SOME EVIDENCE REFUTING THE HMO "FAVORABLE SELECTION" HYPOTHESIS: THE CASE OF KAISER PERMANENTE

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INTRODUCTION

Many health services researchers and benefit specialists believe that health maintenance organizations (HMOs) experience favorable selection of enrollees. Favorable selection is said to occur if, after adjusting for factors used to set rates (generally demographic characteristics), HMO enrollees have lower average health care costs or are healthier than people covered by alternative types of health plans (Hellinger, 1987). Evidence regarding this selection bias issue is conflicting. Several studies have shown that HMO enrollees do not differ significantly in health status from people covered by conventional health insurance plans (Welch, Frank and Diehr, 1984; Grazier et al., 1986; Lairson and Herd, 1987). Yet, many studies of health plan choice have also shown that HMO joiners tend to have significantly lower prior health service use than those

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who remain in conventional plans (Roghmann, Sorenson, and Wells, 1977; Luft, 1981; Jackson-Beeck and Kleinman, 1983; Buchanan and Cretin, 1986). Some evidence suggests that past health service utilization is one of the best predictors of future utilization (Mullooly and Freeborn, 1979; Hellinger, 1987). Based on a study of utilization by people randomized into HMO or conventional fee-for-service (FFS) care, Manning et al. (1984) suggest that prepaid group practices have a less expensive practice style than FFS, primarily because they try to avoid hospitalizations. However, since many of these studies were conducted before conventional plans began to reduce their hospitalization costs because of DRG guidelines and a trend toward outpatient surgery, the differences in cost of care observed in earlier studies may no longer hold.

We tested the hypothesis that favorable selection was occurring for the Kaiser Permanente Medical Care Program (KPMCP), the largest prepaid group practice model HMO in California, using data from state- and county-level probability sample health surveys conducted by the California Department of Health Services in 1989, the Behavioral Risk Factor Surveillance Survey and the Alameda County Chronic Disease Surveillance Survey. In this paper we summarize the results of our analyses that compare the sociodemographic characteristics, self-reported health status, health practices, and use of selected health care services of adults covered by the Kaiser Permanente health plan with adults covered by another private health insurance plan, and then discuss their implications.

CALIFORNIA BEHAVIORAL RISK FACTOR SURVEILLANCE SURVEY

Methods

The California Behavioral Risk Factor Surveillance Survey (CALBRFSS) is a telephone interview survey covering health risk behaviors, chronic disease conditions, and preventive health practices. The survey has been conducted continuously for the State of California since January 1984 by the Chronic Diseases Branch, California Department of Health Services (California Department of Health Services, 1990a). CALBRFSS respondents are a probability sample of noninstitutionalized adults living in residences with telephones. Telephone numbers are randomly selected using the Waksberg method, a three-stage cluster sampling technique with random-digit dialing, which is designed to generate a random sample of California telephone numbers, including unlisted and new subscribers (Waksberg, 1978). At the last stage, a household member aged 18 or older is randomly selected for interview. Interviews are completed with only the target respondent and are conducted

in either English or Spanish. During 1989, interviews were completed for 82.8% of eligible adults who were identified through these procedures. The CASRO (Council of American Survey Research Organizations) response rate, which is more conservative in that it includes in the denominator a fraction of numbers for which there was no answer, was 64.2%. Data from respondents were weighted to reflect the estimated age-, sex-, and race-ethnic composition of the 1989 California adult population, using population estimates obtained from the California Department of Finance (CDOF). The distributions of household income and educational level data in the weighted CALBRFSS sample are comparable to CDOF estimates for the California population, even though these variables were not specifically adjusted for.

Source of health care coverage was assessed with a series of eight questions (see Appendix). All respondents were asked whether they were covered by Medicare, Medi-Cal (the California Medicaid equivalent), major medical insurance, a health maintenance organization (HMO), an indemnity-type plan, another type of plan, or a combination of plans. When individuals indicated that they were covered by a private health insurance plan, they were asked the name of their health plan (or the plan they used most often if they had multiple coverage). Respondents who did not indicate having any of the types of health insurance plans mentioned were asked a follow-up question to ascertain whether they paid for most of their doctor bills themselves (as opposed to getting care from a "free" or county clinic) in order to be sure that they really did not have any outpatient health coverage. Based on health care information supplied, six categories of outpatient insurance types were developed: HMO, conventional plan (for example, indemnity or self-insured employer plan), VA/Military, Medicare (with or without supplemental insurance), Medi-Cal only, and No Outpatient Insurance Coverage. Approximately 10% of those in the no outpatient coverage category had major medical coverage. Approximately 2% of the study sample (or 1% using unweighted data) did not supply sufficient information to categorize health plan type.

The study sample was restricted to respondents aged 65 years or under ($n = 1,599$), the population typically receiving health care coverage through their place of employment or professional affiliations. Respondents who reported that their primary source of health care coverage was a non-Kaiser HMO, a conventional indemnity plan or preferred provider plan, or Medicare supplement plan were categorized as "Non-Kaiser Privately Insured" (Non-Kaiser). Respondents without private health insurance (that is, non-CHAMPUS military source, Medi-Cal, Medicare without supplemental plan, and no outpatient insurance) were excluded from the analysis. The approximately 1% of the sample with major medical insurance but no outpatient coverage was also excluded.

