Managed Care and Insurance Coverage

The Impact of S-CHIP Enrollment on Physician Participation in Medicaid in Alabama and Georgia

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Objective. To assess whether increasing enrollment in State Children's Health Insurance Programs (S-CHIPs) has an impact on the number of office physicians participating in Medicaid and the extent of their participation. Effects are measured for a freestanding S-CHIP program with an open provider panel and an S-CHIP program that uses the state's Medicaid provider panel.

Data Sources. Children's Medicaid claims data for primary care services were used to measure physician participation in the program; census and enrollment data were used to describe market area characteristics.

Study Design. This is a time series study of communities in two states, measuring physician Medicaid participation quarterly between 1998 and 2001, controlling for changes in community characteristics and children's program enrollment as well as other factors by quarter.

Data Collection/Extraction. Office physician participation is measured by practice site. Claims data are aggregated to the level of the community and reflect the number of limited practice sites, the ratio of Medicaid office sites to the number of primary care physicians in the community as reported by the American Medical Association (AMA), and the mean number of Medicaid office visits made to physician sites in the community in the quarter.

Findings. In Alabama, the state with a freestanding S-CHIP program, there is little association between increased S-CHIP enrollment and physician participation in Medicaid. In Georgia, where the same provider network serves both programs, increases in S-CHIP enrollment are associated with a decline in office-based physician participation in Medicaid in urban areas.

Conclusion. Linkage of S-CHIP and Medicaid programs through the use of the same provider network, in the absence of market conditions that encourage the expansion of the network, can lead to a negative impact on access for Medicaid enrollees.

Key Words. Medicaid, child health services, physician's practice patterns, health services accessibility

The State Children's Health Insurance Program (S-CHIP), passed by Congress in 1997 and implemented by states beginning in 1998, gave the states funds to provide insurance coverage for low-income uninsured children who were not eligible for coverage under the existing state Medicaid programs. The states were given broad discretion to define benefits, eligibility, administrative features, and provider networks for these programs. Some states chose to use the additional federal funds to expand their existing Medicaid programs by increasing age and income eligibility limits within the entitlement program. Others created "look-alike" programs that were structured like Medicaid programs but were not entitlements and, hence, could be altered based on available funds. Still other states created entirely separate insurance programs or contracted with private carriers for coverage for children who met the S-CHIP eligibility criterion. An important component of assessing the impact of the different choices that states made concerning the structure of their S-CHIP programs is an examination of the programs' impact on the large numbers of low-income children who remain insured under Medicaid in each state (Rosenbaum et al. 1998).

This article examines whether the introduction of State Children's Health Insurance programs with different structures have had different effects on the availability of physician sites of care for children who remain in the Medicaid programs of Alabama and Georgia. The Georgia S-CHIP program, PeachCare, is a Medicaid look-alike program administered by the same agency, using the same physician network, paying the same physician fee rates, and requiring assignment of a primary care physician, just like the Medicaid program. The Alabama S-CHIP program, ALL Kids, is a stand alone program administered by the Health Department rather than the Medicaid Agency, subcontracted to Blue Cross and Blue Shield of Alabama for claims administration, using the Blue Cross physician network, paying Blue Cross usual and customary fee rates with no requirement for covered children to be assigned a primary care physician. The Alabama Medicaid program, like both Georgia programs, assigns primary care physicians to all

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enrollees. The Alabama Medicaid program raised physician fees in October 2000 to align them more closely to those paid by private insurers in the state.

Why would the introduction of the S-CHIP programs be expected to affect physician participation in the Medicaid programs of the two states? Since the beginning of the Medicaid program in the late 1960s, there has been concern about securing enough program participation from office-based primary care physicians to create viable and accessible provider networks for use by Medicaid enrollees. In general, prior research suggests that relatively low reimbursement levels in Medicaid, relatively strong demand for services from private paying patients, and the geographic separation of physicians and Medicaid enrollees all contribute to limited Medicaid participation by office-based physicians. The dual market model of physician participation in Medicaid suggests that physicians accept Medicaid patients when Medicaid reimbursement equals or exceeds the marginal revenue that can be acquired from accepting additional private paying patients (Sloan, Mitchell, and Cromwell 1978; Held and Holahan 1985). Empirical work indicates that both strong demand from private patients and low Medicaid reimbursements depress physician participation as predicted under this model (Adams 1995; Cohen and Cunningham 1995; Hassan, Bronstein, and Johnson 1997).

