

The Effect of Cost Sharing on the Use of Medical Services by Children

Interim Results from a Randomized Controlled Trial

Arleen Leibowitz, Willard G. Manning, Jr.,
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PREFACE

This research was performed as part of Rand's Health Insurance Experiment under Grant 016B80 from the U.S. Department of Health and Human Services. It considers how cost sharing affects the use of medical care by children under age 14. The authors draw upon data collected during the Health Insurance Experiment to examine total expenditures on medical care and hospital and outpatient use, particularly the use of preventive services. The health effects arising from differential use of medical services by children with different cost-sharing arrangements are reported in Robert Valdez et al., "The Consequences of Cost Sharing for Children's Health," *Pediatrics*, May 1985, also available from Rand as report R-3270-HHS (forthcoming).

The present study should be of interest to pediatricians and health policy analysts who are concerned about the effect of health care financing on children's use of health care. A shorter version of this report (without the appendixes) appeared in the May 1985 issue of *Pediatrics*.

SUMMARY

Health care expenditures of 1136 children whose families participated in a randomized trial, the Rand Health Insurance Experiment, are analyzed in this report. Results indicate that per capita use of medical services was one-third greater for children whose families were assigned to a health insurance plan that reimbursed them completely for medical services than for children whose families paid 95 percent of medical expenses.

Families participating in the Health Insurance Experiment were assigned by an unbiased allocation method to insurance plans that varied in the share of medical costs that families were required to pay. One plan provided free care; the others required families to pay either 25, 50, or 95 percent of their medical bills, up to an income-related family maximum. In general, the same coinsurance rate applied to all services. However, one plan, the individual deductible plan, provided free inpatient services but required 95 percent coinsurance for outpatient services, up to a maximum of \$150 per person. The insurance plans covered a wide range of medical services purchased in the fee-for-service sector. Most physician, hospital, and preventive services were covered. Families were enrolled at six sites across the United States. Data for two to three years from each of four sites are analyzed in this report. This represents about 40 percent of the data that will ultimately be available.

The results indicate that the use of outpatient services decreased as cost sharing rose for a variety of use measures: the probability of seeing a doctor during the year, total annual expenditures, number of visits per year. When they did visit the doctor, children on the 95 percent coinsurance plan were less likely to seek care from a pediatrician (as opposed to another type of primary care physician) than children whose families faced lower coinsurance rates.

Outpatient treatment episodes (defined as one or more medical services related to a given problem) also declined with increases in cost sharing. However, the average medical bill per episode did not differ significantly between cost sharing and free plans. Thus cost sharing affected whether parents sought treatment for their children but did not affect the amount of treatment after a visit was initiated. Episodes of treatment for preventive care were as responsive to cost sharing as episodes for acute or chronic illness. Because preventive services appear to be no more discretionary than medical care for acute

problems, full insurance coverage for preventive services would not stimulate use more than full coverage for acute problems.

Generally, hospital expenditures did not vary significantly among children insured on the various plans. Thus, inpatient care was not substituted for the reduced use of outpatient care under the cost sharing plans. In fact, hospital use was greater for young children enrolled in the two plans providing free inpatient services.

Although medical care use varied considerably with level of cost sharing, there was little relationship between use and family income. Because the maximum limit on expenditures was income-related, poor families were more likely than affluent ones to exceed the annual ceiling, after which all care became free. Had this not been the case, lower-income families might have spent less than they did on medical care.

The Health Insurance Experiment plans covered the spectrum of cost sharing from free care to a sizable family deductible. Although the free care plan was more generous than most existing plans, the other plans in the Experiment closely resemble generally available insurance policies. The amount of cost sharing experienced by families in the United States appears to fall within the range of the experimental 50 percent and 95 percent plans, both in terms of percentage of costs paid out-of-pocket and in terms of annual visit rates.

These results imply that reducing the amount of cost sharing for pediatric care will lead to substantial increases in outpatient use. However, reducing coinsurance for children's hospital expenses can be expected to have little impact on total costs of medical care. And fully covering preventive services would add only 5 to 10 percent to the medical care bill. Together with findings on health outcomes for children who participated in the Experiment, these results should aid in designing financial mechanisms that can provide for necessary medical care but that also incorporate incentives to use care wisely.

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Presentation of our findings to the Committee on Child Health Financing of the American Academy of Pediatrics greatly helped to focus the discussion in this report. The comments of Birt Harvey, M.D., on a previous draft are particularly appreciated. The above individuals do not necessarily agree with the conclusions reached by the authors.

CONTENTS

PREFACE	iii
SUMMARY	v
ACKNOWLEDGMENTS	vii
TABLES	xi
 PRIOR STUDIES	 1
METHODS	2
Design of the Health Insurance Experiment	2
Sample for Analysis of Child Health Expenditures	4
Measures of Child Health Use	5
Estimation Methodology	6
RESULTS	7
Descriptive Results for Children	7
Estimated Expenditures for Children's Health Care	10
Episodes of Outpatient Treatment for Children	11
DISCUSSION	13
Current Cost Charing for Children's Health Care	14
Recommendations for Change	15
Appendix	
A. COMPARISON OF HIE AND NATIONAL DATA ON CHILDREN'S MEDICAL USE	19
B. THE ESTIMATED EQUATIONS	22
GLOSSARY OF ACRONYMS	27
REFERENCES	31

TABLES

1. Proportion of Sample Remaining After Accounting for Refusals at Various Stages	3
2. Mean Annual Expenditures by Plan, for Children and Adults	5
3. Percentage of Children with Outpatient and Inpatient Use, by Plan and Age Group	8
4. Annual Office Visit Rates per Child Under 14, by Plan and Site	9
5. Proportion of Children's Visits to Pediatricians, by Plan	9
6. Estimated Annual Medical Expenditures per Child, by Plan	10
7. Annual Medical Expenditure per Child, by Income Tertile	11
8. Annual Outpatient Episodes of Treatment, by Plan	12
9. Outpatient Episodes per Year for Children Aged 0-13, by Type of Episode	13

THE EFFECT OF COST SHARING ON THE USE OF MEDICAL SERVICES BY CHILDREN: INTERIM RESULTS FROM A RANDOMIZED CONTROLLED TRIAL

Pediatricians and others concerned about children's health are intensely interested in how health care financing encourages or discourages the use of health care services for children.[1] Early results from the Rand Health Insurance Experiment (HIE) demonstrate that the use of medical services by people under age 65 is sensitive to cost sharing.[2,3] This report explores the degree to which the inverse relationship between use and the level of cost sharing in the fee-for-service system applies to children 13 years old and under. We examine whether price responsiveness affects both outpatient and inpatient care for children. We also examine how cost sharing affects different kinds of outpatient use: well care and care for acute and chronic conditions.

