

# Which Physicians Limit Their Medicaid Participation, and Why

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**Objective.** This study identifies factors differentiating Medicaid participating physicians who accept all Medicaid patients from those limiting their Medicaid participation.

**Data Sources.** Data come from periodic telephone surveys of random samples of physicians conducted by the American Medical Association (AMA).

**Study Design.** Surveys conducted in 1990–1993 were pooled to form a sample of 4,188 Medicaid-participating office-based physicians. Respondents were classified as accepting all Medicaid patients or as limiting their Medicaid participation. Descriptive statistics are used to examine differences between these groups with respect to selected personal, practice, community, and reimbursement variables. Logistic regression analysis is used to identify factors associated with physicians accepting all Medicaid patients or limiting their Medicaid participation in some way.

**Data Collection Methods.** Survey data were supplemented with 1990 census data, 1990 AMA Physician Masterfile data, and 1989 data on physician payment levels.

**Principal Findings.** Less than half of Medicaid-participating physicians and only about one-third of participating primary care physicians accept all Medicaid patients. Higher Medicaid fees are associated with physicians participating fully, but the marginal effects of changes in fees on the probability of physicians participating fully is small.

**Conclusions.** Increases in Medicaid reimbursement aimed at primary care physicians or those in underserved areas may convert limited participants into full participants and, in so doing, improve the access of Medicaid eligibles to care. The increases in payment level needed to increase the proportion of physicians participating fully would be substantial, however, and may not be politically feasible.

**Key Words.** Medicaid; access to care; physician reimbursement

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There is widespread agreement that Medicaid eligibles often have inadequate access to health care and that they have particular difficulties gaining access to the care of private, office-based physicians. The program's low reimbursement levels are the most often cited factor in physicians'

reluctance to accept patients whose care is paid for by Medicaid. The equal access provision of the Omnibus Budget Reconciliation Act of 1989 (OBRA-89) brought renewed attention to this issue. The provision required that states demonstrate to the Health Care Financing Administration (HCFA) that payment levels for pediatric and obstetric services are sufficient to ensure access. One of several ways that states can establish compliance with the equal access provision is by demonstrating that "at least 50 percent of obstetric practitioners and at least 50 percent of pediatric practitioners are full Medicaid participants or there is full Medicaid participation at the same rate as Blue Shield participation" (Physician Payment Review Commission 1993).

Since most states rely on claims data to measure access, they have been unable to measure whether physicians accept all Medicaid patients who come to them (full participants), or limit their Medicaid participation in some way (limited participants). Nonetheless, HCFA's criteria underscore the notion that, regardless of the number of Medicaid patients physicians actually see, access to care is maximized by unrestricted participation in Medicaid by office-based physicians.

This article, which extends earlier research (Davidson et al. 1983; Perloff et al. 1987), presents evidence concerning physicians' decisions to be full or limited Medicaid participants. We begin by describing patterns of full and limited Medicaid participation in a national sample of office-based physicians in 1990-93. Logistic regression analysis is used to identify factors influencing physician decisions to be full or limited Medicaid participants and to highlight the role of Medicaid reimbursement levels in this decision. We conclude by considering the implications of our findings for efforts to improve access to care.

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The views expressed in this article are those of the authors and do not necessarily represent the official position of the University at Albany or the American Medical Association.

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## METHODS

The data for this study come from the American Medical Association (AMA) Socioeconomic Monitoring System (SMS), a series of periodic telephone surveys of active, nonfederal, postresident patient care physicians (Gonzalez 1991). These surveys provide an unbroken series of data describing practice characteristics of nationally representative samples of office-based physicians.

Samples for the SMS surveys are drawn from the AMA Masterfile, which lists the entire U.S. physician population, including both members and nonmembers of the AMA. Each core survey collects data from a random sample of approximately 4,000 physicians. Response rates to the SMS surveys vary, but they are typically around 65 percent. This study analyzes data from the SMS core surveys for years 1990 through 1993. By pooling multiple survey years we obtained a sample large enough to permit analyses of Medicaid participation by specialty.<sup>1</sup> Our sample data were weighted to match the composition of the comparable Masterfile population with respect to several key physician characteristics.<sup>2</sup>

Since 1990, each SMS core survey has asked physicians the following question: "At this time, do you accept all *new* Medicaid patients who come to you, some, or none?" We use the responses to this question to divide physicians participating in Medicaid into two groups, full and limited participants. *Full participants* are those physicians who participate in Medicaid and accept all new Medicaid patients. *Limited participants* are physicians who participate in Medicaid but accept only some new Medicaid patients or none at all.

