This article reviews recent evidence about the relationship between managed care and quality. With one exception, the studies reviewed represent observation periods that extend through 1990 or a more recent year. The review has led to the conclusion that managed care has not decreased the overall effectiveness of care. However, evidence suggests that managed care may adversely affect the health of some vulnerable subpopulations. Evidence also suggests that enrollees in managed care plans are less satisfied with their care and have more problems accessing specialized services. In addition, younger, wealthier, and healthier persons were more satisfied with their health plans than older, poorer, and sicker persons, even after adjusting for the type of health plan. The findings of the studies reviewed do not provide definitive results about the effect of managed care on quality. Indeed, relatively few studies include data from the 1990s, and little is known about the newer types of health maintenance organizations that invest heavily in information systems and rely on financial incentives to alter practice patterns. Furthermore, managed care is not a uniform method that is applied identically by all health plans, and research studying the different dimensions of managed care also is needed.

In their 1994 review of managed care plan performance, Miller and Luft determined that: “The HMO [health maintenance organization] and indemnity plans provided enrollees with roughly comparable quality care, according to process or outcomes measures." They also determined that HMO enrollees were less satisfied with their care than enrollees in indemnity plans.

Miller and Luft reviewed studies published before 1994. Yet, many important studies of the effect of managed care on quality have become available since that time. Moreover, dramatic increases in the proportion of persons enrolled in managed care plans combined with striking changes in the structure and operation of the health care system necessitate that timely data be used to evaluate the relationship between managed care and quality.

This article reviews evidence about the effect of managed care on 3 dimensions of quality (effectiveness of care, satisfaction with care, and access to care). The inclusion of satisfaction and access as separate dimensions of quality acknowledges the importance of the patient's perspective to evaluations of quality.

The Institute of Medicine defines the quality of care as: “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge." In recent years, the importance of the patient's perspective in the evaluation of quality has been recognized, and the inclusion by the Institute of Medicine of “desired health outcomes” in its definition of quality reflects this recognition.

BACKGROUND

During the past decade, the percentage of persons enrolled in managed care plans has increased steadily, while the rate of increase in health care spending has decreased steadily. The annual rate of increase in health plan premiums between
Concern about the quality of care also is manifested by the efforts of numerous organizations (eg, National Committee for Quality Assurance, Joint Commission on Accreditation of Healthcare Organizations, and the Foundation for Accountability) to evaluate the quality of managed care plans. The Health Plan Employer Data and Information Set of the National Committee for Quality Assurance is the most widely used tool to evaluate managed care plans.

METHODS

An ideal study design to evaluate the effect of managed care on the quality of care is randomization of a large number of patients and physicians between managed care plans and traditional indemnity plans in several locations and collection of detailed information about their treatment. With this design, researchers could accurately compare, within several locations, the effectiveness of care for managed care plan enrollees with specific diseases and conditions, for which generally accepted standards exist, with the effectiveness of care for enrollees in traditional indemnity plans. Researchers also could accurately compare the effect of managed care on access to and satisfaction with care.

Yet, no such randomized experiment has been conducted. The RAND Corporation’s Health Insurance Experiment (HIE) is, perhaps, the closest to the ideal study.21 But, the HIE is dated (it was conducted between 1976 and 1981). It included patients in only 1 geographic location (Seattle, Wash) and in only 1 HMO (the Group Health Cooperative of Puget Sound), and physicians were not randomized.

Studies that have compared the effectiveness of care in managed care plans with the effectiveness of care in traditional indemnity plans often compare the experiences of patients with the same disease. However, these studies may be biased because of patient and physician selection effects. Research has demonstrated that persons who choose to enroll in an HMO differ systematically from those who choose not to enroll in an HMO. Persons who have formed strong relationships with their physicians are less likely to join a managed care plan.22 Thus, HMOs may experience favorable patient selection. Research also indicates that physicians who choose to practice in an HMO setting often have less aggressive styles of practice.23,24 Thus, HMOs may experience favorable physician selection. These potential biases suggest that existing studies may overstate the effectiveness of care received by managed care enrollees.

