THE EFFECTS OF HEALTH INSURANCE STATUS ON CONSUMER SPENDING

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Note: This work is substantially abridged. For a complete version, see *Monthly Labor Review*, March 1995, pp. 34-54. The views expressed herein are those of the authors and do not reflect the policies of the Bureau of Labor Statistics (BLS) or the views of other BLS staff members.

In 1993, the nation's health care costs rose to $884.2 billion, up 7.8 percent from 1992. As a share of Gross Domestic Product (GDP), this accounted for 13.9 percent (HHS 1994, p.1) compared to 5.9 percent of GDP in 1965 (NCHS 1993, p. 161), the year in which the federal government initiated Medicare and Medicaid.

As health care costs and usage rose, much of the burden of funding health care shifted to business and government. The business share of health services and supplies grew from 16 percent in 1965 to 28 percent in 1981, and remained fairly stable thereafter (Cowan and McDonnell 1993, p. 229). The federal government's share, however, continued to grow (12.2 percent average yearly increase for 1989-1993), and in 1993 comprised 31.7 percent of the national health care bill (HHS 1994, table 1).

Consumer expenditures for health insurance premiums also have increased recently, probably due, in part, to the shifting of premium costs from employer to employee. The Consumer Expenditure Interview Survey (CE) shows that the percentage of families reporting health insurance expenditures has risen steadily from 55 percent in 1988 to 61 percent in 1993. The CE also shows that premiums have increased from 39 percent of the average family's health care spending in 1988 to 45 percent in 1993. In actual dollars, average premium spending rose 69 percent over this period.

Jacobs and Shipp (1993) show that as a share of current consumption,[1] out-of-pocket health care expenditures peaked at 6.7 percent in 1960-61, declined to 5.4 percent in 1972-73,[2] and rose to 5.7 percent in 1988-89. In 1993, it was 6.9 percent.

Rising health care prices, increased usage, changing demographics, and perennial concerns about government fiscal austerity continually spark debates over health care funding. Households, which have avoided much of the burden of the increase in health care expenditures, are likely to pay a larger share in the future. It is therefore important to examine household expenditure patterns to assess the effect that a transfer of health care costs to consumers may have.

Table I. Selected Characteristics by Insurance Status, 1993 CE Data

Item	Fully Covered	Partially Covered	Medicaid	Not Covered
Sample size	13,394	2,399	1,793	3,291
Number of CUs (in 000's)	63,280	11,260	9,057	16,184
Age of reference person	51.4	45.0	45.0	37.0
Annual income[1]	$33,603	$34,770	$13,041	$21,294
Average number in CU:				
Persons	2.2	3.5	3.2	2.5
Earners	1.3	2.0	0.8	1.4
Children under 18	0.5	1.0	1.4	0.8
Persons over 64	0.4	0.2	0.3	0.0
Percent distribution:				
Age of reference person				
Under 25	4	7	14	19
25-34	18	20	25	28
35-64	49	62	42	51
65-74	16	8	10	1
75 and above	14	4	9	1
Income distribution				
1st quintile	14	10	55	31
2nd quintile	18	16	26	25
3rd quintile	21	23	11	20
4th quintile	23	27	5	13
5th quintile	24	23	3	11
Ethnicity-reference person				
Black	7	12	26	13
Hispanic	4	10	17	13
White and other	90	78	57	74
Educ. of reference person				
Less than H. S. diploma	18	22	50	24
H. S grad/some college	54	60	46	58
College graduate	28	18	4	18
Composition of CU				
Husband/Wife only	28	10	6	10
Husband/Wife/Children	26	36	18	28
Single parent	4	7	26	9
Single person	33	0	20	37
Other	8	47	30	16
Region of residence				
Northeast	22	17	21	15
Midwest	26	25	23	23
South	32	36	35	39
West	19	22	21	23
Occup.-reference person				
Wage and Salary	63	77	37	76
Prof., mgr., supervisor	27	25	4	18
Tech., sales, clerical	15	19	8	15
Service	5	8	8	15
Blue collar and other	16	25	17	28
Self employed	7	6	3	8
Retired	24	10	14	3
Out of labor force	5	7	47	13

[1] Complete income reporters only

Several recent studies have used CE data to analyze different aspects of health care. Miller (1990) and Reise (1993) examine the probability of purchasing health insurance. Rubin and Koelln (1993) test for moral hazard and adverse selection. Rasell, Bernstein, and Tang (1993) combine CE data with National Medical Expenditure Survey data and find regressivity in the distribution of health care expenditures by income level. In this study, CE data are examined to ascertain the relationship of detailed expenditures, including out-of-pocket health care expenditures, to demographic characteristics of families with distinctly different health insurance status.

