georgia distributed a recruitment video through

the local chapter of the American Academy of Pediatrics (AAP) and reduced administrative barriers by instituting electronic billing statewide. But perhaps the most significant change was made in Michigan. This State developed a two-tiered EPSDT system by designating both “comprehensive” and “basic” EPSDT screens and providers. Essentially, this allowed well-child visits billed in a physician office to be basic EPSDT screens. Michigan also encouraged providers to obtain certification as “comprehensive” providers by setting fees higher for EPSDT screens completed by these providers.

## DATA AND METHODS

The primary data for the analyses presented in this article are the HCFA Tape-to-Tape data for 1989 and 1992. These data contain full information on all enrollees, claims, and providers of Medicaid services in the four States studied. To achieve all of the goals of the provider analysis, we used the outpatient claims file, the enrollment file, and the provider file for each State.

The uniform provider file within Tape-to-Tape contains a record for all providers who have billed Medicaid at some time during the year. This file contains information on the type of provider (e.g., physician, clinic), amount billed during the year, name, address, and other characteristics (e.g., specialty). The provider files are organized by an identification number (ID) that is largely unique to individual providers. Our ability to count providers relies heavily on the IDs contained in the State provider files. In Georgia and Michigan, the States depend for the most part on one ID, the ID for the actual treating provider. In Tennessee and California, a “treating” ID and a “billing” ID are included; the former is used here. In Michigan there are multiple IDs assigned to the

<sup>1</sup> The representative set of services included primary care (e.g., visits with new or established patients), hospital care (e.g., initial and subsequent hospital visits), obstetrical care (e.g., vaginal and cesarean delivery and total global codes), surgery (e.g., tympanostomy, hysterectomy), imaging (X-ray, computerized axial tomography [CAT] scan) and laboratory test (e.g., urinalysis, cultures) services. These were chosen because they were found to be representative of services used by Medicaid enrollees and have been used in earlier research on relative fees (Norton, 1995).

<sup>2</sup> Our definition of preventive care services includes first, all EPSDT claims, and second, a subset of non-EPSDT claims based on procedure and diagnosis codes. Non-EPSDT claims with preventive care visit codes (e.g., 99381-99385 in 1992) were included; general visit codes were used only if they occurred with an *International Classification of Disease, 9th Revision* (ICD-9) code indicating a well-child diagnosis code (largely the “V” codes). All immunizations, whether or not they were provided through the EPSDT program, were also included. Although we included prenatal/contraceptive services in an earlier definition of preventive care, we focus here on “basic” preventive care, omitting these services.

same physician along with a “master ID.” Algorithms were used to link all claims with IDs associated with a physicians’ master ID.

We identified “active” providers as those who submitted any claim during the year. These are individual providers who submit a claim under their own ID and, although they bill for part of their Medicaid practices in non-office settings (Adams, Chawla, and Graver, 1996), they are predominantly office-based. Ideally, we would count all individual providers (e.g., physicians, nurses) regardless of whether services are provided in an office or institutional/non-office setting. However, we cannot identify individual physicians nor other personnel for whom clinics, outpatient departments, etc., bill for all of their Medicaid services. These individuals are probably salaried/contracted providers. We measure amounts billed for these providers (including physician and facility billing) in non-office settings; these data are presented as “institutional” providers.

Claims for all enrollees were used in some instances to derive overall measures of physician participation, but because we focus on the child population, claims for all children under age 21 were used for the majority of provider counts. We note that certain exclusions were made in terms of the children for which claims were included: (1) institutionalized children; (2) children covered under Medicaid capitated health plans; and (3) children with dual Medicare and Medicaid coverage. From 18 to 28 percent of Medicaid children were excluded in California and Michigan, respectively, but only 7 percent in Tennessee and virtually none in Georgia were excluded based on these three criteria; most were excluded because of enrollment in a capitated plan. We used the claims files to identify the age of enrollees and identify providers involved in certain

types of service provision (e.g., preventive care, EPSDT). Caseloads were measured as the number of unique enrollees seen by a provider in a year. Preventive care providers are those who have submitted even one claim for preventive care as defined earlier.

We also used the Area Resource File (ARF), published by the Bureau of Health Professions, which includes a wide variety of county-level socioeconomic and demographic variables on an annual basis. The data elements used in this analysis include counts of all physicians at the county and State levels.

## RESULTS

We report results on the changes in relative fees, measures of physician participation, and provision of Medicaid children’s services, focusing on preventive care, in this section. We also include data on changes in enrollee-to-provider ratios over the study period.

### Relative Fees

A major provision of OBRA 89 that should affect physician participation in Medicaid was the requirement that States pay a sufficient amount to guarantee access comparable to that of the privately insured. The requirement is open to interpretation, of course, and States assurances of adequate participation vary. Prior to the BBA 97, States were required to show compliance for obstetrical/pediatric services, and all of the study States were able to show HCFA that they met this requirement. State policies regarding Medicaid payment rates also vary in terms of the structure of payment and changes that have taken place during the study time period. Two of the States, Georgia and Michigan, implemented the Resource-



**Table 1**  
**Index of Medicaid to Private Payment Levels for Representative and Preventive Services:**  
**Four Study States, 1989 and 1992**

State and Type of County	California		Georgia		Michigan		Tennessee	
	1989	1992	1989	1992	1989	1992	1989	1992
<b>Representative Services</b>								
All Counties	0.35	0.37	0.62	0.57	0.45	0.45	0.54	0.57
Urban	0.29	0.35	0.52	0.53	0.40	0.40	0.43	0.53
Rural	0.43	0.40	0.65	0.58	0.48	0.47	0.59	0.59
<b>Preventive Services</b>								
All Counties	0.47	0.45	0.45	0.40	0.48	0.56	0.51	0.48
Urban	0.40	0.43	0.42	0.36	0.44	0.52	0.45	0.44
Rural	0.56	0.48	0.47	0.42	0.50	0.57	0.53	0.50

NOTES: EPSDT is Early and Periodic Screening, Diagnostic, and Treatment services. The representative set of services includes: primary care visit, hospital visit, obstetrical, surgical, imaging, and laboratory codes representative of services used by all Medicaid enrollees. Preventive care services include: EPSDT, non-EPSDT preventive and well-child visit codes, as well as immunizations.

