A RAND NOTE

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Prepared for

The U.S. Department of Health and Human Services

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PREFACE AND SUMMARY

It is well known that the costs of care at Health Maintenance Organizations (HMOs) at any point in time have been lower than those in the fee-for-service sector, but how costs have changed in each of these sectors has been less well documented. The only previous study, which examined the HMO experience during the 1960s and early 1970s, found that HMO and fee-for-service costs rose at approximately the same rate. The present study, which extends this analysis to the period 1976-1981, also demonstrates that HMO costs increased at a rate not detectably different from that in the fee-for-service sector. These results are consistent with the earlier conclusion that HMOs cause a once-and-for-all reduction in cost. They also indicate that the public has been willing to pay for much of the increased costs of modern medical technology.

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Health Maintenance Organizations (HMOs) have been widely touted for their ability to generate savings in medical costs. Although many studies have confirmed that people enrolled in HMOs spend less at each point in time,[1, 2] there has been only one study of the rate of increase in costs at HMOs. Luft[3] examined changes in total costs incurred by State of California employees and federal employees enrolled in a variety of HMO and fee-for-service plans. Those enrolled in HMOs experienced roughly the same rate of increase in medical costs as did those enrolled in fee-for-service plans over the period 1961-1974 (1962-1971 in the case of the California employees). Luft concluded that HMOs "have not been able to substantially alter the national patterns of medical care inflation and increasing resource use" (p. 1).

Most observers expect continued growth in HMO enrollment, now 5 percent of the population.[4] If Luft's finding of a similar rate of cost increase is valid over the long run, it implies that the spread of HMOs may do little to alter the upward trend in medical care costs.[6] Growth of HMOs would temporarily dampen the rate of inflation, but once the proportion of the population enrolled in HMOs leveled off, the old rate of cost increase would resume.

The finding of a similar rate of cost increase in HMOs and fee-for-service also has implications for an even larger, normative question: Does the nation spend excessively on medical care? Many who would say yes cite the role of health insurance in distorting demand and negating the usual market test of consumers' willingness to pay. But HMOs meet a market test in a way that many fee-for-service insurance plans do not. Suppose, for example, that an HMO's premium rises less rapidly than premiums of fee-for-service insurance plans because the HMO has a less rapid rate of innovation. The HMO might gain enrollees if the public did not view the forgone innovations as worth their cost. By contrast, many fee-for-service insurance plans face competition only from other fee-for-service plans. In that situation the rate of increase in medical costs affects all plans equally; consumers cannot choose a plan that has opted for a less rapid rate of technological change. Thus, if HMOs have had a similar rate of increase in cost as the fee-for-service system, one might infer that the public is willing

to pay for most of the new technology and new procedures that are causing the increased costs.[7] Put another way, if one does not observe HMOs that use older technology and consequently have a lower rate of cost increase, one can infer that there is little demand for saving money at the expense of new technology. Given the importance that attaches to the two inferences, it seems useful to update Luft's study.

Methods

We employ two types of data. The first are premiums charged by Group Health Cooperative of Puget Sound (GHC) for participants in the Rand Health Insurance Experiment. These data have two major advantages. First of all they reflect charges to a given cohort of enrollees.[2] The cohort followed over time in this study is quite stable; no new individuals are added except by birth or adoption, and the attrition rate, other than moves from the Seattle area, was only 7.7 percent. An additional 22 percent of the cohort moved from the Seattle area over a three-to-five-year period and no longer received services at GHC. Although the individuals who moved were a cohort who used somewhat less medical care while living in Seattle, the reduction would affect actuarial rates only by about 3 percent[2] even if GHC took account of the moves in setting premiums, which seems doubtful. Secondly, The benefit package is stable with one minor exception, pregnancy benefits, for which an adjustment is readily available and has been made.

The GHC data have the obvious drawback, however, that they come from only one HMO. We therefore obtained further data from the federal Office of Health Maintenance Organizations (OHMO) on the premium charged between 1976 and 1981 by each nonprofit HMO that enrolled federal employees in 1981. We restricted our sample to HMOs that enrolled federal employees because they met the standards of the Office of Personnel Management, which made the group somewhat more homogeneous than the group of all organizations that called themselves HMOs.