The Data. The data are for all families interviewed between January and December 1993. The sample size is 20,877 observations[3] which, when weighted, represent about 100 million families.

Definitions of Health Insurance Status. Following Miller and Reise, the *fully insured* include families whose sum of members covered by each insurance policy[4] is equal to or greater than the number of family members. The *partially insured* include those families whose number of members covered is less than the total number of members. *Medicaid recipients* are those families with at least one member receiving Medicaid, regardless of what other policies they may have. Families that report no policies, policies that covered only someone outside the consumer unit (such as a child at school), or limited coverage policies[5] are *uninsured*.

Demographic Characteristics. The CE also gathers information on demographic characteristics (BLS 1995). Table I presents selected characteristics by health insurance status. Characteristics either refer to the family as a whole, e.g., income before taxes,[6] or to the reference person,[7] e.g., age.

Expenditure shares. One way to examine the data is to search for relationships described by Ernst Engel. In 1857, Engel made his famous proposal that as income increases, the share of income spent on food decreases (Graham et al., 1972). The principle still holds true when shares of total expenditures, rather than income, are examined. In table II, total expenditures are used as a proxy for income because expenditures depend not only on current income, but also on past as well as expected future income. This relates to the "permanent income hypothesis" (Friedman 1957). Furthermore, because all families report total expenditures, but not all report income, we do not need to restrict the sample to include only complete income reporters.

Table II shows that in 1993, total expenditures of both the partially and the fully insured groups are about $8,000 higher than those of the uninsured group, and about $16,000 higher than those in the Medicaid group. Among the four groups, the fully insured allocate the smallest expenditure share (about one-tenth of total expenditures) to food at home, while Medicaid families allocate twice that share (about one-fifth of total expenditures). This example of an Engel relationship holds for a number of expenditure categories when a comparison between the higher and lower income groups is made.

Table II: Selected Average Annual Expenditures and Budget Shares

Expenditure	Fully Covered	Partially Covered	Medicaid	Not Covered
Total Expenditures	$30,372	$31,008	$14,967	$22,492
Share of total	100%	100%	100%	100%
Food at Home ($'s)	3,192	3,908	3,080	2,904
Share of total	10.5%	12.6%	20.6%	12.9%
Housing ($'s)	9,120	9,276	5,532	7,264
Share of total	30.0%	29.9%	36.9%	32.3%
Apparel/Services ($'s)	1,396	1,460	728	1,048
Share of total	4.6%	4.7%	4.9%	4.7%
Transportation ($'s)	5,480	6,220	2,456	4,160
Share of total	18.0%	20.1%	16.4%	18.5%
Health Care ($'s)	2,064	1,628	544	664
Share of total	6.8%	5.3%	3.6%	2.9%
Recreation ($'s)	3,908	3,308	1,104	2,624
Share of total	12.9%	10.7%	7.4%	11.7%

For fully insured families housing comprises the largest expenditure, accounting for three-tenths of total expenditures. Expenditure shares for the next largest major expenditures--transportation (18 percent), other expenditures (15 percent), and recreational goods and services (13 percent)--account for substantially smaller portions of total expenditures. Apparel and services accounts for about 5 percent of the budget, a share that is similar regardless of insurance status.

The partially insured group allocates its budget in a similar fashion to those that have full insurance coverage. Food at home and transportation shares for this group are, however, slightly larger than those of the fully insured group. This is probably the case because families that are partially insured have, on average, more family members and income earners than do families that are fully insured. Also, all sub-component shares in the recreation category, which account for about one-tenth of total expenditures for the partially insured, are slightly lower than those of the fully insured.

An analysis of the Medicaid group's expenditure shares shows a definite Engel relationship for several categories. This group devotes larger shares than any other group to housing (37 percent) and food at home[8]

(21 percent). As noted earlier, their food at home share is about twice that of fully insured families. Expenditure shares for recreation and for all other expenditures are substantially lower for Medicaid recipients.