Additionally, as Fossett and Peterson (1989) pointed out, residential segregation of low-income and minority individuals can create pockets of excess demand for Medicaid services in places where a majority of physician practices are not located. Many physicians thus experience very limited demand for Medicaid services and find entering the Medicaid market very costly, while other physicians can essentially specialize in high-volume Medicaid practices with little competition (Mitchell 1991; Perloff et al.1997; Adams 2001). Institution-based safety net providers have long substituted for care from physician sites for Medicaid-covered patients in selected geographic areas, but fiscal pressures on hospitals and federally subsidized clinics have the potential for limiting the amount of care that these providers can give to Medicaid enrollees (Fossett and Peterson 1989; Davidson 1993; Lewin and Altman 2000).

Because S-CHIP programs provide insurance coverage for previously uninsured children in the communities where providers also participate in Medicaid, the new programs alter the pattern of demand for these provider services, thus potentially altering their Medicaid participation decisions. In Alabama, where the introduction of S-CHIP essentially expanded the number of low-income children with private insurance coverage, the dual-market model suggests that Medicaid physician participation might be expected to decline because private demand has increased. This decline in participation might take the form of reduced Medicaid caseloads or might be associated with the withdrawal of physicians from the Medicaid program all together, depending again on the point where the marginal revenue gained from seeing only privately insured and now S-CHIP-covered children exceeds the revenue gained from seeing Medicaid patients. On the other hand, since S-CHIP-covered children in Alabama have a broader choice of physicians to use for care and no enforced requirement to use a consistent primary care physician, they might choose to seek care outside of the Medicaid provider network, leaving the Medicaid physician practices unaffected by the program.

In Georgia, the implementation of S-CHIP essentially expanded the size and possibly the geographic spread of the Medicaid covered population, since the same administrative rules and reimbursement schedules apply in both programs. According to the dual-market model, participation in the public programs would be unlikely to increase and, in fact, available physician resources per publicly insured child would actually decline with S-CHIP implementation and expansion if excess Medicaid demand is essentially increased in some areas. However, there may be an increase in provider participation in Medicaid with this type of S-CHIP, if the expansion of public coverage is sufficient to attract new providers into these areas. The dual-market model suggests, however, that such an expansion in participation would be expected only if the reimbursement level of the Medicaid program is higher than the marginal costs of serving new Medicaid patients and higher than the additional revenue the physicians could receive from expanding their private practice.

This study uses data spanning one year before and two years after the introduction of the S-CHIP programs in Georgia and Alabama. We examine whether the portion of physicians practicing in a community who participate in Medicaid and the size of Medicaid practices for participants across communities (both measures of the extent of physician Medicaid participation) are associated with changes over time in S-CHIP enrollment. We control at the community level for other factors associated with physician Medicaid participation. To the extent that differences between the states in the impact of S-CHIP enrollment growth on Medicaid provider participation reflect the very different structures of the states' S-CHIP programs, the study provides data on one evaluation measure for assessing the impact of those far-reaching state health policy choices.

METHODS

The units of analysis for this study are the 260 Alabama communities and the 295 Georgia communities that had any office-based physician sites accepting Medicaid-covered children as patients between 1998 and 2000 (and in Alabama, continuing through the second quarter of 2001). Measures are taken for each of these communities for each quarter of the time period. We define these communities as clusters of zip codes that share a common post office delivery name. Zip codes that share a common post office delivery name are geographically contiguous and represent a widely identifiable, unique location. We further divide the two largest communities in these states, Birmingham and Atlanta, into four and five subareas, respectively, by examining how Medicaid-participating physician sites are clustered geographically across the zip codes included in these cities. We extend the study period through the first two quarters of 2001 in Alabama in order to capture the effects of a large increase in Medicaid primary care fees implemented in the state in October 2000.