DATA SOURCES, STUDY SELECTION, EXTRACTION, AND SYNTHESIS

With one exception, the studies reviewed in this article represent observation periods that extend through 1990 or a more recent year. The use of timely information is important because managed care has spread swiftly in recent years, and dramatic changes have occurred in our health care system.

The exception is the HIE. The HIE, a randomized study of the effect of managed care on quality, remains one of the most comprehensive and widely cited research studies of the effect of managed care on the use of services and the cost and quality of care.

Each of the studies reviewed in this article, except the HIE, was published after 1993. Thus, the results were not discussed by Miller and Luft4 in their review of the performance of managed care plans. The present review is not exhaustive; studies of the effect of managed care plans on Medicaid recipients are not included. Only studies that compared health outcomes (eg, mortality, physiologic measures such as blood pressure, measures of functional status, and measures of mental health status) are included in the review of the effectiveness of care, whereas studies that compared the use of preventive services (eg, the proportion of children who received immunizations or the proportion of women who received mammograms) and studies that compared hospital admission (or readmission) rates are not included.
Finally, the studies reviewed include all studies in the annotated bibliography of key findings on the effects of managed care health plans since 1990 published by the United HealthCare Corporation, Minneapolis, Minn\(^2\) that satisfy the aforementioned criteria. Although this publication does not include all studies of the effect of managed care plans on quality (it only includes studies of the effect of managed care plans on general medical care, not the effect of managed behavioral health care plans), it does include summaries of more than 100 studies, including all studies of the effect of managed care on quality that have been published in peer-reviewed journals.

Because managed care plans often have separate divisions for commercial and Medicare business, and because the health insurance program for aged Americans is operated by a distinct entity (the Health Care Financing Administration), the effect on quality of managed care and traditional indemnity plans is reviewed separately for Medicare and non-Medicare populations.

Each of the effectiveness studies reviewed evaluated different aspects of effectiveness. In particular, the effectiveness of care was evaluated for patients with many different conditions (eg, hypertension, acute myocardial infarction, depressive disorder, arthritis, and breast cancer). Thus, it was difficult to compare findings about the effect of managed care for patients with similar conditions across studies. Instead, the findings about the effect of managed care on effectiveness were generated using information about the effect of managed care on a variety of conditions. The following section summarizes the findings from the effectiveness studies. The effectiveness studies reviewed include 2 follow-up analyses of participants in the Medical Outcomes Study (MOS) that have become available during the past 2 years.\(^2,5\) In addition, a short description of the results from the 2 most prominent comparisons of care received in managed care plans and in traditional indemnity plans (the MOS and the HIE) is provided.

### EFFECTIVENESS OF CARE

This section reviews studies that compared the effectiveness of care between managed care and traditional indemnity plans (Table 1). The HIE, MOS, the study of pa-

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**Table 1. The Effect of Managed Care on the Effectiveness of Care**

