

# Do Primary Care Physicians Treating Minority Patients Report Problems Delivering High-Quality Care?

Practice resources appear to be a determining factor in whether or not physicians treating predominantly minority patients deliver care of adequate quality.

by **James D. Reschovsky and Ann S. O'Malley**

**ABSTRACT:** Racial and ethnic disparities in primary health care likely reflect the aggregate socioeconomic composition of a physician's patient panels as well as differences in individual patients' characteristics. National physician survey data indicate that physicians in high-minority practices depend more on low-paying Medicaid, receive lower private insurance reimbursements, and have lower incomes. These constrained resources help explain the greater quality-related difficulties delivering care reported by these physicians—such as coordination of care, ability to spend adequate time with patients during office visits, and obtaining specialty care—that relate directly to physicians' ability to function as their patients' medical home. [*Health Affairs* 26, no. 3 (2007): w222–w231 (published online 22 April 2008; 10.1377/hlthaff.26.3.w222)]

**A**LTHOUGH THERE IS BROAD CONSENSUS that racial/ethnic differences in the quality of health care exist, there is much disagreement over the root causes. Most agree that the disparities issue is complex and that myriad patient, provider, practice, health care system, and community factors are involved.<sup>1</sup> Most disparities studies use population-based surveys, chart reviews, or claims data to document racial and ethnic differences in the quality of care. But it is often difficult to isolate, in these data sources, key underlying differences in care processes and organizational responses that may explain disparities.

In this analysis we take the perspective of primary care physicians to focus on some of these processes and responses. We explore whether physicians whose patient panels (the set of patients they treat) consist of a disproportionate percentage of minorities report more difficulties obtaining services for their patients and

---

*James Reschovsky (jreschovsky@hschange.org) and Ann O'Malley are senior health researchers at the Center for Studying Health System Change in Washington, D.C.*

delivering high-quality care than those treating fewer minority patients.

This study builds on a new line of research that goes beyond assessing an individual patient's characteristics to also examine the contribution to racial disparities from the aggregate socioeconomic and insurance composition of the provider's entire patient base.<sup>2</sup> Because racial and ethnic minorities are geographically concentrated, they are disproportionately treated by a small number of providers. Lower incomes and rates of insurance coverage among minorities affect the capabilities, organization, and resources both at the site of care and in the local delivery system. For instance, Peter Bach and colleagues found that a small percentage of primary care physicians disproportionately treat black Medicare patients. These physicians have less access to health care resources and lower qualifications than physicians who predominantly treat white patients.<sup>3</sup> Moreover, they report more difficulties obtaining needed services for their patients and providing high-quality care to their patients in general. Similar results have been found for hospital and nursing home care.<sup>4</sup>

In addition to comparing the reported problems of physicians whose patient panels consist of fewer versus more minority patients, we explore whether increasing the resources flowing to high-minority physician practices, specifically by increasing Medicaid fees to physicians, might improve physicians' ability to provide high-quality care and help reduce racial and ethnic disparities. We focus on practice resources because this is a key factor over which public policy has a direct and important influence.

## Study Data And Methods

■ **Data.** We used data from the 2004–05 Community Tracking Study (CTS) Physician Survey, supplemented by secondary information from the Census Bureau and other sources. The survey obtained a broad range of information from a nationally representative sample of nonfederal patient care physicians who practiced at least twenty hours per week. The weighted response rate was 52.4 percent. All analyses were weighted to account for the probability of selection and to correct for differential survey nonresponse.<sup>5</sup> Most pertinently, the survey asked physicians what percentage of their patients were black and Hispanic and asked about various difficulties respondents faced obtaining necessary services for their patients and delivering high-quality care.<sup>6</sup> For this study we focused on the experiences of primary care physicians (PCPs): general internists, family or general practitioners, and general pediatricians (N = 3,320).