PRIOR STUDIES

In a sample of the population aged 64 or younger, adults and children whose medical expenses were fully covered by insurance spent about 50 percent more than those who faced cost sharing.[2] More generous insurance led to more episodes of treatment, particularly for acute conditions.[3]

An immediate question is whether those findings apply equally to children's expenditures. Two characteristics of children's health care suggest that the demand for pediatric health services might be more responsive to price than the demand for adults' care. First, the incidence of chronic disease is lower among children than among adults.[4] Many children's illnesses are acute but self-limiting. The demand for care for these illnesses may depend more on cost sharing than does the demand for treating diseases that will not resolve by themselves. Second, much of the medical care provided children is preventive care, which parents may regard as more discretionary than treatment for illness.

Conversely, when parents face cost sharing, they may be less willing to reduce their children's health care than to reduce their own—a preference that may be reinforced by government regulations requiring immunizations and regular checkups for children enrolled in school.

The literature contains no reports of controlled trials that varied cost sharing for pediatric care. Noncontrolled studies of pediatric care focus primarily on demographic determinants of health service use rather than on cost sharing. Families that are more advantaged (high income, high levels of parental education, smaller family size) use more preventive services for their children.[5,6] Perhaps because these demographic factors affect curative visits in the opposite way, the effects of demographic factors on total pediatric visits (preventive and curative) show less consistent effects.[7-14]

METHODS

Design of the Health Insurance Experiment

Because the details of the experimental design appear elsewhere [2,3], only the salient points are noted here. Excluding participants enrolled in a prepaid group practice (who are the subject of separate analyses), the HIE enrolled a representative random sample of more than 5800 persons aged 62 or younger at enrollment; 1844 of these were children aged 13 years or younger. The sample was drawn from families in six sites: Dayton, Ohio; Seattle, Washington; Fitchburg, Massachusetts, and Franklin County, Massachusetts; and Charleston, South Carolina, and Georgetown County, South Carolina. Of these families, 70 percent were enrolled for three years, 30 percent for five. Families were assigned to an experimental health insurance plan by an unbiased allocation method that made the distribution of over 20 characteristics related to health or expenditures as similar as possible across plans.[15] Of families who agreed to an initial interview, 14 percent refused the enrollment offer (Table 1); others had refused preliminary interviews. These families were not reassigned to another plan. Although there were some differences in the types of families that accepted the enrollment offer [16], there are no important differences in health or demographic variables between the sample of children enrolled in free and cost-sharing plans.[17]

The insurance plans varied along two dimensions: the coinsurance rate (fraction of the medical bill paid by the family in any one year) and the maximum dollar expenditure (MDE, an income-related upper limit on annual out-of-pocket expenditures). For the analyses reported in this report, the insurance plans are grouped as follows:

- a. One plan providing care with no out-of-pocket costs (i.e., 0-percent coinsurance), referred to as the "free care plan."

Table 1
PROPORTION OF SAMPLE REMAINING AFTER ACCOUNTING
FOR REFUSALS AT VARIOUS STAGES

Enrollment Criteria	Dayton	Seattle ^a	Mass.	South Carolina	Total
Initial sample	1.00	1.00	1.00	1.00	1.00
Did not refuse screening interview	0.88	0.85	1.00 ^b	1.00 ^b	0.94
Did not refuse baseline interview	0.74	0.78	0.88	0.95	0.85
Did not refuse enrollment interview	0.73	0.70	0.76	0.84	0.76
Did not refuse offer of enrollment	0.68	0.59	0.62	0.71	0.65
No. of families enrolled	390	484	566	568	2008

NOTE: These numbers do not account for families who moved before enrollment, could not be located, or were chronically not at home, or for other losses from the sample not due to refusal.

^aExcludes 752 families enrolled in the Group Health Cooperative of Puget Sound.

^bThere was no screening interview in Massachusetts or South Carolina.

- b. Six plans with a 25-percent coinsurance rate for medical care; in this set, the family paid 25 percent of its medical bills each year up to an MDE of 5, 10, or 15 percent of family income or \$1000 (\$750 in some sites in some years), whichever was lower. Participants in three of the plans paid a higher rate—50 percent—of their dental and outpatient mental health expenses.
- c. Three plans with a 50-percent coinsurance rate for all medical and dental services and the same income-related limitations as in (b).
- d. Three plans with a 95-percent coinsurance rate and the same income-related limitations as in (b).
- e. One plan with a 95-percent coinsurance rate on outpatient expenditures up to a maximum out-of-pocket expenditure of \$150 per person (\$450 per family) per year and no coinsurance after that; all inpatient care is free on this plan, which we refer to as the “individual deductible” plan.

All plans had an identical, comprehensive set of covered services that included ambulatory and hospital care, preventive services, all dental services (except nonpreventive orthodontia), all prescription and certain over-the-counter drugs, most supplies and durable medical equipment, psychiatric and psychological services (except outpatient psychotherapy visits exceeding 52 per person per year), and almost all other personal medical services (except cosmetic surgery for preexisting conditions). Services of nonphysician providers such as audiologists, optometrists, and speech therapists were also covered.

Sample for Analysis of Child Health Expenditures

The sample used in this report includes three years of data from Dayton and two years each from the Seattle and Massachusetts sites. Analysis of data from the South Carolina site is not yet complete. Results relating to episodes of treatment are based on data for children in the first three years of the Dayton site; data for these analyses for other sites are not yet complete. The expenditure analysis sample includes 1136 children who participated for at least one year and decedents who had participated during the year in which they died, but excludes, in the year they withdrew, children whose families withdrew from the Experiment. Over 90 percent of the children initially enrolled completed their assigned time on study.[17] Hence, we have made no adjustments for any bias resulting from attrition.

We also do not include expenditures for newborns during their first partial enrollment year; they are the subject of a forthcoming analysis. We limit our analyses to children 13 years of age and younger. Although pediatricians continue to treat many adolescents until a later age, we chose this definition to correspond to the age divisions used in HIE health questionnaires. Modest sample sizes and comparatively low use of medical care by children in general dictated against separate statistical modeling of use for age subgroups of children. Therefore, we present results on expenditure for the entire sample of children 13 years of age and younger.

After accounting for sample loss, we had 2662 full years of data on children (Table 2). Children assigned to the free plan accounted for about one-third of the observations. The remainder of the children faced cost sharing.