<table>
<thead>
<tr>
<th>Source, y</th>
<th>Data Collection Period and Data Set</th>
<th>Measures</th>
<th>Major Findings</th>
</tr>
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<tbody>
<tr>
<td>Manning et al,(^2) 1984, and Ware et al,(^2) 1986</td>
<td>1976-1981 Health Insurance Experiment HMO-FFS component included 1580 residents in Seattle, Wash, randomly assigned to receive care under FFS arrangement or GHC (Wash)</td>
<td>13 Physiologic measures and 6 general health indexes</td>
<td>No overall effect. High income, initially ill fared better in GHC in terms of general health indexes. Low income, initially ill fared worse in GHC in days in bed and serious symptoms.</td>
</tr>
<tr>
<td>Greenfield et al,(^2) 1995, and Ware et al,(^1) 1996</td>
<td>1986-1993 Medical Outcomes Study Information on 2235 patients with hypertension, type 2 diabetes mellitus, acute myocardial infarction, or congestive heart failure treated by 362 physicians in Boston, Mass, Los Angeles, Calif, and Chicago, Ill</td>
<td>Physiologic measures, functional status (from the SF-36), and mortality</td>
<td>No meaningful differences between HMO and FFS enrollees. Differences were found for subgroups: Medicare patients fared worse in HMOs; poor patients fared worse in HMOs; nonpoverty group fared better in HMOs.</td>
</tr>
<tr>
<td>Yelin et al,(^4) 1996</td>
<td>1983-1994 1025 Patients with rheumatoid arthritis in northern California; 798 treated under FFS arrangement and 227 in HMO; 341 patients followed up for all 11 years</td>
<td>No. of painful joints and Health Assessment Questionnaire score</td>
<td>No significant difference on outcome measure; however, all but 31 of 227 HMO members were in Kaiser Permanente.</td>
</tr>
<tr>
<td>Lee-Feldstein et al,(^2) 1994</td>
<td>1984-1990 5892 Non-Hispanic white women with breast cancer treated in 126 hospitals in Orange County, Calif</td>
<td>Survival rates at the 126 hospitals adjusted for severity</td>
<td>Survival rates adjusted for severity of disease were best at large hospitals, slightly poorer at teaching hospitals and community hospitals, and worst at HMO hospitals.</td>
</tr>
<tr>
<td>Brown et al,(^2) 1993, and Clement et al,(^1) 1994</td>
<td>1990 Survey of 6476 randomly selected Medicare beneficiaries from 75 HMOs in 44 market areas and 6381 randomly selected Medicare beneficiaries enrolled in FFS arrangement in same 44 markets</td>
<td>Death rates and complications from hospital records of 408 HMO and 402 FFS enrollees with stroke and 412 HMO and 401 FFS enrollees with colon cancer</td>
<td>Outcomes for patients with cancer or stroke were similar for Medicare beneficiaries enrolled in HMOs and FFS. Medicare beneficiaries with continued joint pain who were enrolled in HMOs experienced significantly less improvement than Medicare beneficiaries with continued joint pain who were enrolled in FFS.</td>
</tr>
</tbody>
</table>

*HMO indicates health maintenance organization; FFS, fee for service; SF-36, Medical Outcomes Study 36-Item Short-Form Health Survey; and GHC, Group Health Cooperative of Puget Sound (Wash).*
health status. The low-income persons fared worse in the HMO than in the traditional indemnity plan. Although no effect of managed care on quality was conducted by Yelin et al on 1025 patients in northern California with rheumatoid arthritis who were enrolled in two cycles (in 1982 to 1983 and in 1989). Enrollees were followed up through 1994, and the care received by 798 patients with rheumatoid arthritis who were enrolled in a traditional indemnity plan was compared with the care received by 227 patients enrolled in an HMO.

The primary source of data was an annual structured telephone interview. The chief finding was a lack of evidence that patients enrolled in HMOs experienced different health outcomes (ie, number of painful swollen joints, global assessment of pain, overall disease status, the Health Assessment Questionnaire score, and a standardized measure of physical function for people with rheumatoid arthritis) than patients enrolled in traditional indemnity plans. Yelin et al, however, did not study the effect of managed care on subgroups of enrollees.

Breast Cancer Survival Study
Lee-Feldstein et al used survival data for a group of 5892 non-Hispanic white women from a population-based breast cancer registry in Orange County, California, from 1984 through 1990. The outcomes for non-Hispanic white women with breast
cancer were worse in HMO hospitals than in small community hospitals or large teaching hospitals. In addition, the use of breast-conserving surgery was greater at large teaching hospitals than at small community hospitals or HMO hospitals.

**Medicare**

A randomized study of 6476 Medicare beneficiaries enrolled in 75 HMOs from 44 market areas and 6381 Medicare beneficiaries enrolled in traditional indemnity plans from the same 44 market areas was conducted by Mathematica Policy Research Inc. Investigators studied medical records for 1990 for 412 HMO enrollees and for 401 enrollees in traditional indemnity plans who were hospitalized for the treatment of colon cancer. In addition, 408 medical records of HMO enrollees and 402 medical records of enrollees in traditional health plans, all of whom were hospitalized for the treatment of stroke, were studied.