Data were analyzed using the crosstabs procedure from the Research Triangle Institute SUDAAN statistical software package for personal

computer (Research Triangle Institute, 1990). This software, which was specially developed for analysis of weighted data obtained from complex multistage sampling designs, calculates the sample design effect and adjusts sample variance upward when computing standard errors and significance tests.

Kaiser Permanente was named as the primary source of outpatient health coverage by 20.3% of the study sample, after the data were weighted to reflect the age-sex-race composition of the 1989 California population. The remaining 79.7% reported coverage by another HMO (19.5%), a traditional indemnity plan or preferred provider network (56.3%), CHAMPUS (1.8%), or another type of plan offered through their employer or institution (2.1%).

Results

Sociodemographic Characteristics

The Kaiser and non-Kaiser groups were highly similar in terms of sex, age, educational attainment, self-reported household income, and marital status (Table 1). However, compared to the non-Kaiser group, the Kaiser group had both a significantly higher proportion of minorities (45.4% vs. 30.7%, $p < .001$) and a significantly higher proportion of people who were currently employed (82.6% vs. 73.9%, $p < .01$).

Health Characteristics

The two groups had similar health profiles based on self-reported health indicators (Table 2). Over 85% of both groups considered their health to be good or excellent (87.3% of the Kaiser group, 89.1% of the non-Kaiser group). The two groups did not differ significantly in prevalences of self-reported chronic health conditions (arthritis, asthma, back trouble, frequent headaches, heart problems, kidney/bladder trouble, liver trouble, stroke, diabetes, high blood pressure) or health risks (elevated cholesterol, smoking, obesity, and chronic drinking).

Use of Preventive Health Screening Services

While the survey did not collect data about overall health care utilization during the previous year, respondents were asked to indicate how long it had been since they had received a routine health checkup and various cancer detection procedures. The Kaiser and non-Kaiser groups had similar proportions of men and women reporting routine screening procedures (health checkup, digital rectal exam, fecal occult blood test, Pap smear, and mammogram) within the past year (Table 3).

Table 1. A Comparison of the Sociodemographic Characteristics of California Residents Ages 18 to 65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente versus Other Private Health Insurance[1]

Sociodemographic Characteristics	Kaiser Permanente Health Plan Members[2] %(SE)	Non-Kaiser Private Coverage[3] %(SE)
Sex		
Male	52.2 (3.1)	49.9 (1.6)
Female	47.8 (3.1)	50.1 (1.6)
Age		
18-44 years	64.9 (3.2)	68.1 (1.5)
45-65 years	35.1 (3.2)	31.9 (1.5)
Age by Sex		
Male 18-44 years	33.6 (2.9)	35.0 (1.5)
Male 45-65 years	18.6 (2.7)	14.9 (1.2)
Female 18-44 years	31.3 (2.8)	33.1 (1.4)
Female 45-65 years	16.5 (2.5)	17.0 (1.2)
Race/Ethnicity[3]		
White, non-Hispanic	54.6 (3.2)	69.3 (1.6)
Nonwhite or non-Hispanic	45.4 (3.2)	30.7 (1.6)
Black, non-Hispanic	13.3 (2.2)	4.1 (0.7)
Hispanic	19.7 (2.7)	17.3 (1.2)
Asian	11.0 (2.2)	7.7 (1.1)
Other	1.3 (0.9)	1.6 (0.4)
Education		
12th grade or less	35.9 (3.1)	32.5 (1.5)
Some post-high school education/training	32.0 (2.9)	33.5 (1.5)
College graduate	32.2 (3.0)	34.0 (1.5)
Income		
Less than $20,000	18.7 (2.6)	19.1 (1.3)
$20,000-$34,999	29.9 (2.9)	26.1 (1.4)
$35,000-$50,000	18.5 (2.4)	21.0 (1.3)
Over $50,000	28.4 (2.8)	28.1 (1.4)
(unknown)	4.5	5.7
Employment Status[4]		
Employed by other	75.2 (2.6)	64.1 (1.5)
Self-employed	7.4 (1.4)	9.8 (0.9)
Not employed	17.4 (2.4)	26.2 (1.5)
Marital Status		
Single	34.1 (2.9)	34.2 (1.5)

Notes: SE = Standard error.

[1] From the 1989 California Behavioral Risk Factor Survey, based on self-reported interview data for adults ages 18-65, weighted to the age-, race- and sex-specific distribution of the 1989 California population (California Department of Health Services, 1990).

[2] Group denominators for the percentages are as follows: Kaiser, $n = 324$; non-Kaiser with private insurance, $n = 1,178$ (unweighted, $n = 1,275$).

[3] Difference significant at: $p < .001$.

[4] Difference significant at: $p < .01$.

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Table 2. A Comparison of the Health Characteristics of California Residents Ages 18 to 65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente versus Other Private Health Insurance[1]

Health Characteristics	Kaiser Permanente Health Plan Members[2] %(SE)	Non-Kaiser Private Coverage[3] %(SE)
Overall Health		
Good or Excellent	87.3 (2.0)	89.1 (1.0)
History of chronic conditions[3]		
Arthritis	13.1 (2.3)	13.1 (1.1)
Asthma	7.5 (1.6)	7.7 (0.8)
Back trouble in past year	17.5 (2.4)	18.6 (1.2)
Frequent headaches in past year	13.2 (2.0)	12.7 (1.0)
Heart problems	6.8 (1.6)	6.9 (0.9)
Kidney/bladder trouble	9.4 (1.8)	10.8 (0.9)
Liver trouble	3.6 (1.1)	1.9 (0.4)
Stroke	1.2 (0.6)	1.0 (0.3)
Cancer	3.4 (1.2)	3.1 (0.5)
Diabetes	4.2 (1.4)	3.3 (0.6)
High blood pressure[4]	19.2 (2.5)	14.2 (1.1)
Chronic Health Risks[3]		
Elevated cholesterol[5]	10.6 (2.2)	8.2 (0.9)
Current smoker	19.4 (2.4)	19.4 (1.2)
Overweight[6]	19.5 (2.5)	15.7 (1.2)
Chronic drinker (>60 drinks/mo.)	3.1 (1.1)	4.3 (0.7)

Notes: SE = Standard error.