We use Medicaid claims data to construct three measures of physician office site participation for each community in each quarter. Medicaid-paid claims data for children ages 0–18 are aggregated first to the visit level (one record per child per day per provider site), then to the provider site level (one record per unique provider site, for example, physicians with offices in two different locations have two site records), and finally to the community level. We use only claims for primary care services, defined as claims with procedure codes for evaluation and management, preventive care services—including Early Periodic Screening Detection and Treatment (EPSDT) visits and visits with a diagnosis indicating well-child care—and emergency services. We designate physician sites as hospital-based if the sites had no office place of service recorded on any submitted claim. We further differentiate between "limited sites" with Medicaid visit volumes less than one percent of the average visit volume for physicians in the Southeast (i.e., less than 66 visits annually, adjusted for the average number of sites per physician in the state and measured by quarters of the year), and larger sites. Since the number of sites per participating physician differed in the two states, sites in Georgia with less than 14 visits in the quarter and sites in Alabama with less than 9 visits in the quarter are considered limited Medicaid sites.

We use three measures of Medicaid participation as dependent variables for this study. The first measure, the Medicaid participation rate, is the ratio of participating office sites to the number of office-based physicians in the same community. This measure assesses whether the portion of physicians in the community who participate at all in the Medicaid program changes with S-CHIP expansion. The numerator for this rate is the number of Medicaid office sites in the community, derived from claims data in the quarter, while the denominator is the annual count provided by the American Medical Association (AMA) of the number of office-based primary care physicians located in the cluster of zip codes defined as the community.

The second measure of Medicaid participation is the mean Medicaid visit volume per participating office site in the community, and the third measure is a count of the number of Medicaid-participating physician sites in the community that were limited in size, as defined above. Both of these measures assess whether participating physicians alter the extent of their Medicaid practices, as opposed to entering or withdrawing from the program altogether. Reducing the size of a physician Medicaid practice, without withdrawing from the program altogether, is a common strategy among physicians for limiting Medicaid participation in response to pressures such as low reimbursements and market demands (Perloff, Kletke, and Fossett 1995). The mean office volume measure was calculated from claims data as the total number of Medicaid office visits made in the quarter to providers in the community, divided by the number of participating office-based providers in the community in the quarter. This measure assesses the extent to which all of the participating physicians in the community are making a change in their Medicaid practice volumes. The count of limited practice sites measure is the number of sites in the community below the threshold visit-volume level. This count does not reflect any changes in the overall number of Medicaid participating sites or overall visit volume occurring in the community, but it does indicate the propensity for office physicians in practice in the community to serve a very small number of Medicaid patients in their caseloads. Taken together, the three measures assess different aspects of office-based physician Medicaid participation and must be examined together to understand the full impact of market changes on Medicaid participation.

The independent variables used in this study are designed to reflect characteristics of the market area served by each community's participating providers. We define the market area as the set of zip codes from which all providers in the community draw 80 percent of their Medicaid patients over the study period. Each zip code is given a weight for each provider community, based on the share of the community's total Medicaid market that patients from the zip code represent. Demographic characteristics are measured at the zip code and quarter level, where possible, then weighted and summed to represent characteristics of each provider market. This method follows a growing set of literature recognizing the importance of patient flows in defining markets and that market areas tend to overlap (Baker 2001).

