Background: Primary care performance has been shown to differ under different models of health care delivery, even among various models of managed care. Pervasive changes in our nation’s health care delivery systems, including the emergence of new forms of managed care, compel more current data.

Objective: To compare the primary care received by patients in each of 5 models of managed care (managed indemnity, point of service, network-model health maintenance organization [HMO], group-model HMO, and staff-model HMO) and identify specific characteristics of health plans associated with performance differences.

Methods: Cross-sectional observational study of Massachusetts adults who reported having a regular personal physician and for whom plan-type was known (n = 6018). Participants completed a validated questionnaire measuring 7 defining characteristics of primary care. Senior health plan executives provided information about financial and nonfinancial features of the plan’s contractual arrangements with physicians.

Results: The managed indemnity system performed most favorably, with the highest adjusted mean scores for 8 of 10 measures (P<.05). Point of service and network-model HMO performance equaled the indemnity system on many measures. Staff-model HMOs performed least favorably, with adjusted mean scores that were lowest or statistically equivalent to the lowest score on all 10 scales. Among network-model HMOs, several features of the plan’s contractual arrangement with physicians (ie, capitated physician payment, extensive use of clinical practice guidelines, financial incentives concerning patient satisfaction) were significantly associated with performance (P<.05).

Conclusions: With US employers and purchasers having largely rejected traditional indemnity insurance as unaffordable, the results suggest that the current momentum toward open-model managed care plans is consistent with goals for high-quality primary care, but that the effects of specific financial and nonfinancial incentives used by plans must continue to be examined.

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For 3 decades, health policy studies in the United States have urged that primary care be strengthened as a means of controlling health care spending, improving access to care, and ensuring the quality of health care.1-7 The steadily increasing percentage of Americans enrolled in health plans that require them to choose a primary physician, responsible for coordinating their care, is often taken as evidence of progress toward this goal. However, coordination of services is just one of several necessary features of primary care. Primary care is formally defined to include the following characteristics: accessibility, continuity, comprehensiveness, coordination (or integration), clinical management, a “whole-person” orientation, and a sustained clinician-patient partnership.1,2,8-11

Previous studies comparing performance on one or more of these characteristics across different types of health plans have identified substantial differences between indemnity and managed care plans, as well as among different forms of managed care.12-23 In a previous study, Safran et al12 identified significant differences in the primary care performance of indemnity and managed care delivery systems (1986-1988). The results suggested that each of 3 plan-types (indemnity insurance, independent practice association [IPA]/network-model health maintenance organization [HMO], and staff- or group-model HMO) had a unique profile of strengths and weaknesses.
METHODS

STUDY DESIGN

The study population included adults employed by the Commonwealth of Massachusetts and enrolled in any of 12 health plans offered to state workers. With 3 mixed-model plans (ie, plans that offer more than 1 plan-type to enrollees), there were a total of 15 plan/plan-type combinations. Definitions of the 5 models of managed care represented are given in Table 1. Details of the study design are summarized here briefly and documented more extensively elsewhere.26-30

SURVEY OF PATIENTS

Between January 15 and April 30, 1996, the Primary Care Assessment Survey (PCAS)28 was administered to a random sample of eligible state employees, stratified by health plan (n = 10 733). A standard 3-step mail survey protocol with telephone follow-up of randomly selected nonrespondents was used.31 A total of 221 employees from the starting sample were excluded as either unlocatable by mail (n = 184), deceased (n = 11), or no longer an employee of the commonwealth (n = 26). The overall response rate was 68.5% (n = 7 204), with 6810 responses obtained by mail and 394 obtained by telephone. As is customary in survey research, respondents were older and disproportionately female compared with nonrespondents (P = .001). Data from telephone respondents, whose characteristics and responses are presumed to approximate those of nonrespondents, suggest that nonresponse was unrelated to patients' assessments of their primary physician (ie, telephone and mail respondents' assessments of their primary physicians were statistically equivalent). The demographic characteristics of Massachusetts state employees are similar to those of employed adults nationally, except that a larger proportion of state employees are college educated and in older age groups (45 years and older) than employed adults nationally32 (also US Bureau of Labor Statistics, unpublished data, 1997).