SOURCE: Adams, E.K., and Graver, L.J., Emory University, Atlanta, 1998.

Based Relative Value Scale (RBRVS) in the latter part of 1992 as part of a general effort to improve the rationality of their fee schedules.

The relative payment of Medicaid and private insurance programs is one measure of “equal access,” and the fee indexes described earlier are presented in Table 1 for each State for 1989 and 1992 and for urban and rural counties. As these data show, Medicaid fees are significantly lower than private fees in both years for all study States, ranging from 35 percent of private levels in California to 62 percent in Georgia in 1989 for the representative set of services. Only Michigan and Tennessee actually raised Medicaid fees over the study period. Based on the Tape-to-Tape data, we measured the increase in the representative service fees at 23 percent in Michigan and 10 percent in Tennessee.<sup>3</sup> For preventive care specifically, we measured Michigan’s increase at 50 percent and Tennessee’s at 9 percent before and after OBRA 89. Tennessee’s fee increase was for selected obstetrical/pediatric services in 1991-92, largely in response to OBRA 89. There were also increases in late 1992 as a result of the implementation

of the new Medicare fee schedule and procedure codes.

The generosity of Medicaid payments for the representative set of services relative to private fees, however, only increased in Tennessee and California (Table 1). The increase in California apparently reflects a decline in private payments, because the State did not alter its Medicaid fees over this time period. California, as other study States, reported they were in compliance with the “equal access” requirement, and California providers report that their EPSDT program rates are competitive and indeed, more generous than Medi-Cal fees generally (Hill and Zimmerman, 1995). Tennessee’s overall Medicaid payments increased from 54 to 57 percent of private fees levels, increasing from 43 to 53 percent of private fees in urban counties.

Although relative payment levels increased in California for the representative set of services, they decreased from 47 to 45 percent of private fees for preventive services across all counties. Only in Michigan did relative Medicaid payments for preventive services increase markedly. This State set into place a “two-tiered” payment policy in September 1990 in response to OBRA 89. Under this policy, the State

<sup>3</sup> Georgia implemented RBRVS for provider payment late in 1992; we found their fees increased by only 1.5 percent from 1989 to 1992.

**Table 2**  
**Selected Data on All Medicaid Participating Physicians and Medicaid Physicians Serving Children: Four Study States: 1989 and 1992**

Type of Provider	California		Georgia		Michigan		Tennessee	
	1989	1992	1989	1992	1989	1992	1989	1992
<b>All Medicaid Participating Physicians</b>								
Number	47,638	55,251	7,391	9,495	12,499	14,846	7,583	8,394
Percent Distribution by Degree								
Medical Doctors	99	99	99	98	82	82	99	98
Doctors of Osteopathy	1	1	2	2	18	18	1	2
<b>Medicaid Physicians Servicing Children</b>								
Number of Child Physician Providers	31,045	36,453	5,716	8,161	11,012	12,930	6,162	7,369
Percent of All Medicaid Participating Providers	65	66	77	86	88	87	81	88
Number Providing Basic Preventive Care	6,491	7,219	512	758	3,358	3,730	1,266	1,685
Percent Providing Basic Preventive Care	21	20	9	9	30	29	21	23
Percent Providing Basic Preventive Plus								
Prenatal/Contraceptive Services	27	27	22	24	37	38	33	32
Number of EPSDT Physician Providers	2,067	2,301	91	245	43	2,482	215	278
Percent Full and Partial Screen Providers	7	6	2	3	<1	19	3	4
Percent Partial Screen (Only) Providers	<1	<1	<1	<1	—	—	<1	<1

NOTE: EPSDT is Early and Periodic Screening, Diagnostic, and Treatment services.

SOURCE: Adams, E.K., and Graver, L.J., Emory University, Atlanta, 1998.

designated both “comprehensive” and “basic” EPSDT providers. Well-child visits provided in physicians’ offices under the traditional Medicaid program could be billed as “basic” services; if the provider obtained certification as a “comprehensive” provider, fees for preventive care were set significantly higher. Michigan’s relative compensation for preventive care services increased from 48 to 56 percent of private fees across all counties over the study period. These changes in relative fee levels have importance for the patterns seen in the descriptive data that follow and were shown to be important in multivariate analyses of these data reported elsewhere (Gavin et al., 1998).

### Provider Supply

The data presented in Table 2 for 1989 and 1992 can be used to examine the percentage growth in the number of participating physicians, those providing children’s services, and those providing preventive care in each of the study States. As these data show, there were increases in all States in these total numbers; Georgia

experienced the highest percentage growth, 40 percent, in the number of participating physicians serving children (from 5,716 in 1989 to 8,161 in 1992). The percentage increase in the number providing preventive care was also highest in Georgia, at 40 percent, followed by a growth rate of 28 percent in Tennessee, as the number providing some preventive care to Medicaid children grew from 1,313 to 1,685. There was dramatic growth in the number of participating physicians providing preventive care through the EPSDT program in Michigan, rising from only 43 in 1989 to more than 2,000, and this number almost tripled in Georgia.