Among the set of 45 HMOs that enrolled federal employees in 1981, we examined separately group and staff model HMOs and also the five HMOs that own hospitals. Hospital costs have been increasing more rapidly than ambulatory costs, and those HMOs that own hospitals have the option to exert more control over adding new technologies that lead to cost increases.

The premium data from the 45 HMOs suffer from the following definitional ambiguity. For the period 1976-1980, the HMO could report either a single premium or a high and a low premium.[1] In 1981, however, the reporting requirement changed. The HMO was to report only one premium, the rate for the most recently, commonly offered family plan. We have analyzed separately the data from 1976 to 1980 and 1976 to 1981 in order to determine the sensitivity of our results to the reporting change in 1981. In the case of HMOs that reported high and low premiums in the 1976-80 period, we used the average of the two rates.

When we obtained the above data, the latest available year was 1981. However, a published (unweighted) average of all HMO figures is available for the years 1982 and 1983. We have also examined these figures.

We compared the average percentage increase in premiums between 1976 and 1981 (weighted by the HMO's membership) with the percentage increase in personal medical care expenditures in the nation as a whole. Because the latter value is dominated by figures for the fee-for-service system, we will characterize it as the increase in costs for the fee-for-service system, even though it also contains the costs of municipal hospitals, military and veterans' medical care, and even HMOs! We also compared the rate of increase in HMO premiums with the rate of increase in national expenditure among people under 65, because such costs are rising at a somewhat different rate than costs among those over 65 and because HMOs disproportionately enroll those under 65.

Finally, we computed the rate of increase in costs for a set of services most closely akin to those offered by HMOs, namely short-term general and other special hospitals, physicians, eyeglasses and appliances, drugs and medical sundries, and other professional services. (The major omitted categories are dental and long-term care.) We could not directly adjust the data on this subset of services to the under-65 population, so we applied the same adjustment as for the total of

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[1]Whichever premium it chose to report, it was asked to report it for an individual, for an individual plus one other person, and for a family plan. For 1976-1980 we analyzed all three types of premiums; only the family premium is analyzed for 1976-1981, as explained in the text.

personal medical expenditure, in order to estimate the rate of increase in these costs among the under-65.

If the benefit package that the 45 HMOs in our sample provided were being reduced (expanded) during this period, the comparison of premium changes with total national expenditure changes would be biased in favor of (or against) HMOs. Similarly, if the mix of health risks among the 45 HMOs were changing, comparisons of the rate of increase in the nation and in HMOs would be biased. Although such an error would probably be small, we cannot know the extent to which the HMO premium data are affected by these factors. However, to the degree that the results are consistent with the results based on our GHC data, which do not suffer from these problems, both results are more credible.

Much of the change in costs in the fee-for-service system has come about because of the adoption of new procedures or new technology, which has been reflected in a relatively large increase in cost per inpatient day, with a much smaller increase in the number of days and the number of visits.[8,9,10] Although cost-per-day figures cannot be readily computed for HMOs, we have examined the behavior of days and visits to determine whether trends in these measures differ between HMOs and the fee-for-service system. To the degree they do not differ, a conclusion of similarity between HMOs and the fee-for-service system is strengthened.

Results

The percentage increase in Health Insurance Experiment premiums between 1976 and 1981 at GHC for a two-adult, two-child family was 74 percent (Table 1). This is almost identical to the 75 percent increase in total health care cost per capita in the country among the non-aged--and all the study participants were non-aged. It was slightly less than the 83 percent rise in health care costs per capita for all ages. Use of the subset of services more closely resembling those provided by the HMO did not change the numbers appreciably.

The increase of the modal premiums at HMOs that enrolled federal employees was similar to that at GHC (Table 2). Restricting the sample to the 35 group and staff model HMOs by excluding ten network HMOs and independent practice associations (IPAs) does not alter the results.

The results are also qualitatively the same if we use the 1976-1980 period, indicating that the definitional differences cited in the previous section do not play a role in shaping the results.

We also looked at experience in five HMOs that owned their own hospitals; four of these were Kaiser-Permanente plans (Table 3). The rate of increase in these five plans was decidedly below that of the 45 plans examined in Table 2, although the dispersion among the 5 is considerable, and the difference of 12 percentage points (from the mean of all 45 HMOs in Table 2) approximates the standard error of the difference and so is not statistically significant at usual levels.

