

## Market-Level Health Maintenance Organization Activity and Physician Autonomy and Satisfaction

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### **Abstract**

Managed care is widely expected to affect physicians throughout the healthcare system. In this study, we examined the relationship between health maintenance organization (HMO) activity and the level of competition, autonomy, and satisfaction perceived by physicians who do not work for HMOs. We obtained data on physicians from the 1991 Survey of Young Physicians, which contains a nationally representative sample of physicians younger than age 45 who had 2 to 9 years of practice experience in 1991. We examined the relationships between HMO market share and perceived competition, autonomy, and satisfaction using multivariate logistic regression. The main outcome measures were perceived level of competition; several measures of physicians' freedom to undertake common tasks that might be threatened by managed care (eg, hospitalizing patients, ordering tests and procedures); satisfaction with current practice situation; perceived ability to practice quality medicine; whether the physician would attend medical school again; and satisfaction with medicine as a career. We found that an increase of 10 percentage points in HMO market share was associated with a 28% increase in the probability that physicians will regard their practice situation as very competitive as opposed to somewhat or not competitive ( $P < 0.01$ ). Examinations of the relationship between HMO market share and autonomy and satisfaction revealed few significant results. We found no evidence that increases in HMO activity adversely affect physician autonomy. Only a limited amount of evidence indicates that increases in HMO activity reduce the satisfaction of specialist physicians, and no evidence associates HMO activity with the satisfaction of generalists. Although physicians perceive HMOs as competitors, HMO activity has not had a strong negative effect on the autonomy and satisfaction of physicians.

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I ncreasing levels of health maintenance organization (HMO) activity in the healthcare market are widely expected to adversely affect the autonomy and satisfaction of healthcare providers and their patients. A number of studies have examined patient satisfaction with various aspects of capitated healthcare,<sup>1,4</sup> and other studies have examined the effects of capitation on the autonomy and satisfaction of physicians employed by HMOs.<sup>5-9</sup> However, few researchers have looked at the effects of managed care on physicians who are not solely employed by HMOs. Nonetheless, increasing competition from managed care may influence these physicians. Our study investigates the relationship between HMO activity and perceived levels of autonomy and satisfaction among physicians.

Health maintenance organization activity may negatively affect physician autonomy and satisfaction in a number of ways. Most importantly, HMOs may compete with other providers or insurers for the business of patients or other purchasers of health insurance, leading these providers or insurers to alter their behavior to stay competitive. In a profession that has historically been fairly free from the cutthroat competition that characterizes many sectors of the economy, increases in the level of competition perceived by physicians and the corresponding changes in physicians' incomes and practice financial situations could have detrimental effects on their satisfaction. Alternately, increased oversight by insurers, perhaps prompted by increases in competition, could reduce levels of perceived autonomy and also affect satisfaction.

Physicians not directly employed by HMOs may also believe that they will eventually lose the battle for survival, be forced to join HMOs to survive,<sup>10</sup> and end up subjected to the financial incentives, ethical conflicts, and instability that managed care often engenders.<sup>10-14</sup> Finally, managed care may change the way patients regard physicians in general.

On the other hand, physicians may be able to adapt to the changes in medicine in ways that allow them to maintain their perceived levels of autonomy and satis-

faction. Several studies have shown high levels of satisfaction among physicians in various practice settings despite the growth of managed care.<sup>7,9,15</sup>

Since competition is likely to play a key role in physician satisfaction, we began our study by examining the relationship between market-wide HMO activity and the level of competition that physicians feel they face in their practices. After examining competition, we turned our attention toward the relationship between HMO activity and physicians' autonomy and satisfaction.

Measuring physician satisfaction is complicated. As others have noted, satisfaction is subjective and multifaceted.<sup>16</sup> In any medical practice, there are numerous aspects with which an individual can be satisfied or dissatisfied. We first examined the level of autonomy physicians feel they have. The autonomy of physicians not directly employed by HMOs is likely to be particularly open to erosion as HMO activity expands and as HMOs and other insurers who pay for their services adopt increasingly stringent cost-control measures. To the extent that perceptions of autonomy either reflect or determine physicians' ability to provide high-quality medicine, an examination of the effects of HMO activity on autonomy levels may in itself provide useful insight into the effects of HMOs. In addition, since autonomy is likely to be a determinant of overall satisfaction, understanding the effects of HMOs on autonomy will shed light on the ways in which HMOs influence physicians more broadly.

