

Health Care Utilization: The Effect of Extending Insurance to Adults on Medicaid or Uninsured

Author(s): Beth Hahn

Source: *Medical Care*, Vol. 32, No. 3 (Mar., 1994), pp. 227-239

Published by: Lippincott Williams & Wilkins

Stable URL: <https://www.jstor.org/stable/3765788>

Accessed: 24-10-2024 18:37 UTC

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



JSTOR

Lippincott Williams & Wilkins is collaborating with JSTOR to digitize, preserve and extend access to *Medical Care*

Health Care Utilization: The Effect of Extending Insurance to Adults on Medicaid or Uninsured

BETH HAHN, PhD

Current health care system reform proposals center on reducing the number of uninsured by extending private health insurance coverage. Discussion has also included enrolling Medicaid recipients in private programs. Much of the deliberation concerning extending coverage has centered on cost, but largely has not addressed the implications for health care utilization by these groups. If private insurance is extended to those currently uninsured as well as the Medicaid population, what impact will it have on utilization? Using data from the 1987 National Medical Expenditure Survey, the results of this analysis show that utilization would increase for the uninsured if private insurance benefits were extended, whereas utilization would decrease for those with Medicaid, however, the magnitude of the increase depends on the type of care. Key words: uninsured; Medicaid; health care utilization. (Med Care 1994;32:227-239)

Current health care system reform proposals center on reducing the number of uninsured by extending private health insurance coverage. Discussion has also included enrolling Medicaid recipients in private programs. Much of the deliberation concerning extending coverage has centered on cost, but largely has not addressed the implications for health care utilization by these groups. It is important to examine utilization not only for its direct relationship with cost, but because of its ramifications for resource allocations, such as physician supply.

Research on medical care use has indicated that the uninsured use fewer services

compared to the insured, whereas persons with public coverage tend to have higher rates of hospitalization and physician visits compared to the privately insured. However, as a population, both the uninsured and those with public coverage are distinct from the privately insured. Compared to persons with private insurance, these groups are younger, more likely to be minority and low-income—all factors that affect health and health care utilization. If private insurance is extended to those currently uninsured as well as the Medicaid population, what impact will it have on utilization? This paper will address this question using data from the 1987 National Medical Expenditure Survey to simulate utilization for the uninsured and Medicaid recipients under private insurance coverage.

Differences in Medical Care Usage

Researchers agree that the uninsured are less likely to receive health care services

From the Center for General Health Services Intramural Research Agency for Health Care Policy and Research, Rockville, Maryland.

The views expressed here are those of the author. No official endorsement by the Department of Health and Human Services or the Agency for Health Care Policy and Research is intended or should be inferred.

Address correspondence to: Beth Hahn, PhD, CGHSIR, 2101 East Jefferson Street, Suite 500, Rockville, MD, 20852.

compared to the insured. Research to date has varied widely in projections of the breadth of the gap in utilization, due to differences in sample, and definitions of services and insurance status.¹⁻⁸ Most descriptive studies have shown that the uninsured average approximately one fewer physician visits per year compared to the insured.¹⁻⁵ Research that has controlled for other determinants of use finds that, depending on the sample of adults, the uninsured used 48% to 75% of physician visits relative to the insured.⁶⁻⁸

The magnitude of the difference in hospitalization is more difficult to quantify due to the relative infrequency at which the general population younger than age 65 experiences hospitalizations and the variation in units of measurement (i.e. number of stays, days, or nights). Descriptive estimates of inpatient hospitalization for the uninsured as a percentage of use by the insured range from 81% for any admission² to 48% for total hospital days.¹ However, research that controlled for factors associated with use yielded estimates of 33% for hospital admissions⁷ and 12% to 31% for hospital days depending on the population of adults.^{6,8}

Although the uninsured are a central part of any proposed legislation, the increased cost of public programs (primarily Medicaid) has drawn attention to the possibility of revising the program by including the publicly insured in the same program to cover the uninsured. Few studies have compared utilization across all three groups, but studies that compare the Medicaid-insured to persons with private insurance suggest that usage is higher among the publicly insured with Medicaid-AFDC recipients averaging 5.6 physician visits and Medicaid-SSI enrollees averaging 8.6 visits.⁹ Descriptive research by Rowland and Lyons¹⁰ shows that the patterns of higher use by persons with Medicaid persist even when the population is limited to persons with low income. Their findings show that among low-income non-elderly adults Medicaid participants aver-

aged 5.7 doctor visits compared to 3.3 for the privately insured and 2.6 for the uninsured. Studies show Medicaid enrollees also have higher rates of hospitalization compared to the general population.¹¹⁻¹²