Key independent variables in this analysis are the percent of S-CHIP enrollees and the percent of Medicaid enrollees of the child population in the communities' market areas by quarter. These data are derived from the states' S-CHIP and Medicaid enrollment files, divided by census data population counts for children in each zip code. Additional control variables, based on zip-code-level projections from the 1990 census (from data provided by Consolidated Analysis Centers, Inc. [CACI] in Arlington, VA), include the total population under age 19, median household income, and whether the portion of the population identified as African American in the census exceeds 30 percent (the 75th percentile of the distribution of the portion of African American across counties in the two states). The number of primary care office physicians per capita (number of children) in each zip code is derived from a combination of AMA Masterfile data and census data. All of the zip-code-based measures are aggregated to the provider community market level, as described above. Presence of a federally subsidized clinic participating in Medicaid is derived from claims data and linked to each community, as is the extent of health maintenance organization (HMO) enrollment, as reported on an MSA (Metropolitan Statistical Area) basis by InterStudy. Communities are identified as urban if they were located in counties that were part of MSAs. These population, income, demographic, insurance, and other provider measures are included to control for the potential level of private and public market demand and the level of competition for service to these patients by other care providers.

To control for the other important factor in physician decisions concerning Medicaid participation, the relative generosity of Medicaid reimbursement, we calculated an index of Medicaid to private insurance fees for each community in each quarter. Private insurance fee data were purchased from CareData, a proprietary source of information on prevailing physician charges in broad geographic area (three-digit zip clusters) in each state for the three years of the study. We identified a set of CPT4 evaluation/management codes (99201-4; 99212-14) found with frequency (20 or more) in both Medicaid claims and in the private insurance fee datasets. The ratio of the Medicaid to private payment level was calculated for each procedure code based on the median reimbursement for the procedure in the market, as recorded in Medicaid claims data, divided by the 80th percentile of the billed rate for the procedure in the CareData dataset. This assumes that actual reimbursement for physician services averages about 80 percent of billed charges. These ratios were calculated for each quarter, and weighted based on their frequency of occurrence in each quarter in each geographic area. The sums of these weighted frequencies thus represent the relative generosity of Medicaid fees compared to private reimbursement levels for a "market basket" of commonly provided procedures on a geographically specific quarterly basis.

We estimate fixed-effect log linear regression models to test the association between the level of S-CHIP enrollment and the three Medicaid participation measures for office-based physicians in each community. The fixed effects in these models control for unobserved community characteristics that are constant over time. Our regressions also include time dummies for each quarter over the three-year 1998–2001 period, as well as all independent variables described above. All three dependent variables were estimated in log form to reduce the skewing effect of very small or very large counts or ratios. Following the literature on physician Medicaid participation that indicates contrasts between rural and urban areas in the size and residential segregation of markets for Medicaid services (Fossett and Peterson 1989; Adams 1995), we modeled rural and urban communities separately. Following earlier studies (Adams 2001), we tested for interactions between the relative generosity of Medicaid fee schedules and the density of the African American population in the markets, as a proxy for residential segregation of low-income populations in neighborhoods distinct from the locations of physician practices. Significant interactions suggest that the effect of relative generosity of Medicaid fees is mediated by the demographic composition of the market.

RESULTS

Table 1 shows the number of Medicaid-participating physician sites and the number of Medicaid and S-CHIP enrollees in Alabama over the 14 quarters of the calendar years 1998 to mid-2001. The 2000 census shows that Alabama had a population of 1,188,274 children under age 19; Medicaid child enrollees comprise approximately 30 percent and S-CHIP enrollees comprise approximately 2 percent of this population by the end of the year 2000. The number of Medicaid-participating physician sites declined by 17 percent to the first quarter of 2000, and then increased 3 percent, for a net decline of 14 percent

Table 1: Alabama Medicaid Physician Sites and Program Enrollment

Quarter	*Rural Office MD Sites*	*Urban Office MD sites*	*Rural Medicaid Enrollees*	*Urban Medicaid Enrollees*	*Rural S-CHIP Enrollees*	*Urban S-CHIP Enrollees*
1	2,183	799	104,655	215,224	0	0
2	2,206	777	108,555	222,817	0	0
3	2,157	800	113,037	234,273	0	0
4	2,076	776	114,414	237,386	4,337	12,623
5	2,046	753	117,894	245,489	5,391	15,219
6	1,998	773	114,630	239,056	6,884	19,001
7	1,990	743	114,291	239,733	5,656	15,109
8	1,897	735	113,213	238,804	7,963	20,100
9	1,781	696	112,780	236,590	8,470	21,093
10	1,815	726	108,144	227,125	9,110	22,245
11	1,863	742	114,448	239,974	8,937	21,728
12	1,823	716	112,167	235,306	8,764	21,210
13	1,872	744	110,491	232,847	7,930	19,184
14	1,838	727	115,465	244,054	7,183	17,555