The increase in average premium of all HMOs (not just those that enrolled federal employees) from 1981 to 1983 is 30 percent.[4] This compares with a 22 percent increase in personal health care expenditure per capita during these two years.[8] The 30 percent value includes data from IPAs and new HMOs, and is not weighted by the number of members. For these reasons we do not consider this figure as reliable as those we calculated, but the implication with respect to the rate of increase in HMO costs is consistent with the other data we have analyzed.

The increase in expenditures in both the fee-for-service system and in HMOs was not caused by an increased number of hospital days or physician visits, because hospital days and visits fell at both HMOs and in the fee-for-service system (Table 4). By contrast, hospital expenses per (adjusted) day in the country at large nearly doubled between 1976 and 1981.[9] Assuming that input prices rose the same amount at HMOs, one is left with the conclusion that intensity rose by roughly the same percentage amount at HMOs as in the fee-for-service system.

Discussion

Our data show that Luft's finding for the 1961-1974 period--that the rate of cost increase at HMOs resembled that in the fee-for-service system--continues to hold for the 1976-81 period. Thus, over a two-decade period we can say that, to a first approximation, the rate of increase in costs at HMOs was the same as in the fee-for-service system. Any differences in the rate of increase are within the realm of measurement error contained in the data. Moreover, the increase in both systems is not occurring in the number of hospital days or office visits but in the cost per day, or cost per visit, or both.

If one could treat the behavior of existing, well-established HMOs as that which would be found in a medical care delivery system with many more HMOs than at present, one could infer that: (1) The long-run rate of increase in costs will not be markedly slowed in such a world, although it would be slowed during a transition period while HMOs grow; and (2) at present levels of medical care expenditure, consumers may want to pay the increased costs of many new procedures and capabilities.

The latter point deserves further comment. If the same quantity of each new technology were being added in both systems, there would be a similar absolute increment to costs in each; hence, given their lower base, one would observe a greater percentage increase in costs at HMOs. Because the observed rates of increase are similar, we can infer that new technology is not used as intensively or not adopted as rapidly at HMOs. (We abstract from economies of scale with respect to new technology, which, if they are greater in HMOs, could alter the situation.) If, for example, HMOs were 80 percent as expensive as fee-for-service plans in 1960,[1] they would be adopting new technology or applying it at only 80 percent the rate of the fee-for-service system.

If HMOs make less intensive use of technology, that is not necessarily bad. It is possible, for example, that HMOs apply the new technology less frequently than the fee-for service sector in circumstances in which no medical benefit can be anticipated. Put in a more general context, the role of insurance may cause the fee-for-service system to carry the use of technology past the point where the additional benefit equals the additional cost to society.[11]

Although HMOs may use new technology less, they nonetheless have clearly adopted most of it. Real per capita expenditure on medical care from 1960 to 1981 increased by a factor of 2.25, an increase that we have found in both HMOs and the fee-for-service system.[1, 12] (This calculation uses the medical care price index as a deflator.) Assuming that much of this increase represents the effect of new technology and procedures, one can infer that HMOs are adopting most such new modalities. For example, if they began 80 percent as expensive but were adopting new technology at half the rate, HMOs in 1981 would cost only

59 percent as much as fee-for-service care (0.59 = (.80 + 0.5(2.25))/(1 + 2.25)). Thus, to the degree that HMOs can be treated as meeting a market test, the public does appear willing to pay for most of the costs of new technology.

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Table 1

Premiums Charged the Health Insurance Experiment, 1976-81, by Group Health Cooperative of Puget Sound and National Figures

(In dollars)

Category	1976	1977	1978[a]	1979	1980	1981	Percentage Change, 1976-1981 Adjusted [a]
Adult	30.82	35.30	39.07	42.64	47.15	53.64	74.0
1st child	13.67	15.80	17.38	18.85	20.90	23.76	73.8
2nd child	11.10	12.95	14.15	15.26	16.89	19.15	72.5
3rd child	7.87	9.30	10.13	10.88	12.05	13.65	73.4
4th and any additional child	5.30	6.45	6.90	7.29	8.04	8.84	66.8
Two adults, two children							73.8

	Percentage increase 1976-81
U.S. personal health care expenditure per capita [b]	83
U.S. expenditure per capita, comparable HMO services [c]	84
U.S. personal health care expenditure per capita, non-aged [d]	75
U.S. expenditure per capita, comparable HMO services, non-aged [e]	76

[a] Beginning in 1978, pursuant to the Hyde Amendment, abortions were no longer a covered service. Additionally, at this time the experiment elected to pay maternity care fees on a per case basis. This resulted in a reduction of $1.04 from the original adult premium of $39.07 established for 1978, so that the actual amount paid in 1978 was $38.03. Adult premiums for years 1978 and later have been adjusted upward by 2.73% (= 104/3803) to account for this benefit change.