Next, we examined two other components of overall satisfaction levels: physicians' satisfaction with their current practice situations and physicians' perceived ability to provide high-quality medical care. Finally, two general measures of overall satisfaction, one asking about physicians' willingness to go to medical school again and another asking directly about their level of satisfaction with their careers in medicine, were examined.

In addition to examining the effects of HMOs on all physicians, we investigated whether HMOs influence generalist physicians differently than specialists. Since HMOs employ more generalists than specialists and tend to provide a large amount of primary care, generalists and specialists may be practicing in different competitive environments. Moreover, studies of physician supply suggest that the number of specialists far exceeds the number that will be required,<sup>17,18</sup> and considerable anecdotal evidence suggests that specialists throughout the healthcare system are beginning to disproportionately feel the pinch of managed care.<sup>19,20</sup>

## ... METHODS ...

### Physician Data

The primary data source for this analysis was the 1991 Robert Wood Johnson Foundation Survey of Young Physicians, a broad-based survey designed to collect a wide variety of information about physician characteristics, practice patterns, and perceptions about training and careers. This survey was designed to represent all allopathic physicians (and osteopathic physicians completing allopathic residencies) who were younger than age 45 and had between 2 and 9 years of practice experience in 1991. The survey contains data for 6,053 physicians and had a response rate of 70%. The survey was based on a complex sampling design, and weights that adjust for the sampling design and correct estimates to reflect the American Medical Association Physician Master-file distribution of young physicians by sex, age, country of medical education (United States or other), and American Medical Association membership were used in our analysis. The survey design, including pretesting and weight construction, is described in detail elsewhere.<sup>21</sup> The survey contained a number of questions about physicians' perceptions of competition, satisfaction, and autonomy, along with additional data on the physicians' practices and characteristics.

Use of this data set excludes consideration of the effect of HMOs on older physicians. This limitation was an inherent characteristic of the available data. Nonetheless, surveys of young physicians will contribute to our understanding of the effects that HMO activity has on physicians' perceptions of competition, satisfaction, and autonomy. Moreover, studying young physicians rather than all physicians may provide better information about the effects of managed care in the future. Younger physicians are more likely than older physicians to have spent significant portions of their careers in practice environments where managed care plays a role. Hence, our study provides a look at the ways managed care influences physicians who are regularly exposed to it, and who, by simple demographics, will make up an increasing share of physicians in the future. Previous studies have also used the approach of examining young physicians as a way of identifying future trends in medicine.<sup>22,23</sup>

Because we wanted to focus on physicians who are not fully employed by HMOs, we initially selected for analysis 3,931 physicians who answered "yes" when asked "In [your main] practice do you provide at least some medical care for which patients pay on a fee-for-service basis?" and who also indicated that they were not employed by a group or staff model HMO in their

main practice. This removed physicians who work only within HMO environments but includes physicians who spend some of their time working under managed care contracts and some in fee-for-service medicine. There is no single conceptually optimal way of defining the sample for this study. In particular, we could also have excluded all physicians with any contracts with managed care organizations. However, since this would have removed many physicians who operate outside of managed care much of the time, we opted for the more inclusive definition here. We recognize that this broad sample selection criteria includes a wide variety of physicians within the same group but note that any sample selection criteria would involve seemingly arbitrary distinctions and suffer from similar difficulties. We hope that examining this sample will provide useful information about the effects of managed care on physicians who are not solely employed by HMOs. We did include control variables for the presence of HMO or individual practice association (IPA) contracts in our multivariate logistic regression analyses.

From the initial group, physicians who did not answer any of the questions used in the analysis were excluded, leaving a sample of 3,641 physicians (60% of the original 6,053) for analysis. Physicians in the sample represented all 50 states and Washington, DC. Radiologists, anesthesiologists, and pathologists were not asked selected questions, and in these cases, the number of observations available for analysis was 3,141.

### Health Maintenance Organization Market Share Data

Estimates of the proportion of the population enrolled in HMOs in the county in which each physician had his or her main practice were used as the measure of HMO activity. We focused on HMO activity because of practical limitations. Although analyzing only HMO market share excludes consideration of other forms of managed care (eg, preferred provider organizations), suitable data on other forms of managed care were not available for the time period studied. We hope that during this period HMO market share will serve as an effective proxy for the general level of managed care activity.