■ **Analysis.** We first profiled physicians in low-, medium-, and high-minority practices—those whose patient panels were less than 30 percent, 30–70 percent, and 70 percent black or Latino, respectively—focusing on physician and practice characteristics as well as indicators of patient resources, clinical burden, and insurance reimbursements. Most of these data came from the survey, although some (area income levels and uninsurance rates; Medicaid and private insurance physician pay-

ment indices) were obtained from secondary sources.<sup>7</sup>

We then compared reports of problems associated with access to specialty care, interactions with patients, and care processes cited by these three groups of physicians. Because institutional practices, such as those associated with medical schools, hospitals, and community health clinics, often receive external support beyond that obtained from insurers and patients, we also stratified these descriptive analyses by whether the physician worked in a solo or group practice versus other, more institutional settings (such as a hospital, health maintenance organization [HMO], medical school, or clinic). Key results are highlighted in the text.<sup>8</sup>

Finally, we assessed the degree to which disparities in problems reported by physicians treating lesser or greater percentages of minority patients would be reduced if practice resources were increased. To illustrate this, we regressed physicians' reports on a set of indicators of physician practice resources and then simulated the effect of increasing Medicaid payments to equal those of Medicare.<sup>9</sup>

## Study Results

About 52 percent of PCPs reported having patient panels with less than 30 percent minorities, 36 percent reported that 30–70 percent of their patients are minorities, and 12 percent reported that minorities constituted more than 70 percent of their patient panels in 2004–05. The variation in the minority composition of physician patient panels indicates that a relatively small number of physicians treated a disproportionately large share of minority patients, consistent with previous findings.<sup>10</sup>

■ **Characteristics of low-, medium-, and high-minority practices.** *Patient resources and clinical burden.* Our results confirm well-established associations between greater minority presence, less insurance coverage, and lower income (Exhibit 1). In 2004–05, physicians with greater portions of minority patients were located in areas with lower median incomes and higher uninsurance rates. Moreover, physicians in high-minority practices received more than a third of their practice revenue from Medicaid—more than twice that of physicians in low-minority practices. These patterns are buttressed by the finding that among PCPs in high-minority practices, 35 percent reported that patients' inability to pay was a major problem affecting their ability to provide high-quality care, compared with 23 percent of those in low-minority practices.

Low-income patients often pose greater clinical burdens for physicians, because of poorer health status, more complex personal and social conditions, and greater communication and cultural barriers. We did not find, however, that PCPs in high-minority practices reported larger percentages of their patients as having chronic conditions or being elderly compared with those in low-minority practices. Physicians treating large numbers of minority patients did report having a greater percentage of patients with whom they have a hard time communicating because they speak a different language.