[1] From the 1989 California Behavioral Risk Factor Survey, based on self-reported interview data for adults ages 18-65, weighted to the age-, race- and sex-specific distribution of the 1989 California population (California Department of Health Services, 1990).

[2] Group denominators for the percentages are as follows: Kaiser, $n = 346$; non-Kaiser with private insurance, $n = 1,178$ (unweighted, $n = 1,275$).

[3] "I'm going to read you a list of medical conditions and physical ailments that usually last some time. Please tell me if you have ever experienced this problem or been told by a medical doctor that you have this problem." (Note: missing responses coded as not having the condition.)

[4] "Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?" (Note: missing responses coded as not having high blood pressure.)

[5] "Are you now under the advice of a doctor to reduce your cholesterol?"

[6] Body Mass Index (BMI) of 27.8 or higher for males and 27.3 or higher for females (≥ 85th percentile of BMIs for the reference population in the second National Health and Nutrition Examination Survey.)

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Table 3. A Comparison of the Preventive Health Service Use by California Residents Ages 18 to 65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente versus Other Private Health Insurance[1]

	Kaiser Permanente Health Plan Members[2]	Non-Kaiser Private Coverage[3]
	%(SE)	%(SE)
Preventive Health Service Use		
Screening Procedures Within the Past Year		
Routine physical exam	66.7 (2.9)	65.0 (1.5)
Digital rectal exam[3]	33.5 (3.1)	27.4 (1.4)
Blood stool tests	20.8 (2.6)	15.5 (1.2)
Pap smear (all women)[5]	68.6 (4.0)	73.8 (1.9)
Mammogram (all women)[6]	37.2 (4.4)	30.0 (2.0)

Notes: SE = Standard error.

[1] From the 1989 California Behavioral Risk Factor Survey, based on self-reported interview data for adults ages 18-65, weighted to the age-, race-, and sex-specific distribution of the 1989 California population (California Department of Health Services, 1990).

[2] Approximate group denominators for the percentages are for digital rectal exam, routine physical exam, and blood stool test. Kaiser. n = 346 (unweighted n = 324); non-Kaiser with private insurance, n = 1,178 (unweighted n = 1,275); Pap smear and mammogram: Kaiser, n = 165 (unweighted n = 165); non-Kaiser, n = 597 (unweighted n = 678).

[3] Digital rectal exams are not recommended by the U.S. Preventive Services Task Force as a routine cancer screening procedure for low-risk men and women under the age of 40.

[4] Blood stool tests are not recommended by the U.S. Preventive Services Task Force as a routine cancer screening procedure for low-risk men and women under the age of 50.

[5] Pap smears are not recommended by the U.S. Preventive Services Task Force for women who have had a hysterectomy.

[6] Mammography is not recommended by the U.S. Preventive Services Task Force as a routine breast cancer screening procedure for low-risk women under the age of 40.

ALAMEDA COUNTY CHRONIC DISEASE SURVEILLANCE SURVEY

Methods

The Alameda County Chronic Disease Surveillance Survey (ACCDSS) study sample was also selected using a Waksberg-type three-stage cluster design with random digit dialing. The survey was conducted by the Human Population Laboratory of the California Department of Health Services

(California Department of Health Services, 1990b). For these analyses, the sample was restricted to respondents aged 65 years or under who indicated that they had some type of health insurance or health plan that paid for at least some of their visits to the doctor when they were ill (N = 1,003). People who indicated that they received Medi-Cal were excluded from this sample since it was unlikely that they also had private insurance. Medicare recipients were not likely to influence outcomes since age was restricted to 65 years or under. Kaiser Permanente members were identified from the question, "Do you have the Kaiser plan?" Data were weighted to reflect the estimated age, sex, and racial composition of the adult population in Alameda County in 1989. Based on the weighted data, approximately 43.6% of the respondents were covered by the Kaiser Health Plan. We estimate, based on 1989 CALBRFSS data, that about 20% of the non-Kaiser privately insured group were covered by other HMOs. Data were analyzed using the crosstabs and regression procedures from the Research Triangle Institute SUDAAN statistical software package for personal computer.

Results

Sociodemographic Characteristics

The average age of men and women in the Kaiser group was slightly higher than that of the non-Kaiser group (39.2 years versus 37.1 years). This age difference shows up most dramatically among males, with the Kaiser group having approximately 10% fewer males under the age of 45 as compared to the non-Kaiser group (average age for males was 39 years versus 36.1 years, and for females, 39.3 years versus 38 years). The Kaiser group also had a higher proportion of minorities (48.4% versus 34.9%, $p < .001$), particularly Blacks and Hispanics. Finally, the Kaiser group did not appear to be as well-educated, with 36.2% versus 26.8% of respondents reporting completion of 12 or fewer school years and 30.3% versus 42.1% reporting completion of a college degree ($p < .001$). No statistically significant differences were observed in the distributions of household income level, employment status, marital status, and sex (Table 4).