We constructed county-level estimates of HMO market share using enrollment and service area data for all HMOs operating in the United States. Construction took place in three steps. First, we obtained the total enrollment and service area, specified by county, for each HMO in the United States. The principle source of information on HMO enroll-

ments and service areas was the *National Directory of HMOs*, published annually by the Group Health Association of America.<sup>24</sup> To construct estimates of 1990 county market share, we used the 1991 *Directory*, which lists the enrollment and county service area for each of the 567 HMOs in the continental United States, Alaska, and Hawaii as of December 31, 1990. Second, we distributed the enrollment of each HMO among the counties in its service areas. Finally, we computed the total number of enrollees in each county by summing county enrollments over all of the HMOs serving the county. Using the total number of HMO enrollees in each county along with 1990 census data on county population, we computed HMO market share as the ratio of enrollees to total population. Comparisons of the new estimates with limited HMO market share data obtained from independent sources suggested that the model produced reasonable estimates of HMO market share levels. Among physicians included in the analyses, county HMO market shares ranged from 0 to 49.8%. The mean county HMO market share was 16.2%.

### Dependent Variables

Physicians' responses to questions about competition, autonomy, and satisfaction were coded as dichotomous variables for analysis and examined separately. The first set of questions assessed physicians' perceptions about the level of competition (Table 1). Physicians were asked "Thinking about your practice specifically, how would you describe the competitive situation your practice faces: very competitive, somewhat competitive, or not at all competitive?" The probability that a physician would say that his or her practice was in a very competitive situation was modeled.

The second set of questions was designed to assess levels of perceived autonomy. The first question was a general one: "Does the degree of your professional autonomy exceed, meet, or fall short of your expectations?" The probability that a physician would indicate that their degree of autonomy met or exceeded expectations was modeled. Next, physicians were asked a series of questions about the level of autonomy they had in eight specific aspects of medical care delivery. A separate yes-or-no answer was obtained for each practice aspect. The probability of an affirmative response, indicating that the physician felt he or she had autonomy, was modeled.

A third set of questions was designed to measure various aspects of practice and career satisfaction. The first question asked physicians "How satisfied are you with your current main practice: very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?" The probability that a physician would indicate

being either very satisfied or somewhat satisfied was modeled. Modeling only the probability that a physician would be very satisfied was also considered and produced similar results. The second question asked "Does your opportunity to practice quality medicine exceed, meet, or fall short of your expectations?" The probability that a physician would indicate that his or her opportunity met or exceeded expectations was modeled. The third question asked "Given what you now know about medicine as a career, if you were in college today would you go to medical school?" The probability of an affirmative answer was modeled. The fourth question asked "In general, how happy are you with your present career within medicine: very happy, somewhat happy, or not happy?" The probability that a physician would be very happy or somewhat happy was modeled. Modeling only the probability of indicating being very happy did not affect the results of the adjusted model.

**Statistical Analysis**

The focus of our study was on the effect of an increase in HMO activity on physicians' responses. To assess this, we computed odds ratios for the modeled responses associated with a 10 percentage point increase

in HMO market share (eg, moving from 10% to 20%). The deviation of the odds ratio from 1 gives the increase or decrease in the probability of receiving the modeled response associated with a 10 percentage point increase in HMO market share. For example, an odds ratio of 1.15 indicates that a 10 percentage point increase in HMO market share is associated with a 15% increase in the probability of receiving the modeled response.

We computed the odds ratios using SAS statistical software (SAS, v. 6.11, Cary, NC) with weighted logistic regression techniques that model the dichotomous outcome variable as a function of a set of independent variables. The key independent variable in the model was the HMO market share in the county in which each physician had his or her main practice. Since the effect of HMOs can be confounded by other characteristics of the physicians or the geographic areas in which they practice, a number of additional independent variables were included as controls. Physician characteristics included in the model were specialty, practice setting, age, sex, race, malpractice experience, place of graduation, and whether the physician had a contract with an IPA or HMO in addition to his or her fee-for-service practice. In addition, to control for physician preferences that might be related

to the choice of practice location and also to perceptions about competition, autonomy, and satisfaction, three variables measuring the importance of income, the importance of proximity to a tertiary care center, and the importance of control over work hours in each physician's major career decisions were included. For subsets of the analysis sample, we also had data on annual income and the percentage of practice revenues received from HMO and IPA contracts. We experimented with including these variables for physicians for whom they were available and found that this did not influence our results.