The PCAS is a validated, 51-item, patient-completed questionnaire designed to measure the essential elements of primary care named in formal definitions of the term, including the recent Institute of Medicine definition.6 This study examined 10 PCAS scales across 7 domains of care: access, continuity (visit-based, relationship duration), comprehensiveness (knowledge of patient, preventive counseling), integration of care, clinical interaction (clinician-patient communication, thoroughness of physical examinations), interpersonal treatment, and patient trust.26 The PCAS scales do not assess technical aspects of health care quality because of limitations of patient-provided information about that domain.16,31-35 The PCAS scales exceeded established standards for excellent instrumentation and performance consistently well across population subgroups defined according to age, sex, education, race, household income, and health status.28 Table 2 summarizes the item content for each PCAS scale.

SURVEY OF HEALTH PLAN EXECUTIVES

In October 1996, senior executives from each health plan completed an organizational survey detailing financial and nonfinancial aspects of the plan's contractual arrangements with primary care physicians. The organizational survey was adapted from a recent national study of health plans27 and elicited information about the plan's physician recruitment, selection, and deselection criteria; compensation and financial incentives; and nonfinancial influences on care, including the use of profiling, guidelines, and utilization review. The time frame specified by the survey corresponded to that in which the patient survey was completed. For the 3 mixed-model plans, executives answered each question separately for each model (“product”) offered by the plan. Follow-up interviews, designed to gain a more detailed understanding of key issues covered in the survey, were conducted at the plans' executive offices by 2 members of the core study leadership (D.G.S., W.H.R.).

Pervasive changes in health care delivery, including the emergence of new plan-types, compel further study of these issues. In addition, most comparative studies have examined only 1 or 2 primary care characteristics, some primary care characteristics have not been studied at all, and studies often fail to differentiate among various forms of managed care. Finally, there is a growing awareness that we must move beyond health plan types to identify specific policies and practices of health plans that influence performance.24-27

The present study compares the primary care received by patients in each of 5 models of managed care, including managed indemnity insurance, point-of-service (POS) insurance, IPA/network-model HMO, group-model HMO, and staff-model HMO. Using data provided by patients, the study measures and compares performance on 7 core features of primary care: accessibility, continuity, comprehensiveness, integration, clinical interaction, humane interpersonal treatment, and patient trust. In addition, using information obtained from senior executives at each health plan, the study attempts to identify specific health plan policies and practices that are associated with performance differences.

Table 3 compares the unweighted sociodemographic and health characteristics of our analytic sample across the 5 models of care. By virtue of the study sampling frame, all respondents were employed adults. The mean age was 48.6 years (range, 19-88 years). Just over half of respondents (55.8%) were female, and the vast majority were white (87.9%), with more than a high school education (69.3%). The vast majority of patients in each model of care except POS had been enrolled in their current health plan for at least 3 years. Patients with indemnity insurance were older, sicker, and disproportionately male and white, compared with patients in the other models of care (P<.05). Patients in the IPA and staff-model HMOs were younger, on average, than those in each of the other 3 models (P<.001). Staff-model HMOs had more non-
The principal analytic objective was to compare the primary care experiences of patients in each of the 5 models of managed care represented in the study. The analytic sample included mail respondents who reported having a regular personal physician and for whom plan-type was known (n = 6018). Telephone respondents (n = 394) and mail respondents with no regular personal physician (n = 716) were excluded because they did not complete sections of the survey required for analyses. Patients for whom health plan and/or plan-type were unknown (n = 76) were also excluded.

To identify differences in primary care performance across the 5 models of care, a series of regression models was constructed, each with 1 of the 10 PCAS scales as the dependent variable. Each model included binary indicators of plan-type (ie, model of managed care) as the main effects, and control variables denoting patients’ demographic characteristics (age, sex, race, years of education, and household income), tenure in current health plan, and chronic medical conditions (from a checklist of 21 conditions with high prevalence among US adults). For each PCAS scale, a series of t-tests was used to compare each model of managed care with all other models (ie, not just the reference group). The t-test results were used to define 3 tiers of performance for each scale: highest performance (model of care with the highest adjusted mean score and all models statistically equivalent to that), lowest performance (model of care with the lowest adjusted mean score and all models statistically equivalent to that), and intermediate performance (remaining models of care).

