

Evaluation of a Preferred Provider Organization

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DURING THE LAST FIVE YEARS, PREFERRED PROVIDER organizations (PPOs) have emerged rapidly as a major new alternative approach in organizing health care services. As the emphasis in health care cost-control policy has shifted steadily from regulation to competition, the PPO has represented the first significant addition to variations upon the health maintenance organization (HMO)—the sole form of competitive health plan until the late 1970s. As measured in terms of either number of organizations formed or column inches of print in the professional health care media, the rate of growth of PPOs has been impressive. By early 1985, over 250 PPOs were operational and contracting for health services with approximately one-quarter of the nation's hospitals and physicians (Rice et al. 1986).

The principal driving force behind this growth has been the promise of a cost-effective alternative to existing indemnity insurance or HMO plans that would blend the primary strengths of its two chief competitors. From the HMO came the concept of a managed care network using a variety of approaches to reduce the costs of delivering health care services. This network was combined with the free choice of provider offered by traditional insurance plans by using benefits design to channel patients into the provider network instead of locking them

into an immediate and absolute choice. In reality the dramatic growth in PPOs occurred purely on the speculation that the PPO model was plausible, with anecdotal descriptions of favorable results from several PPO sponsors fueling the fire. To date, no hard evidence has been available on either of the PPO's key promises, namely: (1) to channel patients to new health care providers by using differential benefits coverage, and (2) to supply care more cost effectively through those providers in the absence of financial risk to either the PPO or its providers.

Clearly, this lack of research presented the opportunity to assess formally how a PPO actually functions. In early 1984 the Robert Wood Johnson Foundation funded a three-year evaluation of the Med Network PPO organized by the Admar Corporation. The study is an in-depth review of a single case: the statewide implementation of the Med Network PPO by Security Pacific National Bank, a large California employer. This article presents the research design and initial findings of the Security Pacific evaluation based on analyses of claims and survey data from the PPO's first two years of operation. Beyond providing a profile of one PPO, the intent of this work was to use the case study to identify the central issues involved in assessing the performance of a PPO. Generalizing from a specific PPO to PPOs as a whole is difficult, as the efforts during the last thirty years, which have tried to resolve the cost effectiveness of the HMO, have already amply demonstrated. But this prior research in other managed care settings provides useful guidance to the types of issues that need to be addressed and, given this foundation, a single case can be very instructive in understanding whether the mechanisms driving the PPO are similar to or different from those previously encountered. The recurrent theme of this article is that the issues do, in fact, appear to be quite familiar—that they have been dramatically brought into focus by the incentives used by the PPO. Specifically, the use of modest economic incentives to encourage patients to change providers results in a favorably biased selection both in terms of who uses the PPO and how it is used.

The article first reviews the factors that influence a PPO's performance and summarizes the research issues and design. The results of the evaluation are then presented in four major sections. First, the impact of the PPO on provider market share and on the source of health care used by Security Pacific patients are described. Next, a description

of who used the PPO and why is presented with particular attention to the problems of defining a PPO member and assessing their risk characteristics. The impact of the PPO on cost is then assessed by reviewing three-year trends in expenditures and by analyzing PPO and non-PPO costs to both the bank and its employees in 1984. Then, the operational issues encountered in implementing the PPO are discussed, including problems of explaining the PPO to employees and of providers complying with cost-containment protocols. The final section summarizes the study's principal findings and conclusions.

Issues in PPO Design and Performance

The wide variety of sponsorship, organizational forms, incentives, and control structures found in PPOs today (Rice et al. 1986; Fox and Anderson 1986; Trauner 1986) has been aptly summarized by the statement: If you've seen one PPO, you've seen one PPO. Underneath this diversity, however, runs a common conceptual framework based on the following four key characteristics:

1. An organized network of cost-effective providers, including hospitals, physicians, and other sources of care;
2. Patients channeled into this network through benefits design, so that the individual retains a much higher degree of provider choice than under HMOs;
3. A negotiated form of payment to providers, typically incorporating a discount from usual charges or its equivalent; and
4. Active management of provider practice patterns by the PPO through a variety of techniques, including utilization review, gate-keeper models, etc.

In theory, the end result is a new form of competitive health plan with significant advantages for all parties (Boland 1985). Employers are offered a reduced health benefits premium. Employees have the choice of a managed care option without the lock-in provision that has limited the HMO's attractiveness. Both the PPO's insurance company sponsors and participating providers have the prospect of increasing their market shares in an increasingly competitive market. A PPO's performance in meeting these objectives is dependent upon its ability to do two things. First, it must attract a defined, growing membership

so that the network increases its share of health services. Second, it must provide services to those members in a cost-effective way.

Attracting users is not simply a matter of enrolling a membership; the decision to use the PPO network is made by the patient each time services are utilized. The basic assumption of the PPO model is that modest differences in benefits (primarily reduced deductibles and copayment fees) will induce patients to experiment with a new provider who participates in the PPO and eventually to establish a relationship with that physician so that the PPO network is the source of most, if not all, of their care. Using the network is critical for the performance of the PPO because the PPO can only reduce the cost of services provided within its service network. For example, if the PPO's costs are 30 percent lower than its competitors', but it only attracts into its provider network 10 percent of the total health care expenses, then it will only reduce the employer's overall expenses by 3 percent. Employees who go outside the PPO pay a larger share of costs, but because the unit costs are also higher, this does not save the employer money. In order to meet its promises to all parties, the PPO has to attract a significant increase in volume of health care services to the providers in its network.

Once the PPO attracts users, it must also take care of those patients more cost effectively than competing indemnity plans. There is no fundamental reason why the PPO cannot manage its patients well, and the trend toward using financial incentives for PPO providers (Fox and Anderson 1986) will increase the competitiveness of the PPO network. The real issue here, however, is whether the cost savings are large enough to allow the PPO model to function properly (Palmer 1985). Is the PPO's economic performance sufficiently strong to generate the savings required by both the host employer and its employees, not to mention the possibility of having to fund new incentive payments to providers? The overall potential savings available from the PPO's discounts, plus utilization management, are modest. Yet, they need to be divided between the employer, in the form of reduced premiums, and the employees, in the form of reduced out-of-pocket costs, when they use the network. If the employers are not offered a significant (5 to 10 percent) reduction in their costs, they have little incentive to add the PPO to a health benefits menu that has already become very complicated. If the employees are not offered a significant differential in benefits for changing to the PPO provider, they will not change

their source of care, and the PPO will not increase its market share. In addition, the increased freedom of choice of provider, which is the hallmark of the PPO, is the source of several significant administrative and cost disadvantages relative to the HMO. The PPO has the potential for increased costs for utilization control and benefits administration, as will be discussed below.

Evaluation Design

Questions Addressed by the Evaluation

The purpose of this evaluation is to provide initial insights into four areas that are central to understanding a PPO's performance:

1. Impact of the PPO on provider market share. Do employees change their source of care and use the PPO network? How rapidly did the PPO increase its market share of different types of health services?
2. Development of the PPO's membership. How permanent is the change of providers? Does a PPO "membership," in fact, exist in the face of the opportunity to use non-PPO providers? What are the characteristics of PPO users and how do they differ from nonusers? What are the employees' perceptions of the PPO and the services it has provided?
3. Determinants of the economic performance of the PPO. Did the PPO have a significant impact on the long-term trends in employee and employer health-benefit costs? Does the PPO result in lower overall cost per service for each of the major types of care? How are these differences in unit costs distributed between employer and employee?
4. Operational and design issues. What difficulties does the PPO face in functioning as designed? Is the concept hard to communicate to employees? What administrative issues are faced in coordinating the flow of information between the various actors? Do providers actually follow the utilization-control protocols specified by the PPO?

