

**HEALTH INSURANCE COVERAGE FOR FAMILIES WITH CHILDREN:
FINDINGS FROM THE CONSUMER EXPENDITURE SURVEY**

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Note: This work is substantially abridged. For a complete version, see *Monthly Labor Review*, August 1995, pp. 13-23. 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.

Health insurance coverage is important in the maintenance of good health for families with children. Cunningham and Monheit (1990, p. 78) find children in families with no coverage are "at a disadvantage regarding access to, quality of, and continuity of health care." Kasper (1987) finds uninsured children are least likely to have seen a doctor in the past year, even for immunization or general check-up (tables 4 and 7). Preventive care is important for children, who are prone to illness.

However, health care costs have risen substantially in recent years. From 1989-94, the Consumer Price Index for medical care increased 41.3 percent, compared with 18.2 percent for all other items. In 1993, the Nation's costs rose 7.8 percent from 1992 (*HHS News* 1994). Paulin and Weber (1995) suggest that as a result of these increases, direct costs of care are shifting from business and government to families, thus affecting expenditures for nonhealth items.

Meanwhile, in 1992, more than 8 million American children had no health coverage (U.S. Bureau of the Census 1994). While many of the poorest families received Medicaid benefits (Cunningham and Monheit, pp. 77-78), the percentage of children without public or private coverage grew by more than 40 percent between 1977 and 1987 (*Ibid.*, pp. 80-81).¹

This study identifies families that have full, partial, and no health insurance coverage. It examines the characteristics of each insurance group, policies held, health expenditure patterns, and relationships between demographics and the probability of being insured.

Background. Many studies examine coverage of individuals (Bazzoli 1986). They define the medically indigent as those whose "lack of public or private health insurance coverage" means they incur the direct costs of their health care (p. 356).

Miller (1990) uses data from the 1987 Consumer Expenditure Interview Survey (CE) to study medically uninsured *consumer units*² rather than *individuals*. Reise (1993) examines families with children, dividing the sample into those with full coverage (all members

covered), partial coverage (at least one, but not all,

Table 1 (Abridged). Demographic characteristics of families with children by health insurance status, Consumer Expenditure Survey, 1991-93

Characteristic	Insurance Group		
	(1)	(2)	(3)
Sample size	2,605	347	773
Characteristics of average family			
Age of reference person	37.3	37.1	35.7
Family size	3.8	3.6	3.7
Number of earners	1.8	1.7	1.5
Persons under 18 years old	1.9	1.9	2.0
Total expenditure outlays (annual, in 000's)			
Mean	\$40.8	\$32.5	\$28.6
Median	\$34.7	\$28.7	\$24.3
Other characteristics (in percent):			
Living in the--			
Northeast	22.8	16.7	14.8
Midwest	28.6	24.2	19.3
South	27.3	35.3	34.0
West	21.5	22.8	30.5
Urban areas	87.8	87.3	89.0
Black	7.0	7.8	10.9
Hispanic	4.7	8.7	15.3
Occupation of the reference person:			
Wage and salary	88.2	87.6	75.9
Manager/professional	39.0	30.6	23.3
Technical/sales	18.4	23.9	15.1
Service	5.9	11.2	10.1
Blue collar	24.9	21.9	27.4
Self-employed	7.0	6.6	10.5
Retired	0.3	0.3	0.3
Unemployed	0.4	0.3	1.3
Out of the labor force	4.1	5.2	12.0
Education of the reference person:			
Less than high school	7.0	11.4	28.8
High school graduate/ some college	58.7	65.4	57.2
College graduate	34.3	23.9	20.2
Family composition:			
Single parent	12.6	30.0	22.5
Husband/wife family	87.4	70.0	77.5
Earner status:			
No earners	0.8	1.4	6.9
One earner	30.9	39.2	44.1
Two earners	60.8	51.6	43.3
At least three earners	7.5	7.8	5.7
Housing tenure:			
Homeowner with mortgage	68.9	54.8	41.5
Homeowner, no mortgage	7.8	6.9	9.3
Renter	23.3	38.3	49.2
At least one child:			
Under age 6	50.6	47.3	47.6
6 to 11	51.3	43.5	53.6
12 to 17	37.7	42.1	41.3
Student status of reference person:			
Full time	1.4	3.8	2.2
Part time	5.5	4.6	4.9

Group 1: Fully insured
Group 2: Partially insured
Group 3: Uninsured

members covered) and no coverage (none covered). Both studies predict probability of coverage.

The data. The data are from the 1991-93 CE for families. Families include only parents (single or married) with all children under 18.³ Families with Medicaid or Medicare are excluded from the analysis. As with Miller and Reise, only second interview data are used to ensure that all families are unique.