The expenditure shares of the uninsured group have a similar pattern to those families that are fully and partially insured. The share for housing is larger for the uninsured than it is for the fully and partially insured, but smaller than it is for the Medicaid group. They allocate larger shares for tobacco and alcohol, food away from home, entertainment, and education than most or all of the other groups. This may reflect the greater proportion of single and younger persons in the uninsured group.

Table III: Average Annual Health Care Expenditures and Budget Shares

Expenditure	Fully Covered	Partially Covered	Medicaid	Not Covered
Total Health Care	**$2,064**	**$1,628**	**$544**	**$664**
Share of health care	**100%**	**100%**	**100%**	**100%**
Health Insurance ($'s)	**1,044**	**700**	**280**	**168**
Share of total	**50.6%**	**43.0%**	**51.5%**	**25.4%**
Medical Services ($'s)	**676**	**668**	**152**	**360**
Share of total	**32.7%**	**41.1%**	**27.8%**	**54.6%**
Prescription Drugs ($'s)	**344**	**260**	**112**	**132**
Share of total	**16.7%**	**15.9%**	**20.7%**	**20.0%**

Health care spending. Health care expenditures (table III) are composed of health insurance, medical services, and prescription drugs and medical supplies. Fully insured families allocate the largest share to health care (7 percent), with insurance accounting for about one-half of health care expenditures for this group. The health care expenditure share for the partially insured is lower than that of the fully insured group due mainly to a smaller share of total expenditures allocated to health insurance. Health care consumes a relatively small portion of the Medicaid group's budget, due to government subsidization. The uninsured group allocates the smallest share for health care (3 percent). The typically younger members of this group may, on average, be in better health than members of other groups. Also, because of their age, they may be less risk averse and may hold entry level jobs that limit access to employer sponsored health insurance.

Regressions. Although shares analysis provides some insight into spending patterns, by itself it is not conclusive; it makes some attempt to control for income, but does not control for other characteristics. For example, table II shows that partially insured families spend a larger share of income on food at home than fully insured families, even though they have slightly (though not statistically significantly) more income. This apparent violation of Engel's proposition may be due to the larger average family size of those with partial insurance.

Regressions allow comparisons of expenditures across insurance groups given that characteristics are held constant. This way differences observed in expenditure patterns are more likely related to insurance status than to differences in other characteristics. Furthermore, they provide insight into the potential change in expenditure patterns if health care costs are increasingly borne by the consumer.

Dependent variables. The dependent variables are food at home, housing (less other lodging), apparel and services, transportation (less trips), and recreation and related expenditures. Health care expenditures are omitted because of the difficulty in adequately modeling health care expenditures using CE data.

Model Specification. Each model is specified as follows:

$$Y = a_f + a_j D_j + b_{if} X_{if} + b_{ij} D_j X_{ij} + e_j$$

where

Y is the expenditure to be predicted;

a_k is a parameter estimate for insurance group k (fully insured, partially insured, Medicaid, uninsured);

D_j is a dummy variable describing insurance group j;

b_{ik} is a vector of parameter estimates;

X_{ik} is a vector of demographic characteristics.

Regressions are run using Weighted Least Squares (WLS) to correct for heteroskedasticity.

Income and Expenditures. Including an income variable is extremely important for two reasons. First, levels of detailed expenditures in general are expected to increase as incomes increase. Second, if health care costs are shifted onto the consumer in the future, as is possible, then each dollar of total expenditures that the consumer spends on health care diminishes the amount of total expenditures available to spend on other items, if all else is equal. Including an income variable allows the researcher to estimate both marginal propesity to consume (i.e., the portion of each additional dollar of income that the consumer will allocate to a selected expenditure), and the percent change in each expenditure given a one percent change in income (i.e., income elasticity). It is important to note that a dollar-for-dollar shift of health care costs onto the consumer does not necessarily imply that consumers will automatically increase their health care expenditures by the same level. For example, a family may have a policy with a $200 deductible for doctor's visits, which it reaches or exceeds every year. If the deductible is raised to $300, the family may still choose to pay only $200 in out-of-pocket expenditures by not visiting the doctor for minor ailments. Nevertheless, if

for any reason the family now does use more than $200 in services, its members have less money to allocate to food, housing, and other expenditures. Since changes in health care costs are expected to affect total expenditures for families with different levels of insurance in different ways, it is important to analyze the relationship of expenditures to income by insurance group.[9] For the reasons described earlier, total expenditures are used in the regressions as a proxy for permanent income.[10]

Results. Table IV shows the income parameter estimates from each regression. For convenience, "raw" parameter estimates are summed before presenting in the table.