As Table 1 indicates, we did not use the entire population of SMS respondents in our analysis. First, we excluded radiologists, anesthesiologists, and pathologists from the analysis because the SMS survey did not ask these physicians about whether they accepted new Medicaid patients. Second, we excluded physicians who were employees and those in practices with ten or more physicians (23 percent of SMS respondents). Our reasons for excluding physicians practicing in large groups were both theoretical and substantive: (1) our underlying theoretical framework was developed to explain individual rather than organizational behavior, and (2) these physicians are likely to have little individual discretion over their Medicaid participation.<sup>3</sup> Thus, our analysis is restricted to self-employed, office-based physicians in solo or group practices with fewer than ten physicians.

Table 1: Distribution of SMS Respondents from 1990 through 1993 by Type of Medicaid Participation

	<i>Distribution of SMS Respondents</i>	
	<i>Number</i>	<i>Percent</i>
Total*	9,243	100.0%
Employees	2,117	22.9
Self-employed, large groups	431	4.7
Self-employed, solo/small groups	6,695	72.4
• Nonparticipant	2,414	26.1
• Participant, accepts no new patients	93	1.0
• <b>Participant, accepts new patients (in-scope population)</b>	<b>4,188</b>	<b>45.3</b>
<b>Limited participant</b>	<b>2,238</b>	<b>24.2</b>
<b>Full Participant</b>	<b>1,950</b>	<b>21.1</b>

\*SMS respondents are drawn from the universe of active, nonfederal, patient care, postresident physicians. Physicians in radiology, anesthesiology, and pathology have been excluded from the table.

Third, we excluded physicians who were treating a very small number of Medicaid patients, defined here as physicians who received less than 2 percent of their practice revenues from Medicaid (26 percent of SMS respondents).<sup>4</sup> Finally, we excluded physicians who did not accept at least some new patients (either Medicaid or non-Medicaid) at the time of the survey (an additional 1 percent of SMS respondents). The remaining 45 percent of SMS respondents were included in our analysis.

## DETERMINANTS OF FULL AND LIMITED PARTICIPATION: THEORETICAL FRAMEWORK, MEASUREMENT, AND DATA SOURCES

The theoretical framework for our descriptive and multivariate analyses of full and limited Medicaid participation is adapted from the two-market demand model (Sloan, Cromwell, and Mitchell 1978). The framework, measures, and data sources are now described.

*Level of Payment for Physician Services.* Two-market theory posits that physicians operate in a price-setting market (such as the private health insurance market) in which they essentially set prices for their services, and

a price-taking market (such as the Medicaid market) in which they accept predetermined fees as payment in full. The theory predicts that physicians will continue to prefer patients from the more lucrative price-setting market as long as expected revenues exceed those from Medicaid patients.

Our model includes 1989 state-level Medicaid payments for an intermediate office visit with an established patient and, as a proxy for private payments, comparable Medicare allowed charges (Physician Payment Review Commission 1991). Medicare payments are not an optimal proxy for private payments because evidence suggests that in recent years the former have not risen as sharply as the latter. Few data sources for measuring private payment levels are available, however. Medicare payment data are therefore used as a proxy for private payments, although appropriate caution is needed in interpreting our results. We deflated both the Medicaid and Medicare fees data with a geographic cost index in order to take into account geographic differences in practice costs (Zuckerman, Welch, and Pope 1990).

*Physician Characteristics.* Two-market theory predicts that physicians with relatively low demand for their services in the non-Medicaid market will be most likely to participate in Medicaid. Consequently, Medicaid participation is predicted to be higher for physicians who are not board certified, for physicians who are graduates of foreign medical schools, for less well established physicians, and for women physicians. Our regression analysis includes variables measuring each of these characteristics.<sup>5</sup>

A large body of research has shown that physician participation in Medicaid varies significantly by specialty and by whether the practice is solo or group (Davidson et al. 1983; Perloff, Kletke, and Neckerman 1987; Sloan, Cromwell, and Mitchell 1978; Fossett et al. 1992; Fossett and Peterson 1989). Dichotomous variables measuring these practice characteristics are also entered into our analysis.

