

2412.5

A RAND NOTE

RESEARCH PLAN FOR THE PREFERRED PROVIDER
ORGANIZATION STUDY

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January 1986

N-2298-HHS

Prepared for

The U.S. Department of Health and Human Services



PREFACE

This Note outlines the research plan for Rand's Preferred Provider Organization (PPO) study. The study will analyze the experience of seven large employers that have contracted with one or more **PPOs** to provide additional options for employees participating in the employers' health benefits plans. The study sites reflect a wide variety of PPO structures and geographic locations. The analysis will be based on the employers' claims data and surveys of both employees and providers.

The study is supported by a contract with the U.S. Department of Health and Human Services.

SUMMARY

The Preferred Provider Organization (PPO) Study is designed to analyze the experience of six large employers that have contracted with one or more PPOs to provide additional options for employees participating in the employers' health benefits plans. The study sites reflect a wide variety of PPO structures and geographic locations. Based on the analyses described in this Mote, the study will address a range of questions about the employers' experiences with the PPO option, for example: which employees and dependents make use of the PPO options offered, how does the use and cost experience of those using the PPO compare to that of otherwise similar persons using other providers, and how do the practice patterns of providers participating in the PPO differ from their counterparts? The analyses will use data from medical claims records, employee and provider surveys, and employee personnel records.

RESEARCH QUESTIONS

The research plan is designed to answer three broad research questions:

1. What are the characteristics of employees who elect to enroll in the PPO plan, or use providers participating in the PPO?

The study will examine whether PPO users tended to have higher or lower-than-average rates of service use before the PPO was offered, and whether they planned unusually high or low use when they decided to use PPO providers. The study will also determine whether employees change their usual providers to participate in the PPO and how much of a factor in plan selection is proximity to PPO providers. The study will also analyze the role of other employee characteristics such as age, income, education, family composition, and presence of duplicate coverage in predicting PPO use. It will examine changes in these enrollment patterns over time, in conjunction with measures of patient satisfaction

and information about the financial benefits and coverages offered by each health plan option.

At four of the study sites, defining PPO participation will be a significant research task. At these sites, employees enroll not in the PPO but in the indemnity plan, which allows them to use either preferred or nonpreferred providers. The analysis will focus first on the choice between the distinct alternatives offered by the employer, including HMOs and indemnity plans. For employees enrolled in the indemnity plan with the PPO option, PPO participants will be identified from each family's self-reported regular providers of care and actual use of preferred and non-preferred providers.

2. What is the effect of PPOs on health services utilization and costs?

The study will assess how participation in the PPO affects the rate at which employees and their dependents use health services. This is not the same as comparing use rates between PPO users and nonusers, because the two groups are likely to have had different rates of use in the absence of a PPO.

The analysis will focus on various measures of utilization, including expenditures, number of physician visits, admissions, and lengths of stay. To the extent possible, the reasons for PPO effects on use will be examined--the incentives to use more or fewer services due to differing amounts of cost sharing, the more intensive utilization review activities, and the differences in practice patterns among providers. Comparisons of differences in health care spending will build on the analysis of utilization effects, but also incorporate differences in providers' regular charges and any discounts obtained by the PPO. Assessment of savings to employers will in turn build on the analysis of spending differences, but also incorporate the effects of cost sharing and premium differences.

3. Do providers participating in PPOs practice differently than those declining to participate, or those not included in the PPO?

The study will examine differences in practice styles between participants and others before the beginning of the PPO, to assess whether the PPOs have chosen providers with conservative styles or whether such providers are more likely to associate with the PPO. The analysis will measure the rates of billable services and the lengths of stay for selected diagnoses, adjusting for available patient characteristics. A similar analysis will be performed for the fees charged by PPO and non-PPO providers in the pre-PPO period.

The study will monitor changes in all providers' practice patterns over time. By monitoring all physicians, the study will attempt to separate the effects of the PPO on practice patterns from more general trends in the practice of medicine. To complement this information, the study will obtain information on the PPO providers' experiences and satisfaction with the PPO.

In addition to these three major topics, the research will address several additional topics:

- The utilization review activities used by each PPO
- Methods that can be used by employers and others to accurately assess PPO performance over time
- State laws and regulations affecting PPO development

STUDY SITES

The six employers and the PPOs offered by each are:

- Dade County School Board; Miami, Florida--Met-Elect
- Metro-Dade County Government; Miami, Florida--Met-Elect
- AmeriTrust; Cleveland, Ohio--Emerald Health Network and Ohio Health Choice Plan
- Stouffer's; Cleveland, Ohio--Emerald Health Network
- Hewlett-Packard; Palo Alto, California--El Camino Preferred Physicians Medical Group
- California Institute of Technology; Pasadena, California--California Preferred Professionals, Inc. (CaPP CARE)

All of the employers also offer employees health benefits coverage under a conventional indemnity plan and one or more Health Maintenance Organizations (HMOs). The financial incentives for employees to participate in the PPO differ, as do the relative premiums for fee-for-service versus HMO coverage. Some of the PPOs are hospital-based; some are not. The PPOs seek to control utilization and costs in different ways: intensive utilization review, fee discounts, risk-sharing with the PPO providers, and channeling employees to providers that historically provided more efficient care.

METHODS

The study will use econometric analysis, simulation, actuarial analysis and case studies. The econometric analysis will consist of three integrated models--plan selection, utilization, and practice patterns. Simulation models will combine the results of the econometric analysis with information from claims data to develop estimates of the PPOs' effects on medical care costs and outlays by employers. The methods of actuaries will be incorporated in the econometric and simulation analyses, but also performed separately to develop preliminary results. The statistically more sophisticated econometric models will control for a larger number of differences in the characteristics of PPO and non-PPO users as well as differences in health care utilization that predate the PPO. The simulation model can then be based on a more highly standardized population than would be possible if adjustments were made only for age and sex.

Detailed case studies will be conducted, using interviews with employers, PPOs, insurers, and leaders of the medical community, to obtain critical information that cannot be quantified. The case studies will document developments in the PPO, other health care options offered by the employers, and in the local medical communities during the study period. This information will support the interpretation of the quantitative results.

DATA

The study will use four kinds of data: personnel records, surveys of employees, health insurance claims data, and a survey of physicians. These data have the following purposes in the study:

- Personnel records provide reliable data on employee characteristics, including choice of health plan, and constitute a pool from which to draw samples for the employee surveys.
- The employee survey will obtain additional information on employee characteristics not available from other sources, provider choices, planned use of services, perceived health status, knowledge concerning the PPO and its benefit structure, and satisfaction with the PPO. Two waves of this survey are planned--one as early in the study as possible and the other in the spring of 1987.
- The study will analyze at least three years of claims data at each site: at most sites, the year prior to the effective date of the PPO option and the next two years. The claims data will be the major source of information on health services used, source of care, and prices. In addition, these data will be used to corroborate some of the information on the survey such as regular source of care and presence of duplicate coverage. At some sites, where the information on diagnosis and procedures is most detailed, services will be combined into episodes of treatment, permitting more accurate analysis of patterns of consumer demand and physician practices.
- The physician survey will obtain information on reasons for participating or not participating in the PPO, satisfaction with the PPO, and experiences with the PPO's utilization review procedures.

By merging the survey and claims data for the same families, the study will be able to combine the more accurate and detailed utilization data from the claims records with the more extensive information on the family from the survey.

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I. INTRODUCTION

The Preferred Provider Organization (PPO) Study is designed to analyze the experience of six large employers that have contracted with one or more PPOs to provide additional options for employee health plan participants. The study encompasses the experience of the employer and all of the participants in the employee health plan, including those covered by a Health Maintenance Organization (HMO) and those covered by a traditional indemnity or service benefit insurance policy as well as those enrolled in a PPO. As such, it does not focus on the experience of the PPOs themselves.

Although there is as yet no generally accepted definition of a PPO, the key attribute appears to be incentives to the insured to limit themselves to a subset of local providers who have enrolled in the PPO. The insurance risk is not assumed by the providers, as in an HMO, but remains with the insurance company or self-insured employer.

A PPO can be organized by an employer, an insurer, a group of physicians or hospitals, or an entrepreneur. From the perspective of an employer or insurer, a PPO is trying to direct employees toward low-cost providers. From the perspective of providers, the PPO is trying to direct extra patients to them.

Most PPOs have utilization review components, but such activities are not an appropriate part of the definition. One could easily have incentives to use a panel of preferred providers without any utilization review activities beyond those required for accreditation. All of the PPOs included in this study do have additional utilization review activities, but we regard that as a distinct business decision that they have made. The enrollment of providers may cost-effectively facilitate the conduct of utilization review, explaining why PPOs have pursued this activity very extensively.

PPOs vary on many dimensions. For example, providers offer discounts in some but not in others. In some, the employee enrolls in a PPO on the basis of a lower premium. Additional cost sharing is assessed when employees use providers not in the preferred panel. (In

some cases the cost sharing for outside use is 100 percent. Some have **labelled** this arrangement a "lock in" or an "**Exclusive** Provider Organization.") In others, the employee enrolls only in the standard insurance plan (as opposed to an HMO), and gets reduced cost sharing whenever a preferred provider is used.

The research plans to be described here tend to fall into two categories, which we will refer to as descriptive and analytical. The descriptive work will tell us what happened at the sites we are studying. Examples of questions answered by the descriptive research include:

- How many employees enrolled in the PPO (or enrolled in the **fee-for-service** plan and used PPO providers)? How do they differ from other employees participating in the employer's health plan?
- How did the cost and utilization experience of these employees and their dependents compare with that of other health plan participants?
- Were PPO users more or less satisfied with their medical care than other employees?

Analytical research is needed to answer the question: To what degree has the offering of a PPO affected employers' outlays and their employees' outlays for medical care? The analysis will compare what actually happened with a projection of what would have happened in the absence of the PPO. Thus, when analyzing the cost experience of those employees using PPO providers, we need to estimate what their cost experience would have been had the PPO not been available. Some might have joined an HMO if not for the PPO, so their costs would have been the HMO premium. Others would have used the same providers in the absence of the PPO, so their costs would have been the same, except for any discount obtained by the PPO, and changes in use resulting from both the additional review activities associated with the PPO and the effects of reduced cost sharing. For those who switched to PPO providers on the basis of the plan's incentives, their hypothetical use would also have been affected by differences in charges and practice patterns between

their former providers and their new providers who participate in the PPO.

By comparing the experience of each employee with a projection of what the experience would have been in the absence of the PPO option, and then summarizing the experience of all of a firm's employees participating in the health plan, taking into account their relative rates of use of medical services, we can provide an answer to the question of what effect the offering of a PPO option had on costs. As described in detail in Sec. V, we plan to use a simulation model to account for **all** of the effects that the presence of the PPO has had on individual employees and their dependents. These effects will include ones that are straightforward to simulate, such as the direct effects of discounts and reduced cost sharing, and ones that require complex regression models to estimate, such as the effect of the PPO on the rate of use of services.

Following this distinction, the research plan has separate discussions of descriptive and analytical work. Under the descriptive category are the case histories to be conducted at each site. Through interviews and research of documents, described in Sec. II, the case histories will uncover critical information concerning developments of the PPOs and how they relate to changes in local medical care markets. Information obtained through the case histories will also be used in designing the analytical work discussed. Following the discussion of case histories, Sec. III describes the data to be collected and obtained for use in the other research tasks. These include the claims data from the insurers or third-party administrators at each site, personnel records from the employers, a survey of employees to be conducted as part of the study, and a survey of physicians. A draft of the employee survey has been completed and is included as Appendix B. The physician survey will be drafted after the first round of case history interviews have been completed.

Section IV outlines the plans for development of descriptive statistics. The results of this descriptive work will be of interest not only for monitoring developments at the sites but for contributing to the design of the analytical work.

Two sections of the research plan are devoted to plans for the analytical work. Section V discusses the analysis of plan selection, utilization, and costs. The employee participating in the health plan will be the unit of analysis here, and information on the employee from the claims data, the employee survey, and the personnel records will be linked. Section VI describes the analysis of physician practice patterns. This will be based exclusively on the claims data, and the unit of analysis will be the episode of treatment.

The final section of the research plan is devoted to two extensions of the research. The first is a detailed study of utilization review activities in the PPOs included in the study. The second is a handbook for employers offering PPOs or contemplating doing so in the future that will help them assess the effect of the PPO on their outlays and their employees' outlays for medical care.

II. DEVELOPMENT OF CASE HISTORIES

PURPOSE

The case histories will detail the evolution of PPO programs at the study sites, analyze health care delivery trends in each of the market areas, highlight differences between local markets, and illustrate factors affecting PPO performance across sites. The interview process and data collection for these histories are designed to generate hypotheses to be tested in the statistical analysis and contribute to the interpretation of analytic results. As the study progresses, findings from the surveys and claims data will be incorporated into the interview process for interpretation by respondents as well as to help identify new issues for further investigation.

METHODOLOGY

The first set of interviews will be scheduled with professional and administrative staff at the PPOs; management of participating employees; and with staff of local hospitals, professional associations, HMOs, insurance carriers, Blue Cross/Blue Shield, health planning agencies, employer coalitions, unions, consumer groups, and other major employers in the area. These interviews will form a baseline for analysis of health delivery trends in the area and for evaluation of changing perceptions of alternative delivery systems and PPO benefit arrangements over the course of the study. Also, health benefit plan descriptions, statistical/financial reports, position papers, memoranda, and newspaper articles will be requested at the time of the interviews to allow for development of resource files for each study site.

Before conducting any interviews, we will develop a check list of general topics and key questions to be discussed with each respondent category (e.g., hospital administrators, physicians personnel/benefits managers). This check list will serve not as a questionnaire, but as a starting point for each interview. The interview process will be open-ended, to allow respondents the freedom to emphasize the factors that they feel most greatly affect PPO performance; the check list will

function as a reminder to guarantee that all identified topics have been covered in the interview.

An archive file will be developed for each PPO site. Notes from each interview will be transcribed and placed in the file. Upon completion of each set of interviews, a synthesis of interview findings will be forwarded to each of the research participants in the study. Copies of the actual transcripts will be made available when requested. We will make arrangements to be placed on the mailing list for newsletters or reports issued by professional and hospital associations, employer coalitions, HMOs, health planning regulatory agencies, and chambers of commerce in each of the areas. Researchers at universities and policy centers near the study sites will also be contacted at regular intervals for health-related data. On a quarterly basis, we will review health-based and business-based periodicals to develop a file of articles on the health care and employment markets in each of the areas. We will also collect enacted and proposed legislation as related to licensing of health facilities and health professionals, reimbursement policies, hospital rate review, and regulation of insurance carriers/health service plans/HMOs. Periodically, key articles, newsletters, and copies of pending legislation will be distributed to the contractors in the study along with relevant statistical/financial data collected during the field histories.

We also plan to monitor the development of data banks by local trade associations and employer groups. For example, in the Miami area, the South Florida Health Care Coalition has developed data on cost and utilization trends, while in Santa Clara the American Electronics Association has plans to analyze data from ten major firms, including Hewlett-Packard. Because of legal concerns on the part of the employer coalitions and the proprietary nature of the claims data, we may not have direct access to the reports from the coalitions and trade associations. However, through the interview process, general findings from the analyses may become available and potentially allow us to gather information on the relative performance of provider groups in the communities under study. For example, the South Florida Health Care Coalition has developed a list of hospitals that it is recommending to insurers and employers for inclusion in PPO programs; these hospitals

had responded to its original Request for Proposal for a PPO program; and after analysis of claims data from participating employers, they were found to be the most cost-efficient. Metropolitan developed its provider slate from the Coalition list; other carriers will use the same slate but will end up with a different mix of hospital and physician groups. Through the interview process, information on the perceived performance of different hospitals--and different PPOs--can be monitored over time.

GENERAL ISSUES FOR EVALUATION

The qualitative analysis in the case histories will examine three major subject areas--the local health market, the structure of the preferred provider system, the composition of the workforce, and the design of the health benefits program at participating employers. Table 1 summarizes the types of information that will be sought through data collection and interviews at the study sites.

Each case history will require different approaches to collection and evaluation of data and structuring of interviews. For example, when



Table 1

CASE HISTORY VARIABLES

I. Local Health Market

A. Hospitals

1. Number, size, ownership, and teaching status
2. Per capita supply of acute/facilities
3. Trends in occupancy rates
4. Trends in utilization rates
 - a. Admissions/1000
 - b. Length of stay
5. Financial status (from annual reports, state agencies.)
6. Pending Certificates of Need, licensing applications
7. Development of freestanding facilities
 - a. Surgicenters
 - b. Urgent care centers (FECs)
 - c. Primary care group practices (satellite facilities)
8. Contractual arrangements with PPOs/HMOs
9. Activities of professional associations

B. Physicians

1. Per capita supply of primary care/specialists
2. Percentage of physicians participating in HMOs/PPOs by primary care/specialty classifications
3. Availability of hospital staff privileges
4. Activities of professional associations (local, state)

C. Development of other PPOs

1. Initiators
2. Structure
3. Overlapping membership: hospitals, physicians
4. Enrollment, employer/insurer contracts

D. Area employers

1. Typical benefits packages
2. Changes in administration of health benefits
 - a. Independent utilization review
 - b. Profiling of provider claims
 - c. Growth of self-insurance
3. Development of coalition(s)
 - a. Date(s) organized
 - b. Staffing and funding
 - c. Lobbying activities
4. Sharing of data
5. Attitudes towards alternative delivery systems
 - a. Efforts to bring in/develop HMOs and PPOs

- b. Political efforts to develop cost containment legislation

E. Insurance carriers/HMOs

- 1. Enrollment trends
- 2. Medicaid reimbursement policies

F. State regulation and legal constraints^a

II. Preferred Provider Organization

A. History of development

B. Provider selection and contracting process

- 1. Criteria for selecting hospitals
 - a. Based on costs per day, length of stay
 - b. Based on other considerations
- 2. Criteria for selecting physicians and other professional providers
 - a. By closed invitation, e.g. based on group or hospital affiliations
 - b. By open invitation
- 3. Proportion of local providers solicited; acceptance rate
- 4. Share of member **hospitals'/physicians'** patients

C. Reimbursement for hospital and physician services

- 1. Presence of discounts: size and form
- 2. Other reimbursement provisions
 - a. Rate guarantees
 - b. Limits on rate of increase
 - c. Global fees (with or without inclusion of hospital charges)

D. Marketing policy

- 1. Number and size of major covered groups
- 2. Availability of benefits for individuals, small groups (under 50 lives)
- 3. Marketing by PPO vs. independent insurance brokers/third party administrators/consultants or insurance carriers

E. Utilization review process^b

- 1. Administration
- 2. Methods for prospective, concurrent, and retrospective review
- 3. Feedback mechanisms
- 4. Enforcement mechanisms

- F. Procedures for periodic review of membership; termination of contracts with inefficient providers

III. Employer

A. Workforce

- 1. Industry classification
- 2. Number of workers at work site(s) under analysis
- 3. Composition of workforce (age, sex, education, union status, etc.)