The data in Table 2 also indicate, however, that the proportions of office-based participating physicians involved in serving Medicaid children and/or providing preventive care were quite stable over the study period. In 1989 the percentage of Medicaid participating physicians serving children ranged from a low of 65 percent in California to a high of 88 percent in Michigan. By 1992 this percentage had changed only slightly—ranging from 66 to 87 percent. Georgia showed the most sub-

stantial change, with 77 percent in 1989 compared with 86 in 1992. Tennessee also experienced growth in the percentage of all Medicaid-participating providers serving children—81 percent in 1989 to 88 percent in 1992.

The percentage of participating physicians providing preventive care to children, however, was markedly lower throughout the study period. This percentage ranged from a low of 9 percent in Georgia in both years to a high in Michigan of 30 percent in 1989 and 29 percent in 1992. Michigan was the only State in which office-based physician involvement in EPSDT changed dramatically. In Michigan the percentage of individual EPSDT physicians who served children during the year increased from less than 1 percent in 1989 to 20 percent in 1992. Thus, although there was an increase in the numbers providing services (including preventive services) to children in the study States, there was little or no change in the relative proportions of providers involved in supplying any preventive care or providing preventive care through the formal EPSDT program, with the exception of Michigan.

We are left with the surprising conclusion that only a small percentage of office-based physicians participating in Medicaid provided preventive care services to Medicaid children whether through the EPSDT program or not. Less than one-third of the physicians provided preventive care services in either of the 2 years. Although this percentage ranged from 20 to 29 percent for California, Michigan, and Tennessee in 1992, only 9 percent of the participating physicians in Georgia provided preventive services to Medicaid children. This low percentage can be explained largely by the fact that Georgia does not allow billing for well-child care (except for immunizations) outside of the

EPSDT program. Nonetheless, the percentage of office-based physicians involved directly in Georgia's EPSDT program increased from only 2 to 3 percent over the study period.

Many factors affect the patterns seen here, and multivariate analysis is needed to isolate the effects of confounding factors. In separate analyses (Adams, 1997; Gavin et al., 1998) of these data, we studied the effects of changes in factors such as total physician supply, Medicaid enrollment, area characteristics (e.g., population density, cost of doing business), physician location and specialty, as well as the relative fee indexes presented earlier. We also included a time variable and interactive terms (time  $\times$  State) to gauge the relative changes in each State before and after the enactment of OBRA 89, holding other factors constant. These results indicate a positive and significant effect of relative fees on the probability of providing preventive care in general and EPSDT screens in particular (Adams, 1997; Gavin et al., 1998).

In the multivariate analysis, we also found positive effects of other State activities on these two measures of service provision, except for EPSDT services in Tennessee (Gavin et al., 1998). The net effect of fee and other programmatic changes was positive in all States except Georgia, where the effect of the fall in relative fees was offset by the positive effect of other policy changes. The net effect of the fee and programmatic changes in Michigan, holding other factors constant, was found to be large and positive as expected.

### **Service Volume**

Tables 3 through 5 present changes in the average payments paid by Medicaid to individual providers for children's services, preventive care, and EPSDT ser-

**Table 3**  
**Statistics on Payments to Individual Providers for Children: Four Study States: 1989 and 1992**

Type of Provider	California				Georgia				Michigan				Tennessee			
	Percent of Providers	Mean Amount Paid	Mean Number of Recipients Served	Number of Recipients Served	Percent of Providers	Mean Amount Paid	Mean Number of Recipients Served	Number of Recipients Served	Percent of Providers	Mean Amount Paid	Mean Number of Recipients Served	Number of Recipients Served	Percent of Providers	Mean Amount Paid	Mean Number of Recipients Served	Number of Recipients Served
<b>1989</b>																
Number	35,970	—	—	—	6,274	—	—	13,108	—	—	—	—	6,584	—	—	—
Pediatrician	7	\$23,076	202	276	8	\$33,225	276	5	\$20,705	329	8	\$28,325	8	\$28,325	279	279
Other Primary	25	8,716	79	74	34	11,890	74	44	5,266	101	28	9,081	28	9,081	74	74
General Practitioner	8	7,860	105	108	7	9,593	108	25	5,747	132	7	8,885	7	8,885	105	105
Family Practitioner	6	7,427	99	115	9	9,910	115	4	6,345	126	7	8,202	7	8,202	106	106
Internist	5	1,937	29	22	11	1,890	22	10	1,213	29	8	1,684	8	1,684	23	23
Obstetrician/Gynecologist	5	17,814	57	67	7	32,416	67	5	10,441	73	6	19,772	6	19,772	67	67
Other Physician	54	4,021	53	54	48	5,911	54	34	3,857	82	58	5,628	58	5,628	77	77
Other Individual	14	3,406	34	41	9	5,743	41	16	1,790	34	6	5,886	6	5,886	76	76
<b>1992</b>																
Number	42,327	—	—	—	9,129	—	—	15,213	—	—	—	—	7,929	—	—	—
Pediatrician	7	\$28,922	239	515	8	\$67,207	515	6	\$29,418	350	8	\$49,256	8	\$49,256	422	422
Other Primary	23	12,739	111	140	38	16,092	140	44	7,325	119	28	14,289	28	14,289	109	109
General Practitioner	7	12,712	164	238	11	13,331	238	24	8,252	163	6	14,434	6	14,434	180	180
Family Practitioner	6	10,643	137	182	9	14,858	182	4	8,710	133	7	14,739	7	14,739	161	161
Internist	5	3,384	51	38	10	2,689	38	10	1,466	28	8	2,177	8	2,177	32	32
Obstetrician/Gynecologist	5	23,769	71	90	7	40,534	90	5	13,423	79	6	29,990	6	29,990	79	79
Other Physician	56	6,643	93	90	44	8,821	90	35	4,452	89	57	8,639	57	8,639	102	102
Other Individual	14	4,865	51	66	11	13,490	66	15	2,251	37	7	9,762	7	9,762	127	127