*Demand from the Non-Medicaid Market.* Higher demand from the non-Medicaid market is expected to be inversely associated with Medicaid participation. We use the per capita income of the population in a physician's practice area to capture the demand for services from the non-Medicaid population, entering into the analysis the average 1990 income in the zip code area of the physician's main practice.<sup>6</sup>

*Characteristics of the Health Care Delivery System and the Community of Practice.* Two-market theory posits that physician participation in Medicaid will be inversely related to the level of competition among physicians for non-Medicaid patients. Therefore, it is predicted that Medicaid participation

will be highest in communities that have the highest relative supply of physicians and, in particular, in large metropolitan areas where the supply of health care resources is most plentiful. We include in our analysis the number of primary care physicians per 100,000 population for the county in which the physician practices.<sup>7</sup> We also include dichotomous variables to denote physicians in nonmetropolitan areas and physicians in metropolitan areas with populations under 1 million (leaving as the reference category physicians in large metropolitan areas with populations over 1 million).

Past research indicates that the effects of competition on physician participation in Medicaid often run counter to the hypotheses of the two-market theory: a variety of analyses indicate that Medicaid participation is lowest in large metropolitan areas and in communities with high physician-to-population ratios. Fossett and Peterson (1989) have suggested that this finding is the result of the high degree of economic and racial residential segregation in many large metropolitan areas. Since physicians tend to locate in upper-income areas, far from the residences of most Medicaid patients, participation in Medicaid may be low despite an apparently generous supply of physicians. In order to capture the effects of residential segregation on participation, we include in our analysis the percent nonwhite population in 1990 for the county in which the physician practices.

*Control Variables.* Because the logistic regression analysis examines SMS data pooled over four years, we include in the analysis dichotomous variables denoting the last three survey years, 1991 through 1993.

*Hazard Rate.* Since our sample is restricted to Medicaid participants, the physicians included in our analysis do not constitute a random sample. As a result, it is necessary to control for selection bias (Berk 1983). The need to control for selection bias arises because error terms in a model predicting whether physicians are Medicaid participants (and thus eligible to be included in our analysis) are likely to be correlated with error terms for the determinants of whether physicians are full or limited participants. If we did not control for selection bias, our analysis would yield inconsistent estimates for regression coefficients.

Heckman (1979) has shown that selection bias is identical in nature to bias from an excluded variable and that regression analyses will yield consistent results when the hazard rate—the probability of a given observation being excluded from the analysis—is included in the analysis. Following this technique, our analysis controls for potential bias due to nonrandom sample selection by including in the model a selection term: the probability of a given observation being excluded from the analysis.<sup>8</sup>

## RESULTS OF DESCRIPTIVE ANALYSES

Descriptive analyses indicate that 2,414 physicians, or 34 percent of self-employed physicians practicing in solo or small group practices, were not Medicaid participants in 1990–1993 and that fewer than half of the participating physicians (46 percent) were full participants in state Medicaid programs. Nonprimary care physicians were considerably more likely to be full participants (56 percent) than were their primary care counterparts (36 percent). Full Medicaid participation was also strongly associated with practicing in a small or nonmetropolitan area. The proportion of participating physicians who were full participants was 56 percent in nonmetropolitan areas, 46 percent in small metropolitan areas (with populations of less than 1 million), and only 41 percent in large metropolitan areas.

Full and limited Medicaid participation appear to be an important determinant of the extent of a physician's involvement in serving the Medicaid population, measured here as the proportion of gross revenues received from Medicaid.<sup>9</sup> On average, in 1990–1993, the physicians in our sample received 12.4 percent of their revenues from Medicaid. Those who participated fully received an average of over 15 percent of their practice revenues from Medicaid, however, while their limiting counterparts received less than 10 percent of their practice revenues from Medicaid. In general, primary care physicians received a larger proportion of their practice revenues from Medicaid (15.7 percent) than did non-primary care physicians (9.1 percent). Among primary care physicians, those who participated fully received nearly 24 percent of their revenues from Medicaid, while their limiting counterparts received less than half that much. Among nonprimary care physicians, full participants received over 10 percent of their revenues from Medicaid, while limited participants received only 7.5 percent of their revenues from Medicaid.

Table 2 shows that the proportion of physicians who were participating fully in Medicaid in 1990–1993 varied significantly by specialty. Among physicians in the primary care specialties, the proportion who were full participants ranges from a high of 44 percent for pediatrics to a low of 31 percent for general internal medicine. Among physicians in the non-primary care specialties, the proportion who were full participants ranges from a high of 71 percent for general surgery to a low of 28 percent for psychiatry. Few other statistically significant differences between full and limited participants are depicted in Table 2.