B. Health benefits program (including historical data)

- 1. Number and types of plans offered to active employers, retirees
 - a. Prepaid and indemnity plans
 - b. Changes in benefit package over time
 - c. Date alternative plans first offered
- 2. Plan characteristics
 - a. Services covered
 - b. Cost-sharing by type of service
 - c. Utilization review procedures (for all plan eligibles)
 - 1. Preadmission review
 - ii. Second surgical opinions (mandatory/voluntary)
 - iii. Concurrent hospital review
- 3. Premiums for single, two-party, family coverage in each plan
 - a. Employer contribution
 - b. Employee contribution
- 4. Enrollment by plan by employees, retirees

C. Data analysis by/for employer

- 1. Provider cost, practice pattern profiles
- 2. Employee/dependent utilization
- 3. Coordination of benefits
- 4. Feedback to plan administrators, providers

^a This information will be gathered in a separate effort, a project amendment sponsored by the Federal Trade Commission and the Department of Health and Human Services and designed to survey the laws and regulations that affect PPOs in all states.

^b The PPOs' utilization review processes will be analyzed in detail; Sec. VII describes this analysis.

Example 1: Plan Selection and Consumer Choice Analyses

Increasingly, employers are structuring their health benefit packages to limit their overall expenditures for health services. In some markets, however, there is a limited supply of skilled workers, and employers are reluctant to reduce the level of coverage in their health benefit packages. The packages in place before the PPO may have left little room to add incentives for employees to use PPO providers.

For example, in Silicon Valley (Santa Clara), where Hewlett-Packard (HP) seeks highly trained engineers, a restrictive benefit package could potentially limit hiring opportunities. Thus, the PPO that HP has designed is an option in a plan that reimburses in full for most PPO and non-PPO inpatient hospital services. Controls on hospital utilization rest with the third-party benefit administrator and the newly developed PPO program.

For physician services, the HP plan does reduce coinsurance from 20 percent to 10 percent for PPO services. However, approximately 50 percent of HP enrollees are already in HMO options. The fee-for-service plan may contain a disproportionate number of employees in the management/professional category for whom the 10 percent incentive to use PPO providers may be inadequate to change existing utilization patterns or to switch providers.

If the claims analysis does not provide any evidence of cost savings in ambulatory services from use of PPO providers, the explanation may not rest with the structure or administration of the PPO program, but with risk selection and benefit design in the HP package. The interviews will help to clarify why HP has implemented a PPO package with limited incentives for use of PPO providers and whether HP sought to change employees' hospital and provider choices or, instead, control costs through limiting the increases in hospital and physician charges over time.

Example 2: PPO Evolution

At the present time, PPOs may be marketed as separate benefit options or as add-ons to existing indemnity programs. The first situation typically involves a positive enrollment by an employee, whereas the second allows the PPO to be automatically offered to workers covered by the indemnity package.

For instance, in Cleveland, Stouffer's and AmeriTrust require positive enrollment; whereas at the other sites, the plan is incorporated into the comprehensive major medical plan. How PPO administrators or employers perceive the advantages and disadvantages of these two approaches is unknown at this time. The design of the PPO benefit will affect enrollment decisions. In the case of the Stouffer's PPO program, there is no reimbursement for services obtained outside the Emerald Health Network with the exception of emergency treatment and tertiary care not available at Network hospitals. The AmeriTrust contract does not contain this "lock-in" provision.

The employee survey, described in Sec. III, will allow us to assess general consumer perceptions of exclusive provider benefits and comparisons with existing HMO options. The same questions can be raised in the provider survey. The interview process also will address these issues but will emphasize the employer decisionmaking process--namely, how employers use claims data supplied by insurance carriers or **third-party** administrators to design benefits and how they balance cost containment goals against the realities of the job market. The expectations of benefit managers as to PPO performance, in terms of both enrollment growth and utilization/cost trends, will be evaluated. Also, by expanding the number of interviews to include other local employers with varying group sizes and benefits packages, the decisions of the employers participating in this study can be compared with those of other employers in the same market.

Example 3: Physician Contracting

Typically, most PPOs have contracted with physicians on the basis of hospital staff or group practice affiliations. Most of these PPOs have physician-specific data on inpatient admissions but have not attempted to assess outpatient practice patterns because of a lack of claims data. In some cases, physicians have been offered open-ended PPO contracts, with provisions for cancellation upon failure to conform to utilization review or other technical components of the contract. In other cases, contracts are for a defined period of time, again with cancellation clauses. An unresolved legal issue in many states is whether physicians belonging to hospital-based PPOs are entitled to due process before being removed from a PPO panel.

To complement the practice patterns analysis described in Sec. VI, the case histories will obtain information on how the PPOs first identify and then deal with physician outliers. If, in the practice patterns analysis, we find differences among the PPOs in their effect on practices, we will turn to the case histories for an explanation.

Weeding out overutilizers may be more difficult in some types of PPOs than in others. We may find that the problem is particularly difficult for hospital-based plans if overutilizers on the outpatient side are responsible for a large number of inpatient admissions. Alternatively, PPOs that solicit widely for physician members may face screening problems.

For instance, because the CaPP Care PPO in Southern California was designed as a physician-sponsored program without hospital affiliations, it has had little or no data on which to evaluate physician performance (other than screening for disciplinary actions). One of the marketing advantages of the plan is the availability of care from a large panel of physicians; however, retaining high utilizers within a PPO to maintain a large panel size can distort performance. CaPP Care does not ask its physician members to discount their fees. Therefore, the stringency with which CaPP Care requires physicians to adhere to its utilization review procedures will be critical to the success of the program. At the same time, because of the malpractice situation in California and the lack of an adequate legal definition of "medical necessity," an

inflexible approach to utilization review may present possible legal problems for participating physicians and the PPO.¹

While evaluating physician contracting, one must keep in mind that the provider groups involved with the PPOs under study may be participating in multiple preferred provider arrangements (and in some cases, in HMO arrangements). Information on the reimbursement rates, utilization review procedures, and benefit design in other PPOs is important to our research because of the potential effect upon provider perceptions of the PPO under study and upon provider practice patterns. The PPO arrangements that we are evaluating may be perceived more or less favorably in view of subsequent proposals to local provider groups-- and accordingly may affect provider willingness to participate in the PPO. In addition, providers who belong to other PPOs may have altered their practice patterns to suit these PPOs. Although we will ask about other PPO affiliations in the provider survey, we can obtain information about these PPOs only through the interviews.

¹The legal analysis being undertaken as part of this study will evaluate the potential for malpractice liability in PPOs (see Sec. VII).

III. DATA

The study will use data from four sources: (1) personnel records and/or health plan eligibility records for all employees; (2) claims records submitted by employees who are enrolled in indemnity plans and their dependents; (3) surveys of a sample of all employees, including indemnity and HMO enrollees; and (4) a survey of physicians belonging to the PPOs.

For the analysis of plan selection, medical care utilization and costs, we plan to link information from the personnel records, claims files, and employee survey to build an employee-level file.

Personnel records will give us information on employees relating to work history, type of occupation, salary, and health plan enrollment history. This information may also be contained on eligibility files maintained by the insurers; these files will also list all dependents who are covered under the employee's plan. In order to obtain this information for all employees, we would have to request these files from each insurer and HMO. We have not yet determined if this is feasible.

From the claims files, we will get information on the use of services by the employee, the charges for these services, and the applicable cost sharing and price discounts. In addition, we will determine whether care is obtained from PPO providers or others.

The survey of employees has been designed to augment the information on the personnel and claims files for a sample of employees. It will gather information on characteristics of employees and their dependents relevant to plan selection and utilization, regular source of care, health status, other insurance coverage, projected utilization, knowledge about alternative health plans, satisfaction, and attitudes. It will also be used to better identify mental health services in the claim files. Included in the sample will be HMO enrollees as well as indemnity plan enrollees.

In contrast, the analysis of medical practice patterns will use the claims data exclusively. It will make use of the information on diagnosis and procedures. For diagnoses that are easily identifiable

and frequent, claims for individuals will be aggregated to the episode level, so that frequencies of use of certain procedures can be compared between those using PPO providers and those using non-PPO providers. Those enrolled in HMOs cannot be included in this analysis.

The physician survey will not be integrated with the other data sources. It will be used to obtain descriptive data on the functioning of PPOs from the provider's perspective.

STUDY YEARS

We will analyze data for one pre-PPO year and two post-PPO years for each employer. Because the PPOs were added to the benefits package on different dates and these dates did not always coincide with the beginning of an enrollment period, we will use different years for different employers and these years will not necessarily be consecutive (Table 2).

Table 2

STUDY YEARS BY EMPLOYER

Location	Employer	PPO	Study Years
Miami	Dade County School Board	Met-Elect	83, 84, 85
	Metro-Dade County Government	Met-Elect	84, 85, 86
Cleveland	AmeriTrust Bank	Emerald OHCP	82, 84, 85
	Stouffer's	Emerald	83, 84, 85
Pasadena	California Institute of Technology	CaPP CARE	83, 85, 86
Palo Alto	Hewlett-Packard	El Camino Hospital	83, 85, 86

If we decide to pool the sites, the site dummy will adjust the intercept for differences in cross-sectional costs, year defined as 0 etc., and number of years in expenditure differences. We should look less formally at the transition years for **AmeriTrust, Caltech,** and HP to see if we can learn anything interesting about what happens when a PPO option is first introduced.

PERSONNEL RECORDS

We will request an abstract of the personnel record for every employee who worked at the study sites during the period covered by the claims data. The abstracted record will include age, sex, home address, date of employment, date terminated, total length of service, wage or salary rate, occupational code, health plan enrollment, and type of coverage (individual or family). Typically, personnel files do not list the employee's dependents. We hope to add the number, age, and sex of all dependents covered by the employee's plan from the eligibility files maintained by the insurers or claims processors.

The first request for personnel records will be made just before we select the sample for the employee survey, in the fall of 1985. The sample will be drawn from the population of current employees. We will link this first personnel file to the claims data for the years before 1984 to create a file for descriptive analyses on the complete employee population. To obtain information for 1985 and, where applicable, 1986, we will request a second abstract in early 1986 or in 1987.

CLAIMS RECORDS

Five of the six employers use identical claims forms for services from PPO and non-PPO providers; there are no differences in the information provided. The basic information included in the automated records includes the employee's identification number, the patient's age and sex, the date of service, some description of the services provided, the provider's identification code, whether the provider belongs to the PPO, the charges for these services, and the amount paid under the plan. Additionally, some records indicate if the patient is covered by another plan and, if so, the amount excluded for nonduplication of benefits, and the amount excluded for other reasons.

The automated claims data systems maintained by the various insurers and claims processors differ in the amount of detail retained on diagnosis, procedures, and ancillary services. With a few exceptions,¹ the claims include a primary diagnosis and procedure or type of visit on the physician claim or the hospital claim or both.

Our analysis plan requires that we be able to identify utilization of PPO providers in the pre-PPO year. In the post-PPO years, the claims indicate if the provider belongs to the PPO because payment levels differ for PPO and non-PPO providers. We will request an automated list of PPO providers for the first post-PPO year or, if such a list is not already available, we will create one from the post-PPO claims data. We will then add to the pre-PPO data a variable indicating if the provider later joined the PPO. A provider file created from the claims data will almost certainly be incomplete, but it should include the providers most likely to see employees of the participating firms.

We expect to be able to link the hospital and physician claims for each hospital admission and for each individual and family. Once the records have been linked, we will create a record of the year's utilization for each individual and a similar family record.

EMPLOYEE SURVEY

The survey, which will be self-administered, requests information to augment the data available from claims on family characteristics, duplicate health coverage, utilization for which no claims are filed, expected utilization, and provider preferences. Where possible, respondents will be asked about changes that have occurred since the beginning of the pre-PPO year. In addition, the survey is the primary source of information for analyses of patient satisfaction and knowledge of the different health care plans offered by the employers. Thus, the survey instrument includes the following types of questions:

¹The pre-PPO data for Stouffer's include only total charges; post-PPO physician claims include counts of office visits and ancillary services but no diagnosis or procedure. AmeriTrust's non-PPO hospital claims include the diagnosis but no procedures, and their non-PPO physician claims record diagnosis only at a highly aggregated level.

1. length of residence in area
2. length of employment at the firm
3. family composition and insurance coverage under employee's plan and other plans available through spouse's employment or other sources
4. recent and expected family health care utilization (separately for physical and mental health)
5. specific providers used by family member
6. familiarity with the characteristics of the different health care plans offered by the employer
7. satisfaction with current health care plan
8. family income, education, and health status The survey form, which has been approved by OMB, is attached as Appendix B.

We will draw two samples of employees from each employer. The first sample will be drawn from the population of employees who began work more than one year before the PPO was added to the benefits package. The information on these continuing employees obtained from the survey, combined with their claims records, will be used for comparisons of pre-PPO and post-PPO provider choices and health care utilization.

The continuing employee sample will be surveyed in early 1986 and, at the sites that added the PPO option after January 1984, again in the spring of 1987. The second wave of surveys will update the information to be used with the 1986 claims data and monitor changes in plan selection, satisfaction, and plan knowledge over time. We have dropped our original plans for a second wave at the other sites because we will not be analyzing their experiences after 1985 and in any case do not expect to find enough change in attitudes and knowledge during the third and fourth years of the PPO to warrant the expense of a second wave. If our case history interviews or our monitoring of enrollment changes suggest that such changes may be taking place, we can field the second wave.

For the later sites, we plan a brief six-month follow-up to the first wave. This follow-up is designed to investigate the validity of the claims data for mental health services.

The second sample will be drawn from the employees who were hired after the PPO was added. New employees are likely to be most responsive to the presence of a PPO option. Old employees have established themselves in a health plan and, frequently, with specific providers under that plan. Many of them will be reluctant to break these ties despite the addition of a new health care option. In contrast, new employees must change their health plan and many of them will not have a regular provider of care. For this reason, the long-term effects of the PPOs on the employers' health care costs may be determined by the response of new employees and the rate of employee turnover. To accurately estimate the new employees' participation in the PPO, we will take a single sample in the second year the PPO is offered. The new employees will be sampled only once.

The two samples will include enrollees in all of the employer's major health plans, prepaid as well as fee-for-service. Each will be large enough to support site-specific analyses and stratified by major plan to achieve maximum efficiency. Thus, for the purposes of estimating a model of plan selection, the survey sample will be **choice-based**. To remove the bias introduced by choice-based sampling, we will use methods developed by **Manski** and Lerman (1977) and others.

The samples will be selected from abbreviated personnel records that will be supplied by each employer. The employers will provide prior information on the purposes of the survey, the uses of the data, and confidentiality procedures as well as a cover letter to accompany the survey document. We have planned an initial mailing and two **follow-up** mailings. Approximately one week after the initial mailing, we will **send a reminder card to all respondents**. Two weeks later, a second follow-up letter will reemphasize the importance of the survey's importance; the letter will give a collect number for questions or requests for a replacement questionnaire.

Approximately 13,000 employees over all of the sites will be selected for the continuing employee sample, including about 3,200 HMO enrollees. The new employee sample will also contain about 3,200 persons. At the three sites where we plan a follow-up survey in 1987, a total of 4,800 employees will be resurveyed. These are target sample sizes and may be changed, depending on the results of preliminary descriptive analyses of data from each site. If, as expected, 75 percent of the original sample respond to the survey and, of these, at least 75 percent have complete data for the variables we will use in each of our analyses, we should realize almost 1,000 continuing employees per employer and an additional 400 new employees.

The final sampling plan for the employee survey will be based on power calculations similar to the ones described in Appendix A. Power calculations indicate the number of observations needed to have any given level of confidence (80 percent in the preliminary calculations we have done) that existing differences within the population being sampled will be detected at some level of statistical significance (we use a **two-sided** significance level of .05). The smaller the difference that one wishes to be able to detect, the larger the sample size needed. The mean value and standard deviation of the variable under analysis also affect power calculations. Because we expect that the sites will have different means and standard deviations for the variables we will be analyzing (health plan enrollment, PPO participation, and health care utilization), we will do site-specific calculations to determine the final sample.

PHYSICIAN SURVEY

The physician survey will be fielded in early 1986. The survey instrument will be based on the first complete set of case study interviews. It will include questions on how and why the physician joined the PPO, whether he belongs to other PPOs, and what his experiences have been with the PPO(s).

We plan a telephone survey lasting no longer than 15 minutes to a **sample of approximately 75-100 physicians per site. Each physician in the sample will receive a letter in advance explaining the purpose of**

the survey and soliciting their cooperation. If needed, we will request the PPOs to assist us in achieving our target response rate of between 70 and 80 percent.

IV. DESCRIPTIVE WORK

The first phase of the analysis will involve descriptive comparisons of employees and their dependents electing alternative plans in each of the study sites. Our objectives are:

- to monitor enrollment rates over time and to identify differences between employees enrolling in the PPO or using PPO providers and employees choosing not to enroll in their demographic characteristic, health status, and prior and expected use of care;
- to compare post-enrollment differences in patterns of use between the groups;
- to contrast attitudes about the alternatives available and plan satisfaction among employees in PPOs vs traditional plans vs HMOs.

The descriptive work will provide preliminary evidence on the extent and nature of biased selection and on the effects of PPOs on use patterns. It will also help guide the statistical modeling efforts described in Sec. V.

The descriptive comparisons we envision producing in order to address each of the objectives stated above are described in more detail below. However, we first briefly discuss the data and subsamples to be used in this phase of the analysis.

DATA AND SUBSAMPLES

Information on plan selections, previous use, post-enrollment use, and a limited number of demographic characteristics are available from employee records and from the claims data we will acquire. Thus, some of our descriptive comparisons can be carried out on the entire employee population in each site.