Since the number of other physicians in an area may be an important determinant of physicians' perceptions of competition, as well as of their levels of practice and career satisfaction, the number of generalist and specialist physicians per capita in the county in which each physician had his or her main practice were also included in the models. We considered

**Table 1.** Sample Questions Used to Assess Competition, Autonomy, and Satisfaction

<p><b>Competition</b></p> <p>1. Thinking about your practice specifically, how would you describe the competitive situation your practice faces? (very competitive, somewhat competitive, not at all competitive)</p> <p><b>Autonomy</b></p> <p>1. Does the degree of your professional autonomy (exceed, meet, or fall short of) your expectations?</p> <p>2. As a general rule, would you say that in your practice you have the freedom to:</p> <ul style="list-style-type: none"> <li>- spend sufficient time with your patients? (yes, no)</li> <li>- hospitalize patients who, in your opinion, require it? (yes, no)</li> <li>- keep patients hospitalized for the length of time you think is appropriate? (yes, no)</li> <li>- carefully review patients' medical histories and test results? (yes, no)</li> <li>- care for patients even when they are unable to pay the fees and charges? (yes, no)</li> <li>- order tests and procedures whenever you want to? (yes, no)</li> <li>- control your own work schedule? (yes, no)</li> <li>- care for patients who require heavy use of time and resources? (yes, no)</li> </ul> <p><b>Practice and Career Satisfaction</b></p> <p>1. How satisfied are you with your current main practice situation? (very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied)</p> <p>2. Does your opportunity to practice quality medicine (exceed, meet, or fall short of) your expectations?</p> <p>3. Given what you now know about medicine as a career, if you were in college today would you go to medical school? (yes, no)</p> <p>4. In general, how happy are you with your present career within medicine? (very happy, somewhat happy, not happy)</p>
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including additional variables describing the area, such as population demographics, the number of hospital beds per capita, and a dummy variable indicating urban areas. Because inclusion of these variables did not influence the results, they were omitted for parsimony.

Models were estimated for all physicians and separately for generalist physicians and for specialists. The group of generalist physicians was defined to include those in general and family practice, general internal medicine, and pediatrics. All others were considered specialists. Although we suspect that this classification adequately captures most important distinctions, some ambiguity necessarily surrounds the classification of physicians into groups of generalists and specialists using only broad data. For example, some pediatricians with specialized practices may be included in the generalist group because we did not have sufficient data to make fine distinctions. We classified obstetricians and gynecologists as specialists, but some may provide substantial amounts of primary care. In general, our results are robust to removing problematic specialties.

For each dependent variable, we used chi-squared statistics to test the hypothesis that the odds ratio was equal to 1. Ninety-five percent confidence intervals for the odds ratios are also presented. We also used chi-squared statistics to test the hypothesis that the odds ratios associated with an increase in HMO market share were equal for generalists and specialists. Initially, conventional *P* values of 0.05 or less were used to indicate statistical significance. However, since we performed a large number of statistical tests in this study, some results may meet tests for statistical significance simply because many tests were performed. To account for this possibility, statistical significance was also assessed using the Bonferroni adjustment for multiple comparisons.<sup>25</sup>

... RESULTS ...

Sample Characteristics

Demographic characteristics of the young physicians included in the sample are presented in Table 2. The perceptions of physicians concerning the competitive situation facing their practice, their autonomy, and their practice and career satisfaction are summarized in Table 3. Twenty-two percent of physicians believed their practice is in a very competitive situation. Specialists were somewhat more likely than generalists to perceive that their practice was in a competitive situation (28% versus 15%).

When asked about their general level of autonomy, 53% of young physicians not directly employed by HMOs indicated that their level of professional autonomy met or exceeded their expectations; 47% said that their level of professional autonomy fell short of