Table 2: Proportion of Medicaid Participating Physicians Who Are Full Participants: Physician and Practice Characteristics

	<i>Primary Care</i>	<i>Nonprimary Care</i>	<i>Sample Size</i>
Total	36.4	55.9	4085
<b>Specialty</b>			
General/Family practice	39.2	—	695
General internal medicine	30.6	—	590
Pediatrics	43.5	—	374
Obstetrics/Gynecology	34.7	—	335
Medical subspecialties	—	45.7	317
General surgery	—	70.5	407
Surgical subspecialties	—	57.9	935
Psychiatry	—	27.7	192
Other specialties	—	59.9	240
	( <i>p</i> < .001)	( <i>p</i> < .001)	
<b>Country of Medical Education</b>			
U.S. medical graduate	33.7	58.2	3169
Foreign medical graduate	43.5	47.2	916
	( <i>p</i> < .001)	( <i>p</i> < .001)	
<b>Board Certification</b>			
Not certified	44.7	52.5	963
Certified	32.4	56.7	3122
	( <i>p</i> < .001)	( <i>p</i> = n.s.)	
<b>Physician's Sex</b>			
Male	36.6	56.6	3737
Female	34.6	42.6	348
	( <i>p</i> = n.s.)	( <i>p</i> < .01)	
<b>Years in Practice</b>			
0-9	33.3	54.5	1180
10-19	35.7	55.5	1559
20-29	39.6	55.5	799
30+	40.7	62.2	547
	( <i>p</i> = n.s.)	( <i>p</i> = n.s.)	
<b>Type of Practice</b>			
Self-employed, solo	38.2	52.0	2242
Self-employed, small group	34.0	60.8	1843
	( <i>p</i> = n.s.)	( <i>p</i> < .001)	
<b>Survey Year</b>			
1990	38.8	56.0	592
1991	39.1	57.6	1158
1992	34.0	54.7	1122
1993	35.0	55.3	1213
	( <i>p</i> = n.s.)	( <i>p</i> = n.s.)	

Note: Significance tests based on chi-squared tests.



Table 3 is a description of the relationship between full participation and community characteristics and payment levels among both primary care and non-primary care physicians in 1990–1993. As previously noted, full participation was most common in nonmetropolitan areas and least common in large metropolitan areas. However, as Table 3 indicates, the proportion fully participating was greater everywhere for non-primary care physicians than for primary care physicians.

For both primary care and nonprimary care physicians, we observe a curvilinear relationship between the proportion of physicians who participate fully and the proportion of the county population that was nonwhite in 1990: full participation was greatest among physicians practicing in counties with the smallest and the largest nonwhite population. Similarly, the proportion of physicians participating fully was generally greater in low-income communities, although these relationships were not always perfectly linear. We observe no statistically significant relationship between the supply of primary care physicians and the proportion of physicians participating fully. Finally, Table 3 indicates that higher Medicaid office visit fees were generally associated with significantly more full participation.

## RESULTS OF MULTIVARIATE ANALYSIS

Table 4 presents definitions of the variables included in the multivariate analysis and their sample means for primary care and non-primary care physicians. Table 5 presents the results of logistic regression analyses for primary care physicians and non-primary care physicians. Except for the dichotomous specialty variables, the independent variables in the two logistic regressions are identical.<sup>10</sup> Marginal effects for the independent variables are reported in Table 6. The marginal effects indicate the percentage point changes in the probability of full participation attributable to a unit change in each independent variable as calculated with all other independent variables at their sample means.

Table 5 indicates that Medicaid fees had a significant, positive effect on the proportion of both primary care and non-primary care Medicaid participants who were participating fully. The marginal effects (shown in Table 6) are quite small, however. If we were to increase Medicaid fees by one dollar, the probability of a primary care physician being a full participant would rise by only 1.02 percentage points, from 36.4 percent to 37.4 percent. Among non-primary care physicians the probability would rise by only 1.24 percentage points, from 55.9 percent to 57.1 percent.

**Table 3: Proportion of Medicaid Participating Physicians Who Are Full Participants: Community Characteristics and Payment Levels**