[b] Source: RM Gibson, D Waldo, K Levit, "National Health Expenditures, 1982," *Health Care Financing Review*, Fall 1983, 5:1, Table 4.

[c] Source: Ibid. and *Hospital Statistics*, 1983, Table 1. Value is total nonfederal short-term general and other special hospital total expense from *Hospital Statistics*, plus physician, drugs and medical sundries, other professional services, and eyeglasses and appliances from Gibson, Waldo, Levit.

[d] Source: VR Fuchs, "Though Much is Taken: Reflections on Aging, Health, and Medical Care," *Milbank Memorial Fund Quarterly* 62:150, 1984; Economic Report of the President, 1982, Table B-3.

[e] Estimated from above three values.

Table 2

Increase in Premium Charged by HMOs Offered as an Option by the Federal Employees Health Benefit Plan, 1976-1981 Compared with National Data on Expenditure [a]

(Standard errors in parentheses)

Sample	Number of HMOs with premium data	Percentage increase [b] in modal premium, 1976-81
All HMOs that enrolled federal employees in 1981	45	76 (8.0)
Subset of group and staff model HMOS that enrolled federal employees in 1976 and 1981 [c]	35	76 (12.3)

[a] Premium for 1976 is either the average of high and low rates for a family plan or is a single reported family plan rate. For 1981 it is the most commonly reported family premium.

[b] Percentage increases are weighted by the total number of members in 1981. In the case of the Heath Insurance Plan of Greater New York, only those members with hospital benefits were counted.

[c] A group model HMO contracts with a group practice to provide services; the group is usually compensated on a capitation basis. A staff model HMO delivers services through a group practice established to provide services to HMO members; usually, physicians are salaried. These two types of HMOs are distinguished from both IPAs, an HMO that contracts with physicians from various settings including solo practitioners to provide services, and a network HMO, which is an HMO that contracts with two or more group practices to provide services.

Table 3

Family Premium Per Month, Five HMOs Who Own Their Own Hospital, 1976-81 [a]

HMO	Enrollment, 1981 (000's)	Premium, 1976 ($)	Premium, 1981 ($)	Percent change
Kaiser-Permanente, Northern California	1723	66.12	101.07	53
Kaiser-Permanente, Southern California	1571	75.56	131.61	74
Kaiser-Permanente, Hawaii	117	58.63	110.91	89
Kaiser-Permanente, Oregon	250	66.61	111.57	68
Group Health Cooperative of Puget Sound, Seattle [b]	283	66.71	109.78	65
Weighted average [c]				64
Standard error of the weighted average				8.8

[a] Family premium for 1976 is either one rate or the average of high and low rates, for 1981 it is the rate for the most commonly offered family plan.

[b] These values could differ from those in Table 1 for many reasons. A likely cause is that rates reported to OHMO were for groups other than those enrolled in the Health Insurance Study; these groups could have experienced a change in benefits or composition, or the benefit package offered them could have differed from that offered to the Health Insurance Study group.

[c] Weighted average is by enrollment in 1981.

Table 4

Changes in Premiums, Hospital Days/1000 Members, and Physician Encounters/Member, 1976-1981 Among HMOs Enrolling Federal Employees in 1981 [a]

Type of HMO	Number of HMOs with Use Data	% Change in Premium[b]	% Change in Hospital Days/1000	% Change in Encounters/ Member
All HMOs	26	67	-8	-11
Group and staff HMOs	19	67	-7	-12
U.S. average		83	-6	-6
U.S. average under 65		76	-6	-6

[a] Sources for U.S. averages for hospital days and visits: National Center for Health Statistics, Current Estimates, 1976, 1981, Tables 16, 17, 20.

[b] Weighted by number of members in 1981.