To evaluate whether the model of care effects were consistent for patients with better (or worse) health, 3 sets of interaction terms were tested. The first set interacted plan-type with a variable indicating the number of chronic conditions reported in the patient survey (a binary indicator differentiated patients with physical health index conditions reported in the patient survey (a binary indicator differentiated patients with 2 or more conditions from those with 0 or 1 condition). The second set interacted plan-type with a variable indicating the number of primary care-sensitive conditions reported by the patient. Primary care-sensitive conditions included hypertension, recent myocardial infarction, congestive heart failure, diabetes, angina, migraines, seasonal allergies, asthma, ulcers, arthritis, cancer, back pain, weight problem, and depression. This subset of conditions from the checklist was defined by 9 physicians, blind to the study objectives, as conditions for which good primary care management could substantially affect outcomes. The third set interacted plan-type with an indicator of functional health status from the Short Form-12 Health Survey (a binary indicator differentiated patients with physical health index scores below the national mean [30 points] from those at or above the national mean).

Finally, an additional set of regression analyses was conducted to examine the relationship between primary care performance and specific features of health plans identified through the organizational survey and interviews. To avoid plan-type as a confounding factor, analyses were limited to patients in models of care represented by multiple plans, and models of care for which the representative plans varied in the characteristic being examined (eg, method of physician payment, use of physician profiling). Only the IPA/network-model HMOs met these criteria. The study included 8 IPA/network-model HMOs, with substantial variability in their financial and nonfinancial arrangements with physicians. Among IPA/network-model HMOs, there was variability in physician payment methods (fee for service vs capitation), use of financial incentives concerning patient satisfaction, profiling individual physician performance, and use of clinical practice guidelines.

Probability sampling weights, derived as the inverse of sampling probabilities, were applied to all regression analyses to correct for the effects of differing sampling probabilities across the strata. The statistical software used in our analyses (STATA 5.0) takes these weights into account when computing SEs. All P values were corrected for multiple comparisons by means of Bonferroni’s method for individual t-tests to account for analysis of 10 dependent variables.

### PRIMARY CARE PERFORMANCE DIFFERENCES ACROSS 5 MODELS OF MANAGED CARE

Table 4 presents the adjusted primary care performance results for each model of managed care. For each scale, scores range from 0 to 100, with higher scores indicating more favorable performance. Overall, the indemnity insurance system performed most favorably, with adjusted mean scores that were either highest or statistically equivalent to the highest score on 9 of 10 scales. Staff-model HMOs performed least favorably, with adjusted mean scores that were lowest or statistically equivalent to the lowest score on all 10 scales. The POS and IPA/network-model HMOs performed equally to the indemnity system on many attributes and at intermediate levels for most others. Group-model HMOs performed at mostly intermediate levels. The magnitude of differences across plan-types (highest vs lowest) was generally about 0.40 SD. The largest differences among plan-types occurred for visit-based continuity (0.91 SD), and the smallest occurred for access to care (0.20 SD). Confidence intervals (95%) around plan-type means for 2 representative scales are illustrated in Figure 1. Interactions between plan-type and patient health status (ie, number of chronic conditions, number of primary care-sensitive conditions, functional health status) showed no significant effects.

### PLAN CHARACTERISTICS AND PRIMARY CARE PERFORMANCE

Table 5 summarizes results of analyses examining the association between specific IPA/network-model HMO characteristics and patients’ assessments of primary care. Within IPA/network-model HMOs, capitated (vs fee-for-service) physician payment was significantly negatively associated with 4 aspects of primary care (access, phy-
no single model of care performs at the highest level for aged care. As in our previous work, the study found that the experiences of patients in 5 models of managed care demonstrate significant differences in performance.

