

The Impact of Managed Care Contracting on Physicians

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BACKGROUND: Prior literature suggests that the fragmented U.S. health care system places a large administrative burden on physicians. Less is known about how this burden varies with physician contracting practices.

OBJECTIVE: To assess the extent to which physician practice outcomes vary with the number of managed care contracts held or the availability of such contracts.

DESIGN, PARTICIPANTS, AND MAIN MEASURES: We perform secondary data analyses of the first four rounds of the nationally representative Community Tracking Study Physician Survey (1996–2005), which includes 36,340 physicians (21,567 PCPs [primary care physicians] and 14,773 specialists) across the four survey periods. Our measures include reported hours in patient care, share of hours outside patient care, adequacy of time with patients, career satisfaction, and income.

RESULTS: Doctors who contract with more plans report spending more time in patient care (per 11 additional contracts, about 30 min per week for PCPs and 20 min per week for specialists), report spending a modestly larger share of their time outside patient care (per 11 additional contracts, about 10 min per week for PCPs and specialists), are slightly more likely to report inadequate time with patients (odds ratio 1.005 per additional contract for PCPs), and earn higher incomes (per 11 additional contracts, about 3 % more per year for specialists).

CONCLUSIONS: Contracting opportunities confer significant benefits on physicians, although they do add modest costs in terms of time spent outside patient care and lower adequacy of time with patients. Simplifications that reduce the administrative burden of contracting may improve care by optimizing allocation of physician effort.

KEY WORDS: managed care contracts; administrative costs; time with patients; physician income.

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BACKGROUND

Many studies document the high and rising aggregate administrative costs of the U.S. health care system.^{1–3} A recent survey by Casalino et al. found that physicians spend on average 3 h each week interacting with health plans.⁴ This time is spent on several administrative tasks, including confirming whether a prescribed medication is covered by a plan's formulary, determining whether a certain specialist is part of a plan's preferred network, and dealing with preauthorization forms.⁵

Casalino et al.'s survey results suggest that one important element of administrative complexity is likely to be the number of distinct contracts a physician has. Why, then, do physicians contract with multiple plans? While the costs of adding an additional contract include the contracting costs themselves and the increased administrative burden of dealing with the billing and oversight practices of an additional plan,⁶ increasing the number of contracts may lead to an increase in the size of the physician's market (because more patients can see the physician in-network). An increase in the number of contracts likely also leads to an increase in the physician's negotiating power with respect to a plan (as the physician can decline to participate in a plan that offers low rates) and provides the physician with protection from the possibility that a single plan will offer significantly lower rates in the subsequent contract year, leaving the physician with either no existing patient pool or very low payments.⁷ This possibility is consistent with the findings of Dafny et al., who find that increases in insurer concentration lead to lower physician incomes.⁸

Most of the literature on physician interactions with managed care dates back to the late 1990s, when managed care contracting expanded.⁵ Responses to the Casalino et al. survey, however, suggest that the costs of dealing with health plans have been increasing over time. Contracting opportunities are also increasing. The Affordable Care Act's (ACA) expansions of coverage through new insurance exchanges will give physicians even more contracting options. Most states with insurance exchanges will have at least one new insurance company enter the market, and many states will see a proliferation of new health plans.^{9,10} These new opportunities make it especially timely to understand how the contracting process affects physician practices.

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In this paper, we examine how the number of managed care contracts is related to the number of hours a physician reports spending in patient care, the percent of hours a physician reports spending in practice outside of seeing patients (a proxy for administrative time), perceptions of having adequate time with patients, career satisfaction, and income from practice.