	<i>Primary Care</i>	<i>Nonprimary Care</i>	<i>Sample Size</i>
<b>Community Characteristics (N = 4169)</b>			
<b>Type of Community</b>			
Nonmetropolitan	47.4	68.2	873
Small metropolitan	33.5	57.2	1613
Large metropolitan	32.7	49.5	1683
	( <i>p</i> < .001)	( <i>p</i> < .001)	
<b>Percent Nonwhite, County</b>			
<5%	45.1	66.3	742
5%–10%	39.8	61.2	669
10%–20%	27.9	56.1	1070
20%–30%	34.2	47.4	830
>30%	38.4	52.2	858
	( <i>p</i> < .001)	( <i>p</i> < .001)	
<b>Per Capita Income, Zip Code</b>			
<\$10,000	46.2	55.4	589
\$10,000–\$15,000	36.8	60.2	1863
\$15,000–\$20,000	30.7	52.3	955
>\$20,000	33.9	50.9	762
	( <i>p</i> < .001)	( <i>p</i> < .01)	
<b>Primary Care MDs per 100,000 Population, County</b>			
<50	40.0	57.1	756
50–100	35.9	55.4	2801
100–150	35.8	60.0	488
>150	30.8	43.3	124
	( <i>p</i> = n.s.)	( <i>p</i> = n.s.)	
<b>Payment Levels (N = 4146)</b>			
<b>Medicaid Fee, Office Visit</b>			
<\$15	33.1	46.4	733
\$15–\$20	31.1	48.2	1358
\$20–\$25	36.4	64.2	1142
\$25–\$30	41.7	58.3	542
>\$30	53.2	74.6	371
	( <i>p</i> < .001)	( <i>p</i> < .001)	
<b>Medicare Fee, Office Visit</b>			
<\$20	54.5	37.2	48
\$20–\$25	33.6	51.5	1071
\$25–\$30	36.7	60.3	1832
>\$30	38.2	54.2	1195
	( <i>p</i> = n.s.)	( <i>p</i> < .001)	

Note: Significance tests based on chi-squared tests.

Table 4: Definitions and Means—Variables in the Logistic Regression Analysis ( $N = 4024$ )

		<i>Primary Care</i>	<i>Nonprimary Care</i>
		(N = 1957)	(N = 2067)
FULLIM	Full participation	0.366	0.559
OFFRMDCD	Medicaid fee—office visit	20.655	20.826
OFFRMDCR	Prevailing Medicare charges, office visit	28.027	28.387
GIM	General internist	0.336	0.000
PED	Pediatrician	0.171	0.000
OBGYN	Obstetrics/Gynecology	0.154	0.000
GENSURG	General surgeon	—	0.196
IMSUB	Medical subspecialty	—	0.168
SURSUB	Surgical subspecialty	—	0.436
PSYCH	Psychiatry	—	0.087
OTHERSP	Other specialty	—	0.113
FMG	MD grad of non-U.S. medical school	0.268	0.203
CERT	Physician is board certified	0.678	0.817
EXPER	Years in practice	16.623	16.252
EXPER2	Years in practice-squared	3.938	3.621
FEMALE	Physician is female	0.124	0.049
SOLO	Physician in solo practice	0.563	0.548
PRM-POP	Primary care MDs per 100,000 population	0.733	0.769
NONMET	Nonmetro area	0.244	0.172
SMLMET	Metro—under million	0.351	0.408
P-NONWHT	Percent nonwhite in county population	19.152	19.403
ZIPINCM	Per capita income (\$1000), zip code	15.099	16.202
YEAR91	1991 survey	0.277	0.300
YEAR92	1992 survey	0.290	0.259
YEAR93	1993 survey	0.295	0.290

Medicare-allowed charges (used as a proxy for fees paid by private health insurance) did not have the hypothesized negative effect on participation. As previously noted, this may be due to the fact that current Medicare payments are not an optimal proxy for private payments; there is considerable evidence that Medicare payments to physicians have not risen as much as those paid by private insurers. As a result, in the early 1990s, the Medicare fee for an office visit might not have differed enough from the Medicaid fee to cause physicians to decline full participation in

Table 5: Logistic Regression for Full versus Limited Medicaid Participation, 1990–1993

	<i>Primary Care</i>	<i>Nonprimary Care</i>
<i>Intercept</i>	-1.488* (.585)	-0.221 (.428)
<i>Fees†</i>		
<i>OFFRMDCD</i>	0.045** (.015)	0.050** (.019)
Medicaid fee: office visit		
<i>OFFRMDCR</i>	0.004 (.014)	-0.006 (.015)
Medicare fee: office visit		
<i>Specialty‡</i>		
<i>GIM</i>	-0.169 (.127)	-
General internal medicine		
<i>PED</i>	0.366 (.204)	-
Pediatrics		
<i>OBYN</i>	0.068 (.194)	-
Obstetrics/Gynecology		
<i>GENSUR</i>	-	-
General surgery		
<i>IMSUB</i>	-	-0.889**** (.216)
Medical subspecialties		
<i>SURSUB</i>	-	-0.509** (.196)
Surgical subspecialties		
<i>PSYCH</i>	-	-1.746**** (.411)
Psychiatry		
<i>OTHSP</i>	-	-0.265 (.232)
Other specialties		
<i>Physician Characteristics§</i>		
<i>FMG</i>	0.552** (.201)	-0.237 (.162)
Foreign medical graduate		
<i>CERT</i>	-0.441**** (.111)	-0.051 (.135)
Board certified		
<i>EXPER</i>	-0.010 (.015)	-0.020 (.018)
Years in practice		
<i>EXPER2</i>	0.053 (.039)	0.084* (.040)
Experience-squared		
<i>FEMALE</i>	-0.227 (.168)	-0.139 (.260)
Female MD		
<i>SOLO</i>	-0.048 (.129)	-0.266 (.138)
Solo practice		
<i>Community Characteristics/Type††</i>		
<i>PRM-POP</i>	0.309 (.196)	0.457* (.209)
Primary care MDs/100,000 population		
<i>NONMET</i>	0.403 (.398)	0.434 (.272)
Nonmetropolitan area		