**Table 1. Definitions of Plan-Types (Models of Managed Care)**

<table>
<thead>
<tr>
<th>Plan-Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed indemnity insurance</td>
<td>Enrollees are permitted to obtain care from any physician they choose without financial incentives to select from among a certain set of physicians, and physicians are paid on a fee-for-service basis. Differentiated from traditional (unmanaged) indemnity insurance by the plan's use of 1 or more utilization management requirements (eg, preauthorization for hospital admission).</td>
</tr>
<tr>
<td>Point-of-service plan</td>
<td>The plan contracts with a network of physicians on a nonexclusive basis, and enrollees are given a financial incentive to use the &quot;preferred&quot; network of providers, but are covered for out-of-network care.</td>
</tr>
<tr>
<td>IPA/network-model HMO</td>
<td>The plan contracts with a network of physicians on a nonexclusive basis, and enrollees are not covered for care received from physicians outside the plan's network.</td>
</tr>
<tr>
<td>Group-model HMO</td>
<td>The plan contracts with a single large physician group on an exclusive basis, with the medical group typically paid capitation. Enrollees are not covered for care received from physicians outside the designated medical group, unless it is specifically recommended and authorized.</td>
</tr>
<tr>
<td>Staff-model HMO</td>
<td>Physicians are salaried employees, contracting exclusively with the staff-model HMO (ie, not with any additional plans). Enrollees are not covered for care received from a non-plan physician unless it is specifically recommended and authorized.</td>
</tr>
</tbody>
</table>

**Table 2. Summary of Primary Care Assessment Survey (PCAS) Scale Content**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Content of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to care</td>
<td>Ability to get through to the physician's office by telephone, to get a medical appointment when sick, and to obtain information by telephone, punctuality of appointments, convenience of office location, and convenience of office hours.</td>
</tr>
<tr>
<td>Continuity</td>
<td>How often patient sees primary physician (not an assistant or partner) for routine checkups, and for appointments when sick.</td>
</tr>
<tr>
<td>Visit-based continuity</td>
<td>Primary physician's knowledge of patient's medical history; responsibilities at work, home, or school; principal health concerns, values, and beliefs.</td>
</tr>
<tr>
<td>Knowledge of the patient</td>
<td>Whether primary physician has discussed the following with patient: smoking, alcohol use, seat belt use, diet, exercise, stress, safe sex.</td>
</tr>
<tr>
<td>Preventive counseling</td>
<td>Whether primary physician has discussed the following with patient: smoking, alcohol use, seat belt use, diet, exercise, stress, safe sex.</td>
</tr>
<tr>
<td>Integration</td>
<td>Assessment of primary physician's role in coordinating and synthesizing care received from specialists and/or while patient was hospitalized.</td>
</tr>
<tr>
<td>Clinical interaction</td>
<td>Thoroughness of primary physician's questions about symptoms, attention to what patient says, clarity of explanations and instructions, and advice and help in making decisions about care.</td>
</tr>
<tr>
<td>Communication</td>
<td>Thoroughness of primary physician's physical examinations of patient.</td>
</tr>
<tr>
<td>Physical examinations</td>
<td>Primary physician's patience, friendliness, caring, respect, and time spent with patient.</td>
</tr>
<tr>
<td>Interpersonal treatment</td>
<td>Assessment of primary physician's integrity, competence, and role as the patient's agent.</td>
</tr>
</tbody>
</table>

**COMMENT**

This study demonstrated significant differences in the primary care experiences of patients in 5 models of managed care. As in our previous work, the study found that no single model of care performs at the highest level for all aspects of care. Overall, performance was more favorable in open-model delivery systems, which do not contract with physicians on an exclusive basis (ie, indemnity, POS, IPA/network-model HMOs), than in closed-model systems, in which exist exclusive relationships with physicians (ie, group- and staff-model HMOs). Among open-model systems, the indemnity system performed most favorably. The IPA/network-model HMOs were more extensively represented here than in previous studies, and primary care performance in a POS plan was evaluated for the first time. The findings suggest that these 2 open-model systems, which are rapidly gaining predominance in the insurance market nationwide, perform equivalently to the indemnity system on many dimensions of primary care.