NOTE: Numbers may not add to totals shown because of rounding.  
 SOURCE: Adams, E.K., and Graver, L.J., Emory University, Atlanta, 1998.



vices in each of the study States. We also include changes in the average child caseloads of individual providers of any children's services. These data are presented separately for pediatricians and other primary care specialties (general and family practitioners, internists, and obstetrician/gynecologists). Other physician specialties are grouped into the "other physician" provider group. Data on other individual providers (e.g., nurses, therapists) are also presented separately under "other individual."

The data in Table 3 clearly indicate that the average size of the participating physician's child-related Medicaid practice increased in all States and for all specialties. The increases in average paid amounts were generally in excess of rates of inflation or fee increases. California did not increase fees over this time period, yet average amounts paid by Medi-Cal to participating physicians increased from 25 percent for pediatricians to 75 percent for internists over our study period.

The data in Table 3 indicate that States do differ in the relative magnitude of the increases in physicians' child-related practices. For example, the largest increases in pediatricians' child-practice volume occurred in Georgia and Tennessee; in Georgia, their average dollar amounts more than doubled, and in Tennessee, their volume grew by 74 percent. A large part of this growth was apparently related to a growth in caseloads for these pediatricians; in Georgia, the number of cases grew by 87 percent, and in Tennessee they grew by 51 percent. In California, the growth in child-related Medicaid practices occurred more among general practitioners, internists, and non-primary care specialties than among pediatricians. Here too, the growth in dollars was accompanied by an increase in the number of child enrollees seen per office-based physician.

The increases in service volume of participating providers shown in Table 3 indicate that either those participating in Medicaid in 1989 significantly increased the size of their practices or those newly participating started with high-volume practices, or perhaps both patterns existed. In our multivariate analysis (Adams, 1997), we found that physicians participating in both 1989 and 1992 were more likely than those only participating in 1 year to provide preventive care, participate in EPSDT, and have higher child caseloads, holding other factors constant. We also found that increased enrollment in the physicians' county had a positive, significant impact on the probability of providing preventive and EPSDT services (Adams, 1997; Gavin et al., 1998). The descriptive data presented here indicate that, although the entire provider system grew in response to enrollment and other factors, pediatricians retained their relative role within each State's child provider system.

Table 4 presents information on changes from 1989 to 1992 in the average amounts paid to the subset of child providers providing preventive care services. Mean amounts paid to these providers for all services to children and specifically for children's preventive care are included in the table. Again, the definition of basic preventive care services for children is as defined earlier and is inclusive of EPSDT services. Similar data, specific to only EPSDT preventive services, are provided in Table 5.

As the data in Table 4 show, there were dramatic changes in the average dollar volume of preventive care services provided by all physician specialties in all study States, exceeding what we would expect as a result of inflation or fee increases. We also see that the largest increases occurred in Georgia and Tennessee, as they did for all children's services. In

**Table 4**  
**Statistics on Individual Providers of Preventive Care Services: Four Study States, 1989 and 1992**

Type of Provider	California			Georgia			Michigan			Tennessee		
	Percent of Providers	Mean Amount Paid All Services	Mean Amount Paid for Preventive Care	Percent of Providers	Mean Amount Paid All Services	Mean Amount Paid for Preventive Care	Percent of Providers	Mean Amount Paid All Services	Mean Amount Paid for Preventive Care	Percent of Providers	Mean Amount Paid All Services	Mean Amount Paid for Preventive Care
<b>1989</b>												
Number	7,403	—	—	522	—	—	3,354	—	—	1,381	—	—
Pediatrician	17	\$37,956	\$8,937	21	\$52,197	\$6,240	16	\$21,540	\$4,430	21	\$37,681	\$6,377
Other Primary	37	19,537	2,412	52	30,683	646.00	7	8,956	772	39	15,992	571
General Practitioner	16	17,148	3,210	7	25,667	1,375	46	8,998	845	11	15,236	494
Family Practitioner	13	13,971	2,511	16	16,734	429	13	7,817	968	19	11,481	763
Internist	3	9,692	889	4	5,194	78	6	4,642	307	3	7,703	130
Obstetrician/Gynecologist	5	46,200	539	25	45,324	658	6	15,316	240	6	35,218	327
Other Physician	34	13,441	4,868	25	12,065	1,406	14	8,567	707	32	10,477	552
Other Individual	12	6,911	567	2	11,693	934	<1	13,081	22	8	9,507	1,923
<b>1992</b>												
Number	8,157	—	—	801	—	—	3,754	—	—	1,821	—	—
Pediatrician	14	\$51,395	\$13,241	27	\$93,252	\$21,037	16	\$32,672	\$4,852	22	\$62,715	\$13,712
Other Primary	34	29,879	3,449	5	47,467	1,744	7	13,032	853	41	26,012	1,416
General Practitioner	13	28,830	4,630	5	36,152	5,372	46	13,113	1,009	11	23,699	1,051
Family Practitioner	13	21,734	3,712	17	25,296	1,841	14	10,711	728	18	20,049	2,259
Internist	3	22,685	2,660	3	13,538	2,707	5	6,210	533	4	6,434	275
Obstetrician/Gynecologist	6	54,097	442	25	68,057	840	3	24,286	146	8	51,116	31
Other Physician	41	25,572	10,961	18	21,315	3,676	13	11,578	541	3	16,602	961
Other Individual	11	9,498	577	5	5,479	480	1	14,164	3,103	7	17,465	4,198

NOTE: Numbers may not add to totals shown because of rounding.