Health Characteristics

The Kaiser group did not differ from the non-Kaiser group on self-rating of general health status, with more than 90% of both groups reporting that their health was good or excellent (Table 5). No statistically significant differences between the two groups were observed in the prevalences of most chronic health problems (heart trouble, stroke, cancer, lung disease, asthma, diabetes, high blood pressure, arthritis, back pain, muscle/joint pain, ulcer,

Table 4. A Comparison of the Sociodemographic Characteristics of Alameda County Residents Ages 18 to 65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente Members versus People with Coverage for at Least Some Doctor Office Visits (Excluding Medi-Cal Recipients)[1]

Sociodemographic Characteristics	Kaiser Permanente Health Plan Members[3] %(SE)	Non-Kaiser with Outpatient Coverage[2] %(SE)
Sex		
Male	45.3 (2.8)	50.0 (2.4)
Female	54.7 (2.8)	50.0 (2.4)
Age[3]		
18-44 years	65.8 (2.6)	73.6 (2.1)
45-65 years	34.2 (2.6)	26.4 (2.1)
Age by Sex[3]		
Male 18-44 years	29.2 (2.6)	38.8 (2.4)
Male 45-65 years	16.1 (2.0)	11.4 (1.6)
Female 18-44 years	36.6 (2.6)	34.8 (2.3)
Female 45-65 years	18.1 (2.1)	15.0 (1.7)
Race/Ethnicity[4]		
White, non-Hispanic	51.6 (2.7)	65.1 (2.4)
Nonwhite or Hispanic	48.4 (2.7)	34.9 (2.4)
Black, non-Hispanic	15.9 (1.8)	9.6 (1.5)
Hispanic	18.6 (2.3)	11.1 (1.6)
Asian	11.7 (2.1)	10.3 (1.6)
Other	2.2 (0.8)	3.9 (1.2)
Education[5]		
12th grade or less	36.2 (2.7)	26.8 (2.2)
Some post-high school education/training	33.5 (2.5)	31.1 (2.3)
College graduate	30.3 (2.5)	42.1 (2.4)
Income		
Less than $20,000	16.8 (2.1)	17.0 (2.0)
$20,000-$34,999	29.0 (2.5)	25.4 (2.1)
$35,000-$50,000	23.6 (2.3)	20.0 (1.9)
Over $50,000	27.4 (2.5)	32.3 (2.2)
Unknown	3.2	5.2
Employment Status		
Work for wages/self	78.7 (2.5)	82.9 (1.9)
Marital Status		
Single	42.7 (2.7)	46.2 (2.4)

Notes: SE = Standard error.
[1] From the 1989-90 Alameda County Chronic Disease Survey, based on self-report interview data of adults ages 18-65, weighted to the estimated age-, race-, and sex-specific distribution of the 1989 Alameda County population (California Department of Health Services, 1990b).
[2] Group denominators for the weighted percentages are: Kaiser, n = 444; non-Kaiser, n = 554.
[3] Difference significant at p < .05.
[4] Difference significant at p < .001.
[5] Difference significant at p < .01.

Table 5. A Comparison of the Health Characteristics of Alameda County Residents Ages 18 to 65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente Members versus People with Coverage for at Least Some Doctor Office Visits (Excluding Medi-Cal Recipients)[1]

Health Characteristics	Kaiser Permanente Health Plan Members[3] %(SE)	Non-Kaiser with Outpatient Coverage[2] %(SE)
Overall Health		
Good or Excellent	93.1 (1.2)	90.2 (1.5)
History of chronic conditions[3]		
Heart trouble (any)	10.5 (1.5)	11.3 (1.5)
Angina	2.7 (0.8)	3.4 (0.9)
Myocardial infarction	1.5 (0.6)	1.0 (0.4)
Other heart problems	8.3 (1.3)	9.3 (1.3)
Stroke (CVA or major)	1.0 (0.5)	0.9 (0.4)
Cancer	4.4 (1.0)	3.5 (0.9)
Respiratory problems (lung/asthma)	13.4 (1.9)	15.5 (1.9)
Asthma	10.9 (1.7)	12.3 (1.7)
Lung disease	4.3 (1.2)	5.2 (1.3)
High blood pressure	15.4 (1.9)	13.7 (1.7)
Diabetes	2.5 (0.9)	3.1 (0.8)
Arthritis	11.5 (1.6)	13.4 (1.7)
Frequent pain in past year:	51.4 (2.7)	46.6 (2.4)
Back pain	28.4 (2.5)	27.2 (2.2)
Muscle/joint pain	24.1 (2.3)	23.8 (2.1)
Headaches[4]	25.8 (2.4)	18.0 (1.8)
Ulcer	5.9 (1.3)	6.3 (1.1)
Environmental smell/chemical sensitivity[5]	21.4 (2.3)	18.8 (1.9)
Injury requiring treatment in past year	25.0 (2.4)	21.2 (2.0)
Chronic Health Risks		
Current smoker	19.2 (2.0)	19.9 (1.9)
Hearing problem[4]	11.2 (1.8)	6.8 (1.2)
Elevated cholesterol	13.7 (1.8)	14.2 (1.7)
Obesity[5]	17.9 (2.1)	14.3 (1.7)

Table 5. (Continued)

Sociodemographic Characteristics	Kaiser Permanente Health Plan Members[2] %(SE)	Non-Kaiser with Outpatient Coverage[2] %(SE)
Currently, or in past, has often been exposed to solvents, heavy metals, chemical acids, radioactive materials, heavy dust/asbestos, or pesticides	32.4 (2.5)	32.5 (2.3)

Notes: SE = Standard error.