Table IV: Parameter Estimates: Total Expenditures by Insurance Status

Regression	Fully Covered	Partially Covered	Medicaid	Not Covered
Food at Home	**0.061***	**0.074****	**0.123****	**0.084****
Housing (Owners)	**0.285***	**0.278**	**0.287**	**0.315****
Renters	**0.320***	**0.268****	**0.429****	**0.301**
No Mortgage	**0.236***	**0.184****	**0.242**	**0.247**
Apparel/Services	**0.049***	**0.056****	**0.056****	**0.050**
Transportation	**0.185***	**0.228****	**0.166****	**0.168****
Recreation	**0.145***	**0.123****	**0.089****	**0.142**

*** Parameter estimate is significantly different from zero.**
**** Parameter estimate is significantly different from fully covered group's.**

Food at home. Each insurance group has a positive, statistically significant coefficient for permanent income in the food at home regression. This means that given an extra dollar, all families are predicted to increase their food at home expenditures, but that fully insured families would increase them the least (six cents), followed by the partially insured (seven cents), the uninsured (eight cents) and Medicaid families (12 cents). The income elasticities implied by these figures are discussed later.

Housing (less other lodging). The relationship between housing expenditures and permanent income differs little across insurance groups, at least for homeowners with mortgages. All are predicted to spend about 28 cents out of every additional dollar on housing, except for uninsured families. These families are predicted to spend three cents more (or 31 cents) out of every additional dollar on housing.

When the mortgage is paid off, the marginal propensity to consume housing declines. For the fully insured, the decrease is nearly five cents. For the partially insured the decrease is nearly double--9 cents, while for uninsured families it appears to decrease by about 2 cents, though the parameter estimate for the interaction of owning without a mortgage and total expenditures is not statistically significant for them.

Renters exhibit very different patterns. Fully insured renters have a predicted marginal propensity to consume housing: about 32 cents. Partially insured renters are more similar to homeowners, with a predicted expenditure of 27 cents per dollar. Medicaid renters have the largest marginal propensity to consume housing--42 cents. Uninsured renters are not significantly different from fully insured renters.

Apparel and services. The marginal propensity to consume apparel and services is estimated to be between 5 and 6 cents regardless of insurance status.

Transportation (less trips). Transportation is strongly related to income regardless of insurance group. Partially insured families are predicted to spend the largest share of an additional dollar--nearly 23 cents--on transportation, followed by the fully insured (18 cents), the uninsured and Medicaid families (17 cents each).

Recreation and related expenditures. Recreation and related expenditures consume about one-seventh of every additional dollar (14.5 cents) for the fully insured. The coefficients for the fully insured and the uninsured are not statistically significantly different. Partially insured families are predicted to dedicate a slightly smaller fraction (12 cents) of their additional dollars to recreation and related expenditures, with Medicaid families spending the least (9 cents) of every additional dollar on these items.

Income Elasticities. Although the regression results show how expenditures are predicted to change given an increase of one *dollar* to permanent income, how are expenditures predicted to change given an increase of one *percent* in permanent income? To answer this question, income elasticities are estimated using regression and other results.

An elasticity can be described as the percent change in one factor given a one percent increase in another factor. For example, table V shows the income elasticity of food at home for the fully insured is 0.58. This means that given a one percent increase in income, the average fully insured family is predicted to increase its expenditures on food at home by 0.58 percent. If the income elasticity of a good or service is less than one, it is called "inelastic." If it is exactly one, it is called "unitary elastic." If it is greater than one, it is called "elastic." Expenditures with an income elasticity that is positive but less than one are often called "necessities," while those with elasticities greater than one are often called "luxuries."

The calculation of elasticities is straightforward. In general, the formula for an elasticity ($\eta_{Y,I}$) is:

$\eta_{Y,I} = \partial Y/\partial I*(I/Y)$

where

Y is an expenditure (such as food at home)

I is permanent income.