Information on attitudes, health status, expected utilization, and some socioeconomic characteristics will be available only from the survey. These characteristics may be important in accounting for biased selection and for use patterns.

We plan to carry out a parallel analysis for the full employee population and for the survey sample. An advantage of the parallel analysis is that it should help us to identify if there are differences between the employee population and the survey sample that need to be taken into account in the modeling phase. For example, such differences might be due to survey nonresponse. If certain groups of the population have differential response rates, failure to account for this can lead to biased estimates if characteristics that distinguish responders and nonresponders also relate to outcomes of interest. A weighted estimator can reduce the bias, but weighted analysis potentially leads to less precise estimates than unweighted analysis. The parallel descriptive analysis should help us to identify characteristics of nonresponders and to examine the tradeoff between bias reduction and precision in using weighted vs unweighted analysis in the modeling phase.

Underlying a weighted adjustment for nonresponse is the assumption that responders within a weight class are similar to nonresponders in terms of outcomes of interest--plan selection and post-enrollment utilization. The parallel descriptive analysis should enable us to verify the accuracy of this assumption. If the comparisons suggest that nonresponders behave differently than responders, we can use this information to incorporate options about how they differ in using the analytic model to simulate or predict outcomes under different scenarios (the simulation is described later in this research plan).

For all of the descriptive comparisons, we will treat new employees and old employees separately. We will also attempt to distinguish old employees who, before the PPO option, used a PPO provider (rollovers) from employees who had to change providers to use the PPO (switchers). Biased selection may differ considerably between new and old employees and between rollovers and switchers.

Finally, separate descriptive analyses will be carried out for those **selectin** employee-only coverage and those electing to cover dependents.

PLAN SELECTION

Enrollment Rates

Sample Tables 3-6 are designed to monitor the attractiveness of PPOs to employees and to assess how the PPO enrollment share changes over time. Tables 3 and 4 examine enrollment rates over time. Tables 5 and 6 investigate plan switching behavior to determine whether the availability of the PPO changes the HMO vs fee-for-service choice of continuing employees.

Treatment of Nonenrollment PPO Sites

For the sites with nonenrollment PPOs, our plan selection classification will involve both the insurance plan selected and an analysis of providers used by family members. To do this, we will produce a frequency distribution of families by the percentage of their

Table 3

ENROLLMENT RATES FOR SITES WITH ENROLLMENT PPOS, BY PLAN AND YEAR^a

Year	HMOs			PPO			Indemnities		
	Plan A	B...	Total	HMO C	D...	Total	PPO E	F...	Total
0 (Pre-PPO)									
1									
2									

(Percent of employees electing option)

^a Separate tables will be produced for employee-only coverage and employee plus dependents. For years 1 and 2, tables will also be produced for employees joining the firm subsequent to open enrollment for year 1.

Table 4

ENROLLMENT RATES FOR SITES WITH NONENROLLMENT PPOS, BY PLAN AND YEAR^a

Year	HMOs		Indemnities			Total Indemnity
	Plan A	B...Total HMO	Plan c		
	PPO user	Non PPO User	Not Ascer- tained	Total Plan C		
0 (Pre-PPO)						
1						
2						(Percent of employees electing option)

^a Separate tables will be produced for employee-only coverage and employee plus dependents. For years 1 and 2, tables will also be produced for employees joining the firm subsequent to open enrollment for year 1.

physician contacts that are made to PPO providers. Because there is interest in both the employee's decision about whether to use PPO providers and physician referral patterns, we will attempt to perform separate comparisons for visits that are most likely to be patient initiated and those most likely to be referred.

We will then categorize families within indemnity plans according to the degree to which they use PPO providers. In the sample tables we have assumed a trichotomy: PPO users, non-PPO users, and not ascertained (nonusers). However, we will modify this grouping once we have examined the provider choice patterns; for example, among those seeking care a trichotomy of high, medium, or low use of PPO providers may be more appropriate than the dichotomy suggested in the sample tables.

The plan selection categorization in nonenrollment PPO sites will emphasize the decision to use PPO or non-PPO physicians for patient initiated contacts. However, we are also interested in examining to what degree patients use or are referred to participating hospitals and

Table 5

ENROLLMENT RATES IN YEAR 1 FOR SITES WITH
ENROLLMENT' PPOS, BY PRE-PPO PLAN CHOICE^a

	Year 1 Plan			Total
	HMOs	PPOs	Indemnities	
Pre-PPO Plan	Plan A B...	C D...	E F...	
HMOs				
A				
B				
.	(percent electing year 1 plan by Pre-PPO choice)			
Indemnities				
E				
F				

^a A similar table will be produced examining switching between year 1 and year 2. Separate tables will be produced for employee-only coverage vs employee plus dependents.

participating specialists. Therefore, we will also produce tables showing what proportion of hospitalized patients use PPO hospitals, and frequency distributions of families seeking specialized care by the proportion of contacts to PPO providers.

We will also examine how the frequency distribution changes with the definition of the reference period length--for example, a six month period vs one year. For the nonenrollment sites, the decision to use PPO providers does not have to be made at the time of enrollment in the insurance plan. As employees learn about the benefits of using PPO providers, changes within a year in patterns of use may occur. That is, for nonenrollment sites it may be useful to monitor the PPO choice and changes in employee choice of provider over time periods other than

Table 6

ENROLLMENT RATES IN YEAR 1 FOR SITES WITH NONENROLLMENT
PPOS, BY PRE-PPO PLAN CHOICE^a

		Year 1 Plan				
		HMOs		Indemnities		Total
		Plan A B...		Plan C		
Pre-PPO Plan		PPO User	Non-PPO User	Not Ascer- tained	Total Plan C	
HMOs		(Percent electing year 1 plan by pre-PPO choice)				
A						
B						
Indemnities						
C						
D						

^a A similar table will be produced examining switching between year 1 and year 2. Separate tables will be produced for employee only coverage vs employee plus dependents.

those defined by the period from one open-enrollment season to the next. If the data suggest this is so, tables similar to Tables 4 and 6 will be constructed for subintervals within the year.

Biased Selection

A key question to be addressed is how employees enrolling in the PPO or using PPO providers differ from employees not choosing the PPO. Differences in the distribution of characteristics of employees in alternative plans will be presented as shown in Tables 7 through 10.

Table 7

EMPLOYEE CHARACTERISTICS BY YEAR 1 PLAN SELECTED FOR SITES WITH
ENROLLMENT PPOS AND FOR CHARACTERISTICS AVAILABLE
FROM EMPLOYEE RECORDS AND CLAIMS^a

Characteristic	Plan Type				
	PPO				
	Switchers	Roll- Overs	Not Ascer- tained	Indemnity	HMO
<hr/>					
Sex and Age of Employee					
<hr/>					
M a l e s					
Under 25					
25-35					
35-49					
49 or older					
Females					
Under 25					
25-35					
35-49					
49 or older					
<hr/>					
Employee Salary					
<hr/>					
by quartiles					
<hr/>					
Number Dependents Covered					
<hr/>					
1					
2					
3+					
<hr/>					
Years with Firm					
<hr/>					
1 or less					
2-5					
5-10					
10 or more					

^a Similar tables to be produced for year 2. Separate tables for employee plus dependent coverage. Separate tables for new employees.

Table 8

EMPLOYEE AND DEPENDENT CHARACTERISTICS BY YEAR 1 PLAN SELECTED
FOR SITES WITH ENROLLMENT PPOS AND FOR CHARACTERISTICS
AVAILABLE FROM EMPLOYEE RECORDS AND CLAIMS"

Characteristic	Plan Type				
	PPO				
	Switchers	Roll- Overs	Not Ascertain- ed	Indemnity	HMO
Age of Individual					
Under 5 yrs					
5-14					
15-24					
25-35					
35-49					
49 or older					
Previous Utilization ^b					
Average Expenditures per Person					
Hospitalizations					
none					
1 or more					
Physician Office Visits by Quartile					
Mental Health Expenditures per Person					

^a Similar tables to be produced for year 2. Separate tables for employee only and employee plus dependent coverage. Separate tables for new employees (those joining during year 1).

^b Not available for HMO enrollees and new employees.

The characteristics shown in Tables 7 and 8 are those available for the full enrollment sample. In Table 7, the unit of analysis is the enrollment unit, and the characteristics are those of the employee. Table 8 presents distributions of characteristics of all individuals in the plan, both the employee and enrolled dependents. Information about the distribution of characteristics of all enrolled individuals by plan permits adjustment of plan utilization rates for characteristics of individuals who differ by plan--that is, to separate out the effect of adverse selection from the effect of provider incentives on use. However, in some sites we will not have information on the characteristics of dependents unless they have used care and submitted a claim; for these sites, analysis of dependents' characteristics will be limited to the survey sample.

Tables 7 and 8 illustrate the groups to be contrasted for sites with enrollment PPOs. Tables 9 and 10 show the plan categories for sites with nonenrollment PPOs. The analyses suggested in Tables 9 and 10 are those that will be available only for the survey sample; in Table 9, the unit of analysis is the enrollment unit, whereas in Table 10 it is the individual.

As shown in the sample tables, we will try to distinguish those who changed providers in order to join the PPO (or to use PPO providers) from those who did not have to change. This classification will be based on an examination of visit contacts prior to joining the PPO.

EFFECTS ON USE AND EXPENDITURES

The descriptive analyses will involve comparing use and changes in use among enrollment groups as illustrated in sample Table 11. For this analysis, the unit of observation is the individual patient. Because we will not have claims data for employees electing HMOs, these analyses will be restricted to employees and dependents in the PPO or indemnity plans.

Table 9

EMPLOYEE CHARACTERISTICS BY YEAR 1 PLAN SELECTED
FOR SITES WITH **NONENROLLMENT** PPOS AND FOR
CHARACTERISTICS AVAILABLE FROM **SURVEY^a**

Characteristic	Plan Type			
	Indemnity			
	PPO Rollovers	PPO Switchers	Non-PPO Users	Not Ascertained HMO
Family Income				
by quartiles				
Education of Employee				
less than high school				
high school or equivalency				
some college				
bachelors degree				
some graduate work or advanced degree				

^a Similar tables to be produced for year 2. Separate tables for employee only and employee plus dependent coverage. Separate tables for new employees (those joining during year 1).

Table 11 illustrates the groups to be compared for the sites with enrollment **PPOs**. Similar plan groupings will be made for the sites with nonenrollment **PPOs**. However, the group designations will be made on the basis of providers visited rather than plan selections. Because we will not observe provider selections for nonusers, the comparisons will have to be restricted to service users.'

'For the survey sample, however, some classification of nonusers will be possible on the basis of responses to survey questions concerning where the patient would go to receive care. The survey data will also help us to determine whether non-users are differentially more likely to be persons who would use non-PPO providers; if so, this difference might be attributable to the deterrent effect of greater **cost-sharing**.

Table 10

EMPLOYEE AND DEPENDENT CHARACTERISTICS BY YEAR 1 PLAN SELECTED
FOR **SITES** WITH NONENROLLMENT PPOS AND FOR CHARACTERISTICS
AVAILABLE FROM **SURVEY**^a

Characteristic	Plan Type				
	Indemnity				
	PPO Rollovers	PPO Switchers	Non-PPO Users	Not Ascertained	HMO
Has Duplicate Coverage					
	yes				
	no				
Expected Utilization					
Hospitalization					
expected					
not expected					
Average No. expected physician visits by quartile					
Health status					
Physical					
Mental					

^a Similar tables to be produced for year 2. Separate tables for employee only and employee plus dependent coverage. Separate tables for new employees (those joining during year 1).

Table 11

UTILIZATION OF HEALTH CARE SERVICES BY PLAN GROUP BY CONTINUING EMPLOYEES^a
(Enrollment PPOs)

Utilization	Plan Group											
	PPO Switchers			PPO Rollovers			PPO Other ^b			Indemnity		
	Pre-PPO Use	Post-PPO Use	Change	Pre-PPO Use	Post-PPO Use	Change	Pre-PPO Use	Post-PPO Use	Change	Pre-PPO Use	Post-PPO Use	Change
Hospitalization												
<u>% hospitalized</u>												
average length of stay												
average expenditures/person												
Ambulatory												
<u>% users</u>												
average no. physician visits												
average expenditures/person												
Total												
<u>average expenditures/person</u>												

^a Separate tables to be prepared for employee-only coverage and for employees and family members covered by employee plus dependent plans. Separate tables comparing Post-PPO use only, by plan group, to be prepared for new employees.

^b Unclassified as switchers or rollovers.

We will also construct tables similar to sample Table 11 to compare use and expenditures by new employees enrolling in each plan group. The comparisons will, of course, be restricted to use level subsequent to the availability of the PPO option.

In addition to comparing group means and changes in group means for patients electing the alternative plans, we will produce comparisons standardizing for differences in characteristics that were found to influence enrollment choice. For example, we must present comparisons adjusting all groups to have a common age/sex/prior use level (quintile) distribution.

PATIENT ATTITUDES AND SATISFACTION

The survey includes several questions designed to elicit employees' perceptions about the alternative plans available to them. These questions cover three dimensions: freedom of choice (physicians, hospitals); costs (premiums, out-of-pocket expenditures); and access (wait times for appointments). Multiple items are included to measure attitudes about each aspect of dimension.

For each employee, we will construct nine summated rating scales reflecting perceptions about each plan on each dimension (the scale codes used in the questionnaire will be reversed as necessary so that low scale score values reflect perceptions of low access, low freedom of choice, and high cost). Average scale values given to each option by employees enrolling in the different plans will be contrasted as shown in sample Table 12.

SATISFACTION WITH CARE

The survey includes an adapted version of the widely used Patient Satisfaction Questionnaire to measure employees' attitudes about the medical care they receive. Our adaptation selects items to measure attitudes about features of care that we believe to be particularly salient in assessing patient satisfaction with the PPO option. These dimensions are shown in sample Table 13. Multiple items are used to elicit

Table 12

EMPLOYEE ATTITUDES ABOUT HEALTH PLAN OPTIONS BY PLAN SELECTED^a

Perceptions of Alternatives	Plan Selected		
	HMO	PPO ^a	Indemnity ^a
Freedom of Choice			
HMO			
PPO			
Indemnity			
		(average scale score)	
Costs			
HMO			
PPO			
Indemnity			
Access			
HMO			
PPO			
Indemnity			

^a For nonenrollment sites the categories are PPO users, non-PPO users, nonusers.

attitudes about each feature or dimension because multiple item scales have superior reliability to single items.

Tables will be prepared comparing attitudes toward the different features of care among employees selecting alternative types of plans. We will also examine change over time in satisfaction among those electing the PPO or using PPO providers.

Patient satisfaction has been shown to be a powerful predictor of physician change and disenrollment from an HMO. If we observe sufficient numbers of the panel members of the survey switching plans between years 1 and 2, we will also prepare tables examining switch rates and types of switching according to the level of satisfaction with

various aspects of care voiced in the first survey. Such analysis may be useful in determining both why patients choose PPOs (switch into the PPO) and what leads them to leave the PPO.

Table 13

PATIENT SATISFACTION BY PLAN GROUP

	Plan Group				
	PPO				
Dimension	Switchers	Rollovers	Not Ascertained	Indemnity	HMO
Access to care					
Continuity of care					
Cost of care					
Insurance coverage					
Quality of care					
General satisfaction					

V. ESTIMATING PPO EFFECT ON ENROLLMENT, UTILIZATION, AND COSTS

In contrast to the descriptive research, the analytic research will probe the data to obtain more accurate estimates of the benefits the PPOs have (or have not) provided to employers and employees and to determine how the PPOs have achieved their results. The approach we plan to take is designed to answer questions such as:

1. **Costs:** How much more (or less) would employers and employees have spent on health care without the PPO? How has the PPO affected costs for different categories of employees? How much of the gross difference between PPO and non-PPO fee-for-service costs is due to discounts negotiated through the PPO? How much of the difference is explained by enrollment behavior and how much by utilization behavior?
2. **Plan Enrollment and PPO Participation:** Has there been adverse or favorable selection into the PPO? Has the PPO changed HMO enrollment from what it would have been without the PPO? Are new employees more or less likely than old employees to prefer the PPO over non-PPO fee-for-service providers or an HMO?
3. **Utilization:** Has the PPO changed the health care utilization patterns of those who choose PPO providers? Can we identify the effects on utilization of the PPO's decreased cost-sharing?
4. **Practice patterns:** Does the PPO alter its physicians' practice patterns, or does it select physician members whose patterns already differ? How do the PPO practice patterns and utilization rates for different services compare with HMO patterns found in the literature?

Two complementary analyses, one focusing on beneficiary health care decisions and the other on provider treatment decisions, will provide the answers to these questions. The first analysis will develop explanatory models of plan selection and health care utilization for

different groups of employees and dependents. The models will be used to estimate differences in utilization and costs for specific employee and dependent groups under the PPO versus the traditional FFS plan. These estimates will control for differences in the individual characteristics of PPO participants and those who remain with non-PPO providers. The second analysis--of the practice patterns of PPO and **non-PPO** physicians over the three year study period--is described in Sec. VI. Using data from the claims records, this analysis will examine the physicians' use of services for treating specific diagnoses and lend additional insight into the manner by which the PPO alters utilization and costs.

The plan selection and utilization models will also be used in a simulation model capable of predicting what employer and employee costs would have been in the post-PPO years if the PPO had not been added. The costs predicted without the PPO can then be compared with the actual costs to determine whether the PPO saved money for employers and employees. For PPOs that receive discounts from providers, we will also determine what the savings would have been without the discounts.

The firms participating in this study do not experience high employee turnover. Thus, if new employees are more likely to use the PPO, estimates of the PPOs' cost differentials based only on the first two years of experience will seriously underestimate the PPOs' **longer-run** effects. As we explained in Sec. IV, we expect that new employees, who are less well-connected to a plan or provider, are more likely to participate in the PPO. Therefore, we will estimate a separate model of plan selection for new employees. If we find a greater response to the PPO, we will use the simulation model to predict the effect of the PPO, not only in the first two years, but also in future years when a higher proportion of employees will have joined the firm since the initiation of the PPO. These future cost predictions will incorporate only expected employee turnover and the additional appeal of PPOs to new employees; by necessity, they will assume that no other changes occur in the health plans, the local health care markets, or the beneficiary population.