[1] From the 1989-90 Alameda County Chronic Disease Survey, based on self-report interview data for adults ages 18-65, weighted to the estimated age-, race-, and sex-specific distribution of the 1989 Alameda County population (California Department of Health Services, 1990b).

[2] Group denominators for the weighted percentages are: Kaiser, n = 444; non-Kaiser, n = 554.

[3] "Has a doctor or other health professional ever told you that you have/had [type of health problem]?" (Note: missing responses coded as not having the condition; in most cases, less than 1% of responses were missing.)

[4] Difference significant at p < .05.

[5] "Are you made sick by smells or chemicals you encounter that do not seem to bother most other people?"

[6] Defined as a Body Mass Index (BMI) of 27.8 or higher for males and 27.3 or higher for females (≥ 85th percentile of BMIs for the reference population in the second National Health and Nutrition Examination Survey).

environmental/chemical sensitivity) or injury in the past year that required medical treatment, nor for health risks (smoking, obesity, and exposure to hazardous materials). The only statistically significant differences found were the Kaiser group's higher rates of frequent headaches in the past year (25.8% versus 18%, p < .05) and hearing problems (11.2% versus 6.8%, p < .05).

Health Services Utilization

Less than 10% of the people in both the Kaiser and non-Kaiser groups reported a hospitalization of at least one night during the previous 12 months (Table 6). The men and women in the two groups had comparable average rates of hospitalization (about 0.11 per person). Hospitalizations for childbirth are included in these totals, which may account for the higher hospitalization rates of women aged 18-44 as compared to those for women over age 44.

Table 6. A Comparison of Health Care Use by Alameda County Residents Ages 18-65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente Members versus People with Coverage for at Least Some Doctor Office Visits (Excluding Medi-Cal Recipients)[1]

Health Service Use	Men		Women	
	ages 18-44	ages 45-65[2]	ages 18-44	ages 56-65[2]
Number of hospitalizations of ≥ 1 night in past 12 months[3]				
Kaiser members				
None (% SE)	96.3 (1.8)	87.2 (5.0)	86.8 (3.0)	96.1 (3.9)
1 or more (% SE)	3.7 (1.8)	12.8 (5.0)	13.2 (3.0)	3.9 (1.8)
Total (Mean SE)	.09 (.04)	.15 (.06)	.16 (.04)	.06 (.03)
Non-Kaiser members				
None (% SE)	93.1 (2.2)	91.2 (6.8)	89.5 (2.3)	94.8 (2.4)
1 or more (% SE)	6.9 (2.2)	8.8 (6.8)	10.5 (2.3)	5.2 (2.4)
Total (Mean SE)	.12 (.04)	.11 (.07)	.12 (.03)	.05 (.02)
Number of illness-related doctor visits in the past 12 months[4,5]				
Kaiser members				
0-1 (% SE)	68.6 (4.7)	78.4 (5.2)	57.9 (4.5)	73.1 (5.1)
2-5 (% SE)	27.3 (4.4)	15.8 (4.5)	34.8 (4.4)	21.7 (4.7)
6-10 (% SE)	3.4 (2.3)	3.6 (2.1)	5.6 (2.4)	2.1 (1.6)
11-20 (% SE)	0.6 (0.6)	2.2 (2.2)	1.3 (0.8)	2.6 (1.8)
> 20 (% SE)	0.0 (—)	0.0 (—)	0.3 (.03)	0.6 (0.6)
Total (Mean SE)	1.4 (0.2)	1.1 (0.3)	2.0 (0.3)	1.9 (0.5)
Non-Kaiser members				
0-1 (% SE)	73.1 (3.6)	62.8 (7.5)	53.5 (4.0)	47.4 (5.9)
2-5 (% SE)	20.7 (3.6)	20.7 (5.4)	35.8 (3.8)	36.5 (6.1)
6-10 (% SE)	2.5 (1.1)	13.3 (7.1)	8.3 (2.2)	5.2 (2.4)
11-20 (% SE)	1.3 (1.0)	3.3 (2.0)	1.7 (0.9)	5.4 (2.3)
> 20 (% SE)	2.3 (1.3)	0.0 (—)	0.9 (0.5)	5.5 (2.9)
Total (Mean SE)	2.3 (0.7)	2.3 (0.6)	2.5 (0.3)	4.3 (1.0)

Notes: SE = Standard Error.

[1] From the 1989-90 Alameda County Chronic Disease Survey, based on self-report interview data of adults ages 18-65, weighted to the estimated age-, race-, and sex-specific distribution of the 1989 Alameda County population (California Department of Health Services, 1990b).

[2] Group denominators for the age-sex specific data are as follows:
Kaiser: men 18-44, n = 117; men 45-65, n = 77; women 18-44, n = 156; women 45-65, n = 85;
Non-Kaiser: men 18-44, n = 195; men 45-64, n = 65; women 18-44, n = 213; women 45-65, n = 89.