Table 2
MEAN ANNUAL EXPENDITURES BY PLAN, FOR CHILDREN AND ADULTS
(1983 Prices)

Plan	Total Medical Expenditure		Ambulatory Expenditure		Number of Person-Years for Ambulatory Expenditure	
	Child ^a	Adult ^b	Child ^a	Adult ^b	Child ^a	Adult ^b
Free care	\$389 (± 167)	\$871 (± 134)	\$192 (± 22)	\$402 (± 32)	864	1970
25% coinsurance	259 (± 81)	813 (± 171)	153 (± 28)	328 (± 39)	571	1221
50% coinsurance	301 (± 125)	771 (± 435)	192 (± 65)	242 (± 39)	241	525
95% coinsurance	213 (± 93)	570 (± 110)	114 (± 22)	249 (± 32)	513	1251
Individual deductible	278 (± 85)	723 (± 194)	162 (± 35)	287 (± 37)	473	1136

NOTE: 95 percent confidence intervals in parentheses. All prices have been adjusted using the Medical Care component of the Consumer Price Index (U.S. Bureau of Labor Statistics, *Monthly Labor Review*, various issues).

^aChildren aged 0-13.

^bPersons aged 14 and above.

Measures of Child Health Use

We examined several measures of medical use by children, including annual average medical expenditures and counts of the number of outpatient episodes of treatment for acute and chronic illness and well care. Our annual aggregates included all medical care delivered to children, except expenditures on outpatient mental health and dental care (which are examined in separate reports). [18,19] Claims filed by participants provided data on the type and amount of services and expenditures, including those not reimbursed by insurance (e.g., the coinsurance and deductible amounts). We summed claims data for each participant to arrive at annual expenditure totals and numbers of visits. Data in this analysis were collected between 1974 and 1978, but we adjusted expenditure data using the "Medical Care" Consumer Price Index published by the Bureau of Labor Statistics [20] to reflect medical care prices in 1983.

We calculated the average numbers of office visits to doctors of medicine and doctors of osteopathy during the second experimental year in each site. Second-year expenditures should be least affected by any temporary effects arising from the change in insurance experienced by each family at the start of the study. Well care use by free plan participants increased slightly in the first three months of the study and again at the conclusion of the study.[3]

We categorized care into "episodes of treatment," which consist of one or more medical services related to a given medical problem. Claims data were grouped into episodes using information on diagnosis, interval since previous charge for a related diagnosis, and provider-supplied treatment histories. For example, an initial visit for an ear infection and a recheck visit constituted one episode of treatment, as did a prescription drug purchase without an office visit. We examined three types of outpatient episodes: those for acute problems, for chronic problems, and for well care. Details of the analytic techniques used are given elsewhere.[3,21]

Estimation Methodology

As a result of random assignment, the distribution of factors affecting the demand for medical care use does not vary by insurance plan.[2,15] Therefore, average expenditures on each plan provide unbiased estimates of expenditure differences among the plans. However, large expenditures incurred by a few children with unusual health care needs can affect the mean expenditures on a plan dramatically, even though the HIE has data on sizable numbers of children in each plan. For example, a single child whose medical expenses amounted to \$68,400 in one year accounted for 20 percent of all expenditures on the free plan in the data analyzed here. Therefore, we used the estimation method described in [21], to provide more stable estimates, and to remove the within-plan differences attributable to age, sex, indicators of initial health status, income, and other demographic variables. These adjusted expenditures account for systematic differences in age and sex on children's medical use, allowing us to estimate more precisely the differences related solely to insurance plan. We have corrected the significance statistics to allow for the fact that children in the same family do not provide totally independent observations.[21] The effect of this correction is to provide a conservative estimate of the statistical significance of measured differences. Further details are given in [21].

The few large users of medical care have less influence on measures of use other than expenditure. In the case of number of visits and

numbers of episodes of treatment for acute, chronic, and well care, the sample means estimate the effect of plan with sufficient precision.

RESULTS

Descriptive Results for Children

Per-child expenditures averaged only 39 percent of per-adult expenditure (ages 14 to 65). The pattern of reduced expenditures with higher levels of cost sharing was evident, however, for both adults and children (Table 2). Simple means indicated that total expenditure per child (outpatient plus inpatient expenses) on the 95-percent plan averaged about 55 percent of that on the free plan. For adults, expenditures on the 95-percent plan were 65 percent of the free plan. Expenditures on the intermediate cost-sharing plans fell between these extremes, although average expenditures did not decline monotonically as cost sharing rose. Mean expenditures on the HIE plans were similar to an estimate of national health care expenditures for children under 19 derived from Fisher.[22] Adjusted to 1983 prices, expenditures on physician and other professional services, hospital care, and drugs average \$311 per year for children under 19.[22] (See Appendix A.)

Outpatient use accounted for 55 percent of all children's health expenses on the various plans—much higher than the 42 percent recorded by adults. The pattern of decreasing use with increasing cost sharing again was evident for outpatient expenditures. Expenditures on the 95-percent plan were 59 percent of those on the free plan.

That pattern is mirrored in measures of use other than expenditures. For both younger and older children, the probability of having at least one office visit per year decreased as cost sharing rose and as children aged (Table 3). By contrast, the probability of being hospitalized during a year showed no consistent pattern related to cost sharing for older children. For younger children, the two plans with no cost sharing for inpatient care—the free plan and the individual deductible plan—showed significantly greater hospital use than the cost-sharing plans. The average hospitalization rate for children in the HIE did not differ meaningfully from the national average (the admission probability is 0.05 from both data sources).

The average number of outpatient visits per year also declined as cost sharing increased (Table 4), averaging 2.9 for plans with cost sharing and 3.5 for the free plan. The office visit rates varied considerably by site, however. With one exception, Dayton rates were considerably higher than rates in the other sites, which approximated national averages.

Table 3
PERCENTAGE OF CHILDREN WITH OUTPATIENT AND
INPATIENT USE, BY PLAN AND AGE GROUP

Plan	Outpatient Use		Inpatient Use	
	0-4 Years	5-13 Years	0-4 Years	5-13 Years
Free care	95 (2.4)	85 (1.9)	8.8 (1.9)	4.4 (0.8)
25% coinsurance	90 (3.3)	79 (2.4)	4.2 (1.7)	4.7 (1.1)
50% coinsurance	94 (3.6)	74 (4.8)	6.5 (2.6)	4.9 (1.5)
95% coinsurance	82 (4.5)	68 (4.1)	4.5 (1.8)	4.2 (1.2)
Individual deductible	88 (2.8)	76 (3.3)	10.5 (2.8)	3.9 (1.1)

NOTES: Sample includes children aged 0-13 years who completed the entire enrollment year. Standard errors in parentheses; they have been corrected for intrafamily and intraperson correlation.