Table 2: Georgia Medicaid Physician Sites and Program Enrollment

Quarter	*Rural Office MD Sites*	*Urban Office MD sites*	*Rural Medicaid Enrollees*	*Urban Medicaid Enrollees*	*Rural S-CHIP Enrollees*	*Urban S-CHIP Enrollees*
1	3,345	715	457,357	263,918	0	0
2	3,209	690	453,756	262,146	0	0
3	3,061	662	494,783	288,188	0	0
4	3,036	647	470,827	274,753	2,708	5,775
5	2,864	617	406,895	229,185	2,708	5,775
6	2,800	610	402,679	225,291	11,569	19,813
7	2,778	593	402,686	223,723	17,155	27,586
8	2,856	596	400,250	220,722	22,740	35,850
9	2,591	556	370,048	203,262	27,968	44,742
10	2,494	523	364,786	198,516	35,350	54,564
11	2,454	523	376,223	207,503	41,229	61,457
12	2,360	516	374,835	205,542	45,998	67,711

over the three-year period. On the other hand, the number of Medicaid enrollees increased by 12 percent over this period.

Table 2 shows the same data for Georgia over the 12 quarters of the calendar years 1998–2000. The 2000 census shows that Georgia had a population of 2,289,159 children under age 19; Medicaid child enrollees comprise approximately 25 percent and S-CHIP enrollees comprise approximately 5 percent of this population by the end of the year 2000. The number of Medicaid participating office physician sites declined by 29 percent over this three-year period while the number of Medicaid child enrollees declined by 20 percent.

Table 3 shows the mean values for the community Medicaid participation measures and the market-level independent variables. These data show a slightly higher physician participation ratio and a markedly higher Medicaid fee index in Alabama compared to Georgia. Alabama also had more communities with federally subsidized clinics and smaller average Medicaid physician visit volumes per office site than in Georgia. In both states, urban areas had more limited Medicaid physician practice sites, a smaller portion of children enrolled in Medicaid in their market, many more physicians per capita, higher median incomes, and fewer communities with a high concentration of African Americans in the population.

Tables 4 and 5 show the results of multivariate analyses modeling the impact of changes over time in the portion of children enrolled in Medicaid and S-CHIP programs on the physician Medicaid participation measures. These fixed-effects regressions also included community characteristics that change over time and dummies for each quarter.

In Alabama (Table 4), changes in the portion of children enrolled in the freestanding S-CHIP had no significant effect on physician participation rates or average Medicaid visit volumes in either rural or urban communities. In rural areas there was also no effect of changes in the portion enrolled in S-CHIP on the number of physicians with limited Medicaid practices; in urban areas there was a slight increase in the number of communities with limited-size Medicaid practices ($p = .09$). This is consistent with our prediction of the lack of effect of S-CHIP on the Medicaid provider network when S-CHIP enrollees access care through physicians outside the Medicaid network. In urban communities, relative generosity of fees had the expected effect; they were strongly associated with a larger proportion of physician practices participating in Medicaid and with larger average Medicaid practice volumes. There was no difference in the impact of these fees between areas with higher and lower proportions of African Americans. Higher physician participation rates were more common in urban communities with a higher concentration of African American residents. Also in those urban communities where a larger portion of children in the market were enrolled in Medicaid, more physicians participated in Medicaid and maintained larger practices. Medicaid participation rates, mean Medicaid visit volumes, and the total number of limited practices in urban communities were positively associated with a greater penetration of HMO coverage, perhaps indicating decreased private

Table 3: Mean Values of Community Medicaid Participation Measures and Market-Level Characteristics, 1998–2001