SIMULATION OF MODEL OF COSTS WITHOUT THE PPO

We expect that the addition of a PPO option caused some employees to change the plan or the providers they use to take advantage of the PPO benefits. Other employees did not find that the PPO offered sufficient incentive to change plan or providers. If we assume that the PPO did not influence the provision of care to individual non-PPO users, we can restrict our analysis to those who took advantage of the new PPO option. This assumption is not as strong as it appears. It does not mean that PPO providers did not change their practice styles for **non-PPO** patients. In most of the sites in this study, non-PPO users are those persons using non-PPO providers. If they used a PPO provider, they would be classified as a PPO user. Thus, the assumption is only that non-PPO providers were not influenced by the particular PPO being studied.

PPOs are developing within a medical care system that is changing, but we do not believe that the individual **PPOs** we are studying had any specific effect on other local providers. The more general increase in new provider organizations that began with **HMOs** and continues with **PPOs**, together with other market changes such as the Medicare prospective payment system, clearly has induced changes in the traditional **fee-for-service** system. However, the **PPOs** we are studying do not have large enough market shares to provoke specific competitive responses from **non-PPO** providers practicing in the same markets. Several of the employers in this study implemented other benefits changes at the same time they added the PPO option. We assume that these changes could have been made without the PPO. Our analysis plan is designed to detect the incremental effect of the PPO after we take into account the effect of other changes.

Participants in the PPO could have come from several groups. HMO enrollees may have switched to the **PPO** plan or the indemnity plan to become PPO users, and indemnity plan enrollees may have switched from a non-PPO to a PPO provider. Both types of switching behavior probably caused changes in utilization and costs. Other employees, who were using a provider belonging to the PPO before the PPO was offered by their employer, will automatically become PPO users;' their utilization

'We assume the availability of the PPO option with its incentives to use PPO providers would not cause anyone to shift from PPO to **non-PPO** providers.

and costs will be affected by changes in their providers' behavior brought about by the PPO's utilization control activities and from changes in cost sharing. As already mentioned, the enrollment and consequent utilization behavior of new employees will be altered by the addition of the PPO. Newly covered dependents (new spouses and children) will enroll in the same plan as the employee, but those dependents enrolled in indemnity plans may or may not make the same decision on PPO use as their sponsor. Spouses may have already established relationships with providers whose PPO affiliation differs from the employee's chosen providers. A second or third child will probably be taken to the same pediatrician his siblings use; a first child requires selection of a pediatrician. We presume that members of the same family will make similar choices between PPO and non-PPO providers. However, we expect to find that mixing of PPO and non-PPO providers within a family is not unusual.

For each of these groups, we will simulate utilization and costs in the post-PPO period had the PPO not been offered and use the difference between simulated and actual costs as an estimate of the PPO cost effect. The simulation will assume the following would have occurred if the PPO had not been added to the benefits plan:

1. Employees and dependents who enrolled in an HMO or used **non-PPO** providers in the post-PPO years would have continued to use the same category of providers.
2. We can estimate how many of the employees and dependents who switched from the HMO or non-PPO providers to PPO providers would have stayed with their original choice. In other words, we assume that we can identify "normal" switching that is not related to the PPO and subtract it from **the total** observed switching.
3. The formation of the PPO did not alter utilization and cost patterns for non-PPO users.
4. Employees and dependents who used PPO providers in the **pre-PPO period would have increased or decreased their** utilization and costs in the post-PPO period at the same rate as non-PPO users actually did.

These assumptions, as we already mentioned, allow us to consider only the costs for those who actually selected the PPO option in the post-PPO period and use the change in costs over time for non-PPO users to estimate costs for PPO users in the absence of the PPO option.

The least significant assumption is the first. Persons who stayed with their plan or provider despite the new offer of incentives to use PPO providers almost certainly would not have changed had the benefits package remained unchanged.

The second assumption concerns the switching that occurs even without benefits changes. We would like to subtract these routine provider changes in estimating PPO impact on provider selection. For each employer, we can estimate switching rates between **HMOs** and indemnity plans for several years before the PPO from the personnel records. Unfortunately, we cannot use the same approach to estimate routine switching between PPO and non-PPO providers. Instead, we will try to develop reasonable estimates of the number of persons who would have switched to a PPO provider even without the availability of the PPO benefits from the number who switch among PPO or non-PPO providers or, despite the incentives to use the PPO, switch from PPO to non-PPO providers. Recognizing that switching patterns may not be stable over time, we will follow a conservative approach to estimating normal switching.

The last two assumptions permit us to use continuing non-PPO users as a control group. The case histories will provide some evidence on the validity of these assumptions by assessing whether and how **non-PPO** providers have reacted to the presence of the **PPOs**.

Defining User Groups

The planned simulation method classifies each employee and dependent in each year according to which of the employer's plans covered him and which category of provider he uses. The five basic user groups are:

- non-PPO users: in year 0, indemnity plan enrollees whose health care provider(s) subsequently did not become PPO providers; in years 1 and 2, indemnity plan enrollees who used non-PPO providers.
- PPO users: in year 0, indemnity plan enrollees whose provider became a "preferred" provider once the PPO was added; in years 1 and 2, indemnity plan enrollees who used PPO providers.
- nonusers: in each year, the remainder of the indemnity plan enrollees who didn't have a regular provider or use medical services.
- HMO users: in each year, all HMO enrollees.
- uncovered: in each year, persons who were not eligible for coverage, including employees whose employment began or ended during the study period and dependents who were added or subtracted from the employee's coverage.

The HMO and uncovered groups can be easily identified. The three indemnity plan groups are more difficult to define and identify, especially for the four employers that offer the PPO as an open option in the basic indemnity plan. Identification is easier for the other two employers because they offer PPOs as an enrollment option, but only one of these PPO plans does not reimburse for patient-initiated non-PPO services. We expect that employees will enroll in this exclusive plan only if they intend to rely on PPO providers. In contrast, we cannot be certain that enrollment in a nonexclusive PPO plan will automatically lead to reliance on PPO providers because the low premium offered by this plan permits the employee to have lower costs than the indemnity plan, despite significant non-PPO use.

Therefore, in all but one case, the employees who enroll in an indemnity plan or a PPO plan can use either PPO or non-PPO providers. The structure of the cost simulation we outline below assumes that we can characterize each individual covered by these plans as a non-PPO user or a PPO user or a nonuser. If we find that a number of people use both PPO and non-PPO providers or that we cannot separate nonusers from persons without reimbursable expenses to claim, we may have to adopt a more complicated approach that is bound to raise estimation problems.

An obvious alternative to using a dichotomous variable to represent PPO participation is to use the proportion of utilization delivered by PPO versus non-PPO providers. However, the latter variable is dependent on the level of utilization and may cause problems of simultaneity in estimating utilization as a function of PPO participation. In addition, the error with which we measure the true propensity to rely on PPO providers will be higher for low utilizers. By definition, someone with only one visit will be considered a 100 percent PPO user or non-PPO user; someone with many claims is more likely to have actually used his desired mix of PPO and non-PPO providers.

Ideally, we would be able to label every indemnity plan enrollee as a PPO user or a non-PPO user. The most accurate and readily available information about provider use is contained in the claims data. However, the claims data do not allow us to separate nonusers from nonclaimers. In addition, defining user groups solely on the basis of the claims data would lead us to miscategorize as nonusers more non-PPO users than PPO users. Most plans offer financial incentives to use the PPO, including in some cases a lower deductible. PPO users, who face a lower deductible, will be more likely to file claims and escape misidentification as nonusers than non-PPO users, who will use more medical care before filing a claim.

We will try to develop a method that avoids these problems for identifying each individual eligible to use PPO providers as a PPO user, a non-PPO user, or a true nonuser (not just a nonclaimer). This method will use information on actual provider use from the claims records and information on regular providers of care from the employee survey. As a first step, we will try to increase the number of individuals we can classify from the claims data. For those who have used both PPO and non-PPO providers, we will see whether they have used either type of provider exclusively for primary care and other types of services likely to be patient-initiated. Then we will use information from the survey on regular sources of care to classify the remaining persons who have used both provider types even for primary care or have no claims. We plan to use the survey as a last resort because we will have to manually identify the providers listed as regular sources as PPO or non-PPO providers based on names supplied by the respondents.

Simulation Framework

The simulated PPO effects on employer and employee costs for the total workforce and for specific employee groups will be based on a three-part model of health care utilization, estimated for each of the three study years. The three equations, which are basically the same for all sites, include: (1) the decision of an employee to enroll in an indemnity plan or an HMO; (2) for indemnity plan enrollees, the decision to participate in the PPO; and (3) the level of health services utilization for all indemnity plan enrollees as a function of PPO use. These equations are described more fully below; here we include only a brief description relevant to the simulation.

The utilization equations are structured for use in the simulation. In the pre-PPO year, we will analyze the level of utilization; in each of the post-PPO years, we will analyze the change in utilization between that year and the pre-PPO year for individuals belonging to one of three groups: continuing non-PPO users, continuing PPO users (rollovers), and switchers from non-PPO to PPO providers. The utilization equations will measure utilization in dollars and include PPO participation as an independent variable and interact participation with other individual characteristics. The equations can be written:

Enrollment in HMO or indemnity plan (all employees):

$$e_{it} = e_t(X_{it})$$

PPO participation (individuals covered by indemnity plans with PPO):

$$p_{it} = p_t(Y_{it})$$

Utilization (individuals covered by indemnity plan):

$$t=0 \quad u_{it} = u_t(Z_{it}, x_{it})$$

$$t=1,2 \quad A_{it} = \Delta_t(Z_{it}, x_{it})$$

In these equations, i denotes the individual and t the year, and the variables are defined as follows:

e_{it} = probability of enrolling in indemnity plan versus HMO

p_{it} = given enrollment in indemnity plan, probability of participating in the PPO

x_{it} = binary variable for whether person was a PPO user.

u_{it} = level of utilization (in dollars)

A_{it} = change in (dollar) utilization between year 0 and year t

X_{it} = vector of variables that determine enrollment decision

Y_{it} = vector of variables that determine PPO participation

Z_{it} = vector of variables that determine utilization

The specification will allow us to predict what an individual's utilization would have been if he had belonged to a different participation group. For example, assume for simplicity that those who switched from non-PPO to PPO providers did so only in response to the addition of the PPO option. To predict each switcher's utilization without the PPO we would add to his utilization in period 0 the changes predicted in years 1 and 2 in the absence of the PPO. These predictions would be derived for each switcher from the changes in utilization predicted for a continuing non-PPO user with the same characteristics by the post-PPO utilization change equations.

In order to estimate the full effect of the PPO on utilization, recall that we must predict how much each of several groups would have used without the PPO option. The groups are: rollovers (PPO \rightarrow PPO), switchers within the indemnity plan (non-PPO \rightarrow PPO), switchers from HMOs (HMO \rightarrow PPO), and new employees and newly covered dependents who select the PPO. For each of these groups, we will compare actual utilization with utilization predicted in the absence of the PPO. The simulation is

done essentially the same way for rollovers and switchers from **non-PPO** providers, for whom we have pre-PPO utilization data. New participants, for whom we do not have these data, must be handled differently. We assume that most of the HMO switchers would have remained in the HMO in the absence of the PPO at a predicted dollar cost equal to the HMO premium. If we find a noticeable level of "normal" switching out of **HMOs**, we will have to recognize in the simulation that the PPO will have altered the costs of these normal switchers.

Pre-PPO Indemnity Plan Enrollees. We will predict the change in utilization between the pre-PPO year (year 0) and each of the **post-PPO** years (years 1 and 2), assuming that each person was in the continuing non-PPO group. The prediction will be done for each individual, based on his or her personal and family characteristics. The simulated year 1 and year 2 utilization figure for each person will equal actual year 0 utilization plus the change predicted for years 1 and 2. We will then sum the individual utilization figures to arrive at the group total. Thus, the simulated utilization in year t for each individual (U_{it}) and for all individuals in participation group p (U_{pt}) is calculated as follows:

$$u_{it}(\text{non-PPO}) = \Delta_t(X_{it} | P_{it} = \text{non-PPO})u_{i0}$$

$$U_{pt} = \sum_{i=i}^t u_{it}$$

In the event that persons who use non-PPO and PPO providers in period 0 have different utilization patterns and some switching between the two provider categories is normal, the simulation will account for the effect of the PPO on the utilization over time of normal switchers to PPO providers.

Persons First Covered in the Pre-PPO Years. For persons who were not enrolled in the indemnity plan during the pre-PPO year (year 0), we have **no claims records from which to estimate** year 0 utilization. From the survey, we will know if they used any medical services, but we will not know how many. We will need to predict what their year 0

utilization would have been if they had been enrolled in the indemnity plan as well as the rate of change in years 1 and 2. The complexity of the method we use to estimate their utilization in year 0 will depend on how dissimilar the utilization of PPO users and non-PPO users is in year 0. If PPO and non-PPO users had similar utilization, once we control for individual characteristics, we can predict utilization for each person in the uncovered group from the year 0 utilization equation. However, if utilization depended on whether or not the person used a PPO provider, we may prefer to predict the probability of using a PPO provider and then expected utilization as a function of this probability. The more complex method is written:

$$u_{it} = p_t(X_{it}) \cdot u_{it} | \text{PPO user} + (1 - p_{it}) \cdot u_{it} | \text{non-PPO user}$$

The simulation will indicate the total utilization of covered services for all persons who exceeded or would be predicted to exceed the deductible. We will add an estimate of utilization below the deductible based on known functional forms for the distribution of utilization and the level of reimbursed utilization. We will not try to estimate utilization of uncovered services.

For each individual in the simulation, we can estimate on the basis of the plan's benefit structure the amount of claimed expense that would be covered by the employer and the amount that would be paid **out-of-pocket**. By adding up the estimated employer outlays for all individuals with and without the PPO, we can measure the **PPO's** effect on employer costs. For **PPOs** that offer a percentage discount to the employer, we can divide by the discount rate to determine what the cost effects would have been without the discount. However, for **PPOs** that use a more complicated discounting scheme, we will have to carry out the complete analysis with and without the discounts.

Once the simulation model has been set up, we can consider other scenarios. For example, employers might be interested in estimates of the cost implications of dropping their non-PPO option and offering only the PPO and HMO options. In this case, we could use the simulation

model to predict what the utilization of continuing non-PPO users would have been had they been continuing PPO users instead. We would not be able to predict how many of these non-PPO users would switch to the HMO instead of switching to PPO provider, but we could estimate the cost implications if they all preferred the HMO to the PPO.

ESTIMATION OF EXPLANATORY EQUATIONS

The three equations differ only slightly between sites that allow indemnity plan enrollees mixed PPO and non-PPO use (nonlock-ins) and sites that require employees to choose one or the other (lock-ins). We will begin by estimating site-specific equations and then determine whether we can pool the nonlock-in sites. Only one of the PPOs is a true lock-in plan, but others are offered as enrollment options. If we find that few enrollees in these PPOs use non-PPO providers, we may be able to pool the enrollment plans, whether or not they allow non-PPO use.

The equations for the nonlock-in sites are outlined briefly here. The lock-in equations only differ in that the PPO participation decision is an enrollment decision and therefore not conditional on our being able to classify adequate PPO participation groups. Either we will continue to estimate separate equations for the choice between an HMO and an indemnity plan (PPO or traditional) and for PPO participation, conditional on choosing an indemnity plan, or we will estimate a **three-way** enrollment model.

The three decisions--enrollment, PPO use, and utilization of health services--are interdependent, especially in the post-PPO years. In year 0, enrollment depends on expected utilization, but not PPO participation, and PPO participation is unlikely to be heavily influenced by expected utilization. Once the PPO and its incentives to use member providers is implemented, we expect that enrollment in an indemnity plan will be influenced by the PPO option and the decision to use a PPO provider and benefit from reduced cost sharing will depend on expected utilization. If possible, we will use instrumental variables to eliminate the simultaneity biases that this interdependency would otherwise produce. The instrumental variable approach can adjust for the patient's ability to base his plan selection on permanent

differences between his expected utilization and others' utilization. However, it cannot adjust for his ability to anticipate temporary utilization changes (pregnancy, surgery). If those who anticipate temporary increases in their health care use in the early post-PPO period tend to use PPO providers, we might mistakenly conclude that the PPO increases utilization. We would expect that these temporary aberrations would be less important in the second year of PPO experience.

Equation 1: Enrollment

In year 0, this is a bivariate analysis with the two dependent variables being the type of plan (HMO versus indemnity, or HMO versus indemnity versus PPO) in which the employee enrolls and whether he covers his dependents (or the number of dependents he covers). The unit of analysis is the employee. Where employees are offered more than one indemnity plan, we plan to estimate the HMO/indemnity decision first, then the specific indemnity plan. In years 1 and 2, the dependent variable will indicate whether the employee switched plans. The independent variables in the enrollment equations will include:

Plan choice: age, sex, number of dependents, health status (perhaps of least healthy family member), length of employment at firm, education, family income, employee's earnings or wage, availability of other insurance by type, index of awareness of PPO (years 1 and 2), prior use, expected utilization (1986 only), and perhaps some general attitude variables.

Dependent coverage: number of dependents by type, dependents' ages, sex of employee, predicted plan type, health status, income, availability of other insurance.

For employees who began working at the firm before year 0, a straightforward enrollment equation will be estimated in year 0. In years 1 and 2, the dependent variable will be whether the employee changed his enrollment and included among the independent variables will be which plan he previously enrolled in. If there are very few switchers, we may not be able to satisfactorily estimate a behavioral model of switching, although we may be able to pool observations on switchers in years 1 and 2.

Using data from the one-time survey of new employees, we will estimate separate equations for new employee enrollment and PPO participation equations, but we will not try to estimate utilization equations. Most of the firms appear to have very low turnover and so we are primarily interested in learning whether new employees are more likely to make different plan and provider choices in response to the PPO option. We will assume that, once these choices are made, the new employees' utilization behavior doesn't differ from that of similar continuing employees who have made the same choices.

Equation 2: Participation, indemnity Enrollees Only

The participation equation will also estimate PPO participation in year 0 and changes in participation in years 1 and 2. The dependent variables will be determined by our success in identifying whether nonusers would choose a PPO provider and in creating a simple dichotomy of PPO participation. If we are successful in these tasks, the dependent variables will be based on a dichotomous definition of PPO participation; each person will be classified as either a PPO user or a non-PPO user. The participation equations are defined only for persons enrolled in the indemnity plan and therefore eligible to use the PPO. The unit of analysis is the individual, but we assume there will be intrafamily correlation.