The 50-percent and 95-percent coinsurance and the individual deductible plans most closely approximate the level of coinsurance coverage available generally for pediatric services, including preventive services. Annual office visit rates per child on these plans ranged from a low of 1.7 visits (Fitchburg) to a high of 4.0 visits (Seattle). Nationally, children under 15 years averaged 2.0 visits per year (from a 1977 survey of visits to office-based physicians).[23]

One response to cost sharing is to reduce outpatient visits; another might be to use a different type of provider. To determine whether cost sharing was related to type of provider used, we calculated the share of visits to pediatricians among all primary care visits. Other primary care providers include family and general practitioners as well as internists. We also calculated the pediatrician's share among visits to all primary care physicians and specialists. Pediatricians accounted for nearly two-thirds of all primary care visits on the free, 25-percent, and 50-percent coinsurance plans (Table 5). Children on the 95-percent coinsurance plan were significantly less likely to see a pediatrician for primary care (56.4 percent of visits, versus 67.5 percent of visits on the free care plan). Considering both primary and specialist

Table 4
ANNUAL OFFICE VISIT RATES PER CHILD UNDER 14,
BY PLAN AND SITE

Plan	Dayton	Seattle	Fitchburg	Franklin
Free care	4.1 (0.43)	3.3 (0.33)	3.0 (0.54)	3.2 (0.53)
25% coinsurance	3.1 (0.75)	3.1 (0.60)	2.8 (0.50)	3.7 (0.82)
50% coinsurance	3.7 (0.61)	(a)	2.0 (0.53)	2.1 (0.67)
95% coinsurance	3.2 (0.69)	2.1 (0.43)	1.7 (0.42)	2.4 (0.58)
Individual deductible	2.0 (0.67)	4.0 (0.96)	1.9 (0.36)	2.4 (0.50)

NOTES: Sample includes children 0-13 years who were present the entire second enrollment year. Visits include all visits with MDs and DOs occurring in offices, clinics, emergency rooms, etc. Excludes telephone visits and visits to free-standing radiology and pathology providers. Standard errors, in parentheses, are corrected for intrafamily correlation.

^aThis plan not offered in Seattle.

Table 5
PROPORTION OF CHILDREN'S VISITS TO
PEDIATRICIANS, BY PLAN

Plan	Primary Care ^a (Percent)	All Visits (Percent)
Free care	67.5 (2.5)	49.4 (2.3)
25% coinsurance	61.9 (4.4)	44.1 (3.9)
50% coinsurance	69.1 (6.1)	49.2 (5.4)
95% coinsurance	56.4 ^b (4.7)	40.2 ^b (4.2)
Individual deductible	73.6 (4.5)	53.5 (4.0)

NOTE: Standard errors, shown in parentheses, have been corrected for intraperson correlation.

^aIncludes visits to pediatricians, internists, and family and general practitioners.

^bSignificantly different from the free-care percent at $p < 0.05$.

care, pediatricians accounted for nearly half the outpatient visits on the free plan. The pediatrician's share was significantly lower on the 95-percent coinsurance plan (40.2 percent, $p < 0.05$).

Estimated Expenditures for Children's Health Care

Although the pattern of plan differences in expenditures exhibited the expected decrease in use with increased cost sharing, the relatively large standard errors of simple means yield many insignificant plan differences in Table 2. Therefore, we used statistical methods that generate more precise estimates than sample means.

These methods provide our most reliable estimate of the effect of cost sharing on children's medical expenditures. Estimated expenditures (expressed in 1983 dollars) show less responsiveness to cost sharing than do simple means (Table 6), because the estimates are not unduly influenced by the outliers on the free plan. Families who paid 95 percent of their medical bills average 75 percent of the free plan medical expenses for their children. Each plan requiring copayment recorded per-child expenditures significantly below those on the free plan ($p < 0.05$ for plans with more than 25-percent copayment, $p < 0.07$ for the 25-percent copayment plan), thus confirming that cost sharing reduced total use of medical services. Decreased use of outpatient services as cost sharing rose largely accounted for the reduction in

Table 6
ESTIMATED ANNUAL MEDICAL EXPENDITURES
PER CHILD, BY PLAN

Plan	Expenditures (1983 Dollars) ^a	Ratio to Free Plan
Free care	\$345 (39)	1.0
25% coinsurance	309 (38)	0.90
50% coinsurance	281 (39)	0.81 ^b
95% coinsurance	260 (35)	0.75 ^b
Individual deductible	298 (38)	0.86 ^b

^aStandard error of the estimate in parentheses.

^bSignificantly different from free plan mean at ($p < 0.05$).

total medical expenditures because inpatient care for children was not greatly affected by cost sharing (Table 3). Because hospitalizations for children are infrequent, our estimates of hospital use have wide confidence intervals and we can be less certain than for outpatient care about the presence or absence of a cost-sharing response.

Estimated expenditures did not differ significantly by family income category (Table 7). The probability of using any medical care during a one-year period was significantly related to family income (Appendix B), but the effect of copayment on total medical expenditures did not depend on income level, when other determinants of use are controlled for statistically.

Episodes of Outpatient Treatment for Children

Cost sharing had its greatest effect in reducing outpatient care. To uncover the mechanisms by which cost sharing operated, we examined episodes of treatment for both children and adults in the Dayton site.

Table 7

ANNUAL MEDICAL EXPENDITURE PER CHILD, BY INCOME TERTILE^a

Income Tertile	Expenditures (1983 Dollars)
Low ^b	\$341 (41)
Middle	345 (39)
High	357 (41)

NOTE: Standard error of the estimate in parentheses.

^aPredicted from estimated multiple regression equation using actual characteristics of families in the various tertiles. The log of income had a positive, significant effect on the probability of any use of medical services ($p < 0.0001$), but no significant effect on the level of outpatient use, given that it was positive ($p = 0.30$).

^bLow income includes children in families in the lowest third of income distribution in their site. Middle income and high income indicate family income in the middle and highest thirds of the distribution, respectively.

Did cost sharing reduce the number of episodes or cost per episode? The number of treatment episodes for children under 14 declined from 4.4 episodes per year on the free plan to a low of 2.6 on the 95-percent plan (Table 8). Controlling for age, race, family income, and prior health, the number of episodes on each copayment plan was significantly lower than on the free plan ($p < 0.01$). Children receiving free care had 67 percent more episodes of treatment than children on the 95-percent plan, but the average cost per episode did not differ significantly between the two types ($p > 0.05$). Thus, cost sharing affected whether parents sought treatment for their children but did not affect the amount of treatment after a visit was initiated. (Note, however, that the average patient seeking treatment on the free care plan may be less severely ill, because a higher percentage of the episodes of illness are treated.)