SOURCE: Adams, E.K., and Graver, L.J., Emory University, Atlanta, 1998.

Georgia the average dollars paid to pediatricians for children's preventive care services increased by more than 200 percent, and in Tennessee, preventive care dollar volume more than doubled. Increases for other primary care providers also exceeded 100 percent in these two States. The increase in the average volume for office-based physicians in California was far lower than that in Georgia or Tennessee, with the exception of internists, whose volume increased by almost 200 percent. In Michigan the increases in average dollars paid for preventive care services were quite low, only 10 percent, for pediatricians; family practitioners actually experienced decreases in average payment amounts.

The data presented in Table 4 also indicate that pediatricians generally comprise a larger percentage of the total physician supply for preventive services than other primary care specialties (except in Michigan) and that preventive care services account for a larger proportion of their total Medicaid child-service volume. Whereas pediatricians comprised 5-8 percent of all individual providers serving children under age 21, these providers constituted 14-27 percent of all preventive care providers over the study period. The average size of pediatricians' Medicaid preventive care practice was also larger than that of other primary care specialty providers of preventive care. In the multivariate analysis (Adams, 1997), we found pediatric specialty to be related to significantly higher probability of providing preventive care and higher child caseloads but not to the provision of EPSDT screens, holding other factors constant. This is consistent with a higher probability of providing preventive care through the "shadow" program.

Based on the descriptive data in Table 4, the portion of average total dollars paid to pediatricians for preventive care services ranged from a low of 12 percent in Georgia

in 1989 and 15 percent in Michigan in 1992, to a high of 24 percent in California in 1989 and 23 percent in Georgia in 1992. This percentage for other primary care specialties did not exceed 12 percent (in California) in 1992 and was generally lower, ranging from 4 to 7 percent in the other study States in 1992. In California other physician specialties' practices were disproportionately devoted to preventive care.

The 1989 and 1992 data show that physicians involved in providing preventive care had larger Medicaid practices than physicians providing any type of children's services. Across the study States in 1992, the Medicaid dollar volume paid to preventive care providers for all children's services ranged from 11 to 77 percent higher for pediatricians who provided basic preventive care than for pediatricians providing any services to Medicaid children (Table 3). This implies that providers were supplying these preventive care services in addition to other Medicaid services and/or were providers that served more Medicaid recipients on average. We note that although the obstetrician/gynecologists also fit this pattern—larger Medicaid practices based on dollars paid for all children's services—their preventive care practices were, in 1989 and again in 1992, a negligible portion of all dollars paid to them for children's services.

Table 5 presents comparable data on changes in the provision of EPSDT services from 1989 to 1992 by individual providers for the study States. Here too, there are dramatic increases in the average Medicaid amounts paid to office-based pediatricians and other primary care specialties over the study period in three of the four study States. For pediatricians the average dollar volume increased by 75 percent in California and by more than 100 percent in both Georgia and Tennessee. This same pattern held for the other pri-

Table 5

Statistics on Individual Providers of Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) Services:  
Four Study States, 1989 and 1992

Type of Provider	California			Georgia			Michigan			Tennessee		
	Percent of Providers	Mean Amount Paid All Services	Mean Amount Paid for EPSDT Care	Percent of Providers	Mean Amount Paid All Services	Mean Amount Paid for EPSDT Care	Percent of Providers	Mean Amount Paid All Services	Mean Amount Paid for EPSDT Care	Percent of Providers	Mean Amount Paid All Services	Mean Amount Paid for EPSDT Care
<b>1989</b>												
Number	2,067	—	—	91	—	—	43	—	—	215	—	—
Pediatrician	32	\$47,800	\$15,194	67	\$63,343	\$10,188	40	\$53,947	\$13,119	67	\$39,424	\$11,166
Other Primary	31	25,864	6,451	31	18,664	2,376	56	32,089	3,886	32	15,108	2,270
General Practitioner	14	29,588	7,630	11	30,270	4,428	26	27,778	4,763	8	24,256	1,902
Family Practitioner	15	21,708	5,736	17	12,333	1,307	23	44,458	4,053	22	12,377	2,532
Internist	1	19,929	3,373	1	10,234	22	2	1,218	71	1	8,655	828
Obstetrician/Gynecologist	4	46,963	4,325	0	0	0	5	9,389	135	0	0	0
Other Physician	38	25,502	14,821	2	93,113	66,280	5	86,831	24,509	1	19311	937
Other Individual	0	0	0	0	0	0	0	0	0	0	0	0
<b>1992</b>												
Number	2,301	—	—	247	—	—	2,502	—	—	278	—	—
Pediatrician	23	\$74,937	\$26,618	66	\$98,058	\$27,114	22	\$31,681	\$2,173	63	\$6,946	\$22,927
Other Primary	26	42,885	11,356	32	31,000	6,246	72	14,892	225	36	29,459	5,112
General Practitioner	12	51,302	14,094	6	46,915	15,246	44	15,216	77	1	30,996	1,978
Family Practitioner	12	35,610	9,526	22	30,370	4,022	17	11,904	234	24	28,522	6,601
Internist	2	39,969	7,648	4	13,337	6,172	3	6,313	116	1	14,375	3,735
Obstetrician/Gynecologist	<1	32,946	4,037	<1	1,239	990	8	22,686	36	<1	92,006	1,792
Other Physician	5	49,957	30,340	2	170,381	92,151	6	14,960	568	1	14,237	703
Other Individual	0	0	0	<1	4,435	1,610	1	17,854	1,879	0	0	0

NOTE: Numbers may not add to totals shown because of rounding.