The Mathematica study also compared large numbers of Medicare beneficiaries enrolled in HMOs or in traditional Medicare indemnity plans receiving outpatient care for urinary incontinence, chest pain, and joint pain. Brown et al found that outcomes for patients with colon cancer and stroke (ie, readmission rates and mortality rates) and outcomes for the conditions treated on an outpatient basis (ie, the likelihood of being symptom free at the time of interview) for Medicare beneficiaries with urinary incontinence, chest pain, or joint pain did not vary between HMOs and traditional indemnity plans.

In another article based on the same sample, Clement et al identified 2243 Medicare beneficiaries enrolled in HMOs and 2009 Medicare beneficiaries enrolled in traditional indemnity plans, all of whom had joint pain. The data collected from structured telephone interviews revealed that Medicare beneficiaries with continued joint pain during the previous 12 months who were enrolled in an HMO experienced significantly less improvement than enrollees in the traditional indemnity plan. There was no difference in the likelihood of achieving complete alleviation of symptoms between HMO enrollees and enrollees in traditional indemnity plans. In addition, HMO enrollees were significantly less likely to be followed up or monitored closely than their counterparts enrolled in traditional indemnity plans.

In their study of data from the MOS on 2235 patients with type 2 diabetes, hypertension, recent acute myocardial infarction, congestive heart failure, or depressive disorder, Ware et al found that the 476 Medicare beneficiaries enrolled in HMOs who had 1 or more of the 5 conditions fared worse than the 346 Medicare beneficiaries with 1 or more of the 5 conditions who were enrolled in the traditional indemnity plan. In particular, 257 (54%) of the 476 Medicare beneficiaries enrolled in HMOs and 97 (28%) of the 346 Medicare beneficiaries not enrolled in an HMO experienced declines in physical health status.

**SATISFACTION AND ACCESS**

In their 1994 review, Miller and Luft observed that: “In seven of eight observations from five studies, fewer HMO enrollees were as satisfied with, or evaluated as highly, perceived quality of care and patient-physician interactions than did FFS enrollees.”

The studies reviewed by Miller and Luft were published before 1994 and represent the experience of persons living in a few geographic areas or who were Medicare beneficiaries. None of the 5 studies randomly selected nonaged participants, and none that included nonaged enrollees was national in scope. More important, none compared nonaged enrollees in managed care plans and traditional indemnity plans after 1990.

Results from several large studies of randomly selected nonaged and aged enrollees in managed care and traditional indemnity plans have become available since 1993. In general, these studies support the findings of Miller and Luft about enrollee satisfaction, access, choice, and various demographic variables was collected during a 20-minute interview. Enrollees in HMOs were not as satisfied as enrollees in indemnity plans. Of the HMO enrollees, 29% rated their plan as excellent, 38% of enrollees in indemnity plans rated their plan as excellent.

Access to specialty services was more restricted in HMOs than in the indemnity plans. Of the enrollees in HMOs, 26% rated their access to specialty services as excellent, while 45% of enrollees in indemnity plans rated their access to special services as excellent.

During the 3 years before the study, almost half of the respondents had changed plans (54% of HMO enrollees and 37% of enrollees in indemnity plans). In addition, a strong relationship was revealed between income and satisfaction that persisted even after adjusting for plan effects. Persons with a higher income were more satisfied with their plan than were persons with a lower income, whether they were enrolled in an HMO or a traditional indemnity plan.

**The 1994 Managed Care Survey by the Commonwealth Fund**

This study of 3000 insured adults aged 18 to 64 years in Boston, Los Angeles, and Miami, Fla, who were interviewed by telephone in 1994 included 500 randomly selected adults enrolled in an HMO in each city and 500 randomly selected adults enrolled in an indemnity plan in each city. Information about costs, satisfaction, access, choice, and various demographic variables was collected during a 20-minute interview.

Enrollees in HMOs were not as satisfied as enrollees in indemnity plans. Of the HMO enrollees, 29% rated their plan as excellent, 38% of enrollees in indemnity plans rated their plan as excellent.