Although children had about the same number of episodes as adults, their outpatient expenditures averaged only half of adults' expenses because their mean cost per episode was lower (Table 8).

Did cost sharing discourage preventive care more than acute or chronic care? To determine whether families facing cost sharing would forgo treatment for certain types of conditions more readily than

Table 8

ANNUAL OUTPATIENT EPISODES OF TREATMENT, BY PLAN

Plan	Mean No. of Episodes		Mean Cost per Episode (1983 Dollars)	
	Children < 14 Years	Adults ≥ 14 Years	Children < 14 Years	Adults ≥ 14 Years
Free	4.4	5.2	\$48	\$90
25% coinsurance	3.2	4.1	54	97
50% coinsurance	4.0	3.7	57	90
95% coinsurance	2.6	3.1	47	77
Individual deductible	2.9	3.5	37	84

NOTE: Based on 1015 person-years of data for children aged 0-13, and 2340 person-years of data for persons 14 and over for the first three years in the Dayton site. Differences in the mean number of patient episodes between the free plan and each of the cost-sharing plans were statistically significant on a one-tailed test ($p < 0.01$) in a regression equation that also controlled age, race, family income, and measures of health status at enrollment.

for others, we calculated the number of episodes of each of three types (Table 9). On the free plan in the Dayton site, 63 percent of children's episodes related to acute conditions, 24 percent to well care, and 13 percent to chronic conditions. Our data correspond to national averages which show that in 1975, 25.5 percent of all visits to pediatricians were for well-baby examinations, for general medical examinations, or for required physicals.[24]

Grouping together the plans requiring copayment, we determined that children on these plans had significantly fewer treatment episodes of each type than children on the free plan: They had 72 percent as many acute episodes, 76 percent as many well care episodes, and 63 percent as many chronic episodes ($p < 0.05$). Cost sharing reduced episodes of well care less than it reduced care seeking for acute or chronic problems. Thus we have no evidence that well care episodes were more discretionary, or that they were reduced proportionately more than acute or chronic episodes.

Table 9
OUTPATIENT EPISODES PER YEAR FOR CHILDREN
AGED 0-13, BY TYPE OF EPISODE
(First Three Years of Dayton)

Plan	Acute	Chronic	Well-Care
	Number of Episodes		
Free	2.79	0.58	1.06
Copayment	2.01	0.37	0.81
	Mean Cost per Episode		
Free	42	91	43
Copayment	42	112	46

NOTE: Based on 1015 person-years of data for children aged 0-13 who were enrolled for all three years in the Dayton site.

DISCUSSION

Spending on medical services responded to variation in cost sharing both for children and for adults. Per-child expenditures on the free plan were one-third higher than on the 95-percent cost-sharing plan—a response only slightly less than that of adults.[2] All the measures we examined showed an increase in outpatient use as cost sharing declined; those on the free plan had a higher probability of seeing a

doctor, higher annual expenditures, more visits, and more episodes of outpatient treatment.

Children in the free care plan were significantly more likely to receive their primary care from a pediatrician than children on the 95-percent plan. Although this finding appears to suggest that pediatricians charge more, in fact, HIE data show only slight price differentials between pediatricians and other providers treating children. Pediatricians' charges for a standard visit (corresponding to an intermediate examination for an established patient) averaged 3.5 percent more than general practitioners' fees for children in Dayton and 1.4 percent more in Seattle.[25] These small differentials are confirmed by other recent surveys of physician fees.[26] If participants correctly perceived the lack of a price differential, it is difficult to understand the relationship between plan and choice of a pediatrician as opposed to another physician.

For the most part, hospital expenditures did not vary significantly among children on the various plans. Thus, the lower use of outpatient care by children on the cost-sharing plans does not appear to have increased hospital use on those plans. In fact, young children on the two plans with free inpatient care were more likely to be hospitalized. The structure of the HIE plans, however, guaranteed that after a family on the cost-sharing plans exceeded an annual maximum out-of-pocket expenditure, all care was free for the remainder of the year; had the HIE plans not had an MDE, inpatient costs might have differed more among the plans.

Although we found large differences in medical care use as cost sharing varied, we saw little relationship between use and family income. Because the maximum limit on expenditures was income-related, poor families were more likely than affluent ones to exceed the annual ceiling, after which all care became free. Had this not been the case, lower-income families might have spent less than they did on medical care.

Current Cost Sharing for Children's Health Care

The HIE plans covered the spectrum of cost sharing from free care to a sizable family deductible. Where does the current national situation fall in this range? The HIE free care plan clearly represented more generous coverage than either Medicaid or virtually all private insurance plans offer. Although Medicaid has very limited out-of-pocket payments, its relatively low fee schedules are not universally accepted by physicians, whereas the HIE plans in general paid billed charges.

Nationally, the amount of cost sharing seems to be in the range of the experimental 50- to 95-percent coinsurance plans. National visit rates for children approximate visit rates on those two HIE plans. These plans also correspond to the national average in percentage of the medical care bill paid out of pocket. Families on these two plans paid 66 percent of children's outpatient costs, when nationally, families paid 75 percent of the office visit charges for children under 6 years old, and 71 percent of charges for children aged 6 to 18.[28]

The substantial share of children's outpatient expenses paid by families stands in contrast to the high proportion of children covered by health insurance (87.6 percent).[27] One reason the out-of-pocket payments remain high despite widespread insurance coverage is that health insurance rarely covers one of the most frequent types of child health care—well care. Although well care represents one-fourth of children's treatment episodes, and 15 percent of expenditures, only 3 percent of the plans held by HIE participants before enrollment explicitly stated that they covered preventive services. Seventeen percent of the plans did not cover outpatient care at all, whereas 48 percent covered some outpatient care, but not preventive care.¹ (Outpatient coverage was not defined in 32 percent of the plans.)

Recommendations for Change

Recently, the Committee on Child Health Financing of the American Academy of Pediatrics has called for reforms in health financing that would eliminate "financial barriers" for children's health care as well as broaden the range of services covered to include preventive care [1].

The results presented here are not sufficient to justify a particular level of cost sharing. Nonetheless they do have a number of implications. One rationale for less generous coverage of children's services is that they are more responsive to insurance, so increased coverage would stimulate excessive use. Our results, however, imply that expenditures for children's health care are no more responsive to coverage than adults'. Moreover, because children spend only 39 percent of the adult level, providing free care for children would be less costly in absolute terms than providing free care for adults. However, because of the lower costs and the greater share of outpatient care, children's expenditures are more predictable; therefore insurance is less necessary to protect families from large financial losses.

¹We are indebted to M. Susan Marquis for providing these estimates.