Table 2. Demographic Characteristics

Variable	Unweighted N
All Physicians	3,641 (100%)
Work Setting	
Self-employed solo practice	1,008 (27.3%)
Self-employed group practice	1,220 (34.6%)
Group employed	481 (13.0%)
Hospital	415 (11.1%)
Freestanding clinic	58 (1.3%)
Medical school	240 (6.9%)
University/college	96 (2.9%)
Government	53 (1.3%)
Other	70 (1.6%)
Medical Training	
United States	3,165 (85.3%)
Abroad	476 (14.7%)
Specialty	
General practice	514 (14.8%)
General internal medicine	673 (19.0%)
Specialized internal medicine	163 (4.9%)
General surgery	177 (5.2%)
Specialized surgery	421 (12.4%)
Pediatrics	376 (9.1%)
Obstetrics and gynecology	271 (7.5%)
Radiology	169 (4.0%)
Anesthesiology	209 (5.2%)
Psychiatry	265 (7.0%)
Pathology	66 (1.6%)
Emergency medicine	117 (3.2%)
Other	220 (6.0%)
Age (y)	
<30	6 (0.2%)
30 - 34	753 (19.8%)
35 - 39	2,200 (60.2%)
40 - 44	682 (19.8%)
Sex	
Male	2,846 (78.7%)
Female	795 (21.3%)
Race and Ethnicity	
White	2,623 (87.2%)
Black	374 (2.3%)
Hispanic	448 (2.8%)
Other	196 (7.7%)

Note: Percentages shown are weighted using sampling weights. Data are from the 1991 Survey of Young Physicians.

expectations. However, when asked about specific autonomy issues, most physicians indicated that they had autonomy. In each of the areas addressed on the survey, at least 71% of physicians perceived that they had autonomy.

Most young physicians in our sample reported being satisfied with their practice and career. Eighty-eight percent of physicians reported being either very or some-

what satisfied with their main practice, and almost 76% indicated that their ability to practice quality medicine met or exceeded their expectation. Most physicians (71%) reported that they would attend medical school again if given the chance, and 95% of physicians said they were very or somewhat happy with their career in medicine. Similar levels of practice and career satisfaction were found among generalists and specialists.

**Table 3.** Perceptions of Competition, Autonomy, and Satisfaction

Modeled Response	All Physicians (%)	Generalists (%)	Specialists (%)
<b>Competition</b>			
"How would you describe the competitive situation your practice faces?"			
Very competitive	22.2	14.9	27.6
Somewhat competitive	54.5	55.9	53.4
Not competitive	23.3	29.1	19.0
<b>Autonomy</b>			
"How does the degree of your professional autonomy match your expectations?"			
Exceeds expectations	6.4	5.8	6.9
Meets expectations	47.0	46.3	47.5
Falls short of expectations	46.5	47.9	45.5
Percentage of physicians who have the freedom to:			
- spend sufficient time with their patients	87.2	85.8	88.2
- hospitalize patients who, in their opinion, require it	93.3	95.1	91.6
- keep patients hospitalized for the length of time they think is appropriate	72.1	77.5	66.9
- carefully review patients' medical histories and test results	94.5	94.6	94.5
- care for patients even when they are unable to pay the fees and charges	91.7	91.6	91.8
- order tests and procedures whenever they want to	83.9	85.4	82.7
- control their own work schedule	71.2	73.1	69.8
- care for patients who require heavy use of time and resources	88.9	89.2	88.6
<b>Practice and Career Satisfaction</b>			
"How satisfied are you with your current main practice?"			
Very satisfied	52.3	48.5	55.8
Somewhat satisfied	35.7	38.7	33.5
Somewhat dissatisfied	9.9	10.2	9.6
Very dissatisfied	2.1	2.5	1.9
"How does your opportunity to practice quality medicine match your expectations?"			
Exceeds expectations	9.0	8.0	9.8
Meets expectations	66.6	66.1	67.0
Falls short of expectations	24.3	25.9	23.2
"If in college today, would you attend medical school?"			
Yes	71.2	73.3	69.7
No	28.8	26.7	30.3
"How happy are you with your present career in medicine?"			
Very happy	46.1	42.3	49.0
Somewhat happy	48.9	52.1	46.5
Not happy	5.0	5.6	4.5

Note: Data are from the 1991 Survey of Young Physicians. The base sample contained 3,641 physicians (1,563 generalists and 2,078 specialists). Questions about freedom to hospitalize patients, control hospital length of stay, and care for patients unable to pay the fees and charges were not asked of radiologists, anesthesiologists, and pathologists. For these questions, the sample contains 3,141 physicians (1,563 generalists and 1,578 specialists).

### Health Maintenance Organizations and Competition

We used logistic regression to examine the relationship between HMO market share and responses to the competition, autonomy, and practice and career satisfaction questions. Specifically, for each question, we computed the odds ratio for the modeled response to each question associated with a 10 percentage point increase in HMO market share. The modeled responses were constructed to correspond to increasing levels of competition, autonomy, or satisfaction.