All data presented in this study are unweighted.

Demographic characteristics. There is little difference in age or family size by level of coverage

(table 1); but income (proxied by total expenditure outlays⁴) seems to be correlated with coverage. The fully covered have the highest incomes; the uninsured have the lowest incomes. Also, the uninsured have lower levels of education and work force participation, fewer earners, and are more likely to be black or Hispanic. Only the uninsured are as likely to own as rent, although they have the highest rate of "outright" ownership (i.e., owning with no mortgage).

Table 2 (Abridged). Health insurance policies, by health insurance coverage status, 1991-93

Group Type of policy (2) (3)	Insurance (1)	

Family size	3.8	
3.6 3.7		
Members covered	4.3	
1.8 0.0		
Percent of members covered	113.1	
50.0 0.0		
Percent with at least one--		
Blue Cross policy	28.1	
28.5 9.2		
Commercial health policy	47.8	
44.7 13.7		
HMO policy	24.1	
18.4 8.9		
Dental only policy	9.3	
8.7 7.0		
Other health policies ¹	13.6	
19.0 4.4		
Average number of-		
Policies held	1.39	
1.32 .45		
Blue Cross	.31	
.30 .09		
Commercial health	.56	
.50 .15		
HMO	.26	
.21 .09		
Dental only	.10	
.09 .07		
Other health insurance ¹	.16 .22	
.05		

¹ Includes policies providing special limited coverage, Medicare supplements, and other health insurance policies.

See table 1 for insurance group names.

Policies held. Insured families have similar types and numbers of policies. But quality is different. The fully insured on average cover 113 percent of their members. The partially insured cover 50 percent.

Children make up a large percentage of individuals not covered in partially insured families. Although the CE does not ask which members are covered, assuming there is no overlap until all members are covered, a lower and upper bound on the number of children

covered can be estimated. For the lower bound, families are assumed to follow an "adult first" strategy; i.e., the first persons covered are adults. To get the upper bound, families are assumed to follow a "child first" strategy; i.e., children are covered before adults. Results are shown in the following tabulation:

Data for Partially Insured Families:

Number of children	1.9
Number of children covered:	
Adults first	0.5
Children first	1.5
Percent of children covered:	
Adults first	26.3
Children first	78.9

In other words, at least one-fourth of all children in the partially insured families sampled have no health insurance coverage. If combined with children in uninsured families, between one-ninth and one-sixth of the children in the sample lack coverage.⁵

Table 3. Health care expenditures by health insurance coverage status, 1991-93

Group Expenditure allocation (3)	Insurance	
	(1)	(2)

Total health care (annual)	\$1,880	
\$1,668 \$972		
Health insurance	920	
663 269		
Medical services	732	
811 556		
Prescription drugs/ medical supplies	229	
194 147		
Percent of health care allocated to--	100.0	
100.0 100.0		
Health insurance	48.9	
39.7 27.6		
Medical services	38.9	
48.6 57.2		
Prescription drugs/ medical supplies	12.2	
11.6 15.1		
Percent of total expenditure outlays allocated to--		
Health insurance	2.3	
2.0 .9		
Medical services	1.8	
2.5 1.9		
Prescription drugs/ medical supplies	.6	
.6 .5		
Percent reporting expenditures (quarterly): ¹		
Health insurance	67.3	
58.8 23.0		

Medical services	70.1
62.0 51.2	
Prescription drugs/ medical supplies	57.7
54.2 40.5	

1 Does not include reimbursements for payments made in previous quarters but received in current quarter.

See table 1 for insurance group names.

Health care expenditures. The fully insured pay the most for health care (table 3). Although the partially insured appear to pay more for medical services, the difference is not statistically significant.⁶

The fully insured spend the largest share on insurance, but the smallest on medical services. However, the fully and partially insured spend about the same share on prescription drugs. The uninsured spend the largest shares on medical services and prescription drugs and medical supplies, and the smallest share for insurance.

However, insurance premium payments for the uninsured are for someone outside the immediate family (older relative, etc.), and so perhaps should not be counted when comparing expenditures by insurance status. Furthermore, insurance policies may "favor" certain types of treatment--they may pay for medical services, but not prescription drugs. Therefore, it is interesting to examine expenditures for items other than insurance premiums. Of these dollars, the fully insured allocate 76 percent to medical services and 24 percent to prescription drugs and medical supplies, compared to an 81/19-percent split for the partially insured, and a 79/21-percent split for the uninsured.