Similarly, the current lesser coverage for preventive services is partially rationalized by the belief that only nondiscretionary services—e.g., medical care for accidents or severe illness—should be covered by insurance. However, the HIE results imply that even care for acute illness is somewhat discretionary because it varied with insurance reimbursement. In fact, we have shown that free plan participants increased their use of acute care and preventive services at the same rate. Because preventive services appear to be no more discretionary than acute care services, there is no reason to provide poorer coverage for preventive services on that account. As in the case of children's health care generally, however, one can argue that well care is predictable, and insurance is therefore unnecessary.

Our results do give a rationale for covering inpatient care for children more fully than outpatient care. In contrast to the case for adults [2,3], older children's use of inpatient care was not significantly related to insurance plan. This lack of cost-sharing response for inpatient care implies that generous hospitalization insurance would not stimulate hospital use for children, particularly for those over 4 years old.

Some have argued that if inpatient care is covered more generously than outpatient care, medical expenses may rise (and health status deteriorate) because patients will delay seeking care until they have a more serious (hospitalizable) problem [29], or physicians will hospitalize them for services that could have been provided on an outpatient basis. Neither the results in this report nor those in a companion paper [17] support these contentions for children. The individual deductible plan fully covered inpatient care, but required some cost sharing for outpatient care. Overall, children on the individual deductible plan had significantly lower expenses than children on the free plan. The reduction in use may be attributable to lower inpatient as well as ambulatory expenses, as was the case for adults.[2] In summary, the HIE results suggest that with regard to hospitalization, financing packages could completely cover the costs of inpatient care for children with little danger of stimulating excessive use.

By contrast with inpatient care, the responsiveness of expenditures on ambulatory care to cost sharing implies that outpatient expenditures would be considerably higher if the currently high levels of copayment were eliminated. Assuming that the average family currently faces cost sharing comparable to that of the HIE 95-percent coinsurance plans, moving to free care would increase expenditures for children by about a third.

If preventive services nationally are on average covered somewhat less fully than on the HIE 95-percent plan, fully covering preventive services would increase preventive use per se some 30 percent (Table

3), but all outpatient visits would increase by only 5 to 10 percent, and expenditures would rise by 5 to 10 percent. (See Appendix A for a fuller description of these calculations.) Fully covering preventive services adds rather little to total expenses, because well care represents less than 15 percent of all expenditures for children's health care (Tables 6 and 9). The 5- to 10-percent increase in cost could clearly be financed by a modest increase in cost sharing for other services, if desired.

Decisions about financing of children's health care must not be made on the basis of cost considerations alone. Rather, we must ask what are the benefits of variations in coverage for preventive care, and how do they compare to the benefits of more coverage for acute and chronic problems? The HIE was not designed to test the effectiveness of preventive care, since all HIE plans covered preventive services. However, data on health outcomes for children participating in the HIE [17] reveal that little health benefit accrued to children on the free plan, who received more care. Together with the findings reported here, those results should aid in the design of financial mechanisms that can provide for necessary medical care but also incorporate incentives to use care wisely.

Appendix A

COMPARISON OF HIE AND NATIONAL DATA ON CHILDREN'S MEDICAL USE

The purpose of this appendix is to show how HIE data on expenditures and outpatient medical visits for children compare with national data. The appendix also describes the calculations involved in estimating the cost of fully covering preventive services for children.

COMPARING HIE AND NATIONAL EXPENDITURE ESTIMATES

The national expenditure figure reported in [22] for children under age 19 could not be directly compared to HIE expenditures for children because of differences in the year the data were collected (and therefore in price level), differences in the populations, and differences in the scope of medical services covered. To arrive at a comparable figure, we made adjustments to prices, estimates of expenditures, and estimates of populations covered.

For this comparison we used the latest data available from [22], relating to 1978. We applied the same BLS price index [20] as we used on the HIE data to calculate the value of 1978 expenditures in 1983 prices.

Fisher's [22] data include all health services and supplies received directly by individuals, including the institutionalized population. As Fisher notes, interpolation was required to arrive at a figure for expenditures by persons younger than 19 in the data presented in [22]. To make national data comparable to HIE data, we included personal health care expenditures on hospital care, physicians' services, other professional services, and two-thirds of the expenditures on drugs and drug sundries. We excluded one-third of the drug expenditures to account for the fact that the HIE did not cover nonprescription drugs, which the national data include.

Because the HIE excluded institutionalized individuals, we had to make adjustments to both the estimates of national expenditures on children and to our estimate of the numbers of children covered nationally. To arrive at an expenditure estimate comparable to that in the HIE, we included governmental payments through Medicaid.

Medicare, and other public assistance. Much of the expenditure in other public programs (including expenditures by the Department of Defense, state and local hospitals, and other public expenditures) supports care for the institutionalized population (e.g., patients in state hospitals for the retarded). The excluded programs account for 42.5 percent of all health services and supplies paid for by public programs. We assumed that the excluded public programs had the same distribution among services (e.g., hospital care, drugs) as the included programs, and therefore excluded from total expenditures 42.5 percent of public program expenditures on children.

To convert these expenditures to a per capita figure, we had to define a comparable population. From the *1970 Census of Population* [30], we determined that 99.6 percent of the population of children aged 18 and under were not in institutions. We therefore multiplied the total population of children under 19 by 0.996 to arrive at the proper denominator. Adjusting to 1983 prices, we estimate that per child expenditures average \$311.

COMPARING HIE AND NATIONAL VISIT RATES

Because of the logic used in the HIE to define episodes of illness, each well-care episode may reasonably be associated with a single doctor visit. Thus, free plan participants averaged 1.06 preventive visits and pay plan participants averaged 0.81 preventive visit per year (Table 9). This compares to a national estimate of 0.8 preventive visit per child aged 14 and under. The national estimate was calculated as a weighted average of visits rates for general checkups or immunization of 1.64 per year for children under 5 and 0.40 for children aged 5 to 14 [31, pp. 54 and 60].

The percentage of all HIE pediatric visits devoted to preventive care also corresponds well to national rates. From Table 9, we calculate that 25.4 percent of cost-sharing episodes and 23.9 percent of free plan episodes are for preventive care. Nationally, we estimate that 27.5 percent of visits are for preventive care (0.8 preventive visit out of an annual total of 2.9 visits per child). We derived a national office visit rate comparable to the HIE rates by subtracting nonoffice visits—such as telephone, clinic, and emergency room visits—from the published national figures that include them. For children under 5 years old, 59.5 percent of visits are office visits; for children aged 5 to 14, 65.9 percent of all visits are office visits [31, p. 52]. Applying a weighted average of 63.6 percent office visits to the overall visit rate of 4.6 visits per year [31, pp. 54 and 60] yields an office visit rate of 2.9 per child aged 0 to 14.