Independent variables: age, sex, education, family size, income, duplicate coverage, health status, specific plan in which enrolled (if more than one), and prior use or expected use as available. At sites offering more than one indemnity plan, we may be able to include an independent variable for the specific plan chosen. However, we expect that choice of indemnity plans may be strongly influenced by the desire to participate in the PPO. If so, to avoid simultaneity problems, we will need to use the predicted probability of choosing one or the other of the indemnity plans instead of the actual plan chosen.

Equation 3: Utilization, Indemnity Users Only

The dependent variable is the amount of total inpatient and outpatient utilization for year 0 and the percentage difference in expenditure between year 0 and years 1 and 2. We probably can measure utilization either in dollar amounts or in Relative Value Scale (RVS) units. The RVS measure ignores price effects, including discounts and price inflation. Utilization will be measured from the claims data; dollar amounts will be estimated with and without the discounts so that, as we already described, we can simulate costs with and without the discounts. The unit of analysis is the individual and we again assume intrafamily correlation.

Independent variables: actual or predicted participation in the PPO in relevant time period (in year 0--a dummy for FFS vs. PPO; in years 1 and 2--indicators for prior and current participation, age, sex, health status or change in health status, income, work and home locations, duplicate coverage.

Parallel Analyses of Utilization by Type of Service.

To obtain a more complete picture of whether and how the PPO changes utilization, we also plan to estimate a four-part model of utilization similar to the one used to analyze the Health Insurance Study data on utilization. The four-part model decomposes utilization into: (1) whether any care is sought, (2) the volume of outpatient care, (3) whether any inpatient care is sought, and (4) the volume of inpatient care. Volume of outpatient care will be measured in a number of ways, including claims, visits, and relative value scale units. Volume of inpatient care will be measured by charges, length of stay, and possibly charges divided by a DRG-based case mix index. For the smaller employee groups, we may not have enough data to estimate inpatient volume. If we find that the simpler expenditure estimates are too imprecise to use in the simulations, the disaggregated model will provide an alternate set of estimates.

Because the effects of cost sharing on utilization are well known, we will be able to calculate a residual effect to attribute to PPO selection of providers and utilization control.

All equations will be estimated using regression techniques, including **logit** or **probit** for equations with dichotomous dependent variables and ordinary least squares for equations with continuous dependent variables.

ADDITIONAL CONTROL GROUPS

Although our basic research design is to use those employees continuing to be non-PPO users as the control, we plan to develop an alternative based upon the experience of other employers in the area. If the claims experience of the continuing non-PPO users, after adjustment for biased selection, resembles that of selected other employers in the area, then we will have additional confidence in our inferences about the effects of **PPOs**. If they differ, we will know to probe further until we understand the bases for the differences.

In selecting comparison employers in each of the four market areas that we are studying, we will use only those employers without major changes in health benefit programs during the years under study. Otherwise, we would not be comparing **PPOs** with a control but with an alternative strategy for cost containment. One change in health plans that we will be able to accommodate is one involving the benefit structure--for example an increase in deductibles or coinsurance--because we have the ability to adjust for this with substantial accuracy. Either the results of the Rand Health Insurance Study or standard actuarial methods will enable us to estimate what spending would have been if the health plan had not undergone such a change.

We plan to seek comparison employers through business coalitions and other organizations in a position to know about which employers might be suitable. For example, in the Santa Clara County (CA) area, where Hewlett-Packard is located, the American Electronics Association may be able not only to point out which electronics firms might be suitable, but actually to provide the data. In the Dade County (FL) area, we plan to approach the South Florida Health Action Coalition for assistance, with an introduction by the employers that we are studying.

For each employer that we use for the comparison, we plan to request data on aggregate expenditures per full-year equivalent participant, hospital admission rates, and average length of stay. To the extent that data are available more frequently than yearly, we may be able to make use of this detail. We also plan to seek data on enrollment by employer--specifically, the proportion of participants enrolling in HMOs. If we find that these data are available in a usable form, we will seek data from a number of comparison employers at each site.

VI. PRACTICE PATTERN ANALYSIS

The analysis of provider practice patterns will be undertaken in those sites with sufficient enrollment so that diagnosis-specific analyses can be undertaken. Currently it appears that Hewlett-Packard and the Dade County sites will meet this criterion. A decision concerning the inclusion of Cal Tech/CaPP must await the examination of their claims file to determine if enough cases are available. Even if the data are too sparse to allow the analysis of a complete set of diagnoses, we will probably be able to examine at least the most common ones.

Each site will be examined separately, and within a site there will be comparisons of practice patterns between PPO and non-PPO providers in the period before and after PPO implementation, as well as comparisons over time.

To simplify the discussion, we omit physicians added to the PPO Provider List; however, some may initially be members and subsequently "weeded out." The analysis of *changes* in practice patterns over time would compare cells A2 with A0 and C2 with C0. The analysis of differences between PPO and non-PPO providers would compare A2 with C2, A2 with C1 or A0 with C0. If there are enough physicians and patient episodes in the B0 and B1 cells, it would be useful to compare them with A0 and A1 to determine if the "weeding out **process**" actually focuses on those with aggressive treatment patterns. Thus, we would hypothesize that average expenditures per patient episode will follow the pattern of $C2 > A2$, $B0 > A0$, and possibly $C0 > A0$, and $A0 > A2$. Given time and data collection constraints, we will omit analysis of transitional year data A1, B1, C1. In addition to the comparisons between PPO and **non-PPO** providers and changes over time, in Dade County we can take advantage of the one year lag in start-up for Dade County employees to compare practice patterns by PPO providers in 1984 for school board employees versus county employees to determine if there are differences **in treatment by the same practitioners depending on payment scheme.**

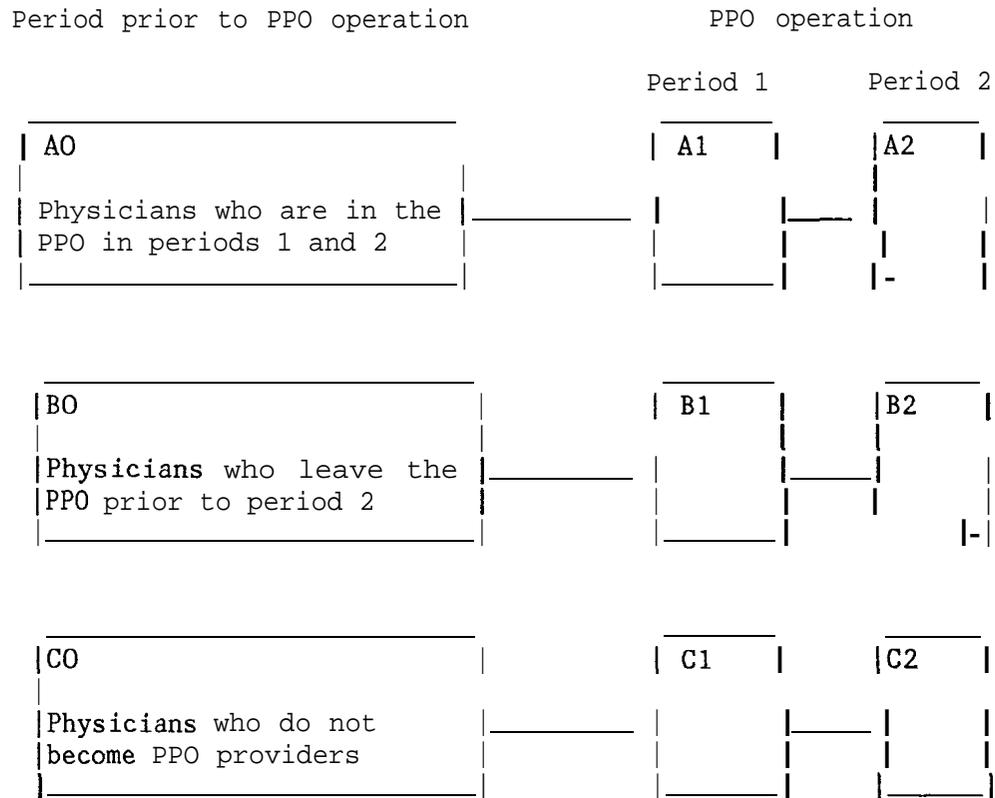


Fig. 1 -- Structure of practice patterns analysis

Discussions with HP staff suggest that there will be few cases in which enough patients with a particular diagnosis are seen by the same physician to undertake physician-specific analyses. Thus, it is best to consider the comparisons to be based on the pool of PPO versus **non-**PPO providers. However, we will examine available characteristics of the physicians to attempt to rule out alternative explanations of observed differences. For example, if PPO physicians at a site are substantially more parsimonious, we will whether the lower use patterns are associated with such characteristics as age and specialty or with subgroups of those physicians--for example, members of a special **fee-**for-service group practice. Sample sizes may be insufficient for

definitive tests, but the observation of such patterns will help temper conclusions.

Four major criteria will guide our choice of diagnoses for consideration: prevalence, clarity of episodes, diagnostic homogeneity, and potential for treatment variability. Regardless of how interesting a diagnosis may be for analysis, if insufficient cases occur in the largest samples (HP and Dade) it will have to be omitted. Thus, once the claims files become available, we can quickly determine how limited will be our choices. For acute diagnoses, it is certainly important that we be able to define the beginning of an episode. The Rand Health Insurance Study (HIS) designed software to link physician visits to each other and to hospital use (Fowler et al., 1981.) The claims forms used by the HIS, however, were carefully designed to capture data that would aid in such linkages. We will compare the episodes identified using the HIS software with a manual examination of the claims files for persons with the selected diagnoses. What will be necessary is a screening of all claims for those with the target diagnoses. All claims for those people, regardless of the diagnoses for the other claims, will be arrayed in the order of service and a determination made as to whether they are related.

In some instances, the focus of attention will not be on specific episodes but on chronic management. Rand is currently conducting a major study of medical outcomes for chronically ill patients treated by different health care systems or by physicians in different specialties. After extensive analysis, The Medical Outcome Study has chosen to examine diabetes, hypertension, major depression, and management of a recent acute myocardial infarction. Certainly for the first two diagnoses the appropriate unit of time is arbitrary, and services per year may be a reasonable choice.

The remaining two criteria for diagnosis selection are more subjective. The issue of diagnostic homogeneity must be addressed at two levels. One is the extent to which ICD9-CM¹ diagnostic categories are reasonably homogeneous and the second is the amount of variability

¹International Classification of Diseases, 9th Revision, Clinical Modification.

introduced in the claims form data. Thus, even though a carrier may code up to five digits of information, if a substantial fraction of the claims forms have coding at only the three-digit level, we will be forced to use somewhat heterogeneous data. A review of the claims files will determine that true level of specificity available. Even if a diagnosis meets all the above criteria, if treatment is highly uniform, such as for acute appendicitis, then detailed analysis of practice pattern differences will probably not be worthwhile.

Although selection of diagnoses for study must await our examination of the claims files, we are suggesting some additions to the list we originally proposed: Maternity care, otitis media, pediatric asthma, duodenal ulcer, uterine bleeding, and cholecystitis.² We plan to consider adding their tentative diagnoses: diabetes, hypertension, recent myocardial infarction, major depression, rheumatoid arthritis, and chronic obstructive pulmonary disease. The examination of practice pattern differentials within a given diagnosis will focus on the use of selected tests, procedures, and visits. With hypertensives, for example, a simple count of office visits per year may be sufficient. For maternity care we would include ultrasound exams, as identified by CPT-4 coding and the proportion of single births with Cesarean section. The CPT-4 coding of HP should allow quite detailed analyses. Of course, there will be many procedures and tests used that either are not readily distinguished or occur insufficiently often within a diagnosis to warrant separate analysis.

The average total billing (ATB) for an episode of care or a year of monitoring is a "bottom line" measure of practice patterns. This figure is the sum of all billings for included services provided by PPO providers (or analogously, non-PPO providers) to patients with the diagnosis. In turn,

²The initial examination of the claims files need only be fairly simple, such as a listing of all diagnoses at the 3, 4 and 5 digit level with more than 30 patients treated by PPO or non-PPO physicians, whichever group is smaller.

$$ATB = \sum_{j=1}^{NPAT} \sum_{i=1}^{NPROC} PROC_{ij} \cdot FEE_{ij} / NPAT$$

billings is merely the sum of the number of each type of procedure, test, or visit ($PROC_{ij}$) times the fee charged FEE_{ij} . To the extent that fee patterns differ for PPO and non-PPO providers, a simple comparison of ATB values will confound practice pattern and fee differences. However, one can easily derive a uniform fee based on the weighted average of observed fees,

$$FEE_i = \sum_j PROC_{ij} \cdot FEE_{ij} / \sum_j PROC_{ij}$$

and compute a standardized average total billings,

$$SATB = \sum_{j=1}^{NPAT} \sum_{i=1}^{NPROC} PROC_{ij} \cdot FEE_{ij} / NPAT$$

The difference between SATB values for PPO and non-PPO providers represents practice pattern differences, while the differences between ATB and SATB for each provider group reflect pricing differences.

VII. ADDITIONAL STUDIES

The statement of work for this study called for us to undertake two additional studies, to be specified at the end of the planning stage. We have decided to add: (1) a qualitative analysis of the utilization review activities each of the PPOs relies on for containing costs and (2) development of a method employers can use to predict the effect of adding a PPO to their health benefits package and to monitor the PPO's effect over time. We will present the results of the second of these studies in the form of a handbook.

UTILIZATION REVIEW ACTIVITIES IN PPOs

On the basis of our initial information gathering at the study sites, the PPOs are apparently depending heavily on utilization review (UR) efforts, especially preadmission review, to meet cost containment objectives. Although basic information about the utilization activities will be obtained from the case histories, we propose an additional study to look into UR in much greater depth. Rand colleague Kathleen Lohr will enable us to gain a better appreciation for the UR activities pursued at each of our sites and compare them with UR activities in other contexts. This study would attempt to answer broad questions like the following:

1. How do the UR activities in the sites compare with the "state of the art" in private sector applications? What is the basis for the differences?
2. What activities pursued at the sites are more feasible to pursue or more effective in the context of a PPO? For example, would preadmission certification be as effective if pursued without a PPO? If so, would its form have to differ?

More specific questions might include:

1. What problems have the PPOs encountered in setting up UR activities and how have they been able to deal with them?
2. Which UR activities are considered by the PPOs to be most successful?
3. To what degree have the PPOs, employers, physicians, and employees been satisfied with the UR programs administered by the PPOs?

Assessment of PPO UR Activities Through Expanded Case Studies: Overview

Data needed for this description and assessment will be gathered through (1) on-site interviews of individuals responsible for UR in the PPO and (2) collection and review of practice manuals, guidelines, records, etc. that document how the PPO's UR program has been set up and run and how UR information is used to change provider behavior. Information obtained from PPO UR officials will be supplemented, to the degree possible, with information obtained from employers (i.e., PPO members/sponsors) and from PPO providers (i.e., physicians and hospital administrators) on the perceived effectiveness and fairness of the UR program established by the PPO. Finally, consideration will be given to attempting to obtain some information directly from employees on whether they have perceived any effect of the UR effort (such as being turned down for an admission or being recommended for ambulatory surgery).

Interviews will proceed according to a semi-structured format, to be conducted by Rand personnel during a case-history site visit. They would be directed at employers and at the personnel within the PPO who are responsible for the UR program. Basic questions to be covered would be developed from the issues and topics noted in the next section. Information from employees and PPO providers will be obtained through the employee survey and the physician survey.

Conceptual Overview

UR should serve at least three management purposes for a PPO: (1) data collection on individual providers so that baseline patterns can be established and trends over time can be monitored; (2) information feedback so that patterns of unnecessary or excessive use of services (e.g., hospital days, tests) can be corrected or recalcitrant providers can be dropped from the PPO; and (3) aggregation and analysis of data demonstrating cost-effectiveness for purposes of marketing the PPO to employers or employee groups.

While UR activities sometimes extend beyond inpatient hospital care, for the PPOs in this study, only the hospital component of UR is likely to be operative during the study period. Consequently, that will be the main focus of this additional study. Descriptive analyses of the PPOs' UR program should determine whether the activities noted below are present, how they are organized, by whom they are performed, and how important they are in the overall UR approach. Those listed here do not exhaust the possible activities of a hospital UR program but they are dimensions to hospital UR that have been shown over the years (e.g., in Foundations for Medical Care) to be important.

- Prior authorization for elective admissions;
- Setting of initial or expected lengths of stay;
- Monitoring emergency admissions (so that only truly emergency admissions bypass the prior authorization step);
- Monitoring length of stay (with provisions for requiring physicians to obtain further authorization if the patient exceeds or is likely to exceed the initial LOS);
- Concurrent review with attention to severity of illness and appropriateness of level of care (e.g., whether patient needs to be in a special unit, or in the hospital at all); and
- Integration into discharge planning.

Other activities may include offering or requiring second opinion programs for elective surgery and requiring written treatment plans prior to or shortly after admission. In addition, the ability to

profile physicians and to educate those whose practice habits are consistently high may be undertaken in some of the PPOs.

One aspect deserving particular attention is personnel. Topics of interest include the following: Is a nurse-coordinator (e.g., a registered nurse) used, or is all UR carried out by physicians? Regardless of who carries out the UR work itself (e.g., prior authorization, setting LOS, etc.), how is the matter of physician advisors across all possible specialties handled? Who is responsible for coordination between the concurrent reviewer and the nursing staff on a hospital floor?

Some administrative matters deserve attention. For instance, what is the appeal process in the event of a denial: Is there provision for the attending physician and the patient to appeal? Can the appellant have recourse to a level of appeal beyond the review physician? Also, does the PPO's UR program overlap, dovetail with, or supplant equivalent activities within member hospitals? Finally, how are patient confidentiality and privacy maintained and inadvertent disclosure of sensitive information prevented?

Types of Questions to be Addressed to Various Respondent Groups

The following are specific questions that might be posed in the on-site interviews. They would attempt to assess the UR activity along three dimensions: formalization, centralization, and the complexity of the UR program itself.

1. What committee or organizational entity is responsible for UR?
 - A. Who is the chairman or leader?
 - B. What is the composition of the entire UR committee/entity?
 - C. Does the committee/entity meet formally, keep minutes, etc.? If so, how often; who participates, etc.?
2. How is UR kept consistent across several member hospitals? Is UR "delegated" to individual hospitals, or run centrally?
3. What overlaps are there, if any, between the PPO's UR effort and those of hospitals at which physician members have privileges?