**EXHIBIT 1**  
**Characteristics Of Low-, Medium-, And High-Minority Primary Care Physician Practices, 2004–2005**

Characteristic <sup>a</sup>	Percent minority patients		
	Low (<30%)	Medium (30–70%)	High (>70%)
<b>Patient resources and clinical burden</b>			
Median household income in physician practice ZIP code (\$)	48,364	43,049 <sup>b</sup>	35,346 <sup>b,c</sup>
Uninsured in county (%)	12.4	15.3 <sup>b</sup>	16.9 <sup>b,c</sup>
Physicians reporting that inability to pay is a major problem for their patients (%)	22.8	24.4	35.0 <sup>b,c</sup>
<b>Patients with chronic conditions (%)</b>			
Patients with chronic conditions (%)	57.9	58.7	53.8
Patients who speak another language (%)	2.2	5.5 <sup>b</sup>	6.8 <sup>b</sup>
Revenue from Medicaid (%)	13.1	19.3 <sup>b</sup>	33.7 <sup>b,c</sup>
Revenue from Medicare (%)	31.7	28.2 <sup>b</sup>	24.4 <sup>b,c</sup>
Revenue from private sources (%)	55.4	52.5	42.5 <sup>b,c</sup>
Hours of charity care in previous month	4.6	5.7 <sup>b</sup>	7.3 <sup>b</sup>
<b>Physician characteristics</b>			
Female (%)	32.0	33.7	43.7 <sup>b,c</sup>
Practice owner (%)	56.6	51.7	30.8 <sup>b,c</sup>
<b>Race and ethnicity (%)</b>			
Hispanic	2.6	6.6 <sup>b</sup>	19.8 <sup>b,c</sup>
White, non-Hispanic	80.1	68.5 <sup>b</sup>	35.4 <sup>b,c</sup>
Black, non-Hispanic	0.8	5.1 <sup>b</sup>	21.6 <sup>b,c</sup>
Other	16.5	19.8	23.2
<b>Years in practice</b>			
Board certified in primary specialty (%)	16.9	15.3 <sup>b</sup>	14.0 <sup>b</sup>
Board certified in primary specialty (%)	89.2	87.9	80.4 <sup>b,c</sup>
International medical graduate (%)	20.6	28.2 <sup>b</sup>	38.8 <sup>b,c</sup>
<b>Specialty (%)</b>			
Internal medicine	30.5	35.0	30.9
Family/general practice	50.6	40.3 <sup>b</sup>	37.8 <sup>b</sup>
Pediatrics	18.9	24.7 <sup>b</sup>	31.4 <sup>b</sup>
<b>Practice characteristics</b>			
<b>Practice type (%)</b>			
Solo/2 physicians	37.3	31.0 <sup>b</sup>	30.6
Group with 3–10 physicians	18.2	17.4	7.1 <sup>b,c</sup>
Group with >10 physicians	12.2	14.5	6.0 <sup>b,c</sup>
G/S HMO	4.4	8.1	5.9
Hospital	16.0	11.2	8.0 <sup>b</sup>
Medical school	3.6	5.6	10.3 <sup>b,c</sup>
Community or state/local clinic	1.5	3.1 <sup>b</sup>	12.2 <sup>b,c</sup>
Other	6.8	9.1	19.9 <sup>b,c</sup>
<b>Practice revenue from managed care (%)</b>			
Practice revenue from managed care (%)	42.3	46.3	48.3 <sup>b</sup>
Practice revenue that is capitated (%)	13.9	20.0 <sup>b</sup>	22.5 <sup>b</sup>
Number of health IT functions used	4.1	4.3	4.0
<b>Physician income and work effort</b>			
Net income from medical practice (\$)	146,031	152,807	127,708 <sup>b,c</sup>
Hours in medically related activities in previous week	51.5	52.1	48.5 <sup>b,c</sup>
<b>Insurance reimbursement</b>			
GAO physician fee index	93.2	92.6	89.2 <sup>b,c</sup>
Medicaid/Medicare fee ratio in state	70.5	74.1 <sup>b</sup>	66.4 <sup>c</sup>

**SOURCE:** Community Tracking Study Physician Survey, 2004–05.

**NOTES:** N = 3,320. G/S HMO is group/staff-model health maintenance organization. IT is information technology. GAO is Government Accountability Office.

<sup>a</sup>Variable descriptions are available in Appendix Exhibit A, online at <http://content.healthaffairs.org/cgi/content/full/hlthaff.27.3.w222/DC2>.

<sup>b</sup>Different from physicians in low-minority practices ( $p \leq 0.05$ ).

<sup>c</sup>Different from physicians in medium-minority practices ( $p \leq 0.05$ ).

*Physician and practice characteristics.* In 2004–05, PCPs in high-minority practices were more likely to be female and to be minorities themselves, compared with those treating fewer minority patients. Only 35 percent of physicians in high-minority practices were white, non-Hispanic. Conversely, very few (3.4 percent) physicians in practices with less than 30 percent minority patients were African American or Hispanic themselves. Physicians in high-minority practices had fewer years of practice experience and were less likely to be board certified than their counterparts in low-minority practices (80.4 percent versus 89.2 percent). They were also more likely to be pediatricians. International medical graduates (IMGs) were nearly twice as likely to be found in high- versus low-minority practices in 2004–05. They constituted a majority in high-minority solo and group physician practices.<sup>11</sup>

Relative to PCPs with few minority patients, PCPs in high-minority practices were less likely to work in solo and group practices and more likely to be in medical school practices, community or state and local government health clinics, or nonhospital institutional settings. Physicians with a higher proportion of minority patients in their panels reported a greater percentage of their practice revenue as coming from managed care—specifically, capitated payments.