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2. Development of the PPO's membership. How permanent is the change of providers? Does a PPO "membership," in fact, exist in the face of the opportunity to use non-PPO providers? What are the characteristics of PPO users and how do they differ from nonusers? What are the employees' perceptions of the PPO and the services it has provided?

3. Determinants of the economic performance of the PPO. Did the PPO have a significant impact on the long-term trends in employee and employer health-benefit costs? Does the PPO result in lower overall cost per service for each of the major types of care? How are these differences in unit costs distributed between employer and employee?

4. Operational and design issues. What difficulties does the PPO face in functioning as designed? Is the concept hard to communicate to employees? What administrative issues are faced in coordinating the flow of information between the various actors? Do providers actually follow the utilization-control protocols specified by the PPO?

The evaluation design recognized from the outset that reductions in utilization and cost may not necessarily be the result of superior

performance by the PPO, but could be influenced by other factors. First, as in any other situation involving voluntary choice by participants, biased selection can cause PPO users to be different from non-PPO users in ways that significantly change their likelihood of using health services. Thus, the analyses of membership characteristics and economic performance are closely linked, and special efforts are being made to define and compare the risk characteristics of the PPO users.

Second, the PPO offers an opportunity for a new type of bias: selectivity in use on a service-by-service basis. Since the user must now choose to use the PPO for each episode of care, the PPO could be systematically used for more or less severe problems. Third, given the dramatic trends toward lower health care utilization and costs nationwide, and especially in California, the influence of major external trends not related to the PPO needs to be considered. This requires developing an external control or reference point for overall changes in utilization and costs for comparable populations in the state, which was provided by an analysis of health care cost and utilization trends between 1982 and 1984 conducted by a southern California business coalition.

Study Setting

In September 1983 Security Pacific National Bank incorporated the Med Network PPO into the Security Pacific Health Care Plan (SPHCP), the self-insured indemnity plan it offered to its 27,000 employees and their dependents. Since no separate enrollment was required, this change made the PPO available to all employees enrolled in SPHCP, offering them the benefits differentials listed in table 1. The principal objective of the benefit design was to encourage the employee to establish a relationship with a PPO primary care physician. The PPO benefits for physician ambulatory services were deliberately structured to look like an HMO, with no deductible or copayment amount, a fixed \$10.00 fee for an office visit, coverage of selected preventive services, and incentives to use primary care physicians as gatekeepers.

Inpatient physician services similarly by-passed the normal deductible and copay requirements; there was, however, no difference to the employee in hospital costs for using a PPO hospital. Thus, the incentive to use PPO physicians and hospitals for inpatient services was mitigated, especially for more expensive hospital stays, by maintaining a 20

TABLE 1
Security Pacific Employee Payments per Service when Using the Med
Network PPO Compared to Standard SPHP Benefits

	PPO	Non-PPO*
M.D. visit	\$10/Visit	Deductible & 20% Copay
Selective preven- tive care**	\$10/Visit	Not covered
X ray & lab.	No fee	Deductible & 20% Copay
Drugs	\$5/Prescription	Deductible & 20% Copay
Inpatient care	Deductible & 20% Copay	Deductible & 20% Copay

* The deductible was \$175 for an individual and \$525 for a family. Copayment had a maximum of \$1,000 per employee per year.

** Pap smear, well-baby care, immunization.

percent copayment for hospital fees and the maximum employee payment (stop loss) of \$1,000 per year. For admissions with hospital charges of more than \$5,000, the employee would pay essentially the same amount, whether or not a PPO physician or hospital were used. This plan created incentives for the employee to establish a relationship with the PPO physician for less severe problems requiring primarily outpatient care or relatively brief hospitalizations. The physician would then channel the patient into the network for referral and hospital care. The absence of a strong, direct economic incentive to the employee to use the PPO hospital represents a major departure from many PPO benefit designs (de Lissovoy et al. 1986) and has clearly influenced the ways in which Security Pacific's employees have used the Med Network. In fact, the PPO list distributed to employees did not name the participating hospitals, so that employees could not even identify the PPO hospitals.

The PPO had been organized by the Admar Corporation five years earlier and, as of 1984, had expanded its California provider network to include contracts with 45 hospitals, 2,500 physicians contracting either as primary care physicians or specialists, three major pharmacy chains, and a statewide home health care service. (The network continues

to expand and as of mid-1986 had 130 hospitals and over 4,000 participating physicians.) Hospitals are reimbursed using a discounted fee system, and physicians are paid using a negotiated fee schedule. The PPO attempts to reduce unit costs by having contractual discounts with the hospitals, physicians, and pharmacies, by specifying the use of generic drugs, and by substituting a lower intensity of care where appropriate (e.g., home health services for hospital days and primary care visits for specialist care). The PPO attempts to ensure that only appropriate services are provided by using the full spectrum of inpatient utilization-review techniques, by using primary care physicians as gatekeepers to review the need for specialty services, and by contracting with physicians practicing in organized groups whenever possible. The PPO hospitals and physicians assume no financial risks, and the primary care physicians have no financial incentives to refer their patients to PPO specialty physicians and PPO hospitals. Their obligation is solely a contractual one enforced by Med Network's review of claims and utilization patterns. Security Pacific projected that if the PPO eventually achieved an overall market share of 40 percent of all services, it would ultimately result in gross annual savings of 2.5 to 3.5 million dollars, based on its 1983 total health benefits cost of 21.5 million dollars. These savings, however, would be partially offset by the benefits improvements under the PPO, primarily elimination of the deductible and reduction of the copayment for employees, and by increased utilization of ambulatory services. Prior anecdotal experience with Med Network by other employers had indicated that the financial incentives to change providers required time to be effective, with market shares increasing from the range of 20 to 25 percent in the first year to over 50 percent after three years.

Research Design

The evaluation uses four complementary data sources to assess the impact of the Med Network program on the study population over a period of four years—a two-year base-line period (1982–1983) and a two-year evaluation period after PPO implementation (1984–1985). Computerized claims files provide detailed data on utilization and costs for the period from January 1982 to August 1985. Computerized eligibility and personnel files provide enrollment histories and demographic profiles of all employees and dependents (including nonusers)

for the same period. A telephone survey of 1,000 employees (conducted in the fall of 1985) provides profiles of the attitudes and characteristics of the PPO user and nonuser populations. Finally, regular field visits between January 1984 and June 1986 allowed first-hand observations of the PPO and SPHCP operations and provided supplemental data on utilization trends from internal management reports. The time lag between receipt of service and claims processing meant that even though claims data were collected for two years after the implementation of the PPO, reliable utilization histories were available for only the 20-month period from September 1983 to April 1985.

The primary study population has been defined as all active employees (and their covered dependents) with California residences who were covered by SPHCP at any time during the four-year study period. In any calendar year this represents approximately 32,000 individuals and approximately 50,000 individuals for the study period as a whole. It excludes retirees, employees on leave, employees who have waived insurance coverage, and employees enrolled in an HMO for the entire study period. The control-group population from the special study of a southern California business coalition represented 170,000 employees and dependents from ten of the area's largest employers. The geographic area covered by the control group, while limited to southern California, accounted for two-thirds of the Security Pacific active population.