Probability of purchase. The fact that the fully and partially insured spend more for items other than premiums does not, by itself, indicate coverage is related to usage. The uninsured have the lowest incomes, so they are expected to spend the least. To estimate the direct effect of coverage, all other factors must be held constant. Rubin and Koelln (1993) find, *ceteris paribus*, coverage is positively correlated with health expenditures for items other than premiums. They do not model frequency of usage, probably because the CE does not measure it directly; respondents are not asked how many doctor visits occurred during the past 3 months. But if there is an expenditure, then someone must have visited.

Table 4 (Abridged). Results of binomial logit predicting probability of incurring expenditures for medical services with median income held constant for all insurance

groups (\$32,175)

Estimates (3)	Parameter	
	(1)	(2)
Intercept	-3.420 ¹	-2.712
-2.050 ²		
Annual Outlays*	0.208 ¹	0.134 ²
0.081		
Predicted Probability for Reference Group:	0.732	0.759
0.661		

* Box-Cox transformation

1 Significant at the 95 percent confidence level.

2 Significant at the 90 percent confidence level.

See table 1 for insurance group names.

Selected results of a binomial logistic regression (Maddala 1993) modeling the probability of incurring expenditures for different types of health care are shown in tables 4 and 5.

The statistical significance of parameter estimates in the first column (tables 4 and 5) indicates the importance of the variable in predicting the probability of an expenditure. The second and third columns show whether this probability is different for the partially or uninsured. If either estimate is statistically significant, there is a difference.

Table 5 (Abridged). Results of binomial logit predicting probability of incurring expenditures for prescription drugs and medical supplies with median income held constant for all insurance groups (\$32,175)

Estimates (3)	Parameter	
	(1)	(2)
Intercept	-3.060 ¹	-1.605
-1.055		
Annual Outlays*	0.160 ¹	0.080
0.028		
Predicted Probability for Reference Group:	0.584	0.606
0.468		

See table 4 for footnotes.

See table 1 for insurance group names.

A reference group facilitates comparisons. In this case, each reference group consists of families with median income (\$32,175), two earners, and reference person who is between ages 25 and 44, married with

two children, and neither black nor Hispanic.⁷

The fully and partially insured have similar probabilities of incurring medical service expenditures (table 4); but the difference in probability for the fully insured (73 percent) and the uninsured (66 percent) is significant in the statistical and economic sense.

Thus, the data may indicate that uninsured families are less likely to seek preventative care, as Kasper finds. By contrast, insured families may be more likely to visit doctors for minor illness, as Rubin and Koelln imply. To further investigate usage, expenditures for prescription drugs and medical supplies are examined. Insured families may incur expenditures for doctor visits; but if illnesses are not severe, doctors need not prescribe medicine. If insured families are more likely *ceteris paribus* to have prescription drug expenditures, then it is assumed that if they are ill, they recover faster than the uninsured.

The predicted probabilities that the fully or partially insured incur expenditures for prescription drugs or medical supplies are similar (table 5). The predicted probability for the uninsured suggests they are less likely to incur an expenditure than the insured, even with all else equal. However, neither the intercept nor income parameter estimate is statistically significant, so caution must be used when interpreting this result.

Given the findings of Kasper, of Rubin and Koelln, and tables 4 and 5, there appears to be a relationship between level of coverage and receipt of medical care. Therefore, it is important to understand the relationship between demographics and coverage.

Probability of coverage. Parameters are estimated using ordered multinomial logistic regression (Maddala 1983). From them the probability that a family is fully, partially, or not insured is predicted.

Several independent variables are chosen. The first is annual total expenditure outlays (quarterly outlays multiplied by four), used as a proxy for permanent income (Friedman 1957). Outlays are subjected to a Box-Cox transformation (Box and Cox 1964) using a maximum-likelihood technique (Scott and Rope 1993).

Table 6 (Abridged). Predicted probabilities for insurance status: Multinomial logit results

	Parameter Estimate	Predicted Probability (by Insurance Group)		
		(1)	(2)	(3)
Sample (size: 3,725) ...		0.699	0.093	0.208
Reference Group: ...		0.757	0.090	0.153
Intercept 1	-3.743 ¹			
Intercept 2	-3.160 ¹			
Annual Outlays (Box-Cox)	0.232 ¹	0.005	-0.001	-0.003
Reference Person				
Under 25	-0.381 ²	-0.074	0.021	0.053
Ref. Person at least 45	0.042	0.007	-0.002	-0.005
One Child	0.129	0.022	-0.007	-0.015