Elasticities are presented in two tables. In table V elasticities are shown for average families in each insurance group. That is, values are computed using the income parameter estimate for the fully insured multiplied by the inverse of the expenditure share for the fully insured. Table VI shows what the elasticity is predicted to be if income and expenditures are held constant across groups. That is, the parameter estimates for income are allowed to vary across groups, but the inverse share is calculated from the "all consumer units" column in table II. Because the elasticities in table VI are standardized for income and expenditures, it is possible to test differences across insurance groups for statistical significance.

Table V: Income Elasticities by Insurance Status, Part I

Expenditure	Fully Covered	Partially Covered	Medicaid	Not Covered
Food at Home	0.58	0.59	0.60	0.65
Housing	0.95	0.93	0.78	0.98
Apparel/Services	1.07	1.19	1.14	1.06
Transportation	1.03	1.13	1.01	0.91
Recreation	1.12	1.15	1.20	1.21

$\eta = \partial Y/\partial I * I/Y$, Where I/Y = Average for Each Insurance Group
NOTE: Differences in elasticities across insurance groups are not tested for statistical significance.

Income elasticities do not vary greatly across groups for most items. In fact, if a good is inelastic for one insurance group, it is inelastic for all groups, and what is elastic for one is elastic for all (except for transportation for the uninsured). Also, housing is notably more inelastic for Medicaid recipients than the other groups, which have nearly identical elasticities. But each of these differences is fairly easy to explain. Because the average Medicaid recipient has less income than the average member of any other group, it is not surprising that housing is more a "necessity" for this group than the others. At any rate, the order of elasticities is the same for each group, regardless of insurance status. That is, food at home is the least elastic good, followed by housing, transportation, apparel, and recreation and related expenditures. The general interpretation of the results in table V is that given a certain income, most families, regardless of insurance group, will "settle" at the point where the average family in one insurance group is about as "sensitive" to a one percent increase in income as the average family in any other group for any particular expenditure item.

More intriguing are the results shown in table VI. Each family is treated as if it had the same level of expenditures and permanent income as the average member of the population. Therefore, any differences in elasticity must be due to differences in the marginal propensity to consume each item. Therefore, differences in table VI more likely reflect differences in tastes or other less quantifiable factors that differ by insurance group.

Table VI: Income Elasticities by Insurance Status, Part II

Expenditure	Fully Covered	Partially Covered	Medicaid	Not Covered
Food at Home	0.52*	0.63**	1.04**	0.71**
Housing	0.93*	0.91	0.94	1.03**
Apparel/Services	1.07*	1.22**	1.22**	1.09
Transportation	1.01*	1.25**	0.91*	0.92**
Recreation	1.19*	1.01**	0.73**	1.17

$\eta = \partial Y/\partial I * I/Y$, Where I/Y is the Average for All Consumer Units
*** Parameter estimate is significantly different from zero.**
**** Parameter estimate is significantly different from fully covered group's.**

When all families are given average income and expenditures, some of the results are noteworthy. For example, for Medicaid families, food at home has an income elasticity exceeding one, but for recreation and related goods the income elasticity is less than one. This may be because Medicaid families have low incomes, and are used to "doing without," even to the point of cutting back as much as possible on the most basic necessities, such as food. Given extra income, therefore, they are more likely to purchase more (or better quality) food than to spend more for recreation. Also of interest is that the income elasticities of housing and apparel do not change much by insurance group even when everyone is given the same income and expenditure level, although the elasticity for housing for Medicaid families moves more in line with the other groups.

Conclusions. Many recent developments related to health care have made it a subject of much discussion. Prices have risen substantially in recent years, and the share of total expenditures devoted to health care is high by historical standards. Rising prices have evidently caused changes in insurance availability, as employers have either reduced their contribution to health insurance or offered programs with higher deductibles as a way to cut costs. Also, as evidence of rising health care prices and reduced employer contributions to employee insurance premiums, out-of-pocket expenditures for health care have risen recently, in conjunction with increased reporting of expenditures on health insurance premiums.