Data Sources

The claims data were edited extensively and converted into two utilization files. One retained information on each valid claims transaction, and the other collapsed the claims into three types of episodes—inpatient, ambulatory surgery, and ambulatory. The data base was unusually well suited to an episode-based analysis since all claims had to be submitted with a three-digit diagnostic code and were associated with a specific problem at the time of entry into the claims system. An inpatient episode was defined as all services provided between admission and discharge, taking into account partial billings for long stays in order to determine the true discharge date. An ambulatory surgery episode was defined by looking for a combination of a hospital's outpatient charge and a surgeon's fee for a procedure costing more than \$250. Ambulatory episodes were defined using a combination of diagnostic data and time sequence for the services. The financial

data on each transaction included the original charge, the amounts covered and paid by SPHCP, the amounts paid by other insurers, and the employee deductibles and copayments. The source data identified whether a PPO provider was involved in each transaction. One known problem in the comparison between the PPO and non-PPO expenditures arose because all PPO utilization results in a claim being submitted, while many non-PPO users with total charges less than the deductible amount never bother to submit a claim. After reviewing the frequency distributions by each level of total charges for 1983 and 1984, the average total charges were recalculated, eliminating the cohort with charges of less than \$150 to allow a fairer comparison between the membership groups.

The telephone survey was conducted in October 1985 (two years after the initial implementation of the PPO) to a stratified sample of 1,000 Security Pacific employees. The sample population was limited to employees who had been employed at Security Pacific prior to October 1984 and who had submitted at least one claim prior to July 1985. Using the analysis of claims data from the first 12 months of PPO implementation, the survey population was divided into 6 groups on the basis of the degree of PPO services used (total, some, none) and highest level (ambulatory only versus inpatient) of services required (table 2). Stratification was essential to permit statistically significant comparisons between the different PPO user groups. The survey questionnaire collected data on awareness of and attitudes toward the PPO, changes in regular source of care, types of services used, health status of the employee, and supplementary demographic information. Employees were called at work by a California marketing-research firm.

Impact of the PPO on Source of Health Care

The ability of the PPO to channel users to its network was analyzed from two complementary perspectives: aggregate claims data that showed the monthly trends in gross market share, and survey data of employee changes in their regular source of care. Both analyses showed that the benefit differentials did result in a significant degree of redirection of care, but, as might be expected, the impact was much stronger for the types of services that offered a direct incentive to the employee. Also, strong preexisting relations with a provider

TABLE 2
Summary of Population Groups and Sample Sizes for Telephone Survey of
Security Pacific Employees

Highest level of care	100% PPO users	Mixed PPO users	Non- PPO users	Total
Ambulatory				
Completed interviews	250	305	200	755
Total population	1,775	1,651	5,861	9,287
Sample fraction	.140	.195	.034	.081
Inpatient				
Completed interviews	31	95	103	229
Total population	64	424	1,331	1,830
Sample fraction	.484	.224	.077	.125
Total				
Completed interviews	281	400	303	984
Total population	1,850	2,075	7,192	11,117
Sample fraction	.152	.193	.042	.088

was a major obstacle to using the PPO and significantly influenced both who used the network and the types of problems brought to it.

Changes in Market Share

The monthly trends in the PPO's market share of ambulatory services showed a significant increase for physician office visits, prescription drugs, and outpatient diagnostic services. The PPO share of physician office visits increased from 19 percent just after the PPO was offered to 32 percent in early 1985, and the share of prescription drugs increased from 13 percent to 33 percent during the same period. The absence of direct financial incentives to either the employees or the physicians to use PPO hospitals resulted in a much lower PPO market share of inpatient services. While the PPO market share for ambulatory services was approximately 30 percent for 1984, its share of inpatient admissions was only 12 percent. Thus, the PPO was not able to translate its success in attracting ambulatory care into a higher volume of participants in the network, as was hoped.

One of the questions raised during the design of the evaluation was how long would it take for the PPO to affect the employees'

source of care? Data were collected for almost two years after the PPO was implemented, in order to allow for the possibility that some changes would occur gradually, but this was not the case. The largest increase in ambulatory market share occurred within the first six months, with the participation rate remaining relatively constant afterward. The monthly inpatient market share increased slowly for a longer period of time, growing from 9 percent in late 1983 to 14 percent in early 1985, but the participation rate then leveled off and did not change appreciably for the next year. Both the PPO's volume of prior authorizations and SPHCP's volume of PPO claims were monitored through June 1986 and showed no significant change. Thus, the shifts in choice of provider occurred relatively quickly and both the PPO and the employer had a good indication of the long-term impact within the first year.

The dispersion of the Security Pacific population in a large number (over 1,000) of small groups scattered over California is believed to have reduced the success rate of the PPO. Admar data from smaller, more concentrated employers who offered the Med Network PPO indicated that they developed a strong relationship with a small number of PPO provider groups. Word-of-mouth endorsement of the PPO in these small groups was an important complement to formal written information. In the strongest cases it resulted in market shares approximately twice those found in Security Pacific.

A final market-share issue centers on the nature of the effect that offering a PPO had on the 25 percent of Security Pacific employees who had previously chosen an HMO. Would the employees be attracted back by the combination of less-stringent restrictions on provider choice and improved benefits? No evidence of such a migration away from the HMOs was found during the first two open enrollments after the PPO was offered, which is not surprising since the PPO was incorporated into the existing SPHCP option with no change in premium. In fact, the HMOs experienced a modest increase in net enrollment, and the principal driving force for the choice of plan appeared to be premium differentials rather than plan characteristics.

Changes in Source of Care

One of the primary issues investigated in the evaluation is whether employees are willing to change their source of care in order to gain

access to the PPO network. The employee survey showed clearly that the patient/provider relationship played a dominant role in the decision of whether or not to use the PPO. When non-PPO users were asked why they had not joined the PPO, 81 percent responded that they were satisfied with their current physicians, while 14 percent cited inaccessibility of the PPO physician. PPO users, on the other hand, were less satisfied with their regular source of care and had used them for a much shorter period of time.

The survey confirmed that employees who used the PPO were, in fact, experimenting with new providers of care: 79 percent said that they had tried at least one new physician as a direct result of the PPO's incentives, and, of these, over 40 percent said that they had changed their regular source of care to a PPO physician. Those who had tried a new PPO physician, however, were not necessarily happy with the result; the fraction indicating they were only somewhat satisfied or not at all satisfied with their medical care was twice as high as for the non-PPO users. In an open-ended question about difficulties encountered in using the PPO, complaints about the perceived competence of PPO providers was the most common problem identified, cited by 42 percent of the weak PPO users and 25 percent of the strong PPO users. It appears that patients who were channeled to a doctor by financial incentives rather than the traditional referral by another physician or a friend are much more skeptical about the quality of care they have received and more willing to criticize it.

Membership: Who Used the PPO and Why?

What Is a PPO Member?

Defining a PPO member is much more complex than identifying the members of an HMO or other managed care programs with a formally enrolled population. Even though some PPOs have a formal enrollment, this does *not* define their effective membership, since one of the key characteristics of the PPO is the freedom to choose a non-PPO provider on a service-by-service basis. The PPO population can only be defined operationally in terms of those individuals who have actually elected to use the PPO for service, so the analysis of PPO membership in this study is restricted to individuals who have received care during

the evaluation period. Membership in the PPO is no longer a simple dichotomy—yes or no—but instead is a continuum with a wide variety of possible measures of the strength of affiliation with the PPO. For example, is an individual who used the PPO for six ambulatory visits, but elected to go outside the network for hospitalization, and then returned to the PPO for follow-up care, more or less of a PPO member than someone who used the PPO for three ambulatory visits for minor problems and had no other care? Given the opportunity for selective use of the PPO by each individual, and the manner in which the benefit model emphasizes incentives for physician services to entice users into the PPO, it is important to assess not only the quantity of PPO services used by an individual, but the nature and severity of those services as well. After exploring a variety of alternative measures of PPO membership, this study primarily utilized a simple definition based on the ratio of PPO charges for all types of services to total charges (PPO and non-PPO). This ratio was calculated for each eligible person in the study based on utilization during the 20-month evaluation period. The population was divided into three membership groups: those with 50 percent or more of their charges in the PPO (strong PPO); those with some PPO use, but less than 50 percent (weak PPO); and those with no charges in the PPO (non-PPO). Conceptually, this approach first divides the study population into two groups—PPO users and non-PPO users—and then divides the PPO users into two subgroups on the basis of the strength of the PPO affiliation.