To our knowledge, this is the first time that a study has differentiated between staff- and group-model HMOs, physicians' knowledge of patients, clinician-patient communication, and interpersonal treatment). The use of financial incentives concerning patient satisfaction was significantly positively related to access, physicians' knowledge of patients, and preventive counseling. The extensive use of guidelines was significantly negatively related to clinician-patient communication, interpersonal treatment, and trust. Profiling individual physician performance was significantly negatively related to visit-based continuity.
study showed more continuity of care in the fee-for-
staff-model patients.12,17,19 IPA/network-model patients experienced better access service system than in HMOs,12,13,15-18 and among HMOs, previous research, access to care was higher in the fee-for-
previous study by Safran et al.12 As in previous-performing plan-types (0.2 SD) was identical to that
magnitude of the difference between the highest- and low-
differences among plan-types were in access to care, where the
differentiation observed. The smallest differ-
correction of the differences observed. The smallest differ-
tent with previous findings, in both magnitude and di-
differences in relationship duration. Plan-type differences in visit-based continuity were the largest of all plan-type differences observed (0.91 SD) and showed a single highest-
performing plan-type (fee for service) and a single lowest-
performing plan-type (staff-model HMOs). In addition, the results suggest that visit-based continuity is important to patients and valued by them. Figure 2 illustrates this evidence, showing the correspondence between patients’ reports about and ratings of their visit-based continuity. As illustrated in the figure, the majority of patients who reported “always” seeing their primary physician for sick visits rated that as “excellent,” while patients who reported seeing their primary physician “some of the time,” or less, most often rated that level of continuity as “fair,” “poor,” or “very poor” (P<.001).
With respect to relationship duration, previous studies have left unanswered questions about whether the less enduring relationships observed in managed care plans, particularly in staff-model HMOs, are the result of em-

Table 3. Characteristics of the Analytic Sample by Health Plan-Type, Unweighted

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Indemnity (n = 761)</th>
<th>POS (n = 579)</th>
<th>IPA/Network-Model HMO (n = 2761)</th>
<th>Group-Model HMO (n = 934)</th>
<th>Staff-Model HMO (n = 983)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean, y</td>
<td>57.8</td>
<td>49.0†</td>
<td>46.6†</td>
<td>48.4†</td>
<td>46.9†</td>
</tr>
<tr>
<td>Sex, % F</td>
<td>48.7</td>
<td>56.0†</td>
<td>58.4†</td>
<td>53.6†</td>
<td>55.9†</td>
</tr>
<tr>
<td>Race, % white</td>
<td>92.6</td>
<td>87.6†</td>
<td>87.1†</td>
<td>91.1†</td>
<td>83.9†</td>
</tr>
<tr>
<td>Years of education, mean</td>
<td>14.8</td>
<td>14.6</td>
<td>14.2†</td>
<td>14.8</td>
<td>14.6</td>
</tr>
<tr>
<td>Household income &lt;$20,000, %</td>
<td>2.9</td>
<td>3.9</td>
<td>4.3</td>
<td>3.1</td>
<td>3.8</td>
</tr>
<tr>
<td>No. of chronic conditions, mean</td>
<td>3.2</td>
<td>2.9§</td>
<td>2.8†</td>
<td>2.8†</td>
<td>2.9§</td>
</tr>
</tbody>
</table>