4. How is the effectiveness of the UR program itself evaluated?
 - A. Are there goals and objectives for reducing service utilization? If so, how were they established?
 - B. How can the PPO tell if they are being met?
 - C. What mechanisms exist for changing/improving UR tasks?
5. During the **PPO's** existence (or, during the study period, or during the last six months ...), what have been the most important problems or issues that have been identified through UR activities?
 - A. Were they resolved? If so, how? If not, why not and what is the status now?
6. What have been the nature and number of disagreements between physicians and UR staff, or between patients and UR staff, about decisions reached by UR personnel?
7. Some consideration might be given to outlining one or more scenarios that might be likely to occur in all the **PPOs**, and asking the various respondents to describe what might happen (or happened in the case of a similar problem that actually occurred). One such hypothetical issue might be the case of a respected or popular primary-care physician who was **over-**referring patients to specialists for surgery. Another might be the case of an entire department at a member hospital whose use of special services (e.g., respiratory therapy), tests (e.g., x-rays, blood tests, or expensive diagnostic procedures), or hospital days exceeded PPO goals or guidelines.
 - A. How would the problem be identified or brought to the attention of those responsible for UR in the PPO?
 - B. Who would take the lead in investigating the problem? Who would take the lead in resolving it?
 - C. **What sort of feedback/educational/disciplinary actions would be taken?**
 - D. **How would the** PPO determine that the problem had been corrected?

8. Has the UR activity been substantially computerized?
 - A. If so, are commercial software programs being used?
Which one(s)? Were the following approaches considered:
The Appropriateness Evaluation Protocol (AEP)? MEDISGRPS
(from Medi-Qual, a division of **InterQual**)? Any in use by
Medicare Peer Review Organization (PRO)? Others?
 - B. Is concurrent and/or retrospective review done through
computerized records? Any special software used?
 - C. Is profiling done? If so, through commercial software?
What programs?
11. What does the UR activity cost? E.g., how much physician
reviewer time is voluntary, how much compensated? What does
other UR personnel cost? What are computer costs? Other
direct/indirect costs and expenditures? Is there any way to
evaluate whether UR costs are balanced by savings to the PPO?
10. Has the UR program had any adverse effects on quality of care?
Is it as capable of detecting problems of underservice as of
overservice?
11. For employers, an additional set of questions regarding
profiling and feedback of information on (aggregate)
patient/employee use might be asked.
 - A. How much information does the PPO provide on use of
services by employees?
 - B. How much information does the PPO provide on provision
of services by member hospitals and/or member physicians?
 - C. What sort of comparative data are available by which to
make some judgments as to the cost-effectiveness of the
PPO? (This is independent of what might actually be
studied in the PPO project itself.)

The following types of questions might be addressed to physician
members:

1. Did you have to sign a written agreement promising to cooperate with UR guidelines and procedures? How stringent is it?
2. How satisfied have you been with the PPO's UR program?
 - A. What have been the best/worst aspects of the program?
 - B. How good/effective is the PPO's UR in comparison with other UR activities with which you have had experience?
 - C. Have disputes been resolved to your satisfaction?
 - D. Have you received feedback information of interest and use to you in your practice? Did you think such information was fair and took any special aspects of your practice or patient population adequately into account?
3. Have you seen any significant harm to patient outcomes and quality of care that you can attribute to overaggressive UR?

The following types of questions might be addressed to employees.

1. Were you aware that your health plan/PPO had a "utilization review" activity? Do you know what it does (is supposed to do)? Are you aware of any explicit or unwritten guidelines about use of services that the PPO UR program enforces? (Give a variety of specific response choices)
2. While on the PPO plan, did you have any illness for which your physician recommended hospitalization? Were you hospitalized? If not, was the problem treated on an outpatient basis (as in, e.g., "day" or "in-and-out" or "ambulatory" surgery)? Did the UR program of the PPO, to your knowledge, play a role in whether you were hospitalized, or where your surgery was done, or how long you got to stay in the hospital?
3. If a proposed hospitalization was denied by the UR personnel of the PPO, what sort of recourse or appeal of the denial were you able to pursue? (Give some specific response choices).
4. If you have had any involvement with UR (e.g., waiting for prior authorization for admission, being assigned an "allowable" length of stay, getting help with planning for your discharge), how satisfied were you with the process?

HANDBOOK TO EVALUATE PPO EFFECT

Numerous employers are currently facing a decision about whether to add a PPO option to their health benefits package. Should they decide to proceed, they will be faced with subsequent decisions concerning whether to continue to offer the PPO, whether to offer an alternative PPO, or whether to drop PPOs altogether. Unfortunately, in many cases, estimating whether a PPO will save money or has saved money is very difficult. Whether there are net savings will depend on factors such as the degree to which employees are already using providers that are included in the PPO, whether those who switch to PPO providers are high or low users, what the effective discounts are, the impact of reduced cost sharing on rates of use of services, and others.

Many evaluations by employers and their consultants tend to look at changes in rates of growth of outlays over time. Such an approach would certainly recognize dramatic PPO impacts, but the inevitable presence of other factors affecting medical care use and prices--many external to the employer--makes it difficult to discern more modest PPO effects. In addition, the effects on outlays by employees are not known.

Other evaluations compare expenditure rates between PPO and non-PPO enrollees. This is fraught with danger, because the groups might differ in many ways other than whether or not they use the PPO. Those with higher expected use might be more or less likely to use the PPO.

The foregoing research plan is designed to get as accurate an assessment of PPO impact as possible. Obviously, the likely delay and expense make it infeasible for an employer to duplicate such a research process. Nevertheless, we expect that a simpler protocol based on results of the study in this project would be feasible for employers and provide them with better information than is available to them at present.

We propose to develop a handbook that would cover two distinct situations:

- A decision by an employer on a proposed PPO, and

- An evaluation of an employer's recent experience with a PPO.

Analysis in the first situation would be more speculative, but would indicate to employers what parameters the PPO impact is sensitive to. Through summarizing the results of analysis outlined in the research plan, employers would be in a good position to apply and/or gather information on patterns in their current health benefits plan that would help predict the impact of a PPO and ask tough questions of the PPO.

With such a handbook, analysis of initial experience with a PPO could be quite well informed, as the employer would have access to claims data for the period covered by the PPO (and possibly a prior period as well) and perhaps could survey its employees inexpensively.

The handbook would be influenced heavily by the results of the research conducted under this contract. For example, whether we find biased selection to be important or not will affect the degree of effort that we recommend employers devote to estimating what is occurring in their plan. Parameters that turn out to be uniform across the sites that we are studying would not have to be estimated again by each employer. An example might be the impact of reduced cost sharing. We might also be able to develop a crude relationship between the proportion of providers in the relevant area that participate in the PPO and the proportion of services that employees will obtain from them. This would obviate the need to undertake the complex task of predicting this from employee claims.

One part of the handbook could be a list of recommended minimum data requirements to evaluate PPOs. Employers could then require their claims administrator or insurer to routinely develop such information, so that assessing the financial impact of the PPO is made easier and faster.

At the beginning of the project, we plan to talk informally to employers and employee benefit consultants to determine what procedures they currently use to predict the effect of new PPOs and evaluate existing ones. Then we would develop alternative methods that more closely follow the research design of this study. By that point,

results of the plan selection, utilization, and cost analyses for the first PPO year should be available to incorporate. Then the handbook would be prepared.

VIII. LEGAL AND INSTITUTIONAL ENVIRONMENT FOR PPOs

In the present environment of rapidly escalating health care costs, PPOs and similar entities appear to have some potential for giving purchasers of health care more leverage in controlling their expenditures. At the same time, state legal and institutional environments appear to offer broadly varying climates for the germination and growth of such arrangements.

The legal climate varies considerably across the fifty states. A few states have enacted legislation specifically authorizing the establishment of PPOs. Many others, however, have laws and regulations in place that prohibit the development of such organizations. In some cases, these laws and regulations have been adopted specifically to impede the creation of such programs. In other instances, they are simply rules that were adopted to solve an earlier problem.

In addition to variations in the legal climate, states appear to vary considerably in their receptivity to PPOs and similar arrangements. In some, the institutional climate appears to be supportive of change. Insurers, medical societies, business coalitions, consumers, state officials, and state legislators favor the adoption of such innovative procedures. In other states, the opposite attitude may prevail, with chilling effects on the development of new purchasing and servicing arrangements.

The purpose of this component of the study is to understand and describe those characteristics that combine to create a hospitable environment for the successful development of PPOs and similar arrangements and those that combine to thwart their successful growth. To accomplish this purpose, we will undertake three distinct study tasks. First, we will conduct a review of the laws and regulations in the fifty states. Second, we will conduct a set of case studies in a subset of the fifty states to: (1) explore the effects of the legal and institutional environment on the development of PPOs and similar arrangements, and (2) explore what effects such arrangements may have upon timely access to quality care and the delivery of services and

determine how programs may have induced provider participation. Third, we will undertake a review of the literature to gather additional information on the above issues as well as to gather any reported information on the cost-effectiveness of PPOs and similar arrangements.

STATUTORY AND REGULATORY ANALYSIS

The research for this task will be conducted under subcontract by Peter Rich of the law firm of Memel, Jacobs, Pierno, Gersh and Ellsworth. The study will proceed in two parts.

Identification of Applicable Law

The initial objective will be to identify existing state statutes, regulations, and interpretive court decisions, as well as pending bills and draft regulations (to the extent that such bills and regulations are reasonably available and appear likely to be enacted at the time of their research), that (i) authorize, permit, or facilitate, or that may prevent, limit, or otherwise restrict, the formation, development, or operation of PPOs or similar arrangements, or (ii) are designed to assure that consumers can rely on PPOs or similar arrangements to provide timely access to needed health care services of high quality, or otherwise to protect the public interest in the operation of such programs or arrangements. The legal review will examine laws and regulations that cover services provided by hospitals, physicians, skilled nursing facilities, dentists, podiatrists, optometrists, psychologists, pharmacists, and laboratories.

The foregoing research will necessitate a comprehensive examination of each of the potentially applicable areas of law in the fifty states and the District of Columbia. At a minimum, the following legal areas will be considered:

(1) Statutes and regulations *authorizing and/or regulating* PPOs, exclusive provider organizations (EPOs), and other selective contracting health care arrangements.

(2) Statutes and regulations *expressly prohibiting or effectively precluding* such arrangements (e.g., (i) "freedom of choice" or "antidiscrimination" provisions under state insurance, hospital service association, or health care service plan laws; (ii) government

code or other statutes and regulations applicable to public hospitals which are under a scheme of regulation distinct from that applicable to private hospitals; (iii) ratesetting laws such as those in Massachusetts and Washington; (iv) the New Jersey "all-payer" system; and (v) indirect restrictions (such as those under the National Association of Insurance Commissions' (NAIC) model statute regulating multiemployer trusts).

(3) Prohibitions against the *corporate practice of medicine and fee-splitting* that may inhibit PPO development

(4) Prohibitions against providing direct or indirect consideration to *induce patient referrals*. Such "antireferral" laws may inhibit PPO development if they are interpreted to apply to discounts or other concessions typically granted by PPOs in order to obtain selective contracts.

(5) Unusually restrictive state *franchise laws* that may inhibit PPO development by requiring burdensome and expensive compliance, particularly by PPO networks.

(6) Similarly unusual state *securities laws* that may inhibit PPO development.

(7) Similarly unusual state *antitrust laws* that may inhibit PPO development. (However, the subcontractor will not perform a comprehensive analysis of the antitrust laws of each state. These are usually similar to the federal antitrust laws in substance, interpretation, and enforcement, and as such are beyond the scope of this study.)

(8) Certain other state statutes and regulations that may significantly affect the important *component elements* of PPOs and similar arrangements. These may include *insurance fraud* provisions that have been interpreted to apply to consumer discount arrangements not subject to prior approval by and/or not granted on an equal basis to the insurer (e.g., waivers or reductions of deductibles and coinsurance by hospitals and physicians, which could be interpreted as a "similar arrangement." They might also include the failure to extend the *privileges and immunities typically accorded peer review activities by health care entities and insurers* to independent utilization reviewers who may provide such services in connection with a PPO arrangement, including privileges and immunities protecting against (i) discovery of

medical records and other peer review information in litigation, and (ii) defamation actions against peer review committee members.

(9) Unusually restrictive *certificate of need laws* that apply to relatively small capital expenditures by, for, or on behalf of health care facilities, and thus may inhibit the development of provider-based PPOs.

(10) *Professional practice acts* which limit the ability of physicians and other health professionals to enter into contracts with PPOs.

The subcontractor will begin the project by identifying relevant information currently in his files or otherwise known within his firm and by determining whether preferred provider consultants with whom he has worked, or trade associations such as the American Hospital Association and the American Association of Preferred Provider Organizations, may have access to additional useful information. These preliminary data will be analyzed and reduced to matrix form to guide further research.

Based upon this first step, the subcontractor will compile existing statutes and regulations available in the firm's files, its extensive library, and local law libraries. To confirm the applicability of statutes and regulations already compiled and to investigate other provisions that may authorize, regulate, or otherwise affect PPOs, the firm will contact by telephone representatives of key state agencies, hospital associations, and medical societies. Groups and agencies to be contacted include the departments of insurance and health, health planning agencies, boards of medical examiners, health care service plan and other state HMO regulatory agencies (which may include the department of corporations), and the division of the state attorney general's office responsible for the health industry.

Statutory and Regulatory Analysis

The subcontractor will analyze the statutory and regulatory information in terms of its legal implications as such material becomes available. The analysis will be conducted along two dimensions. A summary of statutory and regulatory provisions affecting PPOs and similar arrangements will be compiled for each state. The subcontractor

will also explore how successfully or unsuccessfully certain legal concepts or techniques have been used to either encourage or inhibit the development of PPOs and similar arrangements. In exploring the generic categories of provisions, the subcontractor will focus more attention on those few states that appear to have a comparatively intense legal and regulatory environment governing the development of PPOs.

INSTITUTIONAL ANALYSIS

This part of the study will identify additional factors that foster or inhibit the development of PPOs and similar arrangements and the factors' relative importance. To that end, we will conduct case studies of several states, exploring the effects that statutes, regulations, local organizational arrangements, constituency opinions (including attitudes of business, the medical community, and consumers), and key policymakers may have on the development of PPOs and similar arrangements.

Selection of Target States

Based on the information obtained in the legal review of the fifty states, we will select about six states in which to do case studies. The six states will be chosen to reflect the range of environments that seem to exist for the development of PPOs and similar arrangements. We will submit an interim report to the project officer describing our selection criteria.

Conduct of the Case Studies

In each of the case study states, we will interview representatives of the major health care constituencies. These include representatives of the provider organizations, the payer organizations, including self-insured businesses, and consumers or beneficiaries. We will also interview leaders in the policymaking arena, including legislators and their staff and state health officials.

Our purpose is threefold: First, we want to elicit information from these knowledgeable respondents that explains the purpose behind and the perceived effects of the state's statutory and regulatory provisions. Second, we intend to identify other factors that may

contribute to creating a hospitable or hostile environment for the growth of PPOs or similar arrangements. Third, we will explore the implementation questions raised in the Resolution Approved by the Committee on Energy and Commerce on August 1, 1984, including the effect that PPOs may be having on timely access to quality care, the organization and location of delivery systems, and techniques used to induce provider participation.

Our interviews will be somewhat structured but will build upon new information as we get it. On the basis of our initial literature review, we will develop certain "lines of questioning" or themes that should be explored for each category of respondent. As the interviewing progresses and we gain insights into the processes at work, these areas will be explored in greater depth. Interviewers will use written guides to direct but not limit their questioning. The respondent will be encouraged to answer in a full, open-ended fashion.

LITERATURE REVIEW

We will conduct a complete review of the literature for information on the the cost-effectiveness of PPOs and similar arrangements, for information on implementation concerns, and for information on attitudes toward the use and usefulness of PPOs. We will complete this literature review before we undertake the institutional analysis. However, it is worth noting that a preliminary search on this topic suggests that very few informative studies have been conducted or are even under way at this time. Therefore, we will expect to present an annotated summary of the literature either in an appendix of the institutional analysis report or as an independent document, depending upon the extent of the information to be reported.

Appendix A

SAMPLE SIZES FOR EMPLOYEE SURVEY

SAMPLE SIZES FOR PLAN USE EQUATIONS (YEAR 0)

For all calculations, assume that the analyses will use two-sided significance level .05, and we seek to have 80 percent power. Suppose that, in the continuing employee sample, about 50 percent of the subjects are PPO users. Assume that the crucial analysis is to compare the PPO rate in terms of a dichotomous predictor variable, say, X. For simplicity we assume that half of the sample have $X=0$ and half have $X=1$. (For example, X might be an indicator for high general health vs. low general health; $X=1$ if it is higher than the median, $X=0$ if it is lower.)

Let the PPO rate in the high ($X=1$) group be 50 percent + a, and the PPO rate in the low group be 50 percent - a. The sample size required to detect a at 80 percent power is given by:

$$n = 1.96 / (a^*)$$

We have tabulated this formula as follows:

a	50%-a	50% +a	n
1	49	51	19,600
2	48	52	4,900
3	47	53	2,178
4	46	54	1,225
5	45	55	784
6.26	43.74	56.26	500
7.5	42.5	57.5	348
10	40	60	196

For example, if we believe a difference $a=5\%$ is plausible, i.e., the PPO rates for the high and low groups are likely to be 45 percent and 55

percent, we need 784 observations--about 392 PPO users and 392 non-PPO users from this sample.

The power calculation given here assumes that we would dichotomize continuous predictor variables. If we knew the correct specification, using continuous variables would yield a more powerful analysis. Therefore, the power calculation is somewhat conservative. However, because we would not know the correct specification, we consider the dichotomized analysis to be a more robust alternative to the usual analysis using the continuous predictor variable.

Increase in the Sample Size for HMO Users

Suppose we have decided to sample 500 non-HMO subjects. Assuming that this sample yields 50 percent PPO users, it would allow us to detect a difference of 44 percent versus 56 percent in the PPO use rate for a dichotomous independent variable. We will sample a specific number of HMO users so that we will be able to detect a comparable difference in the HMO choice probability for a dichotomous independent variable.