The alternative PPO membership measures considered included both different types of services—e.g., total ambulatory, physician office visits only, etc.—as well as finer stratification of the PPO users into ten, five, and three groups. In particular, there was concern that the impact of large hospital bills on total charges would distort the membership definition. Changing the definitions did not, however, materially affect either the characteristics of the PPO population or the findings regarding current and prior utilization. Therefore, most results will be presented using these definitions.

Number and Demographics of PPO Users

The number of individuals in the three membership groups are shown in table 3, together with selected demographic characteristics. Eligibles

TABLE 3
Relative Size and Selective Demographic Characteristics of Strong PPO Users, Weak PPO Users, and Non-PPO Users in 1984

	Strong PPO users	Weak PPO users	Non- PPO users
Eligibles	4,816	2,351	11,689
Eligible—Years			
Number	4,340	2,190	10,840
Percentage of total	25.0%	12.6%	62.4%
Age distribution			
0–15 yrs.	21.3%	18.6%	19.8%
16–30 yrs.	34.3	28.0	24.1
31–45 yrs.	29.4	33.8	29.8
46–65 yrs.	14.3	19.1	25.0
65+ yrs.	.7	.5	1.3
Sex: Percentage female	60.7%	66.0%	59.5%
Employed at Security Pacific			
Up to 2 yrs.	18.5%	12.7%	10.2%
3–9 yrs.	55.8	55.6	48.1
More than 10 yrs.	25.7	31.7	41.7
New employees	8.8%	7.4%	6.4%
Payroll grade			
Grade 1–10	61.8%	56.6%	46.1%
Grade 11–20	24.8	25.1	27.4
Grade 21+	13.4	18.3	26.5

are the number of individuals in each category, while eligible years adjusts for the number of months each person was eligible for benefits. Overall, the PPO attracted a significant proportion of the study population, with one-third of the users of care trying the PPO at least once during the 18 months. Within the PPO users, the strong PPO group was twice as large as the weak PPO group, with most of the strong PPO members receiving more than 90 percent of their care, as measured by total charges, from the PPO. Thus, in this PPO the population was dominated by two extremes: users either went to the PPO virtually all the time or not at all, and the population that mixed their sources of care was relatively small.

The demographic data show that, in general, the PPO users had

many of the characteristics seen in prior studies of HMO selection: the PPO members were younger, had been hired more recently, and represented a lower penetration of the upper payroll grades. No significant differences were found in education levels, marital status, or family size. In terms of geographic distribution, the PPO did best in urban areas in the southern part of the state, where its more-established provider network attracted 35.5 percent of available employees. It also did well outside of major metropolitan areas throughout the state, where it had a 28 percent penetration. It was significantly less successful in the northern urban areas, where the combination of a smaller critical mass of employees (8 percent of the total) and a relatively new provider network resulted in a penetration rate of 12.3 percent of available employees.

The size of the PPO membership documented in table 3 represents a significant market penetration in terms of individuals, but the raw averages by themselves say nothing about the dynamics of the change, the relative risk characteristics of the PPO and non-PPO users, and the types of PPO services used. In a typical PPO, the decision to choose a PPO provider is made at each episode; it is not an enrollment decision. The employee's choice depends primarily on the tradeoff between the advantages of being able to reduce the cost of medical care versus the disadvantages of having to disrupt preexisting provider ties. Economic vulnerability depends on a multitude of factors, including income, out-of-pocket costs, time costs, transition costs of switching providers, and family size. Those who are poor health risks will find the cost savings of PPOs attractive. These same individuals, however, are most likely to have well-established provider ties, which they are not willing to break. To the extent that patient/provider relationships are highly valued, the PPO will be unfavorably selected unless a substantial group is able to choose the PPO without switching providers.

The following sections on selection bias and selectivity of service use focus on the consequences of this decision process for SPHCP beneficiaries. The univariate results provide substantial information about consumer demand for PPO services, while the multivariate model provides more pinpointed explanations for choosing or not choosing the PPO for primary care episodes.

Selection Bias

The possibility of selection bias in the choice of the PPO was reviewed using utilization and charges data from the evaluation period, charges data from the base-line period, and survey data on the health status of PPO and non-PPO users. By any of these measures, the PPO benefited from extremely favorable selection in terms of lower levels of health risks of those who used it. The average annual per capita utilization and charges for 1984 for the three PPO membership groups (table 4) reveal a degree of difference between the three groups that can only be due to inherent differences between the populations, rather than the influence of the cost-containment efforts of the PPO. The adjusted average annual total charges per eligible person for the strong PPO users are only \$1,157, compared to \$2,367 for the non-PPO users and \$2,882 for the weak PPO users. The largest share of the difference between the groups is due to variations in inpatient utilization, with the strong PPO users' admission rate being only 42 percent of the total. In all three categories of care—inpatient admissions, ambulatory surgery, and ambulatory care—the strong PPO per capita charges are only one-half to one-third of those for the non-PPO users, while those of the weak PPO users are approximately 50 percent higher. Again, it should be emphasized that this general pattern occurred for all definitions of PPO membership that were tested. The degree varied somewhat, but the general magnitude of the differences between the groups remained the same. The comparison of the detailed distributions of total 1984 charges for the strong PPO, weak PPO, and non-PPO users showed that the difference in the average is not due to any one segment, but arises from strikingly different distributions. In particular, the distributions showed that the strong PPO group had a very small fraction of users with total charges during the year over \$1,000, i.e., at expenditure levels that would cover hospitalization.

The data on charges in two prior years for the individuals in the three membership groups showed a similar pattern, the levels of expenditures by strong PPO users being consistently less than half those of non-PPO users and weak PPO users (table 5). Again, when the membership groups were stratified by total charges for 1984 and the average charges in prior years for members of each cell, the strong PPO users had a lower prior-utilization rate than non-PPO users in all cells except one. At all levels of utilization in 1984 the strong

TABLE 4
Average Utilization and Charges per Year by Degree of PPO Use, 1984

	Strong PPO	Weak PPO	Non-PPO	Total
Total eligible	4,340	2,190	10,840	17,370
Percentage of total	25.0%	12.6%	62.4%	100%
Inpatient				
Admissions	71	279	181	166
Avg. charges	\$301.46	\$1,563.69	\$1,001.21	\$897.25
Percentage	8.4%	22.0%	69.6%	100%
Ambulatory surgery				
Episodes	18.6	74.3	44.4	41.7
Avg. charges	\$31.53	\$130.00	\$78.06	\$72.98
Percentage	10.8%	22.5%	66.7%	100%
Ambulatory				
Visits	2.89	6.04	3.42	3.62
Avg. charges	\$309.05	\$977.53	\$654.14	\$608.67
Percentage	12.7%	20.2%	67.1%	100%
Total				
Charges	\$642.36	\$2,671.45	\$1,733.44	\$1,579.03
Percentage	10.2%	21.3%	68.5%	100%
Adjusted* charges	\$1,157.00	\$2,882.00	\$2,367.00	\$2,227.00

* Averages recalculated omitting individuals with total charges of less than \$150 to compensate for claims not submitted by non-PPO users.