SOURCE: Adams, E.K., and Graver, L.J., Emory University, Atlanta, 1998.

mary care specialties. In Michigan quite a different pattern prevailed. For almost all office-based physician specialties, there were decreases in the average amounts of Medicaid dollars paid for EPSDT preventive care services. This largely reflects the dramatic increase in the number of individual providers involved in providing EPSDT services in Michigan in 1992 compared with 1989. With the larger number of office-based providers in 1992, each provided a much smaller portion of the total Medicaid dollar volume.

The role of pediatricians in providing EPSDT services varied across the study States. Tennessee had three times more pediatrician EPSDT providers than California (66 percent and 22 percent, respectively); in Michigan there were more general practitioners providing EPSDT services than pediatricians. Michigan had more than seven times as many general practitioner EPSDT providers as Georgia (44 percent and 6 percent, respectively). The average size of the pediatrician's EPSDT practice, however, was larger than those of other primary care practitioners in all study States and years. Again, pediatricians involved in providing EPSDT services were those with larger-than-average child-related Medicaid practices.

There appeared to be significant involvement of "other" physician specialists in EPSDT services in California and Georgia during 1989 and 1992. However, Georgia's data in both years indicate such large practices for these physicians that the data are suspect. It is possible that we inadvertently identified two clinics as individual physicians in that State.<sup>4</sup> In California "other" physician specialties account for 50 percent of all individual providers, and their mean Medicaid amount paid for EPSDT

services equaled more than \$30,000 in 1992. The importance of these "other" specialists may be driven, in part, by greater competition in California, because that State has more physicians per capita than any other study State, as well as greater penetration of managed care.

### **"Shadow" Program Providers**

We can also derive information about the "shadow" preventive care program in each State in 1989 and 1992 by comparing the data in Tables 4 and 5. The term "shadow" program is often used to describe the provision of preventive care services to Medicaid children outside the EPSDT program. By comparing the data in Table 4 on all providers of preventive care to Medicaid children with that in Table 5 for only those providing some preventive care through EPSDT, we can gain insight on the role of the shadow program in each State over the study period.

Approximately one-half of the pediatricians who provided any preventive care in California, Georgia, and Tennessee in 1989 (Table 4) were also involved in the EPSDT program (Table 5). In Michigan this percentage was less than 1 percent in 1989. In 1992 this percentage was still around 50 percent in California and Tennessee, but in Georgia and Michigan the percentages participating in both the EPSDT and shadow program had increased. In Georgia approximately 75 percent of pediatricians who provided some preventive care also participated in the EPSDT program, and in Michigan virtually all of the pediatricians were in both the "shadow" preventive and EPSDT program in 1992.

For other primary care physician providers, the patterns were somewhat different. A far smaller percentage of other primary care physicians who provided some preventive care provided these ser-

<sup>4</sup> There are sometimes conflicts between the provider type on the provider file and that found on the claims.



vices through EPSDT in 1989. This ranged from less than 1 percent in Michigan to 23 percent in California. By 1992 this had changed dramatically; around 70 percent of other primary care physicians providing preventive care services in Michigan also provided preventive care through the EPSDT program. In the other States, this percentage ranged from 13 percent (Tennessee) to 22 percent (California). The extremely small percentage of any primary care physicians providing EPSDT services in Michigan in 1989 was most likely the result of the strict requirements placed on EPSDT providers in that State prior to OBRA 89. Clearly, changes in Michigan's policies have brought about changes in EPSDT and overall preventive care participation among individual providers over the 1989-92 time period.

### **Institutional Providers**

As noted, the provision of services by "institutional" or non-office-based physicians is extremely important to access for Medicaid enrollees. In Table 6 we consider the importance of these providers to the provision of preventive services specifically. The data in this table summarize changes between 1989 and 1992 in the counts and mean dollars paid for providers whose services were billed through free-standing clinics<sup>5</sup> for all services to children, preventive care services, and EPSDT services separately. We focus on clinic institutional providers because they were the primary institutional providers of preventive and EPSDT services in all States except California.<sup>6</sup> We also include infor-

mation on changes in clinic caseloads for all services to children over the study period.

The data in Table 6 indicate that both the number of clinics and clinics' average Medicaid practice volume grew significantly over the study period. There are, however, different patterns for all children's services versus preventive care, as well as some differences across States. For all children's services, the percentage growth in the number of clinics serving children ranged from 50 to 81 percent in three study States, with Tennessee experiencing only 23 percent growth. Although there were differences in the growth rate of dollar volume for all children's services across the study States, the average dollar amounts paid were fairly similar in 1992, averaging around \$40,000 in California, Michigan, and Tennessee, and \$55,000 in Georgia.<sup>7</sup> Although the number of children served by these clinics grew in California, Georgia, and Tennessee, the number declined in Michigan. The decline of clinic-based services for children in Michigan is consistent with the significant increase in office-based physicians providing preventive care in this State before and after OBRA 89. We tested for the effect of clinic providers at the county level on the probability of office-based physician provision of preventive care and found no effect in our multivariate analysis (Adams, 1997).