CALCULATING THE COST OF COVERING PREVENTIVE SERVICES FOR CHILDREN

From Table 9 we can calculate that preventive care accounts for 21.1 percent of outpatient expenditures on the free plan ($45.88/215.54$) and 22.8 percent of outpatient expenditures on the cost-sharing plans ($37.26/163.12$). This amounts to 13.3 percent of total free plan expenditures and 12.9 percent of total cost-sharing plan expenditures, because outpatient care accounts for only a portion of total expenditures (Tables 6 and 9).

Since preventive services respond to price in the same way as total expenditures, we calculate that a move from nearly zero coverage to full coverage would increase expenditures on preventive care by 32.7 percent. Since this increase applies only to the 13 percent of expenses related to preventive care, total outlays would rise by 4.25 percent (0.13×0.327). If we assume that all the price response is accounted for by ambulatory care and none by inpatient care, ambulatory costs would rise by 60 percent when cost sharing is eliminated. This would result in an increase in total expenditures of 7.8 percent (0.13×0.6).

Appendix B

THE ESTIMATED EQUATIONS

This appendix contains the estimated equations of the four-part model for children. Equations 1 to 4 were used to make predictions shown in Tables 6 and 7.

Equation 1 was estimated by a maximum likelihood probit routine that did not directly account for intrafamily correlation. As a result, the standard errors in Equations 1 and 2 are understated and the t-statistics are overstated by 34.7 percent. A glossary of acronyms used in this appendix follows the equations. Equations 5 and 6 show the result of testing an income by plan interaction in Equations 1 and 3. In neither equation does the set of interactions contribute significantly to explanatory power. Neither income nor plan had a significant direct effect in Equations 2 and 4. Therefore, we did not test for an interaction. The plan by income interactions did not contribute significantly to explanatory power in either the equation explaining any use (Chi-square = 0.55) or in the equation explaining level of ambulatory only use, given that medical care was used ($F = 0.99$). Therefore, income by plan interactions were not included in the final estimating equations (Equations 1 to 4).

Equation 1

PROBABILITY OF POSITIVE USE

Term	Coeff.	S.E.	t-statistic
CONSTANT	-0.2476	0.5468	1.0000
P25	-0.1978	0.0908	2.1791
P50	-0.4483	0.1207	-3.7152
PFD	-0.5810	0.0877	-6.6208
IDP	-0.3299	0.0948	-3.4791
EXAM	0.0439	0.0729	0.6021
LINC	0.3416	0.0590	5.7908
LFAM	-0.2334	0.1129	2.0671
BLACK	-0.6099	0.1341	-4.5468
HLTHG	0.0698	0.0785	0.8888
HLTHFP	0.2849	0.2033	1.4013
PAINL	0.0102	0.0769	0.1323
PAINSG	0.0130	0.1444	0.0903
WORRL	-0.0452	0.0932	-0.4849
WORRSG	-0.1115	0.1082	-1.0300
NOMDVIS	-0.2738	0.0936	-2.9246
INMDVIS	-0.4743	0.1124	-4.2198
YR3	-0.1633	0.0690	-2.3667
AFDC	-0.9897	0.2294	-4.3139
AFDCSEA	1.8646	0.2967	6.2841
EXAMFIT	0.4274	0.1773	2.4103
SEA	-0.1061	0.0980	-1.0830
FIT	-0.0768	0.1591	-0.4828
FRA	0.2579	0.1071	2.4072
FEMALE	0.1451	0.0619	2.3450
NEWMEM	0.4391	0.2093	2.0981
AGE	-0.1881	0.0436	-4.3141
AGESQ	0.0090	0.0028	3.2234
Y2	0.1567	0.0652	2.4018
Y3	0.0314	0.1157	0.2716
N = 2662			

Equation 2

PROBABILITY OF POSITIVE INPATIENT

Term	Coeff.	S.E.	t-statistic
CONSTANT	-1.1283	0.107	-10.54
AGE	-0.1038	0.038	-2.75
AGESQ	0.0056	0.003	1.98
FEMALE	-0.1158	0.084	-1.38
N = 2172			

Equation 3

LEVEL OF LOG (AMBULATORY ONLY) USE

Term	Coeff.	S.E.	t-statistic
CONSTANT	5.8322	0.5510	10.5841
P25	-0.3437	0.1249	-2.7525
P50	-0.1255	0.1432	-0.8767
PFD	-0.6559	0.1334	-4.9175
IDP	-0.6000	0.1967	-3.0510
EXAM	0.1506	0.0587	2.5646
LINC	0.0403	0.0529	0.7612
LFAM	0.0484	0.1223	0.3958
BLACK	-0.3816	0.1414	-2.6994
P25SEA	0.2958	0.1868	1.5834
PFDSEA	0.5528	0.2013	2.7463
IDPSEA	0.5076	0.2424	2.0944
P25FIT	0.6460	0.2248	2.8729
P50FIT	-0.1356	0.2709	-0.5006
PFDFIT	0.2521	0.2278	1.1068
IDPFIT	0.4635	0.2559	1.8109
P25FRA	0.1442	0.1945	0.7413
P50FRA	-0.0837	0.2839	-0.2948
PFDFRA	0.4329	0.2127	2.0355
IDPFRA	0.4887	0.2433	2.0090
HLTHG	0.0253	0.0681	0.3722
HLTHFP	0.2353	0.1665	1.4129
PAINL	-0.0254	0.0687	-0.3688
PAINSG	0.1448	0.1214	1.1924
WORRL	0.1238	0.0801	1.5470
WORRSG	0.2059	0.0935	2.2012
NOMDVIS	-0.0712	0.0939	-0.7584
INMDVIS	-0.3979	0.0979	-4.0634
YR3	0.0075	0.0738	0.1010
YR3DAY	0.1303	0.1199	1.0869
LFAMDAY	-0.5975	0.1941	-3.0789
AFDC	-0.6296	0.3332	-1.8896
AFDCSEA	0.6280	0.3539	1.7746
SEA	-1.0755	0.3326	-3.2333
FIT	-1.3416	0.3452	-3.8864
FRA	-1.2932	0.3378	-3.8281
FEMALE	0.0125	0.0526	0.2373
NEWMEM	0.5856	0.1557	3.7621
AGE	-0.1270	0.0309	-4.1118
AGESQ	0.0091	0.0021	4.4424
Y2	-0.0670	0.0427	-1.5686
Y3	-0.1163	0.0762	-1.5262

N = 2033

Equation 4

LEVEL OF LOG USE (FOR INPATIENT USERS)