TABLE 5
 Average Annual Total Charges in Prior Years for Three Degrees of PPO
 Use, Stratified by Level of Expenditures

	Strong PPO users	Weak PPO users	Non-PPO users	Total
Under \$150				
1983 average charges	\$362	\$713	\$634	\$539
1982 average charges	393	618	524	482
\$150-\$300				
1983 average charges	465	602	666	606
1982 average charges	504	837	986	849
\$300-\$500				
1983 average charges	643	758	674	679
1982 average charges	607	769	709	697
\$500-\$1,000				
1983 average charges	809	887	1,221	1,102
1982 average charges	775	1,093	976	970
\$1,000-\$5,000				
1983 average charges	1,251	1,371	2,156	1,911
1982 average charges	1,252	1,740	1,423	1,472
\$5,000-\$10,000				
1983 average charges	2,659	1,563	2,267	2,150
1982 average charges	1,082	2,026	1,707	1,725
\$10,000 and over				
1983 average charges	2,542	3,176	6,710	5,778
1982 average charges	787	2,651	3,777	3,412
Total averages				
1983 average charges	573	1,098	1,255	1,082
1982 average charges	553	1,302	1,007	946

PPO group was composed of individuals with a history of lower use of health services.

A generalized probit choice model constructed from the data was used to construct a simulation model that estimated the impact of each of several variables on the probability of joining the PPO (Wouters and Hester 1988). The results of the simulation model are summarized in table 6 and show that the likelihood of choosing the PPO decreased dramatically with an increasing number of primary care visits and increasing expenditures for outpatient care.

The telephone survey questions dealing with health status also

TABLE 6
Impact of Selected User Characteristics on the Likelihood of Using the PPO

Variable	Value	Probability of choosing the PPO*
Income	\$5,000	.44
	25,000	.36
	45,000	.29
	75,000	.19
Pre-PPO primary care visits	2	.36
	6	.28
	10	.22
1984 ambulatory care expenses	\$50	.27
	175	.21
	500	.17
	1,500	.13
	2,500	.12

* Estimated from probit choice model by using mean values for other independent variables.

confirmed that strong PPO users were a significantly healthier group than weak PPO users. They had only one-half the prevalence of chronic problems under the care of a physician, had a significantly higher self-assessment of health status, and a lower estimate of future health care needs. Weak PPO users had high estimates of future health needs, low self-assessments of health status, but about 18 percent fewer chronic problems than non-PPO users. The higher level of expenditures and poorer health status of the weak PPO users induces the further question: When do weak PPO users choose the PPO system? This raises the second dimension of the PPO's favorable selection, that poor risks choose the PPO only for minor health needs.

Selectivity in PPO Use

One of the major causes of the selection bias in PPO users was that individuals were highly selective in the nature of the medical problems for which they went to the PPO and the types of PPO services that

TABLE 7
Types of PPO Services Received by PPO Users

Types of service	Number of PPO users who received service	Percentage using PPO provider for service
Minor illness	1,847	87%
Preventive care	1,471	70
Minor outpatient surgery	467	60
Specialist care	745	53
Hospitalization, with surgery	320	53
Chronic care	450	49
Hospitalization without surgery	360	47

they used. The survey asked employees whether they had used any of 7 specific types of services during the last 6 months and, if so, whether they had gone to a PPO provider for treatment (table 7). For employees using the PPO, the percentage using the PPO declined dramatically as the severity of the problem increased. For example, 87 percent used the PPO for their minor problems, while only 47 percent used it for their hospital care. The selectivity in use of the PPO was confirmed by reviewing the PPO's share of different types of services among two groups: individuals receiving most of their physician outpatient care from the PPO (strong PPO ambulatory) and individuals receiving some, but less than half (weak PPO ambulatory). The pattern of a declining PPO share of services as the severity of service increases is repeated for both groups (table 8). Thus, while the PPO accounted for 70 percent of physician office visit charges of the strong PPO ambulatory group, it handled only 33 percent of the inpatient charges for the same group. Perhaps the single most dramatic indicator of selectivity is that when the hospital admissions of individuals who had used the PPO for 100 percent of their ambulatory care were reviewed, only 53 percent had used the PPO for their inpatient care. This analysis did not consider the timing of the ambulatory PPO use, so the non-PPO admission could have occurred before the PPO ambulatory care. Given the need for ambulatory follow-up care after discharge, this should not have significantly affected the results.

In any given case the selectivity in use could have been either

TABLE 8
 PPO Market Share* by Type of Service Used for Strong and Weak PPO
 Ambulatory User Group

	Strong PPO Ambulatory (>50%)	Weak PPO Ambulatory (<50%)
Inpatient	33.1%	12.3%
Outpatient surgery		
In hospital	39.1	16.2
In physician's office	31.3	9.5
M.D. office visit	70.8	17.8
Outpatient diagnostic	56.6	
X ray & lab.		20.7
Prescription drugs	74.0	37.1
Total	42.8	14.2

* Market share for each type of service is defined as percentage of total charges for that service which was provided by PPO.

patient initiated, with the patient deciding to go outside the network, or provider initiated, with the physician referring the patient to a non-PPO specialist or hospital. The available data are not sufficient to determine the relative importance of these two factors, but it is clear that both were at work. The PPO recognized that its provider linkages leading from the primary care physician to specialist to hospital were much weaker than desired and began restructuring its provider network in mid-1985 to take better advantage of natural referral patterns. Even though, in theory, the physician contract with the PPO required that primary care physicians refer their patients to specialists in the PPO network, as is discussed below, provider compliance was a problem.

Summary of PPO User Characteristics

Taken as a whole, all of these patterns show that, under the benefit design used at Security Pacific, offering the PPO user a maximum saving of \$1,000 for using physician services and no savings for hospital care resulted in a very skewed user population. The strong PPO group was composed of people who primarily needed modest

amounts of outpatient services and had a substantially lower need for hospitalization. The weak PPO group was a very ill population that required large amounts of health care services and used the PPO for small amounts of minor services. It is highly unlikely that the weak PPO group is a transitional stage for people experimenting with the PPO as a prelude to more regular use of the network's providers. The data on current and prior utilization demonstrate that the PPO encountered the same resistance to changing well-established physician relationships that has limited the HMO market. At each level of current use, the financial incentives offered by the PPO appear to have been more effective among individuals with a history of lower levels of expenditure—i.e., people who were less likely to have established strong physician relationships.

Impact of the PPO on Expenditures

The PPO was successful in attracting new users to its provider network, but did it save money? What was the impact of the PPO on how Security Pacific and its employees divided expenditures for health care? How do the average charges for the common types of services within the PPO network compare to non-PPO providers? Some initial insights into the financial impacts of this PPO are provided below by reviewing the three-year trends in expenditures from 1982 to 1984, and by comparing the charges per service for PPO and non-PPO providers in 1984.

Answering these questions definitively by comparing the experience in the PPO and non-PPO networks, however, is greatly complicated by the differences between the PPO and non-PPO users, including the types of services used in the PPO, as just discussed. The impact of the PPO on utilization rates could not be measured by comparing the experience of the PPO and non-PPO populations, because the populations were so different.

Trends in Expenditures: 1982 to 1984

The three-year trends in the per capita amounts charged, covered for and paid by the various participants show that the PPO had no effect in reducing aggregate expenditures (table 9). Given that the PPO

TABLE 9
Trends in Average Charges and Amounts Paid per Year per Active Security Pacific Eligible,* 1982-1984

	1982	1983	1984
Total number	31,129	32,497	33,480
Average number	27,728	28,412	29,140
Total charges	\$819	\$846	\$1,016
Charges covered	811	828	972
Would pay	682	691	793
Paid by Security Pacific	624	614	717
Paid by employee	92	139	186
Paid by other insurers	59	77	76

* Average dollars per person are calculated using the average number of eligibles for each year.

represented a small proportion of overall expenditures, this does not rule out the possibility that it had a favorable impact on those who used it, but, if so, it was too small to be noticed in the aggregate. The total covered charges per eligible patient increased 17.4 percent from 1983 to 1984, compared to 2.1 percent in the prior year, while comparable data for the control group showed a 9 percent increase from 1983 to 1984. There was no reduction in the average out-of-pocket cost to the employee due to the PPO. The dramatic reallocation of expenditures from SPHCP to employees between 1982 and 1983 occurred due to an increase in employee cost sharing. The deductibles increased from \$100 per person and \$300 per family to \$175 per person and \$500 per family, and the limit on out-of-pocket cost increased from \$500 to \$1,000 in the year prior to the introduction of the PPO. From 1982 to 1983, SPHCP expenditures actually declined from \$624 to \$614, while employee payments increased from \$92 to \$139.