While other recent studies using CE data have examined probability of insurance coverage, tested for moral hazard and adverse selection in insurance markets, and analyzed the distribution of family health care expenditures by income level, this study investigates the relationship of health care expenditures to other items in the consumer budget. Four distinct groups are studied: the fully insured, partially insured, Medicaid recipients, and the uninsured. First, demographic characteristics of these

groups are compared and expenditure shares for each of the groups are derived. Next, Engel relationships and the components of health care expenditures are discussed. Finally, several expenditure categories are regressed on demographic characteristics by insurance group, to ascertain whether relationships between expenditures and demographics differ across insurance group. This analysis is extended to examine differences in income elasticities for expenditures by insurance groups. The results indicate that there are clear differences in consumer spending patterns across insurance groups, and that these are not limited to differences in health care expenditures alone.

Selected References

Bannock, Graham, Ron Baxter, and R. Rees (1972), A Dictionary of Economics, Harmondsworth, Middlesex, England: Penguin Books Ltd., p. 140.

Cowan, Cathy A. and Patricia A. McDonnell (1993), "Business, Households, and Governments: Health Spending 1991." *Health Care Financing Review*, 14(3) Spring, p. 229.

Friedman, Milton (1957), *A Theory of the Consumption Function.* (Princeton, Princeton University Press for National Bureau of Economic Research.), p 221.

Jacobs, Eva and Stephanie Shipp (1993), "A History of the U.S. Consumer Expenditure Survey: 1935-36 to 1988-89." *Journal of Economic and Social Measurement*, 19, pp. 59-96.

Kennedy, Peter (1992), *A Guide to Econometrics*, Third Edition, Cambridge, MA: The MIT Press: 157-158.

Miller, Richard D. (1990), "Another Look at the Medically Uninsured Using the 1987 Consumer Expenditure Survey." Bureau of Labor Statistics Working Paper (206), October.

National Center for Health Statistics (NCHS 1993). Health, United States 1992, Hyattsville, MD: Public Health Service, 1993, p.161.

Paulin, Geoffrey D. and David L. Ferraro (1994), "Imputing Income in the Consumer Expenditure Survey," *Monthly Labor Review*, December.

Rasell, Edith, Jared Bernstein, and Kainan Tang (1993), "The Impact of Health Care Financing on Family Budgets." *Challenge*, November-December, pp. 12-20.

Reise, Elizabeth M. (1993) "A Look at Private Health Insurance Coverage of Families with Children under 18 Using Data from the Consumer Expenditure Interview Survey for 1989-91." *Proceedings of the Section on Social Statistics*, American Statistical Association, pp. 832-837.

Rubin, Rose M. and Kenneth Koelln (1993) "Determinants of Household Out-of-Pocket Health Expenditures." *Social Sciences Quarterly*, 74(4), December, pp. 721-735.

U.S. Department of Health and Human Services (HHS 1994), *HHS News*, November.

U.S. Department of Labor, Bureau of Labor Statistics (BLS 1995), *Consumer Expenditure Survey, 1992-1993: Bulletin 2462*, September.

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[1]Total expenditures less gifts outside the family, cash contributions, and personal insurance and pensions.
[2]Some of the decline is undoubtedly due to the advent of Medicare and Medicaid.
[3]Because of the rotating sample, not all observations represent unique families.
[4]In each case Medicare is counted as a policy.
[5]E.g., dental only, or policies that only cover children injured during school-related athletic activities.
[6]Data are for complete reporters only--generally defined as consumer units that provide values for at least one major source of income. However, they do not necessarily provide a full accounting of income. The Division of Consumer Expenditure Surveys has plans to impute values for missing income. For more information, see Paulin and Ferraro (1994).
[7]The first person mentioned when the respondent is asked to "Start with the name of the person or one of the persons who owns or rents this home."
[8]The value of food stamps is included in both the income and the expenditure tabulations in the CE.
[9]Another important measure is the cross-expenditure elasticity of substitution of health care and other expenditures. However, it is not immediately clear how such an analysis could be conducted; no information on deductibles is collected in the CE. Deductibles result in kinked budget constraint that cannot be controlled for in the regressions. Therefore, no attempt to calculate cross-elasticity is made.
[10]Although simultaneous equations bias may exist when the detailed expenditure is a large share of total expenditures, Kennedy (1992) provides reasons why the problem may not be serious when OLS is used.