*Practice resources.* Physician practice revenue was inversely related to the percentage of minority patients. Physicians in high-minority practices across all settings reported a greater share of practice revenues from the generally low-paying Medicaid program, as compared with those serving fewer minority patients. Moreover, physicians in high-minority practices were in locations where the ratio of Medicaid to Medicare reimbursements was significantly lower than the ratios in practices with 30–70 percent minority patients in 2004–05. Physicians in high-minority practices were also located in areas with lower private insurance reimbursements to physicians. As a likely result of these various factors, PCPs in high-minority practices reported lower incomes on average than those with fewer minority patients, a pattern that held across both solo/group and more institutional practices.<sup>12</sup> There were no significant differences in the use of health information technologies between physicians in high- and low-minority practices.

■ **Do physicians caring for a high proportion of minority patients report greater difficulty providing care?** Relative to physicians treating fewer minority patients, those with a greater share of minority patients differed in their ability to obtain specialty care for their patients and were more likely to report many quality-related difficulties (Exhibit 2). No significant differences were found regarding constraints on clinical autonomy or exposure to certain financial incentives with the potential of compromising care, or in reported problems obtaining inpatient hospital admissions or high-quality imaging (results not shown).<sup>13</sup>

More than a quarter of physicians in high-minority practices disagreed that it was possible to provide high-quality care to all of their patients. This compares with just 16 percent of those in low-minority practices.

**EXHIBIT 2**  
**Problems Facing Primary Care Physicians By Percentage Of Minority Patients In Their Practices, Percentage Indicating Problem, And Simulated Percentage-Point Effect Of Raising Medicaid Reimbursements To Medicare Levels**

Access- or quality-related problem <sup>a</sup>	Percent indicating problem			Predicted percentage-point change with Medicaid-Medicare payment parity		
	Low minority (<30%)	Medium minority (30-70%)	High minority (>70%)	Low minority (<30%)	Medium minority (30-70%)	High minority (>70%)
Unable to provide high-quality care to all patients	16.1	21.7 <sup>b</sup>	26.0 <sup>b</sup>	-0.5	-1.0	-3.2
Ability to access specialty referrals						
Unable to get referrals to high-quality specialists	30.8	35.7	42.4 <sup>b</sup>	-1.7	-2.0	-4.3
Because of inadequate supply	17.9	18.9	22.3	-2.3	-2.5	-4.9
Because of health plan barriers	25.1	28.3	35.2 <sup>b</sup>	-0.6	-0.9	-2.5
Because of patient inability to pay	25.2	29.4	36.7 <sup>b</sup>	-1.7	-2.1	-4.7
Physician-patient interactions						
Unable to maintain continuing relationships with patients	16.1	18.4	18.9	3.2	2.6	2.8
Inadequate time with patients a major problem affecting quality	17.7	24.6 <sup>b</sup>	26.0 <sup>b</sup>	-2.1	-2.6	-5.8
Language or cultural barriers a major problem affecting quality	2.4	4.0 <sup>b</sup>	7.7 <sup>b,c</sup>	-1.1	-0.9	-1.2
Care processes						
Not getting timely reports a major problem affecting quality	11.0	14.5 <sup>b</sup>	24.1 <sup>b,c</sup>	-2.6	-3.2	-7.3
Scope of care expected to treat without referral to specialists is greater than it should be	18.1	22.5	28.4 <sup>b</sup>	-1.7	-2.1	-4.6

**SOURCE:** Community Tracking Study Physician Survey, 2004-05.

**NOTE:** N = 3,320.

<sup>a</sup>Variable descriptions are available in Appendix Exhibit A, online at <http://content.healthaffairs.org/cgi/content/full/hlthaff.27.3.w222/DC2>.