METHODS

Data were drawn from the restricted use files of the first four rounds of the Community Tracking Study (CTS) Physician Surveys (1996–1997, 1998–1999, 2000–2001, and 2004–2005) conducted by the Center for Health System Change. These restricted use files are the only data available that include both the number of managed care contracts held by a practice and the number of hours physicians spend providing patient care.¹¹ The CTS surveys provide representative samples of the population of physicians across 60 sites in the United States (51 metropolitan areas and nine non-metropolitan areas) and are supplemented by a national sample. The physician survey was administered to physicians in the 60 CTS sites and asked questions about practice arrangements, sources of revenue, determinants of physician compensation, allocation of time, and perceptions of the ability to deliver care. Although the last round of the CTS data we use are 8 years old, comparison of the CTS 2005 site-level survey to the 2008 CTS national non-site level survey suggests that the distribution of managed care contracts across practices has not changed substantially over time, and the Casalino et al. survey suggests that the costs associated with contracting have, if anything, increased over time. We examine primary care physicians and specialists separately, as these are largely distinct markets. This large sample size enables us to estimate small magnitudes with precision; however, samples of specialists at any individual site are in some cases quite small.

The physician survey was conducted by telephone. The sample of physicians for each of the 60 sites was randomly drawn from the American Medical Association (AMA) and the American Osteopathic Association Masterfiles, and primary care physicians were oversampled. The response rates for the CTS Physician Surveys in chronological order were 65.4 %, 60.9 %, 58.6 %, and 52.4 %.

Outcome Measures

We examine five outcomes: 1) reported total number of hours in the last week spent directly related to patient care activities; 2) the percentage of the total number of hours in the last week that are not spent in patient care (which is calculated by subtracting reported total number of hours in medically-related activities [which per the survey includes

“administrative tasks, professional activities, and direct patient care”] by (1) above and dividing this difference by reported total number of hours in medically-related activities); 3) the likelihood that a physician responds that he or she is “very dissatisfied” with his or her overall career in medicine (a 1 on a 5-point Likert scale); 4) the likelihood that the physician “disagrees strongly” with the statement that he or she has adequate time with his or her patients (a 1 on a 5-point Likert scale); and 5) the physician’s professional income net of practice expenses. Results (not shown) were not qualitatively affected by using very or somewhat dissatisfied and very or somewhat low adequate time.

Contracting Availability

Physicians may differ in the number of contracts they participate in because of differences in the availability of contracts. To address this possibility, we use the Herfindahl–Hirshman Index (HHI) of insurers in a particular MSA (metropolitan statistical area) or state (if the MSA is not available) as a measure for the number of available contracting opportunities. In areas where a single insurer dominates the market, physicians can likely fill their panels while contracting with just one insurer; in those where the market is less concentrated, additional contracts may be needed to fill a panel. For the 2000–2001 and 2004–2005 CTS survey periods, we use data from American Medical Association’s (AMA) *Competition in Health Insurance: a Comprehensive Study of US Markets*.¹² We use data from the edition published the year following administration of the CTS survey, as that edition contains data from the respective survey year. For the 1996–1997 and 1998–1999 CTS survey periods, when the AMA did not publish indices, we use data from the National Association of Insurance Commissioners (NAIC).

Analysis

Physician data were analyzed using the complex survey modules in STATA 10.0 to account for the sampling structure of the survey and the availability of certain statistical procedures in STATA not found elsewhere, including censored regressions. We run linear regressions for continuous outcome measures (hours in patient care, percentage of hours outside of patient care, income) and logistic regressions for dichotomous outcome measures (likelihood of being “very dissatisfied,” likelihood of “disagreeing strongly” with having adequate time). All regressions control for age, age squared, gender, reported hours of charity care in previous month, years in practice, number of physicians in practice, percent of revenue from managed care, percent of revenue from Medicare, percent of revenue from Medicaid, site-level managed care penetration, and practice type (which includes solo practices [defined by CTS as practices with one to two physicians],

group practice [defined as practices with three or more physicians], HMO-based practices, medical school-associated practices, hospital-based practices, and other types of practices). We include year fixed effects to account for the four cross sections of the CTS. We run three sets of regressions: 1) number of contracts; 2) number on contracts with site fixed effects; and 3) number of contracts with site fixed effects and HHI. All regressions are performed separately for primary care physicians (PCPs) and specialists. We limit our sample to those physicians who worked more than 20 h directly with patients in the previous week to exclude those physicians who do not spend a significant proportion of their time with patients. Our sample includes 36,340 physicians (21,567 PCPs [primary care physicians] and 14,773 specialists) across the four survey periods. Roughly equal numbers of physicians were sampled in each survey year for the first three survey years; in the fourth survey year, the sample was halved by CTS.