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**The 1996 National Research Corporation Study**

A questionnaire was mailed by the National Research Corporation, Lincoln, Neb, to 250 000 households representative of the United States between May and June 1996, and responses were received from 167 000 households (66.8%). The responses indicated that non-Medicare enrollees in HMOs are about as satisfied with their health plan as enrollees in traditional plans.
Table 2. The Effect of Managed Care on Patient Satisfaction and Access to Care*

<table>
<thead>
<tr>
<th>Source, y</th>
<th>Data Collection Period and Data Set</th>
<th>Major Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davis et al, 6 1995</td>
<td>Commonwealth Fund’s telephone survey included a random sample of 3000 insured adults (500 enrolled in HMOs and 500 enrolled in FFS) from each of three cities (Boston, Mass, Los Angeles, Calif, and Miami, Fla)</td>
<td>Enrollees in HMOs were not as satisfied and had more problems with access than enrollees in FFS (29% in HMO and 38% in FFS rated plan as excellent; 26% in HMOs and 45% in FFS rate access to specialty care as excellent)</td>
</tr>
<tr>
<td>National Research Corporation, 7 1996</td>
<td>Survey sent to 250 000 households representative of the United States; responses received from 167 000 households</td>
<td>Percentage of enrollees in HMOs who were very satisfied with plan (41.8%) was higher than for FFS (39.3%)</td>
</tr>
<tr>
<td>Mark and Mueller, 8 1996</td>
<td>Robert Wood Johnson Foundation (Princeton, NJ) follow-up survey to the 1993 National Health Interview Survey included sample of 3450 people</td>
<td>Enrollees in HMOs had slightly poorer access; 24% enrolled in HMOs and 20% enrolled in FFS waited more than 3 days for appointment, and 4.8% enrolled in HMOs and 3.7% enrolled in FFS reported unmet medical care needs</td>
</tr>
<tr>
<td>Allen et al, 9 1994</td>
<td>Three large employers (Xerox Corp, GTE Corp, and Digit Equipment Corp) distributed Employee Health Care Value Survey; completed by 24 306 employees</td>
<td>Overall (including cost considerations) enrollees in managed care plans were more satisfied than enrollees in FFS</td>
</tr>
<tr>
<td>Donelan et al, 10 1994</td>
<td>National telephone survey of 873 persons</td>
<td>Enrollees in FFS were more satisfied with care delivery than enrollees in managed care plans</td>
</tr>
<tr>
<td>Brown et al, 11, 1993, and Brown et al, 12 1993</td>
<td>Survey of 6476 randomly selected Medicare beneficiaries from 75 HMOs in 44 market areas and 6381 randomly selected Medicare beneficiaries enrolled in FFS arrangement in same 44 markets</td>
<td>Medicare beneficiaries enrolled in HMOs were less satisfied and had poorer access than Medicare beneficiaries enrolled in FFS; 45% enrolled in HMOs and 53% enrolled in FFS rated care as excellent; 43% enrolled in HMOs and 61% enrolled in FFS rated access to care as excellent</td>
</tr>
<tr>
<td>Nelson et al, 6 1996</td>
<td>Telephone survey of 3080 Medicare beneficiaries enrolled in HMOs; findings were compared with Medicare beneficiaries enrolled in FFS surveyed in the fall of 1994 MCBS</td>
<td>Medicare beneficiaries enrolled in HMOs were more than 3 times as likely to report access problems than Medicare beneficiaries enrolled in FFS; 13% for HMOs and 4% for FFS</td>
</tr>
<tr>
<td>Adler, 13 1995</td>
<td>MCBS conducted in fall of 1993 included approximately 12 000 beneficiaries, of whom approximately 900 were in HMOs</td>
<td>Medicare beneficiaries enrolled in HMOs were slightly less satisfied than those enrolled in FFS (approximately 87.0% of aged beneficiaries enrolled in HMOs and approximately 91.8% of aged beneficiaries enrolled in FFS were satisfied with usual source of care; for the disabled, 77.3% for HMOs and 88.2% for FFS)</td>
</tr>
</tbody>
</table>

* HMO indicates health maintenance organization; FFS, fee for service; and MCBS, Medicare Current Beneficiary Survey.