<sup>b</sup>Different from physicians in low-minority practices ( $p \leq 0.05$ ).

<sup>c</sup>Different from physicians in medium-minority practices ( $p \leq 0.05$ ).

*Access to specialty care.* Physicians with high-minority patient panels were more likely than those treating few minorities to report difficulties obtaining specialty care for their patients. Survey respondents were also asked whether they faced difficulties obtaining specialty care for specific reasons. Physicians in high-minority practices reported greater difficulty obtaining specialty care for their patients because patients were uninsured or had insurance coverage that posed access barriers, but not because of an inadequate supply of qualified specialists in the area.<sup>14</sup>

*Physician-patient interactions.* Although minorities are less likely to have a usual source of care than whites, physicians treating greater percentages of minority patients were not significantly more likely to report an inability to maintain continuity of care than those treating fewer minority patients. They were more likely to report other difficulties with physician-patient interaction, however. For example, physicians in high-minority practices were more likely than those in low-

minority practices to report language or cultural barriers to communication with patients as a major problem affecting quality. They also more frequently reported that inadequate time during office visits was a major problem that affected their ability to provide high-quality care (24 percent versus 11 percent). These patterns were particularly evident among physicians in solo or group practices.<sup>15</sup> To validate the reports of inadequate time, we used physicians' reports on number of patient visits and hours of direct patient care in the last week to estimate average time spent per patient visit for PCPs in low-, medium-, and high-minority practices. Physicians in high-minority practices spent about 30 percent less time per patient seen than those in low-minority practices (fifteen versus twenty-one minutes).<sup>16</sup> Those in medium-minority practices fell in between.

*Difficulties with care processes.* PCPs in high-minority practices were significantly more likely to report difficulties obtaining timely reports from other providers than were PCPs in low-minority practices. Nearly a quarter of PCPs in high-minority practices reported that not getting timely reports from other providers was a major problem affecting their ability to provide high-quality care, compared with 11 percent of PCPs in low-minority practices, which suggests the existence of increased challenges to care coordination in high-minority practices. Similarly, PCPs in high-minority practices were ten percentage points more likely to complain that the scope of care they are expected to provide without referral was greater than it should be (28 percent versus 18 percent). This pattern is largely attributable to the reports of physicians in solo and group practices.<sup>17</sup>

Taken together, the percentages shown in Exhibit 2 suggest that the ability of physicians in high-minority practices to effectively function as their patients' medical home is constrained.

■ **The role of practice revenues.** Although differences in patient, physician, and practice characteristics likely help explain differences in reported difficulties faced by physicians in low-, medium-, and high-minority practices, we focus on the role of practice revenues, because this is where public policy can most clearly have an impact. We regressed each physician report on variables indicating practice resources and then simulated responses if Medicaid payments were equal to Medicare payments. Exhibit 2 shows the absolute percentage-point difference from unadjusted means predicted to result if there was Medicaid-Medicare physician payment parity. Low Medicaid payment accounted for only part of the resource disadvantages many high-minority practices faced, because the simulations did not account for the greater numbers of uninsured patients in high-minority practices and the lower average private-insurer payments. Nevertheless, the results indicate that if Medicaid fees were raised to Medicare levels, physicians' reports of difficulties providing care for their patients would often decline, particularly among physicians treating large portions of minority patients and for difficulties related to physicians' ability to function as their patients' medical home: time during office visits, timely reports, ability to obtain specialist referrals, and appropriate scope of care.<sup>18</sup>

## Discussion And Policy Implications

The results of this analysis suggest that aggregate characteristics of populations at the community and practice levels have implications for the care available to patients. In other words, it is not only individual patients' characteristics that influence the care received, but also the cumulative resources afforded to a practice based on all of a physician's patients.

PCPs in high-minority practices rely more heavily on lower-paying Medicaid reimbursements, devote more time to uncompensated charity care, and earn lower incomes. Magnifying these resource disparities, geographic areas with more high-minority practices tend to have lower Medicaid and private insurance reimbursements than those with fewer high-minority practices.