*Continued*

Table 5: Continued

	Primary Care	Nonprimary Care
<i>SMLMET</i>	-0.039	0.117
Small metropolitan area	(.191)	(.143)
<i>PNONWHT</i>	0.002	-0.005
Percent county population nonwhite	(.005)	(.004)
<i>ZIPINCM</i>	-0.003	0.026*
Zip code per capita income	(.020)	(.013)
Survey Year $\ddagger\ddagger$		
<i>YEAR91</i>	0.059	0.060
1991	(.169)	(.150)
<i>YEAR92</i>	-0.151	-0.086
1992	(.198)	(.154)
<i>YEAR93</i>	-0.155	-0.121
1993	(.211)	(.151)
Hazard Variable		
<i>Hazard</i>	-0.423	-0.672
Hazard rate	(1.156)	(.807)
Chi-square	146.877	248.401
No. of Cases	2028	2053
Degrees of Freedom	20	21

\*Significant at  $p = .05$ ; \*\*Significant at  $p = .01$ ; \*\*\*Significant at  $p = .001$ .

†Fee variables jointly significant at  $p < .01$  for both primary care and nonprimary care physicians.

‡Specialty variables jointly significant at  $p < .01$  for non-primary care physicians and jointly significant at  $p < .05$  for primary care physicians.

§Experience variables jointly significant at  $p < .01$  for non-primary care physicians and jointly nonsignificant for primary care physicians.

††Community type variables jointly nonsignificant for both non-primary care and primary care physicians.

‡‡Year variables jointly nonsignificant for both non-primary care and primary care physicians.

Medicaid. Thus, while high Medicaid payments increase the probability of full participation, high Medicare payments do not decrease the probability of full participation. High private payments would still be hypothesized to decrease the probability of full Medicaid participation, however.

Results concerning the effects of physician characteristics on Medicaid participation are mixed, supporting some hypotheses but not others. While Table 6 indicates no significant differences in the probability of full participation across specialties in primary care, the probability of full participation is significantly less for medical subspecialists, surgical subspecialists, and

Table 6: Marginal Effects

	Primary Care	Nonprimary Care
Fees†		
Medicaid fee: Office visit (dollars)	1.05**	1.24**
Medicare fee: Office visit (dollars)	0.08	-0.15
Experience†,‡		
5 years in practice	-0.12	-0.27**
15 years in practice	0.14	0.12
25 years in practice	0.40	0.51
Community Characteristics/Type†		
Primary care MDs/100,000 population	0.07	0.11*
Percent county population nonwhite	0.03	-0.13
Zip code per capita income (\$1000s)	-0.08	0.64*
Specialty§		
<i>Primary Care</i> (relative to general/family practice)		
General internal medicine	-3.67	-
Pediatrics	8.61	-
Obstetrics/Gynecology	1.54	-
<i>Nonprimary Care</i> (relative to general surgery)		
Medical subspecialties	-	-21.44***
Surgical subspecialties	-	-11.96**
Psychiatry	-	40.91***
Other specialties	-	-6.05
FMG (relative to U.S. medical graduate)§	12.84**	-5.90
Certified (relative to not certified)§	-10.14***	-1.27
Female (relative to male)§	0.80	0.87
Community Size (relative to large metropolitan)§		
Nonmetropolitan	1.50	1.54
Small metropolitan	-0.84	2.93
Solo Practice (relative to group)§	-1.07	-6.58
Survey Year (relative to 1990)§		
1991	1.37	1.47
1992	-3.40	-2.13
1993	-3.49	-3.02

\*Significant at  $p = .05$ ; \*\*Significant at  $p = .01$ ; \*\*\*Significant at  $p = .001$ .