Three or More Children	0.061	0.011	-0.003	-0.007
Family Type (Husband/Wife)*				
Single Parent	0.083	0.014	-0.005	-0.010
Ethnic Origin (White/other)*				
Black	0.121	0.021	-0.007	-0.014
Hispanic	-0.412 ¹	-0.081	0.023	0.058
Occupation (Manager/Professional)*				
Technical/Sales	-6.20E-04	-0.000	0.000	0.000
Blue collar	-0.052	-0.009	0.003	0.007
Service	-0.348 ¹	-0.068	0.019	0.048
Self-employed	-0.717 ¹	-0.150	0.038	0.112
Retired	1.185	0.147	-0.052	-0.095
Unemployed	-0.210	-0.039	0.012	0.028
Out of labor force	-0.238	-0.045	0.013	0.032
Education (High school/some college)*				
Did not graduate HS	-0.525 ¹	-0.106	0.029	0.077
College graduate	0.012	0.002	-0.001	-0.001
At least one child over 12	-0.258 ¹	-0.049	0.014	0.035
Region (South)*				
Northeast	0.648 ¹	0.095	-0.032	-0.063
Midwest	0.633 ¹	0.094	-0.032	-0.062
West	-0.044	-0.008	0.002	0.005
Degree Urbanization (Urban)*				
Rural	0.188	0.032	-0.010	-0.022
Number of Earners (Two Earners)*				
No earners	-1.266 ¹	-0.285	0.055	0.230
One earner	-0.368 ¹	-0.072	0.020	0.052
At least three	-0.216	-0.041	0.012	0.029
Housing Tenure (Owner with mortgage)*				
Owner, no mortgage	-0.199	-0.037	0.011	0.026
Renter	-0.531 ¹	-0.107	0.029	0.078
Student Status (Non-student)*				
Full-time	-0.260	-0.049	0.014	0.035
Part-time	0.025	0.004	-0.001	-0.003

* Omitted category in parentheses.

1 Significant at the 95 percent confidence level.

2 Significant at the 90 percent confidence level.

See table 1 for insurance group names.

In addition to normalizing the distribution of outlays, the estimated value (1/8) of Box-Cox transformation parameter λ is consistent with the assumption that the probability of full coverage increases with income, but at a decreasing rate. This indicates that a set increase in income (say, \$1,000) is associated with an increase in probability of full coverage, but the increase in probability is greater for a low-income family than for a high-income family.⁸

Also included are several dummy variables describing characteristics of the reference person or the family (including housing tenure⁹) to control for differences in tastes, opportunity of coverage, and other factors. The reference group consists of husband/wife families with two children (both under age 12), median outlays (\$32,175),¹⁰ and two earners, living in their own (mortgaged) homes in the urban South, whose reference person is between ages 25 and 44, neither black nor Hispanic, working for a wage or salary in a managerial or professional position, a high school (but not college) graduate, and not a student.

Logistic regression can be sensitive to weighting. If weighted, parameter estimates are statistically

significant in nearly all cases. On the other hand, the relatively small sample size (especially for the partially and uninsured) may lead to large standard errors, thus understating the number of significant relationships. Therefore, no weights are applied, but the 90 percent confidence level defines statistical significance.

Table 6 shows the predicted *difference* in probability for each group compared to the reference group. For example, families whose reference person is under age 25, but who are otherwise identical to the reference group, are about 7 percent less likely to have full coverage than the reference group, or -0.074 in the fully insured column for the younger group.

Income and insurance status. Despite the statistical strength of income as a predictor of coverage,¹¹ the probability that a family has full coverage increases slowly with income. Given a 1-percent increase in income, the probability of being fully insured barely rises--76.7 percent to 76.9 percent. Even with increases up to \$3,000 per year the probability rises only to 78.1 percent.

Nevertheless, three-fourths of the reference group are predicted to have full coverage, and over four-fifths are predicted to have at least partial coverage. Therefore, it is interesting to study families like the uninsured--those similar to the reference group, except they have lower income (\$24,277, the median value for the uninsured), rent their homes, and the reference person, a blue collar worker, is the sole earner.

Uninsured families are also slow to purchase health insurance given increased income. For example, an increase of \$3,000 dollars is associated with a higher probability of full coverage; however, the difference is small--52.6 percent, compared with 50.2 percent.

Other characteristics. Other characteristics are also associated with coverage. Families with young parents (reference person under age 25) are significantly less likely to have full coverage than older families. On the other hand, families with young children are more likely to have coverage than families with at least one child over age 12. Families may choose coverage more readily when the risks to their children are greater, during early childhood development. Families with older children may also be trying to put more savings into college funds, and may choose not to buy health insurance as a result.