The number of managed care contracts held by practices is highly skewed. To address this skewed distribution, we repeat our analyses using the log of the number of managed care contracts as the measure of contracting. The results reported here are robust to the use of the log of contracts instead of the number of contracts.

To gauge the practical significance of our findings, we provide estimates for the effect of moving from one to 12 contracts (the sample average), a range consistent with expectations about new plan availability in ACA health insurance marketplaces.

RESULTS

Table 1 presents summary statistics on our sample. Primary care physicians, who were oversampled, represent 59 % of our sample. Physicians vary considerably in the number of plans with which they report contracting. The median practice contracted with eight plans – but 19 % of practices that participated in at least one managed care plan had fewer than five contracts and 12 % of such practices had more than 20. The average number of reported managed care contracts held by a practice was 12. The average physician had been in practice for 15 years and participated in a practice with 33 physicians, although the 25th percentile, 50th percentile and 75th percentile of the number of physicians in a practice were one, two, and seven, respectively (not shown in table). The average percentages of revenue from managed care, Medicare, and Medicaid were 46 %, 30 %, and 15 %, respectively. Solo practices made up 36 % of practices, group practices made up 29 % of practices, HMO-based practices made up 6 % of practices, medical school-associated practices made up 7 % of practices, hospital-based practices made up

Table 1. Physician Characteristics

Variable	Mean	Standard deviation
Primary care physician	59 %	49 %
Specialist	41 %	49 %
Number of contracts	12	14
Age	48	10
Female	23 %	42 %
Hours of charity care in previous month	7.5	18
Years in practice	15	10
Number of physicians in practice	33	130
Percent revenue from managed care	46 %	28 %
Percent revenue from Medicare	30 %	23 %
Percent revenue from Medicaid	15 %	17 %
Practice types		
Solo (one or two physicians)	36 %	48 %
Group (three or more physicians)	29 %	45 %
HMO	6 %	23 %
Medical school	7 %	26 %
Hospital-based	12 %	33 %
Other	10 %	30 %
Hours in medicine	55	15
Hours in patient care	46	14
Percent of hours in medicine outside patient care	15 %	14 %
Percent of physicians reporting very low career satisfaction*	4 %	20 %
Percent of physicians reporting very low adequate time with patients*	12 %	32 %
ln (income)	12.0	1.09

*This represents the lowest category out of a 5-point Likert scale.

12 % of practices, and other types of practices made up 10 % of practices.

Physicians report working on average 55 h a week, with 46 of those hours in patient care. They report spending about 15 % of their total work hours outside patient care. About 4 % of physicians report being very dissatisfied with their careers, while 12 % of physicians report having very inadequate time with patients. Average net income of physicians was \$195,000 in 2005 dollars.

Table 2 reports correlates of the number of contracts held by a practice. Demographic and individual characteristics have few significant relationships with contracting, although female specialists hold fewer contracts than do male specialists. Doctors who belong to larger institutions (medical schools, group practices, or hospital-based practices) participate in more contracts; those who belong to HMO practices participate in fewer contracts. A higher share of revenue from Medicaid is associated with participation in fewer contracts. For primary care doctors, Medicare revenue is associated with fewer contracts; for specialists, the opposite result holds. In clustered (by site) cross-sectional regressions (without site fixed effects), the HHI is strongly negatively predictive of the number of contracts held by an individual physician for both PCPs and specialists (see Table 2). That is, physicians hold more contracts at sites where more contracts are available.