†Percentage point change in the probability of full participation attributable to unit change in continuous independent variables.

‡The marginal effect of years of experience varies greatly with the amount of experience the physician has; this is because both experience and the square of this term were entered into the regression analysis.

§Percentage point difference in probability of full participation attributable to categorical independent variables.

psychiatrists (relative to general surgeons). Among primary care physicians, the probability of full participation is significantly higher among foreign trained physicians and significantly lower among board-certified physicians. For non-primary care physicians, the significant, positive coefficient for the years of experience-squared reported in Table 5 indicates that full participation does not have a linear relationship with the amount of time a physician has been in practice. Rather, as Table 6 suggests, the probability of being a full participant decreases with experience during the first part of a physician's career and increases with years of experience thereafter. Other personal characteristics were not significant.

Characteristics of the community and the health care delivery system also seem to have little effect on the probability that physicians are full or limited Medicaid participants (Table 6). There is some limited support for the hypothesis that practicing in areas with higher levels of competition among physicians increases the probability of full participation, at least for non-primary care physicians. Among non-primary care physicians, a higher per capita income in the physician's practice area is associated with a somewhat increased probability of being a full participant.

## CONCLUSIONS AND POLICY IMPLICATIONS

*Implications for Improving Access to Care.* Our data provide a bleak picture of the access of Medicaid eligibles to office-based physician services during the early 1990s. One-third of self-employed physicians practicing in solo or small group practices did not participate in Medicaid; 64 percent of participating primary care physicians limited their Medicaid participation; and only 59 percent of participating physicians practicing in large metropolitan areas—and only 33 percent of primary care physicians in these same communities—reported treating all Medicaid patients who come to them.

Relatively few variables seem to influence the probability of being a full or a limited participant. By far the strongest finding—consistent for both primary care and non-primary care physicians—is that higher reimbursement from Medicaid is associated with full participation. The marginal effect of fees is small, however, limiting the likely usefulness of raising Medicaid fees as a strategy for improving access to private, office-based care.

The potentially limited utility of fee increases is most clearly demonstrated by considering the likely effects of one policy proposal that suggests

greater resulting participation if Medicaid fees were raised to the Medicare level (PPRC 1994). Our findings indicate that if Medicaid payments were increased to the Medicare level—a difference of \$7.38—the proportion of primary care physicians participating fully would increase by only about 7.5 percentage points, from 36.4 to 43.9 percent. Similarly, a Medicaid fee increase of roughly \$13 (an increase of nearly 60 percent) would be required to reach the OBRA-89 target of 50 percent of physicians participating fully. This would bring the Medicaid fee to nearly \$34, \$6 (about 20 percent) above Medicare fees. In large metropolitan areas, the fee increase needed to reach 50 percent full participation among primary care physicians would be even larger. A fee increase of about \$18 would be required to reach this target, bringing the Medicaid fee to nearly \$39 (an increase of 85 percent), \$11 (about 39 percent) above Medicare fees.

The foregoing analysis suggests that while increases in Medicaid payment levels would indeed encourage limiters to become full participants, the increases needed to bring about a nontrivial improvement in access to care would be substantial. These observations are consistent with several recent studies that found that raising Medicaid's primary care payment levels had only very limited effects on Medicaid participation levels (Fanning and de Alteris 1993; Fox, Weiner, and Phua 1992). Moreover—to the extent that they would require Medicaid payment levels above Medicare levels—such increases probably are not politically feasible. Smaller, more politically feasible increases in payment might expand access by encouraging at least some participating physicians to accept more Medicaid patients. However, it is also possible that state Medicaid programs would simply end up paying more for roughly the same level of service to Medicaid eligibles.

An important limitation of this study is that it encompasses only private, office-based physicians. As a result, we are unable to address the potential usefulness of fee increases for expanding access to institutional providers such as hospital outpatient departments, public health clinics, and community health centers. Additional research will be needed to determine the magnitude of changes in access to care in the institutional sector resulting from increases in Medicaid payments, and to assess whether potential gains in access to care in the institutional sector would outweigh the apparently small gains attributable to fee increases in the private, office-based sector.