	Alabama		*Georgia*	
	Rural N = 151 Communities, 14 Quarters Mean (SE)	*Urban N = 110 Communities, 14 Quarters Mean (SE)*	*Rural N = 195 Communities, 12 Quarters Mean (SE)*	*Urban N = 100 Communities, 12 Quarters Mean (SE)*
Number limited	2.7 (5.7)	13.7 (32.5)	3.7 (8.7)	17.3 (36.7)
Ratio participating sites to primary care MDs	1.3 (2.4)	1.6 (3.4)	1.1 (1.9)	1.0 (1.3)
Mean MC office visit volume	56.8 (86.2)	42.9 (65.7)	71.2 (86.3)	62.2 (66.4)
% communities with clinic	48.1% (50.0)	30.2% (10.8)	16.1% (36.8)	11.7% (32.1)
Median household income	$25,892 (5,153)	$31,434 (5,707)	$28,954 (5,886)	$39,713 (9,522)
% with > 30% African American population	28.8% (25.9)	21.9% (17.4)	31.8% (19.3)	23.2 (17.4)
Ratio Primary care physicians per 100,000 children	162.7 (103.7)	571.3 (2004.8)	181.7 (133.8)	804.3 (4543.7)
% Medicaid children	43.3% (17.4)	30.8% (10.8)	43.7% (13.0)	29.9% (12.6)
% S-CHIP children	2.5% (1.8)	2.1% (1.4)	3.1% (3.3)	2.2% (2.1%)
% HMO enrollment	0.7% (3.3)	11.3% (9.9)	1.0% (4.5)	17.3% (13.7)
Mean fee index	72.3 (9.3)	73.6 (9.8)	61.0 (3.5)	59.3 (3.9)

Table 4: Alabama: Multivariate Analysis of the Impact of Public Insurance Enrollment on Physician Medicaid Participation over Time

	Rural Communities *N* = *2,114*			*Urban Communities* *N* = *1,540*		
	Participation Rate	*Average MC Visit Volume*	*Number Limited Offices*	*Participation Rate*	*Average MC Visit Volume*	*Number Limited Offices*
% S-CHIP of all children in market	0.033 (.050)	0.026 (.067)	0.010 (0.081)	0.054 (0.099)	0.161 (0.135)	0.258* (0.154)
Fee ratio in low AA markets	1.165 (2.583)	– 0.107 (3.409)	0.977 (4.131)	13.461** (5.651)	21.807*** (7.699)	9.377 (8.818)
Difference in fee ratio in high AA markets	0.007 (0.937)	– 0.671 (1.236)	– 2.461 (1.498)	– 1.059 (1.503)	– 0.010 (2.047)	– 1.149 (2.344)
High AA community	– 1.956** (0.827)	– 2.834*** (1.091)	2.414* (1.322)	2.849** (1.286)	2.064 (1.751)	1.679 (2.005)
% Medicaid of all children in market	0.011 (0.007)	0.012(0.010)	– 0.003 (0.012)	0.045*** (0.016)	0.056*** (0.021)	– 0.033 (0.024)
Median household income	– 1.97^{e-5} (1.82^{e-5})	– 6.69^{e-6} (2.40^{e-5})	– 1.19^{e-5} (2.91^{e-5})	4.75^{e-5} ** (2.40^{e-5})	5.63^{e-5}* (3.27^{e-5})	11.180 ^{e5}*** (3.75 $^{e-5}$)
Primary care office MD per capita	0.004*** (0.001)	0.002* (0.001)	0.0004 (0.0018)	– 2.89^{e-4} (3.09)$^{e-4}$	3.14^{e-4} (4.21^{e-4})	0.766^{e4} (4.821^{e4})
HMO penetration	– 0.127*** (0.042)	– 0.193*** (0.055)	– 0.145** (0.067)	0.094**** (0.018)	0.101**** (0.025)	0.062** (0.028)
Clinic in community	– 0.401** (0.171)	– 0.791**** (0.225)	0.204 (0.273)	– 0.421 (0.314)	– 0.786* (0.428)	– 0.815* (0.491)

*$p<.10$;
**$p<.05$;
***$p<.01$;
****$p<.001$.