Let the sample size for the HMO population be m . The total sample size is then $500 + m$. The HMO choice rate is then $m/(500+m)$. Consider a dichotomous independent variable X for which there is equal prevalence for X to be 0 or 1. Let b be the effect that can be detected with 80 percent power, i.e., with the sample size $500 + m$, we can detect a difference between $m/(500+m) - b$ and $m/(500+m) + b$. Based on normal approximation, b is given as follows:

$$b = 62.61 \cdot \sqrt{m} / \sqrt{(500+m)^3}.$$

The following is a tabulation of the detectable effect as a function of the HMO sample size.

m	b	logit		
		m/(500+m)-b	m/(500+m)+b	difference
50	3.4%	5.7%	12.5%	0.87
100	4.3	12.4	20.9	0.62
150	4.6	18.5	27.7	0.53
160	4.7	19.6	28.9	0.51
170	4.7	20.7	30.1	0.50
180	4.7	21.8	35.9	0.48
200	4.8	23.8	33.4	0.47

The column "logit difference" is the difference between the two probabilities on the logit scale. For example, if we use a HMO sample size of 50, we can detect a difference between 5.7 percent and 12.5 percent. The logits for these probabilities are $\text{Logit}(5.7\%) = \log(.057/.943) = -2.81$, $\text{Logit}(12.5\%) = \log(.125/.875) = -1.94$; therefore the two probabilities are different by:

$$\text{logit}(12.5\%) - \text{logit}(5.7\%) = (-1.94) - (-2.81) = 0.87.$$

The percentage scale is not appropriate for comparing probabilities in most situations. For example, consider a difference of one percent. If the difference occurs near 50 percent, e.g., if we are comparing 50 percent and 51 percent, the difference is regarded as fairly small in most situations. However, if we are comparing 0.5 percent and 1.5 percent (or comparing 98.5 percent and 99.5 percent), the one percent difference may be regarded as major. The percentage scale fails to represent the fact that such a one percent difference has very different meanings when it occurs in different parts of the range between 0 and 1. Logit is a convenient scale on which to compare probabilities. With larger sample sizes, the detectable effect (on the logit scale) becomes smaller, that is, we can detect smaller effects. As we mentioned earlier, the sample size of 500 for the non-HMO subjects allows us to

detect a difference of 44 percent vs. 56 percent. The difference is 0.50 on the **logit** scale. Therefore, we should sample 170 HMO subjects so that we will detect comparable effects for the HMO vs. non-HMO choice and the PPO vs. non-PPO choice.

SAMPLE SIZES FOR SWITCHING EQUATIONS (YEARS 1 AND 2)

In year 1, some of the HMO participants in year 0 might switch to one of the indemnity plans, either the PPO plan or the regular FFS plan. As was discussed earlier, we assume that 25 percent of our sample was in the HMO plan in year 0, and 75 percent were in the indemnity plan. We assume that the probability to switch either way is between 10 to 20 percent. As before, we will consider the power to detect the association between the switching and a dichotomous explanatory variable such as health. For simplicity we continue to assume that the explanatory variable assumes its two values with equal frequencies, for example, half of the people in each analysis are healthy, and half are unhealthy. We continue to assume that we use 5 percent two-side significance tests, and desire 80 percent power. We use N to denote the total number of subjects in year 0.

Case 1: Switch from HMO to indemnity, $p=10\%$. The detection limit is given by:

$$a = \text{sqrt}(0.71/(N \cdot .25)).$$

In other words, given a total sample of N , we have $N \cdot .25$ people in HMO in year 0 eligible for this switch equation, and we have 80 percent power to detect an effect of magnitude a , i.e., if the effect of the explanatory variable is such that for healthy people the switching probability is $10\%-a$ and the switching probability for the unhealthy people is $10\%+a$, we can detect the effect.

N	a	10%-a	10%+a
1000	5.3%	4.7%	15.3%
2000	3.8	6.2	13.8
3000	3.1	6.9	13.1

Note that it takes a fairly strong effect and a fairly large sample size to be detected.

Case 2: *Switch from regular FFS to PPO in year 1, p=30%. We assume that 75 percent of our sample came from indemnity plans in year 0, with about half using PPO providers. The detection limit is given by:*

$$a = \text{sqrt}(1.65/(N \cdot .375)).$$

N	a	30%-a	30%+a
1000	6.6%	23.4%	36.6%
2000	4.7	25.3	34.7
3000	3.8	26.2	33.8

Case 3: *Choose PPO over regular FFS for people (10%) switching out of HMO, p=90%. We have 25 percent of the sample in HMO in year 0; assume that 10 percent of them switch to indemnity plans in year 1. Assume that 90 percent of them choose PPO instead of regular FFS. Again we like to detect the association between this choice and some dichotomous explanatory variable such as health. Since only about 2.5 percent of our sample are expected to switch out of HMO and therefore be eligible for this choice equation, we don't expect very much power here. (With N=2000, we have 50 people as the denominator for this equation.) The detection limit is given by:*

$$a = \text{sqrt}(0.71/N \cdot 0.025).$$

N	a	90%-a	90%+a
1000	16.9%	73.1%	106.9%
2000	11.9	78.1	101.9
3000	9.7	80.3	99.7

The normal approximation used in our calculation is out of range for this case.

SAMPLE SIZES FOR UTILIZATION EQUATION

A crucial utilization equation is the difference equation (year 0 to year 1 or year 2) for the continuing non-PPO users. We use the parameters from the 25 percent coinsurance plan in the Health Insurance Study (HIS) to estimate the detection limits (Newhouse et al., 1981).

For total medical expenses, the HIS 25 percent plan participants averaged \$346 a year with standard deviation \$1260. (The expenses are a mixture of six sites and five years and are unadjusted for site and year difference in the cost of living.) For ambulatory expenses, the same participants averaged \$149 with standard deviation \$214. Assuming independence and homoscedasticity from year to year, the standard deviation for the difference between two years is \$1764 for total medical expense and \$302 for ambulatory expense.

The sample size n for the utilization difference equation is expected to be the following:

$$n = N \cdot 0.75 \cdot 0.5 \cdot (0.6 \text{ or } 0.7)$$

where: N = total sample size in year 0,

0.75 = fraction of total sample in indemnity plan in year 0,

0.5 = fraction of indemnity plan sample using FFS providers
in year 0,

0.6 or 0.7 = fraction of stayers in the FFS group.

Consider the association between the difference of interest and a dichotomous explanatory variable such as health. We would like to know the detection limit at which we have 80 percent power to detect the association at 5 percent significance level. The detection limit delta is given as follows:

$$\text{delta} = \text{sqrt}(31.36 \cdot (s^2) / 2n)$$

where s is the standard deviation in the equation of interests and $2n$ is the number of person years.

For total medical expense, the detection limits are given as follows (1: Assuming 70 percent staying rate, 2: Assuming 60 percent staying rate):

N	delta (1)	delta (2)
1000	\$431	\$466
2000	305	329
3000	249	269

For ambulatory expense, the detection limits are given as follows (1: Assuming 70 percent staying rate; 2: Assuming 60 percent staying rate):

N	delta (1)	delta (2)
1000	\$74	2.69 \$80
2000	52	1.90 56
3000	43	46

Appendix B

SURVEY OF EMPLOYEE HEALTH BENEFITS

The Rand Corporation

INSTRUCTIONS

1. Please try to answer every question (unless you are asked to skip questions because they don't apply to you).
2. Answer questions by circling the appropriate number or filling in the answer as required.
3. If you're not sure of the answer, please try to give us your best estimate.
4. If you have any questions, feel free to call Susan Hosek collect at (213) 393-0411, extension 7141, Monday through Friday after 9 A.M.
5. Please return the completed survey in the postpaid envelope as soon as possible to :

The Rand Corporation
Coding Room 1394
1700 Main Street
Santa Monica, CA 90406

ASSURANCE OF CONFIDENTIALITY

Participation in this survey is voluntary. Your completing the questionnaire will help our research project on employee health plans.

The information you are being asked to provide in this survey will be combined with information from any health care claims submitted by or for you to Pacific Mutual in 1983 through 1986. By completing this questionnaire, you will be giving Rand permission to combine information from the survey and your claims records.

All information which would permit identification of respondents will be regarded as strictly confidential, will be used only for the purposes of the study, and will not be disclosed to your employer or disclosed or released for any other purposes without your prior consent, except as required by law.

INSURANCE COVERAGE

1. In 1985, which type of health insurance plan were you yourself enrolled in through Caltech or JPL?

(Circle One)

- Pacific Mutual Base Plan..... 1
- Pacific Mutual Economy 500 Plan..... 2
- Kaiser..... 3
- Ross-Loos (CIGNA)..... 4
- Health Net..... 5
- Don't Know..... 8
- None..... 9

2A. In addition to the health insurance plan(s) you are enrolled in at work, were you covered by some *other* health insurance in 1985?

(Circle One)

- Yes**..... 1
- No.. .(Skip to Q.2C).... 2

2B. Was this insurance through your spouse's employer, or some other source?

(Circle One)

- Spouse's employer..... 1
- Other (SPECIFY): _____ 2
- _____

2C. In addition to the health insurance plan(s) you were enrolled in at work, were you covered by some other health insurance DURING ANY PART OF 1984, even for a short period of time?

(Circle One)

- Yes**..... 1
- No.. .(Skip to Q.3)..... 2

2D. Was this insurance through your spouse's employer, or some other source?

(Circle One)

Spouse's employer..... 1

Other (SPECIFY): _____ 2

UTILIZATION OF HEALTH CARE SERVICES

3. For each item below, indicate whether it is a service you yourself used during 1985.

(Circle one number on each line)

	<u>NO, service not used</u>	<u>YES, service was used</u>
a. Visit to an emergency room.....	1	2
b. An overnight hospital stay for a physical health problem.....	1	2
c. An overnight hospital stay for an emotional or personal problem.....	1	2
d. An overnight hospital stay for maternity care..	1	2
e. Visit to physician's office or clinic for a physical problem.....	1	2
f. Visit to your usual medical doctor or clinic for an emotional or personal problem.....	1	2
g. Visit to a mental health professional (psychiatrist, psychologist, etc.).....	1	2
h. Visit to physician's office or clinic for prenatal care.....	1	2
i. Preventive care services (routine physical exam, immunization, etc.).....	1	2
j. Visit to another health care provider for an illness SPECIFY PROVIDER TYPE: _____	1	2

REGULAR SOURCE OF MEDICAL CARE

Questions 4A, 5, and 6 ask about situations you may or may not have experienced. Please answer the questions to the best of your ability.

4A. Which doctor, hospital, or clinic would you have gone to in 1985 if you had had a problem like a high fever that won't go away?

Name of doctor,
hospital, or clinic: _____ SKIP TO Q.4C
LAST FIRST
OR

CHECK HERE if you don't know his/her name: SKIP TO Q.4C

CHECK HERE if you didn't have a doctor, etc.

4B. If you had this kind of problem, how would you choose a doctor, hospital, or clinic?

(Circle All That Apply)

- Ask my family, friends...(Skip to Q.5A)..... 1
- Look in the telephone book...(Skip to Q.5A).... 2
- Look in the CaPP Care directory
. ..(Skip to Q.5A)..... 3
- Other (SPECIFY): _____
...Skip to Q.5A)..... 4

4c. Was this doctor (or hospital or clinic) a member of the CaPP Care?

(Circle One)

- Yes..... 1
- No..... 2
- Don't Know..... 8

4D. How long had he/she been your regular medical care source?

(Circle One)

- Less than 1 year..... 1
- Less than 2 years..... 2
- 2-5 years.. .(Skip to Q.5A)..... 3
- 6-10 years... (Skip to Q.5A).... 4
- More than 10 years...
(Skip to Q.5A)..... 5

4E. If, DURING 1983 or 1984, you would have used a *different* source of medical care for problems like high fever that won't go away, please identify him/her below:

Name of doctor, hospital, or clinic: _____
LAST FIRST

OR

CHECK HERE if you don't know:
I-I

4F. Was this doctor (or hospital or clinic) a member of the CaPP Care?

(Circle One)

- Yes..... 1
- No..... 2
- Don't Know..... 8

5A. Which doctor or other mental health professional (for example, psychologist) would you have gone to in 1985 if you had had an emotional or personal problem?

Practitioner's name: _____ SKIP to Q.5C
LAST FIRST

OR

CHECK HERE if you don't know his/her name: SKIP TO Q.5C

CHECK HERE if you didn't have a practitioner: (/_)

5B. If you had this kind of problem, how would you find a doctor or other mental health practitioner?

(Circle All That Apply)

- Ask my physical health doctor...(Skip to Q.6).. 1
- Ask my family, friends...(Skip to Q.6)..... 2
- Look in the telephone book...(Skip to Q.6)..... 3
- Look in the CaPP Care directory...
(Skip to Q.6)..... 4
- Other (SPECIFY): _____
... (Skip to Q.6)..... 5

HEALTH STATUS

7. Please indicate if each of the following statements is true or false for you. Is each statement definitely true, mostly true, mostly false, or or definitely false for you?

(Circle One Number on Each Line)

	<u>Definitely true</u>	<u>Mostly true</u>	<u>Mostly false</u>	<u>Definitely false</u>
a. I am somewhat ill.....	1	2	3	4
b. I am as healthy as anyone I know.....	1	2	3	4
c. I have been feeling bad lately.....	1	2	3	4
d. My health is excellent.....	1	2	3	4

8. Does your health limit the kinds or amounts of vigorous activities you can do, such as running, lifting heavy objects, or participating in strenuous sports?

(Circle One)

Yes, limits..... 1

No, does not limit..... 2

9. Are you unable to do certain kinds or amounts of work or housework because of your health?

(Circle One)

Yes, unable..... 1

No, not unable..... 2

10. The next few questions are about how you feel and how things have been with you mostly *within the past month*. (READ EACH QUESTION.) Would you say you have felt that way all of the time, most of the time, a good bit of the time, some of the time, a little bit of the time, or none of the time during the *last month*?

(Circle One Number on Each Line)

	<u>All of the Time</u>	<u>Most of the Time</u>	A Good Bit of the Time	<u>Some of the Time</u>	A Little Bit of the Time	<u>None of the Time</u>
a. During the last month, have you been a very nervous person?....	1	2	3	4	5	6
b. During the last month, have you felt calm and peaceful?.....	1	2		4	5	6
c. During the last month, have you felt downhearted and blue?.....	1	2		4	5	6
d. During the last month, were you a happy person?....	1	2		4	5	6
e. During the last month, have you felt so down in the dumps that nothing could cheer you up?.....	1	2	3	4	5	6

11. How many days in total did you spend in bed due to illness in 1985?

Number of days:

12. Is your health better, the same, or worse than it was BEFORE 1985?

(Circle One)

- Much better 1
- Somewhat better 2
- Same 3
- Somewhat worse 4
- Much worse 5

13. Do you currently have any of the following health conditions, or did you have any of these problems during 1985?

(Circle One Number on Each Line)

YES NO

- | | | |
|---|---|---|
| a. high blood pressure..... | 1 | 2 |
| b. severe allergies..... | 1 | 2 |
| c. cancer..... | 1 | 2 |
| d. heart trouble..... | 1 | 2 |
| e. diabetes..... | 1 | 2 |
| f. asthma..... | 1 | 2 |
| g. epilepsy..... | 1 | 2 |
| h. emotional or mental
problems..... | 1 | 2 |
| i. other chronic conditions.. | 1 | 2 |

FAMILIARITY WITH CALTECH-JPL HEALTH PLAN CHARACTERISTICS

14. In January 1984, Caltech and JPL offered a new health care option called CaPP Care to employees enrolled in a Pacific Mutual Plan. Listed below are six characteristics of health plans. For each characteristic, indicate how you think using CaPP Care doctors compares with two other options offered by Caltech/JPL.

Check one of the two boxes in column A according to how you think using the Pacific Mutual Base Plan and choosing CaPP Care doctors compares with using Pacific Mutual and choosing other doctors.

ALSO, check one of the two boxes in column B according to how you think using CaPP Care doctors compares with using doctors in the Kaiser Plan offered by Pacific Mutual as an alternative to the Pacific Mutual Plans.

WE ARE EQUALLY INTERESTED IN THE IMPRESSIONS OF PEOPLE IN ALL HEALTH PLANS ABOUT CaPP Care.

(Circle One Number on Each Line in Both Columns)

	A. Compare using CaPP Care doctors with using other doctors.			B. Compare using CaPP Care doctors with using Kaiser doctors.		
	CaPP Care More Than non-PPO	CaPP Care Less Than non-PPO	Same	CaPP Care More Than Kaiser	CaPP Care Less Than Kaiser	Same
a. The number of doctors you can choose from.....	1	2	3	1	2	3
b. The number of hospitals you can choose from....	1	2	3	1	2	3
c. The number of days before you can see a doctors when you are sick.....	1	2	3	1	2	3
d. The number of days before you can get an appointment for a check-up.....	1	2	3	1	2	3
e. The amount YOU would pay for a visit if you had an illness like a sore throat.....	1	2	3	1	2	3
f. The amount YOU would pay if you were hospitalized for an operation like having your appendix out.....	1	2	3	1	7	

SATISFACTION WITH CARE

15. Think about the health care you receive under the health plan you are enrolled in currently at Hewlett-Packard. Circle one number for each item below to indicate how satisfied you are with that aspect of your health care and the benefits you receive under this plan.

(Circle One Number on Each Line)

	<u>Very Satisfied</u>	<u>Somewhat Satisfied</u>	<u>Neutral</u>	<u>Somewhat Dissatisfied</u>	<u>Very Dissatisfied</u>
a. Access to care (everything involved in arranging to get care and getting to the place where care is delivered).....	1	2	3		
b. Financial matters (the costs to you of enrolling in your plan and the costs of care under the plan).....	1	2	3		
c. The technical skills of your doctors and other health care providers.....	1	2	3		
d. The interpersonal manner of your doctors and other health care providers.....	1	2	3		
e. All things considered, how satisfied are you with your current health care.....	1	2	3		

BACKGROUND INFORMATION

16. What is your age?

Number of years

17. What was your total family income before taxes in 1985? Please add in income from all family members who are dependent on you, including students and others who do not live at home, and unearned income from investments and other sources.