Educational attainment also raises the probability of full coverage. Those who did not graduate from high school are less likely to be fully covered than those who did graduate, although there is no statistically significant difference in probability of full coverage for high school and college graduates.

Occupational status appears to be associated with different levels of health insurance coverage. Of the

wage or salary occupations, only those families whose reference person is employed in services have a lower probability of being fully insured than members of the reference group. Families whose reference person is self-employed are even less likely to have full coverage.¹²

Number of earners is significantly related to coverage. Two-earner families are expected to have more coverage on average than families with fewer earners but equal income, because two-earner families have a greater chance that someone is eligible for an employer-sponsored plan. Some families with three or more earners need the incomes to cover expenses. Earners may be in jobs with low wages or few benefits; therefore, multiple earner families are expected to have a lower probability of full coverage. The negative coefficient for these families seems to confirm the intuition, but it is not statistically significant, so no firm inference can be drawn.

Cultural differences may make some groups less averse to the risks of being uninsured. The coefficient for Hispanics is statistically significant. Its negative sign indicates Hispanics are less likely to be insured.

Regional differences are significantly related to differences in health insurance coverage. Compared with the South, families in the Northeast and Midwest have a much higher probability of being fully insured. This may be attributed to any number of differing factors, including State laws, health care costs, work force unionization, or other factors. The West, however, is not significantly different from the South.

In most cases, the probability of being partially insured does not change much with characteristics. This may imply that families "vault over" the partially insured category--i.e., given extra income, they will move from no insurance to full coverage. But this is not necessarily true. For example, it is possible that a two-earner family with full insurance coverage moves to the partial coverage class if an earner loses a job, rather than slipping all the way into no coverage. Some of those with partial coverage may move to the no coverage category under similar circumstances. Thus, the probability of partial coverage is similar across demographic characteristics, even though some families may be moving in and out of the category.

Conclusions. Health insurance is important to families. Those with coverage are more likely to receive some kinds of care than those with no coverage, even if income and other factors are equal.

Income, age, education, and number of earners are positively related to a family's level of health insurance coverage. Reference person characteristics--service worker, self-employed, or Hispanic--are negatively

related to the probability of full coverage.

Although income is an important predictor of insurance status, families do not change their level of coverage much, even when income increases substantially. This implies that if increased health insurance coverage is a desired outcome, direct grants of cash to families will not raise levels of coverage in any substantial way. Although prices and qualities of insurance plans are not studied in this article, it would be useful to find out what influence these factors have on the probability of receiving coverage. Also, data on difficulty of obtaining access to health insurance coverage is useful to understanding why some families are uninsured. For example, if plans are readily available through an employer, are families likely to take advantage of them? (See Wiatrowski 1995.) Exploration of these issues should provide for interesting future research.

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¹Based on data from the 1977 and 1987 National Medical Care Expenditure Surveys. (See exhibit 2.)

²A person living alone or sharing a household with others who are all financially independent; members of a household related by blood, marriage, adoption, or other legal arrangement; or two or more persons living together who are responsible for at least two of three major expenses: food, housing, and other expenses.

³This includes only children living at

home.

⁴Includes mortgage principal payments and actual outlays for vehicles.

⁵If all partially insured families follow the "children first" strategy, then 11.2 percent of children in the sample are uninsured. If they all follow the "adult first" strategy, then 15.8 percent are uninsured.

⁶The standard errors of the mean for medical services are: 32.49 (fully insured) and 92.64 (uninsured).

⁷These variables are a subset of those chosen for the multinomial logit model described later.

⁸Evidence of plausibility comes from Reise and Miller. Both authors find that increasing income is related to a lack of coverage at a decreasing rate. Both authors' specifications are also forms of the Box-Cox transformation. Reise, in effect, assumes λ is zero: the natural log is the appropriate transformation. Miller assumes λ is 2: a squared term is appropriate. In this study λ (1/8) is between these estimates.

⁹Miller uses a dummy variable for renters "as a proxy for wealth" (p. 8), and finds them more likely than owners to lack full coverage (p. 24). In this study a variable denotes those who own their homes outright. Paulin (1995) finds "outright" owners spend 11 cents of each additional dollar on health and personal care, compared to 5 cents for mortgage and rent payers. This may reflect a wealth effect, or simply that "outright" owners have more money available to spend than mortgage payers, *ceteris paribus*.

¹⁰Outlays are not normally distributed. Using the mean would raise predicted probabilities (table 3).

¹¹The parameter estimate for income is statistically significant at the 99.9 percent confidence level.

¹²In fact, *ceteris paribus*, only those with no earners have a lower predicted probability of full coverage.