*Implications for Medicaid Managed Care.* Observers have noted that Medicaid managed care plans have found it hard to attract providers; some have attributed this difficulty to low capitation levels (Davidson 1993;



Hurley, Freund, and Paul 1993). Our findings are consistent with these observations, particularly if states are unwilling to set capitation rates at what would effectively be above the Medicare level. But even more fundamentally, managed care may limit physicians' flexibility to define the extent of their Medicaid participation. Historically, the fee-for-service system permitted providers to modulate their involvement with Medicaid in response to changing conditions such as rising practice costs, changes in payment level, and changes in demand. While this flexibility may limit access, it also preserves access by permitting continued involvement in the program at a level that is at the physician's discretion. Medicaid managed care contracts that require "fixed" participation—either by requiring that physicians participate fully, or by requiring that they accept a predetermined number of patients—may limit this flexibility. This loss of flexibility may discourage physicians from entering into managed care arrangements, making implementation of these arrangements more difficult and leading to unintended reductions in access as physicians formerly available to at least some Medicaid eligibles decline any involvement with the programs. The consequences of requiring fixed participation in Medicaid managed care are not well understood, and the effects of such consequences on access to care should be examined closely in states enrolling Medicaid eligibles into managed care.

*Implications for Health Reform.* The most general implication of this (and other studies of physician participation in Medicaid) is that if a health reform proposal creates incentives for providers to select from among patients on the basis of expected revenue, then in all likelihood providers will do so. Such incentives may be the explicit result of differences in payment level by source, as in our current health care system. Alternatively, they may be the result of imperfect risk adjustment, that is, adjustments to premium or capitation rates that do not adequately reflect the differences in health status and health care utilization expected for certain groups of enrollees (such as Medicaid eligibles who as a group are in poorer health and at higher risk for many adverse health outcomes than their higher-income counterparts). Either of these conditions, explicit differences in payment levels by source, or imperfect risk adjustment, may create the kind of incentives that historically have led providers to limit their involvement with Medicaid or to enroll but underserve this population. If access is to be fostered, and Medicaid's distorted patterns of physician participation are to be avoided in the future, health reform will need to ensure that providers receive what is effectively equivalent payment for all.

## NOTES

1. The decision to pool multiple years of data was supported empirically by each of the following: (1) the proportion of physicians fully participating in Medicaid did not differ significantly across 1990–1993; and (2) in the multivariate analysis we interacted survey year with Medicaid fees, a key independent variable that could have undergone significant change between 1990 through 1993, but the fee-year interactions were not significant.
2. These physician characteristics are the physician's specialty, years in practice, board certification, and AMA membership. These characteristics were incorporated into the SMS weighting scheme because past research has shown that they are related to the probability of responding to the SMS questionnaire (Marder and Thran 1987).
3. Little is known about the behavior of various health care organizations and large group practices relative to Medicaid patients. These entities may behave in a manner similar to individual and small group practices, but there also may be important differences. We limited our analysis to small group practices because it seemed unwise to apply a theory of individual behavior (and to use survey data collected at the individual level) to examine the behavior of large entities. Research on the behavior of larger entities is needed, but will require theoretical perspectives and methods quite different from those used here.
4. It is necessary to choose such a cutoff point because some physicians see only a very small number of Medicaid patients each year and do so primarily because these patients have been referred to them by another physician. While accepting the occasional Medicaid patient, these physicians are not generally accessible to Medicaid patients and are best classified as nonparticipants. At the same time, the choice of any such cutoff point must not introduce bias into the analysis. We conducted sensitivity analyses that indicated some minor changes in significance levels but no substantive differences in the findings from analyses choosing cutoff points of 1, 2, 3, 4, or 5 percent of practice revenues. Additional sensitivity analyses reported elsewhere (Kletke, Perloff, and Fossett 1993) support the choice of the 2 percent cutoff point as an effective means of distinguishing between Medicaid participants and nonparticipants.
5. To measure how well practices are established, we included in the analysis both the number of years a physician has been in practice and the square of that number, since past research has shown that the effects of this variable are often nonlinear.
6. All data on the population characteristics of the physician's practice area are derived from the 1990 U.S. Census. The population data are for the zip code in which the physician's main practice is located. Zip code areas with small populations were aggregated with adjacent zip codes to ensure that statistics were calculated on a base of at least 10,000.
7. We consider general/family practitioners, general internists, pediatricians, and obstetrician/gynecologists to be primary care physicians. Data used to compute the number of primary care physicians in the county in which the physician

- practices are from the 1991 year-end AMA Physician Masterfile. Data on the size of the county population are based on 1990 census data.
8. The probit analysis from which the hazard rate is computed is available from the authors.
  9. Past research suggests that physicians are likely to overstate the extent of their Medicaid participation (Kletke et al. 1985).
  10. In the regression analysis for primary care specialists, we use general/family practice as the reference category for the specialty variables. In the analysis for non-primary care physicians, general surgery is the reference category.

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