Data in Table 6 show that the involvement of clinics in providing EPSDT services grew in all States, but particularly in California and Michigan. In California the number of clinics grew by more than 60 percent, and in Michigan the number tripled. Although the number of clinics providing EPSDT services also increased in Georgia and Tennessee, the percentage growth was less than 25 percent in each.

<sup>5</sup> This includes all rural health, Federally Qualified Health Centers (FQHCs), public health departments, and other free-standing clinics.

<sup>6</sup> In this State we found a larger number of dollars being paid to hospital-based clinics than in the other States (Adams, Chawla, and Graver, 1996). Although California data indicated an average amount of EPSDT services in these settings of around \$24,000 in 1989 and \$51,000 in 1992, the other States generally reported zero EPSDT dollars in this setting.

<sup>7</sup> We note that Medicaid amounts paid to these providers include the facility overhead, which is likely higher than that of an office-based physician.

**Table 6  
Number and Percent Change in Numbers of Clinics Providing Any Children's Services in Medicaid and Basic Preventive or EPSDT  
Services: Four Study States, 1989 and 1992**

Service Type	California			Georgia			Michigan			Tennessee		
	1989	1992	Percent Change	1989	1992	Percent Change	1989	1992	Percent Change	1989	1992	Percent Change
<b>Any Services</b>												
Number of Clinics	1,445	2,612	81	261	458	75	705	**1,060	50	754	925	23
Mean Amounts Paid	\$28,753	\$43,982	53	\$35,218	\$55,479	58	\$23,654	\$43,855	85	\$24,982	\$40,482	62
Mean Caseloads	154	233	51	480	598	25	295	239	-23	200	296	48
<b>Basic Preventive</b>												
Number of Clinics	*580	*1,137	96	171	225	32	200	**296	48	371	521	40
Mean Amounts Paid	\$6,622	\$10,836	64	\$29,878	\$57,039	91	\$28,118	\$30,219	7	\$6,120	\$8,233	35
<b>EPSDT</b>												
Number of Clinics	*288	*466	62	170	194	14	83	**248	199	151	185	23
Mean Amounts Paid	\$10,069	\$20,943	108	\$3,005	\$65,710	119	\$64,969	\$65,710	1	\$14,523	\$21,058	45

\* Includes 46 school-based clinics in 1992; omitted from 1989 numbers.

\*\* Includes 6 school districts (unknown number of school-based clinics); only 4 provided preventive care services.

NOTE: EPSDT is Early and Periodic Screening, Diagnostic, and Treatment services.

SOURCE: Adams, E.K., and Graver, L.J., Emory University, Atlanta, 1998.

The amount of EPSDT services provided by these clinics and paid for by Medicaid grew by 45 percent in Tennessee and more than doubled in both California and Georgia. In Michigan the average amount was virtually equal in the 2 years, but as was the case for Georgia, was much higher in absolute terms than the other two States. In Georgia and Michigan, clinics were paid an average of \$65,000 for EPSDT services in 1992, whereas in California and Tennessee, these amounts were lower, at \$20,000-21,000.

### **Enrollee Provider Ratios**

Counts of providers or participation rates do not convey enough information regarding the extent of physician involvement in Medicaid. Ultimately, counts of physicians need to be related to enrollee counts to understand the adequacy of physician supply, especially in a time of expansion of eligibility for Medicaid children.

In Table 7 we present data on several child-enrollee-to-provider ratios measured at the county level for 1989 and 1992. These ratios include either all enrollees or enrollees under age 21 in the numerator. The denominator varies with several measures: (1) all participating providers; (2) those serving children; (3) primary care physicians serving children; (4) preventive care providers; or (5) EPSDT providers.

In general, the counties in each study State experienced an increase in the ratio of all enrollees to providers over the study period, with the exception of Michigan. With respect to children, California and Georgia counties saw an increase of 100 or more per physician and Tennessee's ratio of Medicaid children to child providers increased by more than 300 on average across counties. In Michigan this ratio decreased by approximately 100. Although there was a marked increase in

the number of child enrollees per participating primary care physician in California and increases in Georgia and Tennessee, this ratio remained constant in Michigan over the study period. Tennessee, which also experienced a marked increase, had the highest ratio, 352, of all the study States by 1992.

As we consider the preventive care ratios and changes, it is apparent that Michigan's Medicaid physician provider system expanded over time. In Michigan as well as California, there was a 2-percent decline in the number of child enrollees per participating physician providing preventive care services over the study period. In contrast, there were increases in these ratios observed in Georgia and Tennessee of 16 and 40 percent, respectively. Michigan exhibited the lowest number of child enrollees per participating preventive care physician in 1992, with a ratio of 233 children per provider.

With respect to EPSDT providers, the picture is even more dramatic in Michigan. There was a decline of more than 1,000 percent in the ratio of children per EPSDT participating physician in that State; by 1992 this ratio was 377, down from its value of 11,518 in 1989 (Table 7). In contrast, the ratios observed in the other States all exceeded 1,000 children per physician provider of EPSDT services, and these actually increased in California and Tennessee over the 1989-92 time period.

Thus, although the study States made overt efforts to enhance their provider systems and were successful at varying rates, this expansion was not generally sufficient to keep up with the concurrent expansion of child enrollees.