Panel A of Table 3 reports results for the number of hours in direct patient care. Moving from a practice with only one contract to the average practice with 12 contracts is

Table 2. Relationship of the Number of Contracts with the Herfindahl–Hirshman Index and Physician Characteristics

	Primary care physicians	Specialists
Herfindahl–Hirshman Index	−0.001** (0.0002)	−0.0007** (0.0002)
Age	−0.035 (0.092)	0.247 (0.162)
Age squared	−0.001 (0.001)	−0.003* (0.001)
Female	0.147 (0.497)	−2.434** (0.495)
Hours of charity care in previous month	0.002 (0.010)	0.033* (0.014)
Years in practice	0.079* (0.036)	0.024 (0.040)
Number of physician in practice	0.002 (0.002)	−0.004 (0.002)
Percent revenue from managed care	12.002** (0.603)	16.218** (0.821)
Percent revenue from Medicare	−1.846* (0.807)	3.159** (0.880)
Percent revenue from Medicaid	−3.449** (0.944)	−3.422** (1.113)
Site level managed care penetration	−4.623** (1.765)	−4.697* (2.381)
Group practice (three or more physicians)	0.888 (0.580)	2.310** (0.526)
HMO	−7.229** (0.925)	−8.720** (1.493)
Medical school	2.851** (0.939)	5.075** (1.015)
Hospital based	1.599* (0.695)	0.565 (0.972)
Other	−0.004 (0.785)	0.097 (0.909)
1998	0.167 (0.384)	0.707 (0.506)
2000	0.871* (0.379)	1.196* (0.562)
2003	3.001** (0.788)	0.161 (0.589)

Linear regressions are performed. The omitted group for practice type is solo practices, defined by the Community Tracking Study as practices with one or two physicians. All regressions include year fixed effects. Standard errors are in parentheses.

HMO health maintenance organization

* $p < 0.05$

** $p < 0.01$

associated with about 30 more min spent by PCPs in direct patient care ($p=0.001$) and 20 more min spent by specialists in direct patient care ($p<0.05$) per week. The inclusion of site fixed effects has no substantive effect on the results for number of contracts for PCPs, but it does for specialists (the result is no longer statistically significant in these specifications). The insurer concentration in an area has no statistically significant effect on reported total number of hours in patient care.

Panel B of Table 3 reports results on the percent of total hours spent outside of patient care. Moving from a practice with only one contract to the average practice with 12 contracts is associated with a precisely-measured but small 0.2755 percentage points more time spent outside of patient care (about 10 min of additional time spent outside patient care)¹³ ($p<0.05$) per week (with a similar magnitude for specialists). Group practices and HMO practices are associated with a lower percentage of total hours outside patient care (not shown in table). The insurer concentration in an area has no statistically significant effect on percent of total hours spent outside of patient care.

Table 4 presents results for physician satisfaction, adequacy of time with patients, and income. Panel A presents results for physician satisfaction. Participating in

additional contracts does not have a significant effect on physician satisfaction. Panel B presents results with respect to physician perceptions of time with patients. For PCPs only, in all specifications, each additional contract is associated with odds of 1.005 of reporting very low adequate time with patients ($p<0.05$). Increasing market concentration, which is associated with lower system fragmentation, is itself associated with a near statistically significantly lower likelihood of reporting very low adequate time with patients ($p=0.053$).

Table 4, Panel C presents the results of the effect of the number of contracts on physician income. For specialists, increases in the number of contracts are associated with increases in income. Moving from a practice with only one contract to the average practice with 12 contracts is associated with about a 3%, statistically significant, increase in physician income per year ($p<0.01$). This result is consistent across all specifications. For PCPs, more contracts are associated with a statistically insignificant 1.6 % increase in income. In both cases, the insurer concentration in an area has no statistically significant effect on physician income.

DISCUSSION

Prior research has shown that managed care contracting adds to physician dissatisfaction and administrative expense. But physicians themselves choose whether to contract and how many contracts to take on. If contracting is so costly and unpleasant, why do physicians do it?