Table 4. Primary Care Performance by Health Plan-Type, Adjusted

<table>
<thead>
<tr>
<th>Scale</th>
<th>Indemnity (n = 761)</th>
<th>POS (n = 579)</th>
<th>IPA/Network-Model HMO (n = 2761)</th>
<th>Group-Model HMO (n = 934)</th>
<th>Staff-Model HMO (n = 983)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to care</td>
<td>70.6</td>
<td>68.0</td>
<td>69.2</td>
<td>69.2</td>
<td>67.3</td>
</tr>
<tr>
<td>Continuity</td>
<td>89.4</td>
<td>81.7</td>
<td>86.5</td>
<td>75.0</td>
<td>68.9</td>
</tr>
<tr>
<td>Relationship duration</td>
<td>78.7</td>
<td>80.3</td>
<td>79.3</td>
<td>75.6</td>
<td>68.9</td>
</tr>
<tr>
<td>Comprehensiveness</td>
<td>58.7</td>
<td>55.4</td>
<td>56.4</td>
<td>56.0</td>
<td>51.4</td>
</tr>
<tr>
<td>Knowledge of the patient</td>
<td>48.8</td>
<td>44.7</td>
<td>44.6</td>
<td>52.8</td>
<td>46.7</td>
</tr>
<tr>
<td>Preventive counseling</td>
<td>72.8</td>
<td>69.7</td>
<td>71.3</td>
<td>69.6</td>
<td>65.2</td>
</tr>
<tr>
<td>Integration</td>
<td>82.4</td>
<td>81.3</td>
<td>80.5</td>
<td>78.8</td>
<td>75.5</td>
</tr>
<tr>
<td>Clinical interaction</td>
<td>81.1</td>
<td>79.8</td>
<td>79.6</td>
<td>79.2</td>
<td>75.3</td>
</tr>
<tr>
<td>Physical examinations</td>
<td>81.2</td>
<td>78.6</td>
<td>78.6</td>
<td>79.2</td>
<td>73.6</td>
</tr>
<tr>
<td>Communication</td>
<td>78.2</td>
<td>76.1</td>
<td>76.7</td>
<td>75.2</td>
<td>72.2</td>
</tr>
</tbody>
</table>

*POS indicates point of service; IPA, independent practice association; and HMO, health maintenance organization.
†P<.001 vs fee-for-service plan.
‡P<.01 vs fee-for-service plan.
§P<.05 vs fee-for-service plan.
||From a checklist of 21 chronic conditions prevalent among US adults.

Despite known differences in the nature of the contractual arrangements that the models have with their physicians (ie, salaried employment vs independent medical group contracted by the plan). The substantial differences in their performance, with staff-model HMOs performing significantly less favorably on all dimensions, suggest that the different contractual arrangements that the plans have with physicians may be important.

For the primary care characteristics that have been studied previously, the results here are largely consistent with previous findings, in both magnitude and direction of the differences observed. The smallest differences among plan-types were in access to care, where the magnitude of the difference between the highest- and lowest-performing plan-types (0.2 SD) was identical to that observed in the previous study by Safran et al.12 As in previous research, access to care was higher in the fee-for-service system than in HMOs,12,13,15-18 and among HMOs, IPA/network-model patients experienced better access than staff-model patients.12,17,19

Also consistent with previous research,12,13,16,20 this study showed more continuity of care in the fee-for-service system than in other models of care. The study adds to previous evidence concerning continuity by differentiating between visit-based continuity and relationship duration. Plan-type differences in visit-based continuity were the largest of all plan-type differences observed (0.91 SD) and showed a single highest-performing plan-type (fee for service) and a single lowest-performing plan-type (staff-model HMOs). In addition, the results suggest that visit-based continuity is important to patients and valued by them. Figure 2 illustrates this evidence, showing the correspondence between patients’ reports about and ratings of their visit-based continuity. As illustrated in the figure, the majority of patients who reported “always” seeing their primary physician for sick visits rated that as “excellent,” while patients who reported seeing their primary physician “some of the time,” or less, most often rated that level of continuity as “fair,” “poor,” or “very poor” (P<.001). With respect to relationship duration, previous studies have left unanswered questions about whether the less enduring relationships observed in managed care plans, particularly in staff-model HMOs, are the result of em-
physician actions (eg, changing plan offerings), physician actions (eg, leaving a plan, relocating), or patient actions. In the present study, the observed discontinuities are almost certainly the result of patient actions. All plans except 1 (POS, founded in 1994) had been offered to employees for at least 7 years, and the overwhelming majority of study participants had been enrolled in the same plan for at least 3 years (Table 2). Physician turnover in all plans, reported in organizational surveys and interviews, had been negligible in the 2 years preceding the study. Thus, the more frequent physician switching observed in the staff-model HMOs, and to a lesser extent in group-model HMOs, appears to reflect patients' voluntary actions and suggests that patients in these models of care are failing to establish primary care relationships that they consider worth maintaining.