Table 5: Georgia: Multivariate Analysis of the Impact of Public Insurance Enrollment on Physician Medicaid Participation over Time

	Rural Communities N = 2,255			*Urban Communities N = 1,180*		
	Participation Rate	*Avg. MC Visit Volume*	*Number Limited Offices*	*Participation Rate*	*Avg. MC Visit Volume*	*Number Limited Offices*
% S-CHIP of all children in market	– 0.040	0.005	0.021	– 0.342****	– 0.618****	– 0.124
	(0.033)	(0.044)	(0.052)	(0.078)	(0.125)	(0.124)
Fee ratio in low AA markets	– 4.134	– 2.770	8.162	– 0.984	– 2.153	5.750
	(6.613)	(8.964)	(10.487)	(9.641)	(15.503)	(15.393)
Difference in fee ratio in high AA markets	– 0.429	1.658	– 3.980	– 6.915*	– 10.634*	– 3.088
	(2.592)	(3.514)	(4.111)	(3.650)	(5.869)	(5.828)
			– 3.087			
			(5.828)			
High AA community	0.159	– 1.511	2.481	4.477**	6.636*	1.023
	(1.591)	(2.156)	(2.522)	(2.213)	(3.558)	(3.533)
% Medicaid of all children in market	0.023**	0.015	– 0.011	– 0.030	– 0.057*	– 0.028
	(0.009)	(0.013)	(0.015)	(0.021)	(0.034)	(0.034)
Median household income	-1.25^{e-5}	-1.32^{e-5}	1.380^{e5}	3.71^{e-6}	2.11^{e-5}	5.640^{e5}
	(2.26^{e-5})	(3.07^{e-5})	(3.590^{e5})	(2.56^{e-5})	(4.11^{e-5})	(3.590^{e5})
Primary care office MD per capita	-19.18^{e-4}***	2.85^{e-4}	0.001	-3.69^{e-5}*	8.11^{e-6}	3.70^{e7}
	(5.73^{e-4})	(7.77^{e-4})	(0.001)	(2.21^{e-5})	(3.55^{e-5})	(3.53^{e5})
HMO penetration	0.102	0.140	0.066	– 0.014**	– 0.016*	– 0.019**
	(0.094)	(0.127)	(0.149)	(0.006)	(0.009)	(0.009)
Clinic in community	– 0.104	– 0.224	– 0.134	– 0.271	– 0.765	– 0.027
	(0.408)	(0.553)	(0.648)	(0.937)	(1.506)	(1.496)

*$p<.10$;
**$p<.05$;
***$p<.01$;
****$p<.001$.

demand for some physician services, while Medicaid visit volumes and the number of limited practices were negatively associated with the presence of a federally subsidized clinic, suggesting that the two sources of care are substitutes serving the Medicaid market.

In contrast to all of these findings, in rural communities in Alabama, neither the relative generosity of Medicaid fees nor the size of the local Medicaid population was associated with Medicaid physician participation. Fewer physicians participated in Medicaid, physician participants had smaller Medicaid practices, and more physicians had limited-size practices in communities that had a high portion of African American residents and communities with more HMO penetration. Participation rates were lower and Medicaid practice sizes were smaller in communities with federally subsidized health clinics, but were higher in communities with relatively more physicians per capita.

In Georgia (Table 5), where the same physician network serves both Medicaid and S-CHIP enrollees, fewer urban physician sites participated in Medicaid and average Medicaid practice volumes decreased as the S-CHIP enrollment increased. This is consistent with our prediction that physician participation in Medicaid may decline when more patients are accessing the network, especially when fees are held constant. As Table 3 showed, generosity of fees was low and there was less variation over the study period in Georgia, compared to Alabama. Higher Medicaid fee ratios were not associated with more physician Medicaid participation in urban areas, and had significantly less positive association in communities with high black populations, as the hypotheses concerning residential segregation predicts. As in urban Alabama, urban Georgia communities with a higher concentration of African American residents in the market had higher Medicaid participation rates and also had higher average Medicaid visit volumes than other urban communities. Average visit volume was slightly lower in areas with more Medicaid children; if there were excess demand in these urban areas, increases in enrollees would not increase physician participation or volume. Higher penetration of HMOs in urban markets was associated with lower participation rates, smaller Medicaid visit volumes, and fewer limited practices, while the presence of more physicians per capita in the market was associated with lower participation rates.