Our results suggest that doctors work more hours and earn more money when they contract with more plans. Choosing to contract with an additional plan is associated with about 0.03–0.05 more hours in patient care (about 0.1 % of mean hours) for both primary care physicians and specialists, and with a statistically significant 0.3 % increase in income for specialists. For primary care physicians, the increase in income associated with an additional contract is of a similar magnitude to the increase in hours worked, suggesting that most of the physician gain from contracting in this group occurs because contracting provides access to more patients. The larger income effect for specialists, by contrast, suggests that in this group, contracting may improve bargaining power. In both cases, doctors with more contracts are more likely to report having inadequate time to spend with patients. Doctors with more contracts also spend modestly more time outside patient care, but the size of this effect, while precisely measured in this large sample, is small.

By contrast, changes in contract availability, which we proxy for with insurer concentration, have fewer consistent effects on physicians. In more concentrated markets with

Table 3. Relationship of the Number of Contracts with 1) Time Spent In Patient Care and 2) Percentage of Hours Outside of Patient Care

	Primary care physicians			Specialists		
	Linear regression	Linear regression + site fixed effects	Linear regression + site fixed effects + HHI	Linear regression	Linear regression + site fixed effects	Linear regression + site fixed effects + HHI
PANEL A: Number of hours in patient care						
HHI			-0.0003 (0.0002)			-0.00008 (0.0003)
Number of contracts	0.046** (0.013)	0.037** (0.013)	0.037** (0.014)	0.030* (0.013)	0.018 (0.013)	0.018 (0.013)
R ²	0.10	0.12	0.12	0.09	0.11	0.11
F-test		4.37**	4.33**		2.69**	2.70**
PANEL B: Percent of hours in medicine outside patient care (measured in 100 s)						
HHI			0.0001 (0.0002)			0.00007 (0.0003)
Number of contracts	0.025* (0.012)	0.026* (0.013)	0.024 (0.013)	0.024 (0.014)	0.031* (0.014)	0.032* (0.015)
R ²	0.07	0.08	0.08	0.07	0.09	0.09
F-test		3.49**	3.45**		3.21**	3.22**

The coefficients for HHI (Herfindahl–Hirshman Index), which ranges from 0 to 10,000, represent the effect of an increase in 1 point. The coefficients for number of contracts represent the effect of an increase in one contract. For Panel B, measured in 100 s means that a one percentage point increase would be represented by a coefficient of 1.0, not 0.01. Linear regressions are performed for Panel A and B. All regressions include year fixed effects. Controls include age, age squared, female gender, hours in charity care in the past month, years in practice, number of physicians in the practice, percent revenue from managed care, percent revenue from Medicare, percent revenue from Medicaid, site level managed care penetration, and practice type (group practice [defined by the Community Tracking Study as practices with three or more physicians], HMO-based, medical school-associated, hospital-based, and other type; the omitted group for practice type is solo practices [defined by the Community Tracking Study as practices with one or two physicians]). Standard errors are in parentheses. R² is reported for each regression. F-tests are reported to test the joint significance of the site fixed effects and of the site fixed effects and HHI.

*p < 0.05
**p < 0.01

Table 4. Relationship between Number of Contracts and 1) Career Satisfaction, 2) Time with Patients, and 3) Income

	Primary care physicians			Specialists		
	Linear regression	Linear regression + site fixed effects	Linear regression + site fixed effects + HHI	Linear regression	Linear regression + site fixed effects	Linear regression + site fixed effects + HHI
PANEL A: Odds of being very dissatisfied with one’s career						
HHI			0.99991 (0.0001)			0.99990 (0.0001)
Number of contracts	1.00006 (0.004)	0.9992 (0.004)	0.9988 (0.004)	1.002 (0.005)	1.001 (0.005)	1.001 (0.005)
F-test		2.11**	2.05**		2.15**	2.11**
PANEL B: Odds of reporting very low adequate time with patients						
HHI			0.99988 (0.00006)			1.004 (0.003)
Number of contracts	1.005* (0.002)	1.005* (0.002)	1.006* (0.002)	1.003 (0.003)	1.004 (0.003)	1.004 (0.003)
F-test		3.39**	3.32**		3.16**	3.01**
PANEL C – Log of Physician Income (measured in 100 s)						
HHI			-0.001 (0.003)			-0.002 (0.002)
Number of contracts	0.157 (0.114)	0.163 (0.122)	0.180 (0.123)	0.283** (0.101)	0.310** (0.114)	0.283* (0.115)
R ²	0.05	0.06	0.06	0.08	0.09	0.09
F-test		2.68**	2.68**		2.39**	2.48**