EXPLAINING THE DIFFERENCES IN PRIMARY CARE PERFORMANCE

In the context of this study, we cannot conclusively determine the reasons for the observed differences across the 5 models of managed care. However, the information obtained from senior health plan executives provides some useful insights.

First, health plan executives offered a single and markedly consistent characterization of attitudinal differences between physicians practicing in different models of care. They suggested that physicians practicing in open-model systems (ie, fee for service, POS, IPA/network-model HMOs) are inherently more concerned with establishing enduring patient relationships than physicians in closed-model systems (group- and staff-model HMOs). They noted that physicians in open-model systems knowingly assume responsibility for building and maintaining their patient panel as part of their professional life, while physicians in closed-model systems were said to largely rely on their plan to provide them with patients. Although we cannot verify the attitudinal differences that the executives described, the study findings are consistent with the hypothesis that the executives suggest.

In addition, the study results suggest that primary care performance is influenced by specific financial and nonfinancial strategies used by plans to manage care. Within IPA/network-model HMOs, financial incentives were substantially related to several aspects of performance. Paying physicians capitation (vs fee for service) was negatively associated with most PCAS scales, and the negative association was statistically significant for measures pertaining to the quality of the physician-patient relationship (ie, knowledge of patients, communication, interpersonal treatment). On the other hand, where IPAs offered physicians financial incentives based on patient satisfaction, a positive association with many aspects of performance was observed, and a few of these associations (access to care, knowledge of patient, preventive counseling) were statistically significant. Among nonfinancial strategies employed by plans, the extensive use of practice guidelines was significantly associated with several aspects of primary care performance, while profiling individual physician performance (satisfaction and/or utilization) was not.

Taken together with the plan-type comparisons, the results suggest a striking relationship between primary care performance and the level of alignment between physicians' professional identity and/or financial interests and those of health plans. In this study, the managed indemnity plan and staff-model HMOs stood at opposite extremes of this spectrum, with virtually no links between physicians and the indemnity plan, contrasted with physicians serving as salaried employees of the staff-model HMOs. Forming the middle ground, in terms of both performance and the level of plan-physician association, were the POS plan, IPA/network-model HMOs, and group-model HMOs.

LIMITATIONS

There are important limitations of the study that should be considered. First, the study population consisted of employed, insured adults who were predominantly white, with at least a high school diploma. Further study of these issues in a more sociodemographically diverse population is important, particularly in the face of state and federal policies that increasingly require or encourage more medically and socioeconomically vulnerable populations (eg, Medicaid, Medicare) to enroll in various managed care arrangements.

Second, the 5 models of managed care examined in this study are represented through 15 plan and plan-type entities in Massachusetts. The marked consistency between findings of these plan-type comparisons and those observed in other studies suggests that these results are not merely an artifact of localized health care delivery pat-
terns. However, further study in other markets is warranted. The observed relationship between specific features of IPA/network-model HMOs (eg, physician payment, profiling, use of guidelines) and primary care performance should be viewed more cautiously. A larger study, including a much larger number of plans, with widely varying configurations of organizational and financial characteristics, is needed to verify the relationship between specific features of the plan-physician interface and primary care performance.

Third, the study does not provide information with which to compare technical aspects of care across plan-types. Studies comparing performance on technical elements of quality are needed to further our understanding of the relative strengths and weaknesses of each plan-type.

Finally, the study is limited by the absence of performance benchmarks that would enable us to define levels of acceptable (and unacceptable) performance, and to indicate the clinical and/or cost implications of performance differences. While available data suggest a substantial association between the PCAS scales and important outcomes of care (eg, adherence, satisfaction, self-reported changes in health), studies to provide the necessary benchmarking information with respect to outcomes are just under way.

**CONCLUSIONS**

Despite substantial changes in the health care delivery system in the past decade, the results of this study suggest that previously observed performance differences on defining characteristics of primary care persist today, and that substantial differences are observable for features not previously examined (ie, physicians' knowledge of patients, communication with patients, and patients' trust). Overall, performance appears more favorable in open-model delivery systems, which do not contract with physicians on an exclusive basis. Group-model HMOs performed at mostly intermediate levels, and staff-model HMOs performed least favorably on all elements assessed. The results did not differ for patients in better (or worse) health, as defined by specific chronic medical conditions or by functional health status.