Our results indicate that the minority makeup of physicians' patient panels is associated with greater reports from physicians of difficulties providing high-quality care. At least some of this relationship appears to be explained by the lower resources flowing to high-minority practices. Two of the quality indicators most affected by Medicaid payment levels in our simulations, time spent per patient seen and difficulties getting timely reports from other providers, suggest the possibility that physicians may compensate for the lower revenue flows by increasing the volume of patients they see, reducing the time spent per patient seen, and perhaps devoting less time to coordinating and documenting care. This is despite the more complex psychosocial contexts and the language and cultural barriers that often complicate the treatment of lower-income and minority patients.<sup>19</sup>

Physicians in high-minority practices were more likely than those in low-minority practices to cite problems obtaining care from specialists for their patients. Although more research is needed, one possible implication is that PCPs in high-minority practices are forced to treat patients with more-complex conditions whom they would normally refer to a specialist, placing further stresses on the provider and potentially lowering the quality of care. We found that physicians treating more minority patients were more likely than those treating fewer minority patients to report that the scope of care they are required to provide is too broad, a finding consistent with this interpretation.

■ **Study limitations.** This study has several limitations that should be recognized. It relied on physician survey reports of difficulties providing high-quality care, rather than on objective and validated quality measures. Survey reports can be influenced by differences in respondents' values, perspectives, and expectations. Reporting error on the percentage of minority patients, although not likely to be large, might have reduced our ability to detect differences between low-, medium-, and high-minority practices. Moreover, observations at only the physician level do not permit detailed controls for individual patient-level differences, just as observations at the individual patient level typically fail to adequately control for provider or system characteristics. Ideally, one would have hierarchical data that include represen-

tative data on community health systems, the physician practices within that community, the physicians within those practices, and the patients treated by those physicians.

■ **Policy implications.** The results of this study suggest that racial and ethnic disparities in primary health care are in part systemic in nature, and the lower resources flowing to physicians treating more minority patients are a contributing factor. In particular, we illustrated that if Medicaid payments to physicians were on par with those paid by Medicare, disparities in reported difficulties between physicians whose patient panels were made up of greater versus smaller proportions of minorities would diminish, often substantially. Low payments may be leading PCPs to reduce the time spent with patients and more generally diminish their ability to function effectively as their patients' medical home.

Previous research indicates that low Medicaid payments to physicians discourage them from serving Medicaid patients, reducing access to care for beneficiaries.<sup>20</sup> Our research suggests the possibility that low payments further threaten the quality of care in ways that go beyond diminished access to services, thereby contributing to racial disparities in health care. Moreover, low Medicaid payments to physicians with substantial Medicaid caseloads could be compromising the care provided to all of the physician's patients, not just the Medicaid recipients.<sup>21</sup> State legislators and governors should not assume that physicians will be able to shift costs so that Medicaid patients receive care equivalent to care for other patients. The concentration of Medicaid patients in a small number of physician practices, a trend that is increasing, implies that opportunities for cost shifting are often limited.<sup>22</sup> In addition to raising payment rates for the treatment of Medicaid patients, efforts to increase insurance coverage or otherwise increase resources flowing to physicians who serve low-income and minority populations would implicitly reduce disparities.<sup>23</sup>

.....  
*A previous version of this paper was presented at the Association for Public Policy Analysis and Management Annual Research Conference, Washington, D.C., 8 November 2007. Funding for this analysis was from the Commonwealth Fund (Grant no. 20060591). The Robert Wood Johnson Foundation funds data collection for the Community Tracking Study Physician Survey. The authors thank Anne Beal and Stephen Schoenbaum of the Commonwealth Fund for helpful comments on an earlier draft and the anonymous reviewers for their useful suggestions.*