PPO versus Non-PPO Expenditures in 1984

Even though the PPO did not have an effect on aggregate trends, a comparison of the experience of PPO and non-PPO users during 1984, the first full year of implementation, confirms that the PPO, in fact, worked as designed in several ways. First, reviewing the disposition

of the initial charged amount, the PPO network did reduce the employees' share of the charges for the targeted ambulatory care services, from 35.7 percent outside of the PPO to 11.0 percent inside the PPO (table 10). The employee cost sharing for inpatient services was approximately the same in both networks, so that, overall, the employee paid 12.5 percent of charges for services provided by the PPO, compared to 25.2 percent of non-PPO charges. The PPO offered a significant discount for ambulatory services (25.9 percent), but had a much smaller discount for inpatient services (6.3 percent). These discounts substantially mitigated the impact on the employer of the reduction in employee contributions, but the employer still ended up carrying a slightly larger proportion of the costs for both ambulatory and inpatient care. If the costs per service for the PPO provider were also lower, the employer still has the possibility of an overall reduction in expenditures.

Second, total amounts paid per service were lower under the PPO for both inpatient and ambulatory care. The overall cost per case for PPO nonpsychiatric admissions was \$3,743, or 19 percent less than that for non-PPO admissions, due to a 20.1 percent shorter length of stay (table 11). The largest differences were in surgical and medical admissions, with the maternity length of stay being approximately the same. Owing to the small volume of PPO cases and the limitations of the data available, it was not possible to do an explicit adjustment of the overall cost data for case mix or severity composition. Given the previous findings regarding the health status of the PPO population, however, and their tendency to use the PPO for less serious types of problems, it is likely that a substantial portion of the difference in both length of stay and cost per case is due to a simpler case mix.

The comparison of PPO and non-PPO average charges per service for the most common ambulatory services shows that the PPO discounts resulted in significant reductions in expenditures per service (table 12). These discounts reduced the average charges for physician office visits, diagnostic tests, and prescription drugs by 34 percent, 23 percent, and 29 percent, respectively. As anticipated, employees realized significant savings in all categories by using the PPO. The average cost to the employee for PPO physician services and prescription drugs was approximately one-half of what it was outside the PPO, with even greater savings occurring for diagnostic services, because they required no copayment. Surprisingly, the unit costs of the PPO were

TABLE 10
 Comparison of Allocation of 1984 Charges among Payment Sources, PPO vs. Non-PPO, by Type of Service

Disposition of initial charge	Ambulatory care		Inpatient care		Total	
	PPO	Non-PPO	PPO	Non-PPO	PPO	Non-PPO
Security Pacific	63.1%	48.1%	79.3%	77.5%	70.1%	65.5%
Employee	11.0	45.7	14.4	11.1	12.5	25.2
Other						
insurance	0	3.0	0	10.4	0	7.5
Discount	25.9	3.2	6.3	1.0	17.4	1.8

TABLE 11
Summary of Inpatient Costs to Security Pacific per Admission by Service,
PPO vs. Non-PPO, Sept. 1983 to May 1985

	PPO admissions	Non-PPO admissions
MEDICAL		
Admissions		
Number	113	805
Percentage	12.3%	87.7%
Length of stay	3.72	4.85
Paid per case	\$2,488	\$3,002
SURGICAL		
Admissions		
Number	202	1,661
Percentage	10.8%	89.2%
Length of stay	4.08	5.13
Paid per case	\$4,712	\$5,890
MATERNITY		
Admissions		
Number	119	711
Percentage	14.3%	85.7%
Length of stay	2.9	2.97
Paid per case	\$3,290	\$3,497
PSYCHIATRIC		
Admissions		
Number	7	232
Percentage	2.9%	97.1%
Length of stay	21.42	26.45
Paid per case	\$13,734	\$14,089
TOTAL		
Admissions		
Number	441	3,409
Percentage	11.4%	88.6%
Length of stay	3.94	6.06
Paid per case	\$3,902	\$5,267
TOTAL, EXCLUDING PSYCHIATRIC		
Admissions		
Number	434	3,177
Percentage	12.1%	87.9%
Length of stay	3.66	4.58
Paid per case	\$3,743	\$4,623

TABLE 12
Comparison of PPO and Non-PPO Unit Costs for Ambulatory Services,
1984

	PPO		Non-PPO	
M.D. OFFICE VISIT				
Total charge	\$56.12	100%	\$47.59	100%
Total paid	37.21	66.3	46.28	97.3
Security Pacific	27.32	48.7	25.73	54.1
Patient	9.89	17.6	20.55	43.2
Discount	18.91	33.7	-0-	-0-
Other insurance	-0-	-0-	1.28	2.7
DIAGNOSTIC TESTS				
Total charge	57.42	100	80.44	100
Total paid	44.02	77.0	76.40	95.0
Security Pacific	44.02	77.0	52.98	65.9
Patient	-0-	-0-	23.42	29.1
Discount	13.36	23.0	-0-	-0-
Other insurance	.12	-0-	3.99	5.0
PRESCRIPTION DRUGS				
Total charge	22.31	100	28.27	100
Total paid	15.78	70.7	27.42	97.0
Security Pacific	10.80	48.4	17.66	62.5
Patient	4.98	22.3	9.76	34.5
Discount	6.53	29.3	-0-	-0-
Other insurance	-0-	-0-	.85	3.0

low enough that SPHCP's costs were reduced in two of the three categories, even though the employees were no longer sharing the cost through deductibles and copayments.

The cumulative impact on unit charges for ambulatory services was estimated by using the average number of diagnostic services per physician office visit and the average number of prescriptions per visit to construct a standardized office visit that was a composite of the three types of service. (The standardized visit consisted of an average physician office-visit fee, 75 percent of an average diagnostic charge, and 75 percent of an average prescription fee.) The total cost of a standardized visit within the PPO network was \$41.14 (or 33.7 percent) lower than outside the PPO. SPHCP accounted for \$10.14

(or 24.5 percent) of these savings, even in the presence of the lower employee cost sharing, which resulted in an employee saving of \$31.59 on average. Thus, the combination of discounts and benefit design does appear to have created a balance between savings to the employee and employer as measured here by average cost per service. Each of the three types of services, however, represents an average over a wide range of complexity, so the issue of case mix arises once again. The selectivity issues raised previously in the analysis of the membership composition and inpatient costs apply here as well. It is likely that the case mix of PPO services is not as severe and accounts for part of the difference in average charges.

Costs of Primary Care Episodes

In order to control for both selection bias and selectivity in use, a separate analysis of selected diagnoses for outpatient primary care episodes was conducted. This analysis used the results of the econometric choice model discussed previously to control for selection bias. It dealt with the selectivity issue by limiting the analysis first to a general set of outpatient primary care diagnoses, and then to only selected acute respiratory illnesses. The results showed that, for the average individual, using the PPO resulted in a saving of 19 percent in general diagnoses and 17 percent for the respiratory illnesses, before taking into account the PPO discount. Although these results are encouraging indications that the PPO, in fact, generated savings, this analysis is continuing in order to refine the definitions of ambulatory episodes and to improve the relatively low amount of variation in costs explained by the model.