Indemnity plans. However, enrollees in preferred provider organizations (PPOs) were significantly less satisfied with their plan than were HMO enrollees or enrollees in traditional indemnity plans.

In fact, 16.5% of nonaged enrollees in HMOs and 16.5% of enrollees in traditional indemnity plans were completely satisfied with their plan; only 13.1% of nonaged PPO enrollees were completely satisfied. The percentage of nonaged enrollees in HMOs who were very satisfied with their plan (41.8%) was slightly higher than the corresponding percentages of enrollees in traditional indemnity plans (39.8%) and PPOs (39.7%).

Nonaged enrollees in traditional indemnity plans rated their access to medical services significantly better than nonaged enrollees in PPOs or HMOs. In particular, 32.7% of nonaged enrollees in traditional indemnity plans indicated that they had no problems obtaining care compared with 23.4% of nonaged enrollees in PPOs and 20.1% of nonaged enrollees in HMOs. Similarly, 30.8% of nonaged enrollees in traditional indemnity plans rated their access to specialty care as excellent compared with 21.9% of nonaged enrollees in PPOs and 19.6% in HMOs.

The 1994 Robert Wood Johnson Foundation National Access Study

The Robert Wood Johnson Foundation (Princeton, NJ) National Access Survey, fielded in the spring and summer of 1994, was a follow-up to the 1993 National Health Interview Survey sponsored by the National Center for Health Statistics of Hyattsville, Md. The National Access Survey achieved a 75% response rate and is based on a sample of 3450 persons. Information was obtained from telephone interviews augmented by in-person interviews to ensure that vulnerable populations were adequately represented.

Findings from this survey revealed that HMO enrollees, PPO enrollees, and enrollees in traditional indemnity plans have reasonably good access to services and relatively few unmet needs. Yet, a slightly higher percentage of HMO enrollees (24%) than PPO enrollees (21%) or enrollees in traditional indemnity plans (20%) had to wait more than 3 days...
for an appointment, and a slightly higher percentage of HMO enrollees (4.8%) than PPO enrollees (3.7%) or enrollees in traditional indemnity plans (3.0%) reported unmet medical care needs.

The 1993 Employee Health Care Value Study

To improve their corporate health benefit plan strategies, 3 large employers (Xerox Corporation [Stamford, Conn], GTE Corporation [Stamford], and Digital Equipment Corporation [Maynard, Mass]) distributed a survey during the fall of 1993 that was completed by 24,306 employees.32 Each of the employers had noted a sizable migration of employees from indemnity plans to managed care plans during the early 1990s and was strongly interested in obtaining information that could be used to compare health plans across a broad range of characteristics.

Results indicated that employees generally were more satisfied with managed care plans than with indemnity plans. In particular, employees enrolled in managed care plans were more satisfied with the paperwork requirements, financial arrangements, and plan-provided information than were employees enrolled in indemnity plans. Yet, employees enrolled in managed care plans were not as satisfied with the provision of care (eg, continuity of care and physician-related choice) as were the employees enrolled in indemnity plans.

The 1994 Harvard University and Robert Wood Johnson Foundation Survey

Louis Harris and Associates, on behalf of Harvard University (Cambridge, Mass) and the Robert Wood Johnson Foundation, conducted a telephone survey of 873 persons in 1994 that inquired about views on health services and health plans.33 The survey oversampled persons who reported that they were in poor health, persons with disabilities, and persons who were hospitalized during the 12 months before the study.

Enrollees in managed care plans reported more problems with their health care than did enrollees in indemnity plans. For example, 22% of enrollees in managed care plans and 13% of enrollees in indemnity plans indicated that they had problems obtaining treatment that they or their physicians believed was necessary. Furthermore, 15% of enrollees in managed care plans and 6% of enrollees in indemnity plans believed that their physicians spent inadequate time treating them.