In rural Georgia communities, Medicaid participation rates were higher where there was a relatively larger portion of Medicaid-covered children in the market. As in urban areas, participation rates were lower in communities with more physicians per capita in the market.

DISCUSSION

Controlling for the many measured and unmeasured community factors that are associated with Medicaid physician participation, this study finds different effects of the growth in state S-CHIP enrollments on physician Medicaid participation in two states with different S-CHIP structures. In Alabama, with a freestanding S-CHIP program that was not dependent on preexisting Medicaid provider networks, growth in S-CHIP enrollment was marginally associated only with an increase in the number of very small Medicaid practices in urban areas. While to participating physicians, this program appeared more like an increase in private demand, it was not large enough to alter most physicians' Medicaid supply decisions. In Georgia, with a Medicaid look-alike S-CHIP program that relied on the Medicaid provider network, growth of the S-CHIP program was associated with declines in physician participation rates in urban areas. The S-CHIP expansion may have only added to preexisting excess Medicaid demand without altering other incentives that would encourage physician Medicaid participation. Average Medicaid visit volumes also declined in urban areas, as the same group of physicians began to provide care for newly enrolled S-CHIP clients; this actually implies a "displacement" of Medicaid with S-CHIP enrollees in these areas. However, Medicaid participation rates, visit volumes, and practice size were not significantly associated with increased S-CHIP enrollment in rural Georgia.

Medicaid participation among urban physicians in Alabama responded to other community factors largely as expected from the literature on dual-market models of Medicaid participation. Rural physician Medicaid participation was more related to the presence of other providers in the community (higher participation rates where there were more physicians, lower participation rates where there were subsidized clinics) and was also lower in areas with a high concentration of African American residents.

Medicaid physician participation in Georgia was not positively responsive to higher fees, possibly because fees did not vary substantially over the period we observed. Instead, across both urban and rural communities, Medicaid participation rates were lower where there were more physicians per capita. The finding of lower Medicaid participation rates in communities with more physicians per capita is counterintuitive, since more competition would reduce private demand per physician. However, this phenomenon has been widely observed in the literature on Medicaid participation especially in cross-sectional studies, which cannot control for unobserved characteristics of communities positively associated with physician location but negatively with Medicaid participation (e.g., percent privately insured). Fossett and Peterson (1989) also discuss that higher physician per capita rates tend to occur in areas with strong private demand but that residential segregation in these areas can isolate low-income residents apart from physician practice locations, making it difficult for physicians to serve Medicaid clients in combination with private clients. Along these same lines, physician Medicaid participation was higher in Georgia urban communities with higher concentrations of African American residents, and in rural communities with more Medicaid enrollees in the market area. These findings suggest that some Georgia physicians respond to Medicaid demand by practicing in high-demand areas, while the majority cluster their services in areas with higher private market demand.

In conclusion, while the choice of states to use S-CHIP monies to expand eligibility for Medicaid programs or to take advantage of existing Medicaid administrative structures for their new S-CHIP programs has some potential efficiency advantages (Rosenbaum et al. 1998), adding more children to a provider system that is either static or declining in size, due to many community and program factors, can disadvantage children already in Medicaid. This occurs especially if the expansion of eligibility for public insurance is not accompanied by a fee increase that would alter the balance in public and private revenues. This negative impact on Medicaid programs was not observed for the freestanding S-CHIP program we examined, and may be an advantage for freestanding programs in general, especially, again, if this expansion is accompanied by increased Medicaid fees. Covering additional children with publicly sponsored insurance will not automatically assure improvements in access to care unless an adequate provider system is available to provide that care.

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