Operational Issues

Employee Understanding of the PPO

In order for the PPO to work effectively, employees must be aware that it exists and understand its principal features. The results of the telephone survey showed that the essential information was conveyed effectively: virtually all (99 percent) employees were able to identify the PPO and even 59 percent of non-PPO users perceived that it

offered significant financial incentives to change providers. There were significant misunderstandings, however, about its benefit differentials and administrative design, even two years after the PPO had been initially offered, that weakened the PPO and caused continuing administrative problems. Employees were most knowledgeable about how to gain access to PPO providers (the absence of a locked-in feature, gatekeeper access to specialist care, etc.) and least knowledgeable about the financial aspects. For example, only 42 percent of non-PPO users and 64 percent of PPO users understood that there was no deductible for diagnostic services ordered by a PPO provider. Less than 20 percent of any group understood how to obtain PPO prescription discounts properly. In comparison, about 76 percent answered the question on access to specialist care correctly.

Security Pacific made a major effort to communicate information concerning the new benefits to its employees through the company newspaper, individual mailings, redesigned benefits brochures, and presentations by personnel, so it is clear that conveying the fine points of the PPO is a difficult task. Employees' information about the PPO came almost solely from official communications; word-of-mouth information from other employees was a major source of information for only 4 to 15 percent of the employees surveyed. Prior to the survey, the Security Pacific had some concern that the relatively infrequent updating of provider listings had been an obstacle to employees' use of the PPO, but the survey indicated that this was not a problem.

Administrative Problems

Establishing procedures and rules within the PPO for controlling utilization and costs is one matter; enforcing them over time in a large volume of transactions involving a diffuse network of thousands of providers and tens of thousands of patients is quite another. Particularly in the absence of either financial incentives or any degree of ownership of the PPO on the part of providers, compliance with the PPO's rules is dependent upon a strong coordination of policies and systems between the PPO and the payer, in this case SPHCP. Since these two organizations are quite different in their incentives, political pressures, and administrative capabilities, the required meshing did not always occur.

The implementation of the PPO at Security Pacific was hampered by a variety of operational problems involving both the PPO and the

bank. In paying claims, SPHCP sometimes made administrative decisions that undercut the PPO's incentives. For example, if a PPO specialist was not available, the PPO benefit was sometimes granted to an employee who was referred to a non-PPO physician by his PPO primary care doctor. The greatest problems in this area arose from limitations in the computer systems supporting both organizations' efforts to administer a relatively complex program. For example, almost two years elapsed before SPHCP's claims system was modified to check automatically whether a provider participated in the PPO or not. Until this was done, a small but very troublesome fraction of claims from PPO providers slipped through the manual screens, were paid inappropriately, and then had to be retroactively adjusted. In general, the separate responsibilities of the PPO for utilization review and SPHCP for paying claims placed a heavy demand on both organizations' systems, led to large duplicate data bases that never matched exactly, and required duplicate entry of key data. The consequences of these problems for PPO users were evident from the employee survey. Problems related to claims submissions and payment were the second most frequent complaint identified among the respondents.

Problems with Provider Compliance

For the PPO, the explosive growth during this period led to systems and procedures that lagged behind what was required to manage the provider network. The ultimate success of the PPO in reducing hospital costs is dependent upon both physician compliance with its utilization-review processes and the physicians' use of PPO hospitals. Given the absence of financial incentives to doctors, how successful was the PPO in influencing physician behavior in each of these areas? The effectiveness of the prior authorization for inpatient admissions was assessed by comparing the number of admissions in each quarter of the year with the number of prior authorizations issued for admissions during the same period. During the first year of implementation, only one-half the admissions were authorized. The trend by quarter showed steady improvement, and by the end of the evaluation period the noncompliance rate had dropped to 20 percent. The problem cases were primarily surgical admissions (70 percent) and only 10 percent of them were complicated by the involvement of non-PPO physicians. An equally

serious problem was that, during 1984, the PPO physicians used the PPO hospitals for less than 50 percent of their Security Pacific admissions. (A PPO admission was defined as one under the control of a PPO physician, independent of where it occurred.)

The PPO's efforts to identify and resolve these problems were hampered by continuing problems with their own utilization data base and coordination of claims data with SPHCP. These difficulties in enforcing provider compliance dramatize the PPO's need for strong management information support to monitor behavior in a timely fashion on an ongoing basis, and to have effective sanctions for both providers and patients to correct problems once they are identified.

Conclusions

Summary of Principal Findings

The principal findings of the descriptive analyses of the claims and survey data are as follows:

1. Employees did change their source of care and use the PPO. The availability of the PPO resulted in a significant fraction of the eligible SPHCP population trying new providers and shifting their regular source of care to the PPO. One-third of the population eligible to use the PPO did so, with two-thirds of the PPO users obtaining more than half their care from the PPO network and 80 percent experimenting with at least one new physician. Forty percent of those using the PPO said that they had changed their regular source of health care to a PPO provider. Existing relationships with a regular provider, however, was clearly a major factor influencing the decision to use the PPO. Satisfaction with preestablished provider relationships was the reason given by 81 percent of non-PPO users for not trying the PPO, and weak PPO users had longer, more satisfactory relationships with their PPO sources of care than strong PPO users.

2. The impact of the PPO on market share was felt quickly in the types of services offering a significant benefit differential to the patient. Most of the increase in PPO market share of ambulatory services occurred within the first six months after the benefit was offered. In the absence of financial incentives to the patient to use the PPO for

hospitalization, the increase in PPO hospital market share was much smaller, growing very slowly over the first 18 months and then flattening out.

3. Strong PPO users represented a much more favorable risk pool than non-PPO users. The population using the PPO for most of their care were younger, healthier, and had many fewer chronic problems than non-PPO users. They consumed many fewer services than non-PPO users in prior years, even after adjusting for current levels and types of use. The decisions by patients that created the selection bias were clearly influenced by the lack of an incentive to use the PPO's hospitals, but appear also to reflect a more generic resistance to making a change in established sources of care.

4. The PPO was used quite selectively for simpler, less severe problems. The model of attracting patients into the network through incentives to use PPO primary care physicians, and then having the physicians channel the patients to PPO specialists and hospitals was not successful. The channeling of more severe problems beyond the primary care physician into the specialist physician and hospital network broke down due to a combination of actions by the PPO network, the employer, and individual patients. The patient was more willing to experiment with a new provider for less serious problems, and the financial incentives carried more weight in these decisions. The integration of the primary care physicians, specialists, and hospitals in the PPO provider network was not as strong as desired. The employer, who self-administered a health plan, found it difficult to enforce the benefit differentials and, in general, to reprove its own employees for not following the PPO guidelines. The relative importance of these three players in the breakdown cannot be assessed, but each of them clearly played a role.

5. The PPO appears to be cost effective, but its true impact is complicated by the highly biased population selection and selective case mix. In general terms the financial incentives of the PPO performed as designed. The PPO did not affect SPHCP's aggregate expenditures, but the weak hospital incentives meant that this was not a fair test of the PPO's potential for overall employer benefit cost reduction. Through the combination of benefits redesign and discounts, the PPO was able to cut employee costs for ambulatory services by more than half without increasing employer costs. The average cost per service for care in the PPO was substantially lower than that for non-PPO

services. The composite cost per outpatient visit was one-third lower within the PPO and the average cost per admission was 20 percent lower. The econometric analysis of outpatient primary care episodes, which was designed to control for selection bias and selectivity of use, indicates that the PPO did, in fact, generate real savings in these limited types of problems, but this problem-specific analysis is continuing.