When all physicians in our sample were examined together, a 10 percentage point increase in HMO market share was associated with a 28% increase in the likelihood that they perceived their practice situation as very competitive (odds ratio, 1.28; 95% confidence interval, 1.18 - 1.38) (Table 4). The odds ratios for generalists and specialists were not statistically significantly different, although the fact that the odds ratio for specialists is higher than that for generalists and approaching statistical significance ( $P = 0.06$ ) suggests a difference.

**Table 4.** Odds Ratios for a 10 Percentage Point Increase in HMO Market Share on Perceived Competition, Autonomy, and Satisfaction

Modeled Response	All Physicians	Generalists	Specialists
<b>Competition</b>			
"How would you describe the competitive situation your practice faces?"			
Very competitive (versus somewhat or not competitive)	1.28* (1.18 - 1.38)	1.15 <sup>†</sup> (1.01 - 1.32)	1.35* (1.23 - 1.49)
<b>Autonomy</b>			
Degree of professional autonomy			
Meets or exceeds expectations (versus falls short of expectations)	0.99 (0.93 - 1.05)	1.02 (0.92 - 1.13)	0.97 (0.89 - 1.05)
Physician has freedom to:			
- spend sufficient time with patients	1.02 (0.92 - 1.12)	0.92 (0.80 - 1.06)	1.11 (0.97 - 1.28)
- hospitalize patients who, in his or her opinion, require it	1.00 (0.86 - 1.15)	1.15 (0.88 - 1.51)	0.92 (0.77 - 1.10)
- keep patients hospitalized for the length of time he or she thinks is appropriate	1.01 (0.93 - 1.09)	1.06 (0.94 - 1.19)	0.96 (0.86 - 1.06)
- carefully review patients' medical histories and test results	0.96 (0.84 - 1.11)	0.92 (0.74 - 1.15)	1.00 (0.83 - 1.21)
- care for patients even when they are unable to pay the fees and charges	0.88 <sup>†</sup> (0.79 - 0.99)	0.90 (0.75 - 1.08)	0.90 (0.77 - 1.06)
- order tests and procedures whenever he or she wants to	0.90 <sup>†</sup> (0.83 - 0.98)	0.87 <sup>†</sup> (0.76 - 1.00)	0.91 (0.82 - 1.02)
- control own work schedule	1.05 (0.98 - 1.14)	1.00 (0.88 - 1.12)	1.07 (0.97 - 1.19)
- care for patients who require heavy use of time and resources	0.90 (0.81 - 1.01)	0.97 (0.82 - 1.14)	0.82 <sup>†</sup> (0.70 - 0.96)
<b>Practice and Career Satisfaction</b>			
Very or somewhat satisfied with main practice (versus somewhat or very dissatisfied with main practice)	0.94 (0.85 - 1.03)	1.08 (0.93 - 1.26)	0.85* (0.75 - 0.96)
Opportunity to practice quality medicine meets or exceeds expectations (versus falls short of expectations)	0.91 <sup>†</sup> (0.85 - 0.98)	0.94 (0.84 - 1.06)	0.89 <sup>†</sup> (0.81 - 0.98)
If in college today, would attend medical school	1.14* (1.05 - 1.22)	1.18* (1.05 - 1.34)	1.12 <sup>†</sup> (1.02 - 1.23)
Very or somewhat happy with present career in medicine (versus not happy with present career in medicine)	0.97 (0.84 - 1.13)	1.01 (0.80 - 1.27)	0.93 (0.77 - 1.13)

Note: Data are from the 1991 Survey of Young Physicians. The 95% confidence intervals for the odds ratios are in parentheses. Odds ratios were adjusted for differences in specialty, practice setting, age, sex, race, malpractice experience, place of graduation, whether the physician had a contract with an IPA or HMO in addition to his or her fee-for-service practice, importance of income, importance of proximity to a tertiary care center, importance of control over work hours, and number of generalist and specialist physicians per capita in the county in which each physician has his or her main practice.

\* $P < 0.01$ .

<sup>†</sup> $P < 0.05$ .