### **DISCUSSION**

The foregoing analysis provides a broad descriptive view of the study States'

**Table 7**  
**Ratios of Enrollees to Participating Providers and Ratios of Medicaid Children to Providers:**  
**Four Study States: 1989 and 1992**

Type of Provider	California		Georgia		Michigan		Tennessee	
	1989	1992	1989	1992	1989	1992	1989	1992
<b>Participating Provider Ratios for all Medicaid Enrollees</b>								
All Participating Providers	139	160	309	371	216	186	248	400
<b>Child Provider Ratios for Medicaid Children</b>								
All Participating Child Providers	424	513	830	994	678	569	645	954
Primary Care Physicians Serving Medicaid Children	52	342	215	254	159	159	226	352
Preventive Care Physicians Serving Medicaid Children	382	373	839	976	237	233	325	455
EPSDT Physician Providers	1,015	1,441	2,665	2,123	11,518	377	1,386	2,101

NOTES: EPSDT is Early and Periodic Screening, Diagnostic, and Treatment services. For 1989, all ratios measure the number of children relative to one provider, i.e., 139:1. Medicaid children are defined as all enrollees under 21 years of age. Participating child providers are defined as all Medicaid participating pediatricians and one-fourth of all Medicaid participating general and family practitioners.

SOURCE: Adams, E.K., and Graver, L.J., Emory University, Atlanta, 1998.

Medicaid child provider systems before and after OBRA 89. The data provide a clear message that these provider systems responded to policies either directly or indirectly inspired by OBRA 89 as well as the increased demand from ongoing expansions in child Medicaid enrollments. These data also show that each State's system of providing services for Medicaid children was different at both the beginning and end of the study period.

Although each study State's system grew, the composition of growth varied. Georgia and Tennessee's preventive care system grew in a more traditional way, with significant expansion in the average volume of participating pediatricians' preventive care services. In California the expansion was relatively greater for non-pediatric specialties, especially "other" physician specialties, perhaps indicating the effect of competition and managed care in that State. Michigan's route to expansion of preventive care services was different and perhaps more successful. In Michigan the expansion in the number of physicians providing preventive care was so great that the average volume for each provider rose only slightly. These State patterns were largely applicable to the subset of EPSDT preventive care services as well.

Although there was significant expansion in the numbers and service provision of office-based physicians, an important question was whether this was accompanied by a decline in the provision of preventive care by "institutional" providers. The data presented here indicate that was largely not the case. Each State experienced growth in the number of clinics and the average service volume of clinics for preventive and non-preventive children's services. Michigan's experience, again, was quite different. In that State the case-loads of children served by the average clinic actually declined by 1992. The number of clinics providing EPSDT services virtually tripled in Michigan after OBRA 89; hence, there were only minimal increases in the amount of preventive and EPSDT care provided by the average clinic. Thus, it appears that Michigan's policies markedly increased the supply of both office-based and clinic providers of preventive and EPSDT services.

The findings in this and the multivariate analyses of these data have implications for current policies in several areas. The importance of the "equal access" provision for Medicaid is confirmed. Medicaid fee policy does affect participation and provision of services and specifically preventive

care services. Our analysis shows that Medicaid fees are only fractions of those in the private sector, and some States were not able to increase relative fees even as they increased their own payment levels because of concurrent increases in the private sector. The findings also have importance for States as they move more of their enrollees into managed care. Capitated rates are set on historic fees for service levels and may not generate sufficient revenues for recruitment and retention of provider networks. For example, TennCare, a program that was introduced with lower provider rates and stringent requirements on providers to serve Medicaid clientele, is experiencing continued problems with provider networks and patient access (State Health Watch, 1997). Georgia is currently proposing relatively greater increases in its fee schedule for primary care providers, as these are the providers most in demand as managed care expands. Future research should analyze the relationship of historic payment rates and the viability of capitated rates under Medicaid managed care across the States.

The findings on the relative growth in provider and Medicaid enrollment in the study States also have significance for policy. Eligibility expansion alone is not sufficient to ensure access to needed services, and States must consider the expansion of provider systems in line with eligibility expansion. The findings that physician provision of preventive care and child case-loads are responsive to relative fee levels (specific to preventive care), as well as to other types of programmatic changes, confirm that these are valuable policy tools. Although the States no longer have to submit data on obstetric and pediatric payment levels under the BBA, these are clearly policies that the States will want to monitor to ensure access for Medicaid children.

States also need to consider policies related to the geographic distribution of providers and enrollees. In particular, the role and location of “institutional” providers is important for States to consider. As States expand managed care, these traditional “safety net” providers should perhaps be maintained in the system either directly by carve-outs or by encouraging contractual arrangements between managed care companies and FQHCs, rural health centers, and other traditional providers of preventive care to Medicaid children. This will be a particularly important policy area, given the BBA revision of cost-based payment rules for these providers, which will likely reduce their revenue streams.

All of these policy considerations become more important as States continue to expand eligibility for low-income children either through Medicaid or other approaches under the CHIP program. As noted, the availability of willing providers in the geographic areas in which these children reside will be critical for ensuring their access to mainstream health care services. Among children potentially eligible for CHIP, approximately 40 percent use a physician office as their usual source of care (Center for Health Systems Change, 1998). Although this means physicians can serve in outreach efforts for CHIP, it also highlights that the majority of children either have no usual source or a non-office-based usual source of care. States will want to consider what neighborhoods these expansion children are likely to reside in and whether the provider system is able to absorb them. If these children are being enrolled in non-Medicaid risk pools and/or health delivery systems, States will need to consider the adequacy of payment levels to private sector providers from whom children may be seeking care. Evaluations of CHIP that



take into account baseline and changes in provider supply are called for to fully understand the impact of improving access for these children.

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