6. Provider compliance with PPO guidelines in the absence of financial incentives to perform is a major problem. PPO provider compliance with both utilization-review programs and the channeling of referrals into the PPO network was poor initially. The absence of financial incentives to providers places the full burden for monitoring and enforcing compliance with the PPO's procedures upon its administrative management-information systems. Strong systems support is essential and requires not only good systems within the PPO but also effective coordination with the claims payer, in this case SPHCP. The PPO continually strengthened its management-information system support, staffing, and procedures in this area to make them more effective, and over time demonstrated significant improvements in performance.

7. Making the PPO function effectively presents significant administrative and communication challenges. The structure of the PPO makes its design very unforgiving of error; it does not tolerate mistakes or sloppiness in execution. The complexity of both the benefits design and administrative design of the PPO makes it a difficult program to administer. Even though employees' general awareness of the PPO was excellent, even strong PPO users had major misconceptions about key features of its design. Ongoing employee education efforts are necessary to convey the full benefits of the PPO to its potential users and to teach its users how to use it appropriately. This was complicated by the separation of the utilization review by the PPO from the payment of claims by the SPHCP, which created some confusion on where claims were, in fact, submitted and how they were reviewed and paid.

Conclusions

In summarizing the conclusions of the Security Pacific study, the limitations of this evaluation should be reviewed. The fundamental

limitation is apparent. The present research has studied only one PPO, yet the performance of any competitive plan will certainly vary with its design and execution. Instead of attempting to provide the definitive answer on how PPOs function as a new form of competitive plan, this study has looked at major features of one PPO in an effort to identify potentially important generic characteristics. The proof of whether they are generic can only be provided from in-depth reviews of other PPOs. Fortunately, we will not have to wait long to find out; a multisite study sponsored by the Department of Health and Human Services is now well under way (Ginzberg et al. 1986).

In addition, the evaluation has focused on the charges to the parties directly involved: SPHCP and its covered employees. It did not attempt to address the problem of cost shifting, i.e., the possibility that the discounts given to Med Network resulted in higher charges to other users. The study attempted to account for the impact of reductions in price, but it was beyond its scope to determine the economic basis, if any, of the lower price. Similarly, the evaluation is silent on the issue of differences in quality of services, except for the employees' satisfaction with their care.

To what extent, if any, can we generalize from the experience of Security Pacific with the Med Network PPO? Of particular concern is the atypically weak incentive to use the PPO for hospitalization. We can only speculate at this point, but our findings regarding the importance of provider relationships are quite consistent with extensive prior research on choices of health plan involving health maintenance organization (HMO) options (Berki and Ashcraft 1980). Prior research has shown repeatedly that the existence of a strong relationship with a physician is one of the main obstacles to enrollment in a managed-care program that uses a selective provider network. Faced with a tradeoff between a modest economic gain and breaking an established relationship with their doctor, most people will stay with their physician. People with more serious (and expensive) problems are likely to have developed a strong relationship with their provider, and they will resist breaking that bond, especially during an episode of care.

In some ways, the HMO represents a less threatening mode of change, since the choice of plan occurs only once a year at a time when care is not needed. The choice of plan and choice of provider are somewhat separated from each other in time. The PPO juxtaposes these two choices, since the PPO is selected only when care is needed, and, to some extent, this magnifies the emotional impact of changing

the provider, especially for more serious medical problems. A PPO benefits design which has proportionately larger rewards for changing providers for more expensive medical problems increases the tension on the employee at a time when such tension is least needed. This is true whether or not the PPO has a formal enrollment because even an employee who has enrolled in the PPO has to choose to use it on a service-by-service basis.

It appears that the major problem is changing physicians; changing hospitals is less of an issue. Presentations from the pilot PPO operated by the Hospital Corporation of America (HCA) for its Nashville employees showed that they were quite willing to change hospitals, and HCA's market share of employee admissions doubled in one year. The HCA pilot was not, however, selective in its network of physicians and did not require changing doctors. Designers of PPOs have repeatedly emphasized the importance of selectivity of physicians in long-term economic performance.

With these caveats in mind, the following four principal conclusions have emerged from this initial evaluation:

1. The PPO is less likely to be effective in channeling more severe and, thus, more expensive cases into its provider network. These are the cases that are most important to manage because they are fewer in number, yet account for a disproportionate share of total expenses. These cases are less likely to be shifted to the PPO because the relationship with the existing provider is stronger, the financial incentives carry less weight relative to other concerns, and the magnitude of the financial incentive is capped by stop-loss provisions which limit an employee's out-of-pocket costs. Features frequently built into current health insurance to protect the patient from large out-of-pocket expenditures limit the PPO's financial incentive in more expensive cases.

2. The PPO is simple in its basic concept, but demands a precision that makes it very difficult to be well implemented. Some organizations are tolerant to faults because their inherent incentives work to compensate for shortcomings. The PPO is *not* such an organization. It requires a precision in benefits design, structuring of the provider network, and systems support for managing that network that is new to managed-care organizations. The more geographically dispersed the provider network and the employees, the more demanding the standards.

3. At this time, a properly designed and implemented PPO can

result in savings to both employees and employers, but it is not easy. The PPO can achieve the desired result of channeling patients into a more cost-effective network. The savings relative to traditional non-managed indemnity plans, however, are likely to be less than expected due to the difficulty of moving high-cost cases into the PPO. In addition, much of the PPO's projected savings come from its inpatient utilization-review programs which are rapidly being incorporated into indemnity plans, sometimes as a separate product line of the PPO itself. As these utilization-review programs take hold, the PPO's performance advantage will diminish, although it will always have the benefit of working with a more limited set of providers and, thus, possibly be able to influence their behavior more.

4. The PPO is evolving very rapidly and is probably still at an early stage in its learning curve. One of the fascinating aspects of this study was the observation that the Med Network PPO grows and evolves on a day-to-day basis. The organization that existed at the start changed substantially during the 16-month evaluation period. It has shown no signs of stabilizing since then. Its provider network more than doubled and has become more tightly integrated. Its system support, controls, and management talent matured steadily as the organization almost tripled in size. These changes in the Med Network have been paralleled by changes in PPOs in general (Fox and Anderson 1986).

In summary, even with its limitations, the PPO is a useful addition to the portfolio of managed-care products and will be an important competitor to both HMOs and indemnity insurance plans for the next three to five years. The initial experience of employers with the PPO, at least as determined by their anecdotal descriptions of their experience and their willingness to incorporate it within their benefits plans, has been quite favorable. Even if the PPO isn't structured quite right the first time, the health benefits climate is such that its sponsors are being given the chance to make modifications and improve its performance.

The diversity of the PPO's form, combined with its rapid rate of evolution and the complexity of its structure and incentives, will certainly make it fertile ground for future research. The almost unlimited flexibility in the design of the PPO—the benefits incentives it offers to employees, the use of limited restrictions to provider choice,

the incentives and controls used to influence provider behavior—offer the potential for a rich series of studies of this new organizational form. Another area for research is analysis of the providers' reaction to their experience with the PPO. To date, the volume of patients is generally too small to have significant impact on the individual physician or hospital, but as the volume grows it will have a major impact on the long-term success of the PPO. Uncertainty over the central issue of whether or not PPOs do, in fact, save employers money is likely to continue and to provide a major challenge to future researchers. The tools available today for controlling for case mix, in particular adjusting for severity of illness, are relatively crude. In addition, the way in which the PPO is implemented—the other options available to employees, the risk profile of the specific employee group, the administrative decisions made by the benefits office over time—all can significantly affect any given employer's experience. The divergence between the findings from careful research that document the cost savings of HMOs and the growing perception by employers that they are not realizing any cost savings probably provides a useful caution to those looking for a quick, certain assessment of the long-term role and effectiveness of the PPO.

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