(Circle One)

- \$9,999 or less..... 1
- \$10,000-19,999..... 2
- \$20,000-29,999..... 3
- \$30,000-39,999..... 4
- \$40,000-49,999..... 5
- \$50,000-74,999..... 6
- \$75,000 or more..... 7

18. What is the highest grade in school that you completed?

(Circle One)

- No high school diploma/equivalency..... 1
- High school diploma/equivalency..... 2
- Some college, but no bachelor's degree... 3
- Bachelor's (B.A.,B.S.)..... 4
- Some graduate school..... 5
- Post-graduate degree..... 6

19. What is the zip code of your home address?

Zip code

20. How long have you lived in the Greater Los Angeles area?

Number of years

OR

Less than 1 year 00

21. What is your marital status?

(Circle One)

- Married... (Complete Part II) 1
- Separated... (Complete Part II) 2
- Widowed... (Skip to Part III) 3
- Divorced... (Skip to Part III) 4
- Never married... (Skip to Part III) 5

**PART II
SPOUSE QUESTIONNAIRE**

EMPLOYMENT AND INSURANCE COVERAGE

1. Was your spouse employed in 1985?

(Circle One)

- Yes, 35 or more hours per week..... 1
- Yes, 20-34 hours per week..... 2
- Yes, less than 20 hours per week..... 3
- No... (Skip to Q.4A)..... 4

2. Considering all the jobs he/she has held, how many years has your spouse worked?

Total number of years of full-time employment.....	<input type="text"/> <input type="text"/>
Total number of years of part-time employment.....	<input type="text"/> <input type="text"/>

3A. Was your spouse *eligible for* health insurance benefits through his/her employer any time in 1985?

(Circle One)

- Yes 1
- No... (Skip to Q.4A) 2
- Don't know 8

3B. What type(s) of health insurance plan(s) was your spouse *eligible for* through her/his employer?

(Circle As Many As Apply)

- A Health Maintenance Organization (HMO) like Kaiser..... 1
- A traditional insurance plan (like the Pacific Mutual Base Plan)..... 2
- Other (SPECIFY_____) 3
- _____
- None... (Skip to Q.4A)..... 4

3C. In 1985, which type of health insurance plan offered by his/her employer was your spouse *enrolled in*?

(Circle As Many As Apply)

- A Health Maintenance Organization (HMO)
(like Kaiser)..... 1
- A traditional insurance plan (like
the Pacific Mutual Base Plan)..... 2
- Other (SPECIFY): _____ 3

- None..... 4

4A. In addition to any health insurance plan(s) your spouse might have been enrolled in at work, was he/she covered by some *other* health insurance in 1985?

(Circle One)

- Yes, through my plan at
Caltech/JPL..... 1
- Yes, through another plan..... 2
(SPECIFY): _____
- No..... 2
- Don't know..... 8

4B. In addition to the health insurance plan(s) your spouse might have been enrolled in at work, was he/she covered by some other health insurance in 1984?

(Circle One)

- Yes, through my plan at
Caltech/JPL..... 1
- Yes, through another plan..... 2
(SPECIFY): _____
- No..... 2
- Don't know,..... 8

UTILIZATION OF HEALTH CARE SERVICES

5. For each item below, indicate whether it is a service your spouse used in 1985.

(Circle one number on each line)

	<u>NO, service not used</u>	<u>YES, service was used</u>
a. Visit to an emergency room.....	1	2
b. An overnight hospital stay for a physical health problem.....	1	2
c. An overnight hospital stay for an emotional or personal problem.....	1	2
d. An overnight hospital stay for maternity care..	1	2
e. Visit to physician's office or clinic for a physical problem.....	1	2
f. Visit to your usual medical doctor or clinic for an emotional or personal problem.....	1	2
g. Visit to a mental health professional (psychiatrist, psychologist, etc.).....	1	2
h. Visit to physician's office or clinic for prenatal care.....	1	2
i. Preventive care services (routine physical exam, immunization, etc.).....	1	2
j. Visit to another health care provider for an illness SPECIFY PROVIDER TYPE: _____	1	2

REGULAR SOURCE OF MEDICAL CARE

6A. Which doctor, hospital, or clinic would your spouse have gone to in 1985 if he/she had had a problem like a high fever that won't go away?

Name of doctor,
hospital, or clinic: _____ *SKIP TO Q.6C*
LAST FIRST

OR

CHECK HERE if you don't know his/her name: *SKIP TO Q.6C*

CHECK HERE if he/she didn't have a doctor, etc.

6B. If your spouse had this kind of problem, how would he/she choose a doctor, hospital or clinic?

(Circle All That Apply)

- Ask family, friends...(Skip to Q.7A)..... 1
- Look in the telephone book...(Skip to Q.7A).... 2
- Look in the CaPP Care directory...
(Skip to Q.7A)..... 3
- Other (SPECIFY): _____
... (Skip to Q.7A)..... 4

6C. Was this doctor (or hospital or clinic) a member of CaPP Care?

(Circle One)

- Yes..... 1
- No..... 2
- Don't Know..... 8

6D. How long had he/she been your regular medical care source?

(Circle One)

- Less than 1 year..... 1
- Less than 2 years..... 2
- 2-5 years... (Skip to Q.7A)..... 3
- 6-10 years... (Skip to Q.7A).... 4
- More than 10 years...

6E. If, DURING 1983 or 1984, your spouse would have used a *different* source of medical care for problems like high fever that won't go away, please identify him/her below:

Name of doctor, hospital, or clinic: _____
LAST FIRST

OR

CHECK HERE if you don't know:

6F. Was this doctor (or hospital or clinic) a member of CaPP Care?

(Circle One)

- Yes..... 1
- No..... 2
- Don't Know..... 8

7A. Which doctor or other mental health professional (for example, psychologist) would your spouse have gone to in 1985 if he/she had had an emotional or personal problem?

Practitioner's name: _____ SKIP TO Q.7C
LAST FIRST

OR

CHECK HERE if you don't know his/her name: SKIP TO Q.7C

CHECK HERE if he/she didn't have a practitioner:

7B. If your spouse had this kind of problem, how would you find a doctor or other mental health practitioner?

(Circle All That Apply)

- Ask his/her physical health doctor
..(Skip to Q.8)..... 1
- Ask family, friends...(Skip to Q.8)..... 2
- Look in the telephone book...(Skip to Q.8)..... 3
- Look in the CaPP Care directory...
(Skip to Q.8)..... 4
- Other (SPECIFY): _____
..(Skip to Q.8)..... 5

7C. Was this practitioner a member of CaPP Care?

(Circle One)

- Yes 1
- No 2
- Don't Know 8

7D. How long had he/she been your spouse's source of care for emotional or personal problems?

(Circle One)

- Less than 1 year..... 1
- Less than 2 years..... 2
- 2-5 years...(Skip to Q.8)..... 3
- 6-10 years.. .(Skip to Q.8)..... 4
- More than 10 years...
(Skip to Q.8)..... 5

7E. If, DURING 1983 or 1984, you spouse would have seen a *different* doctor or other mental health professional for an emotional or personal problem, please identify him/her below:

Practitioner's name: _____
LAST FIRST

OR

CHECK HERE if you don't know:

7F. Was this practitioner a member of CaPP Care?

(Circle One)

- Yes..... 1
- No 2
- Don't Know 8

HEALTH STATUS

8. Please indicate if each of the following statements is true or false about your spouse -- is each statement definitely true, mostly true, mostly false, or definitely false for him/her?

(Circle One Number on Each Line)

	Definitely true	Mostly true	Mostly false	Definitely false
a. He/she is somewhat ill.....	1	2	3	4
b. He/she is as healthy as anyone I know.....	1	2	3	4
c. He/she has been feeling bad lately.....	1	2	3	4
d. His/her health is excellent.....	1	2	3	4

9. Does your spouse's health limit the kinds or amounts of vigorous activities he/she can do, such as running, lifting heavy objects, or participating in strenuous sports?

(Circle One)

- Yes, limits..... 1
- No, does not limit..... 2

10. Is your spouse unable to do certain kinds or amounts of work, housework, or school work because of his/her health?

(Circle One)

- Yes, unable..... 1
- No, not unable..... 2

11. The next few questions are about how your spouse feels and how things have been with him/her mostly *within the past month*.
 (READ EACH QUESTION) -- Would you say he/she has felt that way all of the time, most of the time, a good bit of the time, some of the time, a little bit of the time, or none of the time during the *last month*?

(Circle One Number on Each Line)

	<u>All of the Time</u>	<u>Most of the Time</u>	A Good Bit of the Time	Some of the Time	A Little Bit of the Time	<u>None of the Time</u>
a. During the last month, has he/she been a very nervous person?.....	1	2				6
b. During the last month, has he/she felt calm and peaceful?.....	1	2				6
c. During the last month, has he/she felt downhearted and blue?.....	1	2	3	4	5	6
d. During the last month, was he/she a happy person?.....	1	2	3	4	5	6
e. During the last month, has he/she felt so down in the dumps that nothing could cheer him/her up?.....	1	2		4	5	6

12. How many days in total did your spouse spend in bed due to illness in 1985?

- - -

Number of days: 1-1-1-1

13. Is your spouse's health better, the same, or worse than it was BEFORE 1985?

(Circle One)

- Much better 1
Somewhat better 2
Same 3
Somewhat worse 4
Much worse 5

14. Does your spouse currently have any of the following health conditions, or did he/she have any of these problems during 1985?

(Circle All That Apply)

- | | YES | NO |
|---------------------------------------|-----|----|
| a. high blood pressure | 1 | 2 |
| b. severe allergies | 1 | 2 |
| c. cancer | 1 | 2 |
| d. heart trouble | 1 | 2 |
| e. diabetes | 1 | 2 |
| f. asthma | 1 | 2 |
| g. epilepsy | 1 | 2 |
| h. emotional or mental problems | 1 | 2 |
| i. other chronic conditions... | 1 | 2 |

OTHER

15. What is your spouse's age?

Number of years

16. What is the highest grade in school that your spouse completed?

(Circle One)

- No high school diploma/equivalency..... 1
- High school diploma/equivalency..... 2
- Some college, but no bachelor's degree... 3
- Bachelor's (B.A.,B.S.)..... 4
- Some graduate school..... 5
- Post-graduate degree..... 6

17. How long has your spouse lived in the Greater Los Angeles area?

Number of years

OR

Less than 1 year..... 00

**PART III
CHILD QUESTIONNAIRE**

1A. Do you have any dependent children? Do not include children whom you currently do not support.

(Circle One)

Yes..... 1

No 2SKIP TO Q.14

1B. IF YES, how many?

Number of dependent children

2. In columns A through D of the chart below, please indicate for each of your *dependent* children, their age and sex, and which health insurance plan(s) cover them.

List only those children who are dependent on you for their support.

(Circle As Many As Apply)

A. Child no.	B. Sex:		C. Age	D. Insurance Coverage:			
	Male	Female		your plan	spouse's plan	other plan	not covered
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	1	2	3	4
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	1	2	3	4
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	1	2	3	4
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	1	2	3	4
5. I	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	1	2	3	4
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	1	2	3	4

PLEASE ANSWER QUESTIONS 3-13 FOR YOUR DEPENDENT CHILD. IF YOU HAVE MORE THAN ONE DEPENDENT CHILD, PLEASE ANSWER FOR THE CHILD WHO USUALLY USES THE HOST HEALTH CARE.

INDICATE WHICH CHILD YOU ARE ANSWERING FOR BY ENTERING THE CHILD'S NUMBER FROM COLUMN A.

I am answering for child No.

UTILIZATION OF HEALTH CARE SERVICES

3. For each item below, indicate whether it is a service your child used during 1985.

(Circle one number on each line)

	<u>NO, service not used</u>	<u>YES, service was used</u>
a. Visit to an emergency room.....	1	2
b. An overnight hospital stay for a physical health problem.....	1	2
c. An overnight hospital stay for an emotional or personal problem.....	1	2
d. Visit to physician's office or clinic for a physical problem.....	1	2
e. Visit to your usual medical doctor or clinic for an emotional or personal problem.....	1	2
f. Visit to a mental health professional (psychiatrist, psychologist, etc.).....	1	2
g. Preventive care services (routine physical exam, immunization, etc.).....	1	2
h. Visit to another health care provider for an illness SPECIFY PROVIDER TYPE: _____	1	2
<hr/>		

REGULAR SOURCE OF MEDICAL CARE

REMEMBER TO ANSWER FOR THE DEPENDENT CHILD WHO USES THE MOST HEALTH CARE.

4A. Which doctor, hospital, or clinic would your child have gone to in 1985 if he/she had had a problem like a high fever that won't go away?

Name of doctor,
hospital, or clinic: _____ SKIP TO Q.4C
LAST FIRST

OR

CHECK HERE if you don't know his/her name: SKIP TO Q.4C

CHECK HERE if he/she didn't have a doctor, etc.

4B. If your child had this kind of problem, how would you choose a doctor, hospital, or clinic?

(Circle All That Apply)

- Ask my family, friends...(Skip to Q.5A)..... 1
- Look in the telephone book...(Skip to Q.5A).... 2
- Look in the CaPP Care directory...
(Skip to Q.5A)..... 3
- Other (SPECIFY): _____
... (Skip to Q.5A)..... 4

4C. Was this doctor (or hospital or clinic) a member of CaPP Care?

(Circle One)

- Yes 1
- No 2
- Don't Know 8

5A. Which doctor or other mental health professional (for example, psychologist) would your child have gone to in 1985 if he/she had had an emotional or personal problem?

Practitioner's name: _____ SKIP TO Q.5C
LAST FIRST

OR

CHECK HERE if you don't know his/her name: SKIP TO Q.5C

CHECK HERE if he/she didn't have a practitioner: I I

5B. If your child had this kind of problem, how would you find a doctor, or other mental health practitioner?

(Circle All That Apply)

- Ask his/her physical health doctor
... (Skip to Q.6)..... 1
- Ask my family, friends... (Skip to Q.6)..... 2
- Look in the telephone book... (Skip to Q.6)..... 3
- Look in the CaPP Care directory...
(Skip to Q.6)..... 4
- Other (SPECIFY): _____
... (Skip to Q.6)..... 5

5C. Was this practitioner a member of CaPP Care?

(Circle One)

- Yes 1
- No 2
- Don't Know 8

PLEASE CONTINUE TO ANSWER FOR THE DEPENDENT CHILD WHO USES THE MOST HEALTH CARE.

5D. How long had he/she been your child's source of care for emotional or personal problems?

(Circle One)

- Less than 1 year..... 1
- Less than 2 years..... 2
- 2-5 years... (Skip to Q.6).....3
- 6-10 years...(Skip to Q.6)..... 4
- More than 10 years...
(Skip to Q.6)..... 5

5E. If, DURING 1983 or 1984, your child would have seen a different doctor or other mental health professional for an emotional or personal problem, please identify him/her below:

Practitioner's name: _____
LAST FIRST

OR

CHECK HERE if you don't know:

CHECK HERE if not applicable (child too young): SKIP TO Q.6

5F. Was this practitioner a member of CaPP Care?

(Circle One)

- Yes 1
- No 2
- Don't Know 8

HEALTH STATUS

6. In general, would you say this child's health is excellent, good, fair or poor?

(Circle One)

- Excellent 1
- Good..... 2
- Fair..... 3
- Poor..... 4

7. Please indicate if each of the following statements is true for your child -- is each statement definitely true, mostly true, mostly false, or definitely false, for him/her?

(Circle One Number on Each Line)

	<u>Definitely true</u>	<u>Mostly true</u>	<u>Don't know</u>	<u>Mostly false</u>	<u>Definitely false</u>
a. This child's health is excellent.....	1	2	8	3	4
b. This child seems to be less healthy than other children I know.....	1	2	8	3	
c. This child seems to resist illness very well.....	1	2	8	3	
d. When there is something going around, this child usually catches it.....	1	2	8	3	
e. This child was so sick once I thought he or she might die.....	1	2	8	3	
f. This child has never been seriously ill.....	1	2	8	3	

8. Does your child's health limit the kinds or amounts of vigorous activities he/she can do?

(Circle One)

Yes, limits..... 1

No, does not limit..... 2

9. Is your child unable to do certain kinds or amounts of work or school work because of his/her health?

(Circle One)

Yes, unable..... 1

No, not unable..... 2

Child too young, does
not apply..... 3

10. The next few questions are about how your child feels and how things have been with him/her mostly *within the past month*.
 (READ EACH QUESTION) -- Would you say he/she has felt that way all of the time, most of the time, a good bit of the time, some of the time, a little bit of the time, or none of the time during the *last month*?

REMEMBER TO ANSWER FOR THE DEPENDENT CHILD WHO USES THE MOST HEALTH CARE.

(Circle One Number on Each Line)

	<u>All of the Time</u>	<u>Most of the Time</u>	A Good Bit of the Time	Some of the Time	A Little Bit of the Time	<u>None of the Time</u>
a. During the past month, how much of the time did this child seem to be restless, fidgety or inpatient?.....	1	2	3	4	5	6
b. During the past month, did this child seem to be anxious or worried?.....	1	2	3	4	5	6
c. How much of the time during the past month did this child seem to be depressed (down-hearted or blue)?.....	1	2	3		5	6
d. How much of the time during the past month did this child seem to be cheerful and lighthearted?.....	1			4		6
e. During the past month, how much of the time did this child seem to be a happy person?.....	1	2	3	4	5	6

11. How many days in total did your child spend in bed due to illness in 1985?

Number of days:

12. **Is** your child's health better, the same, or worse than it was BEFORE 1985?

(Circle One)

- Much better..... 1
- Somewhat better..... 2
- Same..... 3
- Somewhat worse..... 4
- Much worse..... 5
- Not applicable-child
too young..... 6

13. Does your child currently have any of the following health conditions or did he/she have any of these problems during 1985?

(Circle All That Apply)

- | | YES | NO |
|---|-----|----|
| a. recurrent ear infections.. | 1 | 2 |
| b. severe allergies..... | 1 | 2 |
| c. diabetes..... | 1 | 2 |
| d. asthma..... | 1 | 2 |
| e. emotional or mental
problems..... | 1 | 2 |
| f. other chronic conditions.. | 1 | 2 |
| g. learning difficulties or
school problems..... | 1 | 2 |
| h. behavior disturbance | 1 | 2 |
| i. speech difficulties | 1 | 2 |

14. **Thank you for completing this survey. Please return the completed survey in the enclosed postage paid envelope as soon as possible.**

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