### Health Maintenance Organizations and Autonomy

Increases in HMO activity were not associated with the responses of physicians to a general question about their level of professional autonomy (Table 4). Similarly, there was no systematic relationship between HMO activity and autonomy when specific aspects of medical practice were examined. Limited evidence indicates that increases in HMO market share are associated with decreases in the freedom physicians feel they have to care for patients unable to pay the fees and charges (odds ratio, 0.88; 95% confidence interval, 0.79 - 0.99) and to order tests and procedures whenever they want to (odds ratio, 0.90; 95% confidence interval, 0.83 - 0.98).

### Health Maintenance Organizations and Practice and Career Satisfaction

When all physicians were examined together, we found no evidence that increases in HMO market share were associated with changes in the level of satisfaction with their practices (Table 4). However, when specialists were examined separately, a 10 percentage point increase in HMO market share was associated with a 15% decrease in the odds that a physician will indicate being very or somewhat satisfied with his or her main practice (odds ratio, 0.85; 95% confidence interval, 0.75 - 0.96). No effect was found when generalists were examined separately. The results for generalists and specialists were significantly different ( $P < 0.01$ ).

Increases in HMO activity were also associated with decreases in the probability that specialists will say that their opportunity to practice quality medicine meets or exceeds their expectations. An increase of 10 percentage points in HMO market share reduces by 11% the odds that specialists will indicate that their opportunity to practice quality medicine meets or exceeds their expectations (odds ratio, 0.89; 95% confidence interval, 0.81 - 0.98). No association was found for generalists. The results for generalists and specialists were not significantly different.

Curiously, a 10 percentage point increase in HMO market share was associated with a 14% increase in the odds that physicians will indicate that they would go to medical school again if given the opportunity (odds ratio, 1.14; 95% confidence interval, 1.05 - 1.22). This finding persisted when generalists and specialists were examined separately. No relationship was found when physicians' happiness with their current careers was examined.

### ... DISCUSSION ...

Health maintenance organization activity is strongly related to young physicians' perceptions about the competitiveness of the situation in which they practice. For both generalist and specialist physicians, increases in HMO market share in the communities in which they practice were associated with increases in the probability that physicians would indicate that their practice situation was very competitive rather than somewhat or not competitive.

Conventional wisdom suggests that increases in competition brought on by increases in HMO market share may reduce levels of autonomy and satisfaction among physicians. Increases in competition may subject physicians to increasing levels of utilization review and other forms of oversight, which may reduce autonomy or satisfaction. Alternately, HMO activity may increase their uncertainty about the future, force private practice physicians to adapt their practice styles to remain competitive, or change the expectations and perceptions of patients with whom these physicians interact. All these factors, and perhaps others as well, could lead to reduced levels of satisfaction.

However, there is no evidence that increases in HMO activity reduce the autonomy or satisfaction of generalist physicians. In a variety of models using a wide range of dependent variables, our main finding was a lack of a significant relationship. When responses to questions about general level of autonomy and level of freedom in several areas of clinical practice thought to be threatened by the rise of managed care (eg, freedom to admit patients to the hospital and to control length of stay) were examined, there was no strong evidence that increases in HMO activity reduced perceived levels of autonomy. Of eight specific aspects of medical practice examined, increases in HMO activity were associated with decreases only in perceived freedom to order tests and procedures whenever the physician wanted to. Furthermore, as discussed below, given the large number of statistical tests performed in this analysis, caution should be exercised when interpreting this single significant coefficient.

We also found no evidence that increases in HMO market share were associated with decreases in the level of satisfaction that generalist physicians not directly employed by HMOs have with their main practice, their ability to practice quality medicine, or with their general level of satisfaction with their career in medicine. In fact, our results suggest that increases in HMO market share are associated with increases in the willingness of physicians to return to medical school again if given the chance.



As with generalists, we found no evidence that increased HMO activity reduced specialists' levels of autonomy. There was no statistically significant effect of HMO activity when specialists were asked about their level of autonomy generally. When asked about eight specific aspects of medical practice, in only one case (freedom to care for patients who require heavy use of time and resources) was there a significant decline in autonomy associated with increasing HMO activity. However, as noted above, caution should be exercised when interpreting single significant coefficients because of the large number of tests performed.

The relationship between HMO activity and the satisfaction of specialists is somewhat different from that for generalists. Increases in HMO activity were associated with decreases in specialists' levels of satisfaction with their main practice and with their perceived opportunity to practice quality medicine. However, consistent with the finding for generalists, increases in HMO market share were associated with increases in the likelihood that specialists would say they would go to medical school again. There was no relationship between HMO activity and specialists' responses to a question asking about their general level of happiness with their career in medicine.