#### NOTES

1. B.D. Smedley, A.Y. Stith, and A.R. Nelson, eds., *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* (Washington: National Academies Press, 2002).
2. P.B. Bach, "Racial Disparities and Site of Care," *Ethnicity and Disease* 15, no. 2 Supp. (2005): S31-S33.
3. P.B. Bach et al., "Primary Care Physicians Who Treat Blacks and Whites" *New England Journal of Medicine* 351, no. 6 (2004): 575-584.
4. A. Chandra and J. Skinner, "Geography and Racial Health Disparities," NBER Working Paper no. w9513 (Cambridge, Mass: National Bureau of Economic Research, 2003); and D.B. Smith et al., "Separate and Unequal: Racial Segregation and Disparities in Quality across U.S. Nursing Homes," *Health Affairs* 26, no. 5

- (2007): 1448–1458.
5. Because the sample frame is from the American Medical Association (AMA) and American Osteopathic Association (AOA) Masterfiles and a majority of the sample was surveyed in the previous round, information was available about the characteristics of both survey respondents and nonrespondents, increasing the ability to make adjustments for differential nonresponse and reducing the likelihood of response error. For an extensive description of the weight development and other survey methods, see S. Williams et al., *Community Tracking Study Physician Survey Methodology Report 2004–05, Statistical Design and Tracing for the Community Tracking Study Physician Survey*, Technical Pub. no. 70, 2006, <http://www.hschange.org/CONTENT/888/888text.pdf> (accessed 24 January 2008).
  6. There might have been some error in physicians' reports on the percentage of their patients who were African American or Hispanic, but this is not likely to have substantially affected our analysis. Patients' physical characteristics and surnames are readily apparent to physicians, and cognitive testing of this question indicated that physicians had little difficulty responding. Moreover, because we categorized this variable into three broad categories, any misclassification is likely to be small, and its effect would be to understate differences between low-, medium-, and high-minority practices.
  7. Appendix Exhibit A online provides greater detail on all variables and data sources used. The technical appendix is available at <http://content.healthaffairs.org/cgi/content/full/hlthaff.27.3.w222/DC2>.
  8. See Appendix Exhibits B and C online; *ibid*.
  9. To control for practice resources, we used payer mix, as indicated by the percentage of practice revenue from Medicaid, Medicare, and private payers and the number of hours spent monthly on charity care. In addition, we included Medicaid and private-payer physician payment indices, which were also interacted with Medicaid- and private-payer-mix variables, respectively. We tested other models in which a broader range of covariates were included, capturing patient, physician, and practice characteristics. Results were robust.
  10. Bach et al., "Primary Care Physicians."
  11. See Appendix Exhibit B online, as in Note 7.
  12. *Ibid*.
  13. In other findings (not shown), physicians with greater percentages of minority patients reported fewer problems obtaining outpatient mental health services than those treating fewer minorities.
  14. The lack of relationship was confirmed by another, similar measure not reported: the percentage reporting that the "lack of qualified specialists in the area was a major problem affecting primary care physicians' ability to provide care."
  15. See Appendix Exhibit C online, as in Note 7.
  16. The number of visits was adjusted for site of visit (such as office, hospital, nursing home).
  17. See Appendix Exhibit C online, as in Note 7.
  18. Office visit time results are consistent with S. Decker, "Medicaid Physician Fees and the Quality of Medical Care of Medicaid Patients in the USA," *Review of Economics of the Household* 5, no. 1 (2007): 95–112.
  19. Low reimbursements could also lead physicians to see fewer patients, and in particular fewer Medicaid patients. Greater difficulties obtaining physician care among Medicaid beneficiaries is evidence that this occurs. See S. Zuckerman et al., "Changes in Medicaid Physician Fees, 1998–2003: Implications for Physician Participation," *Health Affairs* 23 (2004): w374–w384 (published online 23 June 2004; 10.1377/hlthaff.w4.374).
  20. *Ibid*.
  21. Decker, "Medicaid Physician Fees."
  22. P. Cunningham and J. May, "Medicaid Patients Increasingly Concentrated among Physicians," Tracking Report no. 16 (Washington: HSC, 2006).
  23. Examples of programs that subsidize physicians serving low-income areas include the National Health Service Corps and the Medicare Incentive Payment Program.