[3] "How many different times were you in the hospital at least overnight in the past 12 months?"

[4] "During the past 12 months, how many times did you see a doctor about your health when you were not feeling well?"

[5] Kaiser versus Non-Kaiser differences in illness-related doctor visit rates for Men 18-44 and Women 45-65 significant at p < .05.

Illness-related doctor visits during the previous 12 months were examined separately for men and women overall and by 18-44 and 45-65 year-old age groups. It should be noted that these visit data do not reflect total doctor office visits during the year—that is, they do not include visits for routine wellness checks or follow-up care for chronic health problems, such as high blood pressure or diabetes. Overall, Kaiser women averaged 1.96 (s.e. 0.24) visits as compared to non-Kaiser women's 3.04 (s.e. 0.37) visits, a difference statistically significant with $p < .01$. This was primarily a result of very high utilization by approximately 10% of the non-Kaiser women aged 45-65. Kaiser men had a lower average number of illness-related visits than non-Kaiser men, 1.3 (s.e. 0.16) versus 2.27 (s.e. 0.58), respectively, but the difference was not statistically significant. Because these means may be unduly influenced by the extremely high utilization of a small percentage of respondents, the distribution of visits by sex and age group is also shown. Approximately 39% of respondents in both the Kaiser and non-Kaiser groups reported no illness-related visits during the previous 12 months, and the majority had less than two visits. Non-Kaiser men aged 18-44 and non-Kaiser women aged 45-65 were significantly more likely than their Kaiser counterparts to report making more than 10 illness-related visits (3.6% versus 0.6% and 10.9% versus 3.2%, respectively) during the year, and non-Kaiser men aged 45-65 also had greater percentages reporting more than one such visit than Kaiser men in that age group.

Multiple linear regression models were used to test the relationship of Kaiser membership to illness-related doctor visits for each sex separately, controlling for age (18-44 versus 45-65), race (white versus minority), and capping number of visits at 21 to counter the influence of the few very high utilizers (Table 7). As was expected, Kaiser membership was a significant predictor for women ($p < .01$), but not for men. However, neither age (45-65 versus 18-44, or 35-44, 45-54, and 55-65 versus 18-34) nor race were significant independent predictors, and these models explained less than 1% of the variance in illness-related visits. When several self-reported health indicators were added into the models (in good or excellent health, injury during the past year, chronic back pain during the past year, frequent muscle/joint pain or arthritis during the past year, and a history of respiratory problems such as asthma or emphysema), Kaiser women still had a significantly lower average visit rate ($p < .02$), although the difference was attenuated somewhat from the first model; the difference for men became borderline significant ($p < .10$). These more inclusive models explained a significantly greater amount of the variance in illness-related utilization, 27% for women and 19% for men. None of the other health indicators tested (cancer, heart problems, stroke, diabetes, and high blood pressure) added significantly to the explanatory model. This may have been due to the low prevalence of the severe health problems in the sample population and the fact that most respondents probably did not consider visits for diabetes and high blood pressure as seeing a doctor about their health when they "were not feeling well."

Table 7. Multiple Linear Regression Models Predicting Illness-Related Doctor Visits by Alameda County Residents Ages 18-65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente Members versus People with Coverage for at Least Some Doctor Office Visits (Excluding Medi-Cal Recipients)[1,2]

Independent Variables	B Coeff.	(SE)	p-value
Women: Model 1, $R^2 = .021$			
(Intercept = 2.455)			
Age (1 = 45-65, 0 = 18-44)	0.573	(0.439)	.193
Race (1 = nonwhite, 0 = white)	0.315	(0.372)	.397
Coverage (1 = Kaiser, 0 = non-Kaiser)	-0.965	(0.350)	.006
Women: Model 2, $R^2 = .269$			
(Intercept = 5.478)			
Age (1 = 45-64, 0 = 18-44)	0.158	(0.323)	.626
Race (1 = nonwhite, 0 = white)	-0.026	(0.293)	.930
Health (1 = good/excellent, 0 = fair/poor)	-4.217	(0.878)	.000
Respiratory problems (1 = yes, 0 = no)	0.959	(0.564)	.090
Injury requiring MD care (1 = yes, 0 = no)	2.175	(0.481)	.000
Frequent back pain (1 = yes, 0 = no)	1.212	(0.352)	.001
Coverage (1 = Kaiser; 0 = non-Kaiser)	-0.637	(0.279)	.023
Men: Model 1, $R^2 = .008$			
(Intercept = 1.844)			
Age (1 = 45-65, 0 = 18-44)	0.169	(0.437)	.699
Race (1 = nonwhite, 0 = white)	-0.024	(0.416)	.954
Coverage (1 = Kaiser, 0 = non-Kaiser)	-0.587	(0.364)	.107
Men: Model 2, $R^2 = .196$			
(Intercept = 4.833)			
Age (1 = 45-64, 0 = 18-44)	-0.175	(0.305)	.565
Race (1 = nonwhite, 0 = white)	-0.225	(0.336)	.504
Health (1 = good/excellent, 0 = fair/poor)	-3.737	(1.302)	.004
Respiratory problems (1 = yes, 0 = no)	1.644	(0.761)	.031
Injury requiring MD care (1 = yes, 0 = no)	0.585	(0.405)	.149
Frequent back pain (1 = yes, 0 = no)	0.991	(0.471)	.036
Coverage (1 = Kaiser, 0 = non-Kaiser)	-0.580	(0.311)	.063

Notes: SE = Standard error.
[1] From the 1989-90 Alameda County Chronic Disease Survey; based on self-report interview data of adults ages 18-65, weighted to the estimated age-, race-, and sex-specific distribution of the 1989 Alameda County population (California Department of Health Services, 1990b).
[2] "During the past 12 months, how many times did you see a doctor about your health when you were not feeling well?"