Term	Coeff.	S.E.	t-statistic
CONSTANT	7.6707	0.0893	85.88
FIT	-0.1562	0.1674	-0.93
FRA	-0.0988	0.1635	-0.60
SEA	-0.3099	0.1403	-2.21
N = 136			
R ² = 0.0362			

Equation 5

PROBABILITY OF POSITIVE USE WITH INCOME AND
PLAN INTERACTIONS

Term	Coeff.	S.E.	t-statistic
CONSTANT	0.086	0.875	0.099
P25	0.548	1.194	0.459
P50	0.423	1.519	0.278
PFD	-1.331	1.220	-1.091
IDP	0.209	1.221	0.171
EXAM	0.064	0.073	0.876
LINC	0.311	0.094	3.319
LFAM	-0.108	0.150	-0.720
BLACK	-0.583	0.134	-4.343
LINCP25	0.039	0.133	0.293
LINCP50	-0.003	0.167	-0.016
LINCPFD	0.081	0.135	0.605
LINCIDP	-0.014	0.136	-0.101
NOMDVIS	0.265	0.094	2.826
INMDVIS	0.495	0.108	4.582
AFDC	0.965	0.239	4.042
AFDCSEA	1.827	0.299	6.115
EXAMFIT	0.404	0.177	2.284
LFAMDAY	0.216	0.213	1.018
SEA	-0.476	0.334	-1.427
FIT	-0.440	0.360	-1.220
FRA	-0.116	0.345	-0.336
FEMALE	0.144	0.062	2.330
NEWMEM	0.464	0.208	2.231
AGE	0.187	0.043	4.299
AGESQ	0.009	0.003	3.212
Y2	-0.154	0.065	-2.371
Y3	0.031	0.116	0.266

Equation 6

LEVEL OF LOG (AMBULATORY ONLY) USE
WITH INCOME AND PLAN INTERACTIONS

Term	Coeff.	S.E.	t-statistic
CONSTANT	6.137	0.734	8.359
P25	0.033	1.079	0.031
P50	-1.029	1.398	-0.736
PFD	1.191	1.208	0.986
IDP	-0.509	1.112	-0.458
EXAM	0.130	0.064	2.024
LINC	0.016	0.077	0.205
LFAM	0.067	0.124	0.543
BLACK	-0.367	0.142	-2.581
LINCP25	0.018	0.119	0.155
LINCP50	0.102	0.152	0.668
LINCPFD	-0.169	0.132	-1.278
LINCIDP	0.034	0.123	0.272
NOMDVIS	-0.066	0.095	-0.700
INMDVIS	-0.516	0.094	-5.485
AFDC	-0.860	0.339	-2.538
AFDCSEA	0.821	0.358	2.294
EXAMFIT	0.026	0.157	0.163
LFAMDAY	-0.640	0.196	-3.269
SEA	-0.955	0.304	-3.145
FIT	-1.260	0.327	-3.851
FRA	-1.235	0.310	-3.986
FEMALE	0.005	0.053	0.090
NEWMEM	0.568	0.156	3.645
AGE	-0.122	0.031	-3.924
AGESQ	0.009	0.002	4.338
Y2	-0.070	0.043	-1.640
Y3	0.124	0.076	1.637

GLOSSARY OF ACRONYMS

Acronym	Meaning
CONSTANT	Intercept
P25 ^a	= 1 if individual on 25-percent coinsurance, = 0 otherwise.
P50 ^a	= 1 if individual on 50-percent coinsurance, = 0 otherwise.
PFD ^a	= 1 if individual on 95-percent coinsurance, = 0 otherwise.
IDP ^a	= 1 if individual on Individual Deductible Plan, = 0 otherwise.
EXAM	= 1 if individual took entrance screening examination, = 0 otherwise.
LINC ^b	= natural logarithm of a weighted average of 2 years of family income in 1972 dollars.
LFAM	= natural logarithm of family size.
BLACK	= 1 if family is black, = 0 otherwise.
HLTHG ^c	= 1 if self-rated health is good, = 0 otherwise.
HLTHFP ^c	= 1 if self-rated health is fair or poor, = 0 otherwise.
PAINL ^d	= 1 if self-reported pain is little, = 0 otherwise.
PAINSG ^d	= 1 if self-reported pain is great or some, = 0 otherwise.
WORRL ^e	= 1 if self-reported worry about health is little, = 0 otherwise.
WORRSG ^e	= 1 if self-reported worry about health is some or great, = 0 otherwise.
NOMDVIS	= 1 if no visits to physician in year prior to baseline interview, = 0 otherwise.

INMDVIS	= 1 if 0 or 1 visits to physician in year prior to baseline interview, = reciprocal of number of visits to physician otherwise.
YR3	= 1 if individual enrolled for 3 years, = 0 if individual enrolled for 5 years.
AFDC	= 1 if someone in family received Aid to Families with Dependent Children, = 0 otherwise.
SEA	= 1 if observation from Seattle, = 0 otherwise.
FIT	= 1 if observation from Fitchburg, = 0 otherwise.
FRA	= 1 if observation from Franklin County, = 0 otherwise.
AFDCSEA	= (AFDC) * (SEA)
EXAMFIT	= (EXAM) * (FIT)
FEMALE	= 1 if female, = 0 if male.
NEWMEM	= 1 if added to family after baseline interview, = 0 otherwise.
AGE	= Age in years.
AGESQ	= Age squared.
Y2	= 1 if observation from year 2, = 0 otherwise.
Y3	= 1 if observation from year 3, = 0 otherwise.
P25SEA	= (P25) * (SEA)
PFDSEA	= (PFD) * (SEA)
IDPSEA	= (IDP) * (SEA)
P25FIT	= (P25) * (FIT)
P50FIT	= (P50) * (FIT)
PFDFIT	= (PFD) * (FIT)
IDPFIT	= (IDP) * (FIT)
P25FRA	= (P25) * (FRA)

$P50FRA = (P50) * (FRA)$
 $P50FRA = (P50) * (FRA)$
 $IDPFRA = (IDP) * (FRA)$
 $LINCP25 = (LINC) * (P25)$
 $LINCP50 = (LINC) * (P50)$
 $LINCPFD = (LINC) * (PFD)$
 $LINCIDP = (LINC) * (IDP)$

^aThe omitted variable is the free plan.

^bIncome is set equal to \$1000 if reported to be less. The years averaged are 1972 and 1973 in Dayton and 1973 and 1974 in the other sites. Each year received a weight of 0.5 in constant dollars.

^cThe omitted variable is self-rated health excellent.

^dThe omitted variable is self-reported pain none.

^eThe omitted variable is self-reported worry about health none.

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