The coefficients for HHI (Herfindahl–Hirshman Index), which ranges from 0 to 10,000, represent the effect of an increase in 1 point. The coefficients for number of contracts represent the effect of an increase in one contract. For Panel C, measured in 100 s means that a one percentage point increase would be represented by a coefficient of 1.0, not 0.01. Logistic regressions are performed for Panel A and B. Linear regressions are performed for Panel C. All regressions include year fixed effects. Physician income is estimated using censored regression values. Controls include age, age squared, female gender, hours in charity care in the past month, years in practice, number of physicians in the practice, percent revenue from managed care, percent revenue from Medicare, percent revenue from Medicaid, site level managed care penetration, and practice type (group practice [defined by the Community Tracking Study as practices with three or more physicians], HMO-based, medical school-associated, hospital-based, and other type; the omitted group for practice type is solo practices [defined by the Community Tracking Study as practices with one or two physicians]). Standard errors are in parentheses. R² is reported for each linear regression. F-tests are reported to test the joint significance of the site fixed effects and of the site fixed effects and HHI.

*p < 0.05
**p < 0.01

fewer insurers, physicians will not have to incur the higher transactions costs associated with more insurers to gain the same market share. Consistent with this framework, we find that increases in insurer concentration are associated with a near statistically significantly decreased likelihood of perceiving inadequate time with patients.

Our study has several limitations. Our data are from 1996–2005. However, as we note above, the distribution of contracts was largely unchanged from 2005–2008. Our measure of the number of contracts is not granular enough to differentiate cases where a practice holds multiple contracts with the same managed care plan. These types of contracts may be easier to deal with than different contracts with different managed care plans. Some practices may have more administrative staff to deal with more contracts—a practice characteristic that is not measured in the Community Tracking Study. This is consistent with our finding that physicians in group practices, which had more contracts, spent a lower share of total hours outside patient care. Our measure of administrative time—percent of time in medicine outside of patient care—is indirect and includes activities other than dealing with health plans. We attempt to deal with this by controlling for time spent in charity care and eliminating those physicians who spend 20 or fewer hours in patient care (these physicians may be academic physicians who spend the majority of their time in research). Our measures of time with patients and in medically related activities were subjective. It is possible that those with more contracts differentially over-estimate or under-estimate their time in medically related activities. Our analyses include multiple hypotheses. Consistent with most econometric analyses, we report *p* values unadjusted for Bonferroni corrections; however, our main results for time spent in patient care and income remain significant at *p* < 0.05 after this correction is applied. Finally, while the magnitude of our results is generally quite robust to the inclusion of site fixed effects, their statistical significance is affected by site fixed effects, implying that some of the variation in contracting and in outcomes across sites is correlated (positively or negatively) with unobserved site characteristics.

In sum, we find that more contracts are associated with higher incomes and more time in patient care, but also modestly more time spent by physicians outside patient care and lower perceived adequacy of time with patients. The expansion of insurance coverage expected through the ACA is predicted to increase the number of insurers in each state and the availability of contracting opportunities. Our results suggest that these new opportunities will, in general, improve practice prospects for physicians, and are particularly likely to do so if they are combined with steps that promote administrative standardization. Several elements of the ACA, including the development of uniform standards

for processing administrative interactions and transmitting claims (with financial penalties for health plans that do not adopt these rules) could reduce the transactions costs of contracting.¹⁴ These provisions are slated to take effect over the next 2 years and physicians should monitor and participate in their development.¹⁵

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