Table 8. A Comparison of Preventive Health Service Use by Alameda County Residents Ages 18-65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente Members versus People with Coverage for at Least Some Doctor Office Visits (Excluding Medi-Cal Recipients)[1]

Procedure Done in Past Years	Kaiser Permanente Health Plan Members[1] %(SE)	Non-Kaiser with Outpatient Coverage[2] %(SE)
Routine physical exam	50.8 (2.7)	48.7 (2.4)
Cholesterol check	35.8 (2.6)	36.0 (2.3)
Blood pressure check	83.3 (2.0)	81.7 (1.9)
Pap smear (all women)[3]	66.7 (3.6)	66.3 (3.1)
Mammograms (all women)[4,5]	23.8 (3.1)	15.9 (2.3)

Notes: SE = Standard error.
[1] From the 1989-90 Alameda County Chronic Disease Survey, based on self-report interview data of adults ages 18-65, weighted to the estimated age-, race-, and sex-specific distribution of the 1989 Alameda County population (California Department of Health Services, 1990b).
[2] Group denominators for the percentages: Kaiser, n = 444 (women n = 207); non-Kaiser, n = 555 (women n = 302).
[3] Rates for all women ages 18-65. Pap smears are usually not recommended for women who have had a hysterectomy.
[4] Rate for all women ages 18-65. Screening mammograms are usually not recommended for women under the age of 40.
[5] Difference significant at p < .05.

In terms of routine health screening procedures, the Kaiser and non-Kaiser groups had similar percentages of people reporting that they had received routine physical exams, cholesterol checks, blood pressure checks, and Pap smears within the past year, but Kaiser women had significantly higher mammogram rates (Table 8). Although this may be a result of slightly more Kaiser than non-Kaiser women being 40 years of age or older (screening mammography is not recommended for women under 40); mammography rates were substantially higher for women aged 40 and over with Kaiser coverage than non-Kaiser coverage (47.3% versus 34.9%).

Respondents were asked to report the extent to which their health coverage paid for hospital bills, doctor visits, routine checkups/preventive services, and prescriptions (Table 9). Compared to the group of respondents covered by non-Kaiser plans, the Kaiser group had significantly higher percentages reporting that their health plan covered all or most of their doctor visits (93.8% versus 77.1%, p < .001), routine and preventive care (87.8% versus 60.0%, p < .001), and prescription medications (70.5% versus 57.1%, p < .001).

Table 9. A Comparison of the Perceptions of What Their Health Plan Covers, Alameda County Residents Ages 18-65 with Different Sources of Outpatient Health Coverage: Kaiser Permanente Members versus People with Coverage for at Least Some Doctor Office Visits (Excluding Medi-Cal Recipients)[1]

Perceptions Of Coverage	Kaiser Permanente Health Plan Members[2] %(SE)	Non-Kaiser with Outpatient Coverage[2] %(SE)
Percentage who say that their health plan covers all or most of the costs of their:		
Hospital bills	90.6 (1.7)	83.6 (2.0)
Doctor visits for illness care[3]	93.8 (1.4)	77.1 (2.2)
Routine checkups/preventive services[3]	87.7 (2.1)	60.0 (2.4)
Prescription medications[3]	70.5 (2.5)	57.1 (2.5)

Notes: SE = Standard error.
[1] From the 1989-90 Alameda County Chronic Disease Survey, based on self-report interview data of adults ages 18-65, weighted to the estimated age-, race-, and sex-specific distribution of the 1989 Alameda County population (California Department of Health Services, 1990b).
[2] Group denominators for the percentages are: Kaiser, n = 444; non-Kaiser, n = 555.
[3] Difference significant at p < .001.

DISCUSSION

The results of our analyses of data from probability sample surveys of state (the 1989 California Behavioral Risk Factor Surveillance Survey) and county (1989 Alameda County Chronic Disease Surveillance Survey) populations indicate that, as a group, 18 to 65-year-olds covered by the Kaiser Permanente Medical Care Program are highly comparable to those covered by other sources of private outpatient health insurance in terms of sociodemographic and self-reported health characteristics. Thus, based on health characteristics alone, there is no evidence for "favorable selection" by the Kaiser HMO in this particular population. This finding replicates the results of the studies by Luft (1981); Welch, Frank, and Diehr (1984); and Grazier et al. (1986).

The Kaiser and non-Kaiser samples were highly comparable in their use of preventive health services. In both studies, the proportions of respondents in both groups who reported that they had received a routine physical examination, blood pressure check, and cholesterol check in the past year did not differ significantly although women in the Kaiser group were more likely to report having had a mammogram in the past year. This suggests that there was not a greater propensity for Kaiser members to receive preventive screening services than for those covered by other plans. However, in recent years, it has become more difficult to assign costs of preventive care to health plans for the first three procedures because they can take place outside of a doctor's office (for example, through worksite- or community-based programs). Since 40% of the non-Kaiser respondents in the Alameda County study indicated that their health plan did not cover the costs of routine/preventive care, the comparability of percentages receiving preventive services in the past year should not be equated with comparable cost outlays for preventive health care by the different types of health insurers.