Within IPA/network-model HMOs, several features of the plan-physician interface, particularly those involving financial incentives to physicians, were significantly associated with patients' assessments of their primary physician. Thus, while the majority of plan-related variance in primary care performance scores was

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**Table 5. IPA/Network-Model HMO Characteristics as Predictors of Primary Care Performance: Regression Coefficients**

<table>
<thead>
<tr>
<th>Primary Care Scale</th>
<th>Pay Physicians Capitation, β</th>
<th>Financial Incentives Regarding Patient Satisfaction, β</th>
<th>Profile Individual Physician Performance, β</th>
<th>Extensive Use of Practice Guidelines, β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to care</td>
<td>-2.30†</td>
<td>2.57‡</td>
<td>-0.27</td>
<td>-4.30</td>
</tr>
<tr>
<td>Continuity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visit-based</td>
<td>-2.10†</td>
<td>2.00†</td>
<td>0.44</td>
<td>-4.40</td>
</tr>
<tr>
<td>Relationship duration</td>
<td>1.30</td>
<td>-0.99</td>
<td>1.50</td>
<td>-6.10</td>
</tr>
<tr>
<td>Comprehensiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge of patient</td>
<td>-2.10†</td>
<td>3.50†</td>
<td>0.10</td>
<td>0.22</td>
</tr>
<tr>
<td>Preventive counseling</td>
<td>-1.32</td>
<td>1.29</td>
<td>0.10</td>
<td>0.16</td>
</tr>
<tr>
<td>Integration of care</td>
<td>-2.50</td>
<td>1.29</td>
<td>-0.43</td>
<td>0.16</td>
</tr>
<tr>
<td>Clinical interaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>-3.20†</td>
<td>0.95</td>
<td>0.18</td>
<td>-6.10†</td>
</tr>
<tr>
<td>Physical examinations</td>
<td>-1.40</td>
<td>0.39</td>
<td>0.79</td>
<td>-4.20</td>
</tr>
<tr>
<td>Interpersonal treatment</td>
<td>-2.55†</td>
<td>1.32</td>
<td>0.95</td>
<td>-9.50§</td>
</tr>
<tr>
<td>Trust</td>
<td>-1.66</td>
<td>1.25</td>
<td>0.91</td>
<td>-6.30‡</td>
</tr>
</tbody>
</table>

*Results are based on regression models that adjust for patient sociodemographic characteristics (age, sex, race, years of education, household income), tenure in current health plan, and chronic medical conditions. IPA indicates independent practice association; HMO, health maintenance organization.

†P ≤ .05.  
‡P ≤ .01.  
§P ≤ .001.

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**Figure 2.** Distribution of visit-based continuity ratings by reported levels of visit-based continuity with primary physician. Results depict patients’ responses to a pair of questions. The first question (report) asked how often the patient sees his or her primary physician (not an assistant or partner) when he or she is sick and goes for an office visit (always, almost always, etc). The second question (rating) asked the patient to evaluate this level of continuity (excellent, very good, etc).

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**Figure 3.** Percentage of patients reporting levels of visit-based continuity with a primary physician. Results depict patients’ responses to a pair of questions. The first question (report) asked how often the patient sees his or her primary physician (not an assistant or partner) when he or she is sick and goes for an office visit (always, almost always, etc). The second question (rating) asked the patient to evaluate this level of continuity (excellent, very good, etc).
accounted for by plan-type classifications, limitations of the current plan-type classification system were also clear.

Further study of these issues, in a more sociodemographically diverse population, and with a larger and more nationally representative group of plans, is required. However, the observed differences in primary care performance across different models of health care delivery underscore that differentiating among the many forms of managed care, and identifying specific organizational and financial characteristics that influence quality, is critical to furthering the value of quality assessment and the success of quality improvement. With US employers and purchasers having largely rejected traditional indemnity insurance as unaffordable, the results suggest that the current momentum toward open-model managed care plans is consistent with goals for high-quality primary care, but that the effects of specific financial and nonfinancial incentives used by plans must continue to be examined.

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