Medicare

The 1990 study by Brown et al34 of the experience of 6400 randomly selected Medicare beneficiaries from 75 HMOs and 6400 randomly selected Medicare beneficiaries enrolled in a traditional indemnity plan found that HMO enrollees were less satisfied than were enrollees in the traditional indemnity plan. This was true for almost every dimension of care (eg, access, waiting times, and perceived thoroughness of the examination) except cost. In particular, 45% of the Medicare beneficiaries enrolled in HMOs and 53% enrolled in the traditional indemnity plan rated their overall quality of care as excellent. Similarly, 43% of the Medicare beneficiaries enrolled in HMOs and 61% enrolled in the traditional indemnity plan rated their ease of access to physician care as excellent.35

In addition, data from the Medicare Current Beneficiary Survey (MCBS) conducted during the fall of 1993 support this finding.33 The MCBS is a continuous personal interview survey designed to collect information about all care received by Medicare beneficiaries. Interviews are conducted every 4 months. The MCBS conducted during the fall of 1993 includes interview data from approximately 12,000 Medicare beneficiaries, of whom approximately 900 were enrolled in an HMO. Data revealed that the percentage of beneficiaries enrolled in HMOs who were satisfied with their care was less for aged and disabled beneficiaries. Approximately 87.0% of aged beneficiaries (individuals under 65 years) enrolled in an HMO were satisfied with their care compared with 91.8% of aged beneficiaries enrolled in a traditional indemnity plan. For disabled beneficiaries, the corresponding percentages were 77.3% and 88.2%.

More information about the perspectives of Medicare beneficiaries on managed care plans was obtained from a telephone survey, conducted by Mathematica Policy Research, of 3080 beneficiaries who had been enrolled in an HMO during the 12 months ending February 29, 1996.3 More information was randomly selected from the group health plan file maintained by the Health Care Financing Administration; the survey collected information about access, satisfaction, health status, and demographics.

Although the survey by Mathematica Policy Research did not collect information from Medicare beneficiaries enrolled in a traditional indemnity plan, responses about access to care were compared with responses from the MCBS conducted during the fall of 1994.3 The HMO enrollees were more than 3 times as likely to report problems accessing care than were their counterparts enrolled in a traditional indemnity plan (13% vs 4%). Moreover, older, sicker, and poorer enrollees had more problems accessing care whether they were enrolled in HMOs or a traditional indemnity plan.

Because the phrasing of the questions related to satisfaction varied considerably between the 2 surveys, satisfaction with care was not compared between beneficiaries enrolled in HMOs and beneficiaries enrolled in traditional indemnity plans. However, investigators determined that sicker, older, and poorer beneficiaries were less satisfied with care than were healthier, younger, and richer beneficiaries whether they were enrolled in HMOs or traditional indemnity plans.

To isolate the effect of managed care on the quality of care, the care received by enrollees in managed care plans must be compared with the care received by enrollees in indemnity plans (a cross-sectional study) or, for persons who change enrollment between managed care and indemnity plans, the care received must be compared for the 2 types of plans (a be-
Several reasons explain the lack of before-and-after studies. First, obtaining information about a sufficient sample of patients who have changed enrollment between managed care and indemnity plans is difficult. In any year, relatively few persons may make such a change. Second, tracking the care received by individuals through time is difficult, especially if they change health plans. To compare the effectiveness of care received by enrollees who change enrollment between managed care and indemnity plans (recently, most changes have been from an indemnity plan to a managed care plan), personal identifiers must be obtained from each plan. Yet, plans are hesitant to provide detailed data about the treatment of specific persons and to provide information that may be used to identify the persons (eg, name, date of birth, place of birth, and social security number) because of confidentiality issues and marketing concerns.

Overall, the evidence presented in this article does not support the premise that managed care has lowered the effectiveness of care. However, it does suggest that managed care may adversely affect some subgroups of enrollees. In particular, evidence suggests that sick enrollees who are poor or elderly fare worse in HMOs.