Overall, our results provide little evidence that increases in HMO activity and the corresponding increases in competition have had a deleterious effect on the autonomy and satisfaction of physicians who are not solely employed by HMOs. This conclusion is further supported by noting that we performed many separate statistical tests in this study. However, this raises the possibility that some results that met statistical significance tests may have done so only because a large number of tests were performed. In this light, we reassessed the statistical significance of our findings using a Bonferroni adjustment.<sup>25</sup> When the Bonferroni adjustment was applied, only the results from the analysis of the effect of HMO market share on perceptions of competition for all physicians and for specialists and the effect of HMOs on the likelihood of indicating a willingness to go to medical school again for all physicians remained statistically significant. All other results became insignificant.

The finding that increases in HMO market share are associated with increases in the probability that physicians would indicate a willingness to go to medical school again is curious, because it is not consistent with the general findings that managed care has no effect on autonomy and satisfaction. For specialist physicians in particular, it is not consistent with the fact that increases in HMO market share are associated with decreases in the level of satisfaction with their

current practice and with their perceived ability to practice quality medicine. While it is certainly possible that this question measures aspects of satisfaction not associated with other facets of practice and career satisfaction and that increases in HMO activity are indeed associated with increases in the security physicians have with their decision to attend medical school, we recommend further investigation into these matters to help sort out these results.

The finding that HMO activity reduces levels of practice satisfaction and perceived ability to practice quality medicine for specialist physicians not solely employed by HMOs but does not do so for generalists may reflect the impact managed care is expected to have on the number of jobs for specialist physicians over the next several years.<sup>17,18</sup> It is also consistent with many news reports and other anecdotal evidence that suggest that specialist physicians may be bearing the brunt of the shift toward managed care. (*The New York Times*, April 15, 1995:A1, A23. *The Washington Post*, April 25, 1995:A1, A4. *The Wall Street Journal*, March 17, 1995:A1, A4. *The Washington Post*, July 17, 1994:A1, A16.). Our finding is opposite the findings of previous work that reported that, among generalists and specialists working in managed care settings, generalists were less satisfied than specialists.<sup>7,26</sup>

While we believe our study contributes important information to discussions of physician satisfaction, it has some limitations. First, it is based on observational data and thus causal inferences cannot be drawn with certainty. Our finding that increases in HMO market share are associated with increases in the likelihood that physicians will perceive that their practice is competitive is consistent with marketplace changes generally thought to be occurring, but these correlations may be caused by unobserved characteristics of markets or other factors that we did not observe (eg, attractiveness of an area as a place to live). Similarly, our finding that there is no strong association between HMO market share and perceived autonomy and satisfaction may be the result of confounding factors that offset an effect of HMO market share. To minimize any difficulties from confounders, we attempted to statistically control for as many confounding factors as possible, and we believe that the likelihood of bias from any remaining unidentified sources is small. Nonetheless, there may be additional causal factors for which we have not accounted.

A second limitation is that we were not able to include data on the market activities of non-HMO managed care organizations. While we believe that

HMO market share by itself provides useful information, we encourage further work that incorporates a broader set of managed care measures.

Third, defining the sample was a challenge. We included in our analyses physicians who practice only fee-for-service medicine as well as physicians who practice some fee-for-service medicine and also have contracts with managed care. Because there is a broad spectrum of involvement with managed care organizations, this lumps together physicians in a wide variety of practice settings. We did include controls for the presence of IPA and HMO contracts in our statistical analyses to attempt to control for these differences to some extent, but this study does not capture the effects of managed care on more finely delineated groups of physicians.

Our study revealed no strong reasons to believe that HMO activity negatively affected the autonomy and satisfaction of physicians in the early 1990s. However, a number of issues should be considered when applying these findings to medicine currently and in the future. First, the marketplace continues to change and to shift ever further toward managed care. Ongoing changes in healthcare delivery and financing may place increasing pressure on physicians not directly employed by HMOs and, over time, may lead to greater dissatisfaction and decreases in their autonomy. In addition, payers who were not traditionally included among "managed care" organizations, including Medicare and Medicaid, are increasingly adopting utilization review, financial incentives, and other mechanisms that may independently influence physician autonomy and satisfaction. Although our results are good news, further attention to satisfaction and autonomy is warranted as changes in the healthcare marketplace continue.

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