We want to point out that most cancer screening procedures, Pap smear being the exception, are not recommended for low-risk people under the age of 40 or 50. Consequently, the data presented in this report should not be extrapolated for use as an indicator of quality of cancer prevention activities in the Kaiser Permanente Medical Care Program as compared to other health plans. The higher-than-expected percentages of 18 to 65-year-old adults reporting a routine checkup within the past year suggest that some respondents may have interpreted the term as any type of checkup, such as for diagnosis of illness, as opposed to a comprehensive wellness exam.

In our analysis of the Alameda County data, we found some evidence for "favorable selection" among women, but not among men, using the average number of illness-related outpatient visits during the previous 12 months as a criterion. We do not know why this was the case, although re-analysis of the self-reported health data by sex suggested that non-Kaiser women were somewhat less healthy than the Kaiser women. Unfortunately, the Alameda survey did not ask about total number of doctor office visits during the past year for any reason, including follow-up or monitoring of chronic health problems. It is possible that some types of visits considered to be illness-related by people who have to submit claims for reimbursement may have been considered to be health maintenance visits by Kaiser members, who were more likely than their counterparts to indicate that their plan covered routine/preventive services. It is also possible that the combination of the HMO's health maintenance care, the self-care orientation conveyed to members, the telephone advice-nurse service, and appointment nonavailability kept Kaiser members' illness-related visits lower than their non-Kaiser

counterparts, especially for self-limiting conditions. Finally, fee-for-service practitioners may be more likely to encourage patients to return for follow-up visits in order to generate revenue. No differences were found in average number of hospitalizations during the previous year; however, we have no information about average length of stay or about the reasons for hospitalizations that did occur.

We acknowledge that this study has several limitations. First, neither of the two surveys whose data we used for these analyses was specifically designed to examine the "HMO favorable selection" issue. Thus, while we feel that we had good information about the sociodemographic and health characteristics of the respondents, our information about their health service utilization during the previous year was very limited and based entirely on self-report. Second, comparison of the two survey samples, after eliminating respondents over age 65 and those with no private health care coverage, did not allow for more refined subgroup analyses (for example, comparison of the characteristics and utilization patterns for the Kaiser and non-Kaiser groups in different age-sex groups). Third, neither of the surveys contained questions about the health status and utilization histories of the families of the respondents. Lairson and Herd (1987) have suggested that "favorable selection" for HMOs may be more a function of the size and health of the individual's family than the individual per se.

Finally, the non-Kaiser insured group comprised people with diverse types of health care coverage—Independent Practice Association (IPA) and group model HMOs, conventional indemnity plans, preferred provider organizations (PPOs), self-insured employer plans, union-affiliated plans, and so forth, rather than conventional indemnity plans alone—although approximately 80% of the group were covered by a conventional plan. We do not know the extent to which inclusion of HMO and PPO subscribers in the non-Kaiser group mitigated against our finding significant between-group differences in health indicators and utilization rates. However, a separate parallel analysis of the CALBRFSS data comparing HMO enrollees versus conventional plan subscribers arrived at the same results. Because of the nature of the ACCDSS health care coverage questions, we were unable to separate HMO enrollees from conventional plan holders in order to make a cleaner comparison of the association of health care coverage with hospitalizations and illness-related outpatient visits during the previous year.

Further, studies in this new cost-containment era are needed to help resolve the question of whether prepaid health plans experience "favorable selection" based on an individual's health status and propensities to use health services, or whether the less hospital-based and more self-care and prevention-oriented practice styles associated with prepaid health plans are what really account for more "favorable costs."

APPENDIX

Health Care Coverage Questions on the Surveys

California Behavioral Risk Factor Surveillance Survey Questions:

Now I'd like to ask you a few questions about your health care coverage, which you use when paying hospital bills, doctor bills, or clinic bills. We are interested in the relationship between different kinds of health care coverage and use of preventive services.

Are you covered by any of the following kinds of health care plan?

Medicare? (available to adults over the age of 62 or on social security)

Medi-Cal? (available to low-income Californians, for example, those on SSI, AFDC)

Major medical insurance, which pays for hospital stays?

A health maintenance organization, or HMO, for example, Kaiser, Maxicare or Foundation, which allows you to see doctors for no fee or a small fee at each visit?

A health insurance plan, such as Blue Cross or Aetna, which pays a percentage of each doctor bill for routine care while you are responsible for the rest?

Any other type of plan, for example, the military or student health?

(If has a health plan): What is the name of your health plan?
(If more than one health plan): What is the name of the plan you use most often?

(If no apparent health care coverage): Does this mean you pay all the costs each time you see a doctor for routine office care?

Is there one doctor you usually go to who knows your medical history?

Alameda County Chronic Disease Surveillance Survey Questions:

Do you have any kind of health insurance or medical care plans, including Medi-Cal or Medicare?

Do you have the Kaiser plan?
Do you have Medi-Cal?
Do you have Medicare?
Does your health care plan cover all, most, some, or none of your hospital bills?
Does your health care plan cover all, most, some, or none of your doctor visits?
Does your health care plan cover all, most, some, or none of your prescriptions?
Does your health care plan cover all, most, some, or none of your check-ups or other preventative services?
How many different times were you in the hospital at least overnight in the past 12 months?
During the past 12 months, how many times did you see a doctor about your health when you were not feeling well?

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