The best designed and most comprehensive studies of the effect of managed care on the effectiveness of care (the HIE and the MOS) revealed no significant differences between the overall health outcomes of HMO enrollees and enrollees in traditional indemnity plans. However, both studies revealed important differences for subgroups of enrollees.

The HIE found that low-income HMO enrollees in poor health experienced more serious symptoms than did low-income enrollees in poor health who used traditional indemnity plans. The MOS found that elderly or poor patients with 1 of 5 conditions who were enrolled in an HMO experienced greater declines in physical health status than did their counterparts enrolled in traditional indemnity plans. Furthermore, enrollees in the MOS with 1 of the 5 conditions who were elderly and poor experienced the steepest declines in physical health status.

Evidence from a large randomized study of Medicare beneficiaries revealed no significant differences in the quality of care (ie, mortality, readmission rates, and complication rates) received by hospitalized beneficiaries with colon cancer or stroke or in the quality of care (ie, likelihood of receiving medical attention, estimated likelihood of being symptom free at the time of interview) for beneficiaries with urinary incontinence, chest pain, or joint pain. However, evidence from the same study found that Medicare beneficiaries enrolled in HMOs who had continued joint pain experienced poorer outcomes than similar beneficiaries enrolled in a traditional health plan.

The findings of almost all studies of satisfaction with care and all studies of access to care revealed that HMO enrollees were less satisfied and had greater difficulties accessing care than enrollees in traditional health plans. The exception was found in a survey with 167,000 responding households in 1996 conducted by the National Research Corporation. Nonaged enrollees in HMOs were about as satisfied as nonaged enrollees in traditional indemnity plans.

In all studies of Medicare beneficiaries, HMO enrollees were less satisfied and had more problems accessing specialized services than did enrollees in traditional indemnity plans. Beneficiaries enrolled in HMOs who were sick, poor, or both, were the most dissatisfied and experienced the most problems accessing specialized service.

**CONCLUSIONS**

The findings reviewed do not provide definitive results about the effect of managed care on quality. Indeed, relatively few studies compare the effectiveness of care in managed care plans with that in traditional indemnity plans after 1990. Owing to the rapid pace of change in our health care system, the relevance of findings reported in earlier review articles is disputable.

Furthermore, few data are available about the effect on the effectiveness of care of newer types of managed care plans. Newer types of managed care plans that invest heavily in information systems and rely on financial incentives to alter practice patterns.

Research studying the different dimensions of managed care also is needed. Managed care is not a uniform method that is applied identically by all health plans. Managed care plans diverge importantly in configurations, financial inducements, and the characteristics of participating health care providers and enrollees. Moreover, managed care plans use many means (eg, financial incentives for physicians, utilization review, educational activities, peer pressure, and clinical guidelines) to improve their performance.

Research on the relationship between the dimensions of managed care and quality requires detailed information about the characteristics of health plans, providers, and enrollees. Thus, claims data alone are inadequate. For each claim, researchers must have information about how each provider is compensated, the medical condition of the patient, and the structure of the relevant health plan.

Acquisition of this information and estimation of the relationship between the dimensions of managed care and quality are time consuming, costly, and demanding. The alternative is continued ignorance about the characteristics of managed care plans that can control use of health care services and maintain, or improve, the quality of care.
In particular, there is a need for research that studies the relationship between methods of reimbursing physicians and the quality of care. A recent review concluded that the financial incentives for physicians are a key reason that managed care plans have successfully reduced the use of health care services. Yet, there is no research about how financial incentives affect quality.

Managed care plans use fee-for-service, capitation, “withholds,” bonuses, and a variety of other methods to reimburse physicians. Many managed care plans establish referral accounts to cover the cost of specialists, and, in some instances, primary care physicians receive a portion of the surplus in this account or are liable for some portion of the deficit. Physicians also may face financial incentives related to their equity interests. For example, Columbia/HCA (Nashville, Tenn) enables some physicians to invest in their equity interests. For example, Columbia/HCA regional health care entities are those of the author and do not necessarily reflect the views of the Agency for Health Care Policy and Research.

Accepted for publication July 31, 1997.

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