Unlike much of the research focused on the unsecured, few studies have examined the gap in utilization if private insurance were extended to persons with public coverage, with the exception of a study conducted by Long and Settle.⁷ They examined the impact of the 1981 Omnibus Budget Reconciliation Act using data from the 1980 NMCUES to simulate utilization for persons with low income. The researchers found that low-income adults and children who obtained private insurance after losing Medicaid eligibility did experience a decrease in ambulatory physician services, inpatient hospital, and prescription medicine use. However, the decrease was not statistically significant. For the group who did not replace Medicaid with private insurance, use dropped by 38% for physician services, 71% for inpatient hospital services, and 39% for prescription drugs. Research to date has not examined the effect of insurance changes on utilization for both the uninsured and Medicaid recipients in all income groups.

In addition to the lack of research that controls for differences that may be due to traditional demographics and socioeconomics or studies that examine the effects of extending private insurance to both the uninsured and the Medicaid population, more research is needed to determine whether differences in utilization may be related to type of service. Physician visit counts do not differentiate between care that is in response to a condition and preventive services that may be viewed as discretionary but may have the largest long-term returns to health. Perhaps the difference in number of visits is due to greater use of preventive services by the privately insured or publicly insured compared to the uninsured.

No study has focused on the relationship

between insurance status and use of preventive services in the general population of adults. The Rand Insurance Study examined a variant of this question by comparing and contrasting use of "free" and "cost-sharing" preventive services. Although they found some evidence that free preventive services encouraged greater use (e.g. of immunizations by children and Pap smears by women), most preventive services for women and all for men were equally underutilized regardless of their being free.¹³⁻¹⁴

A study of Woolhandler and Himmelstein¹⁵ did examine the effect of insurance on use of preventive services in a sample of women aged 45 to 64. Their findings indicate that uninsured women were less likely to receive hypertension screening, Pap smears, clinical breast examinations, or glaucoma tests compared to women with any form of insurance. Yet, these differences were not accounted for by differences in number of physician visits which averaged 4.4 for uninsured women and 4.5 for insured women. Research has not examined the effect of insurance on preventive services using a broader definition of preventive care or expanded age groups.

To summarize, much of the past research on insurance status and health care utilization has been descriptive without controls for demographic, socioeconomic, and health factors known to affect utilization.^{1-5,10} Recent studies that have considered the effect of confounding health-related factors and changes in health insurance have either focused on the uninsured relative to the privately insured or focused exclusively on persons with public coverage.⁶⁻⁸ This paper draws on previous research to combine all of these factors in a multivariate model that examines the relationship between insurance status and health services utilization for all three insurance groups, as well as extending private coverage to the uninsured and the publicly (Medicaid) insured. Utilization is measured for reactive physician visits in response to a condition, proactive or preven-

tive physician visits, and total nights hospitalized.

Methods

Data from the Household Component of the 1987 National Medical Expenditure Survey (NMES) were used in the analysis. The NMES sampled approximately 14,000 housing units, resulting in data on 36,259 civilian noninstitutionalized individuals. A stratified multistage area probability design was used to oversample blacks, Hispanics, low income, elderly, and persons with functional limitations of special policy interest (for more information on survey design, see Edwards and Berlin).¹⁶

NMES was designed to provide measures of health status and estimates of insurance coverage, use of services, expenditures, and sources of payment for 1987. The survey was fielded in four rounds with interviews conducted at approximately 4-month intervals.

In addition to the interviews, respondents completed a health status questionnaire (HSQ) providing information on health status, health related behaviors, care seeking, and preventive care. This analysis was restricted to adults in the sample ages 18 to 64 ($n = 16,430$) responding to the Self Administered Questionnaire portion of the survey. Although children comprise a large portion of the uninsured and Medicaid populations, this model is specific to adults. Analysis for children requires different theoretic assumptions as well as family level investigation to fully address the link between insurance and health that are beyond the scope of this analysis.

Dependent Variables

Three dependent variables were constructed to reflect medical care utilization: reactive medical care, preventive or proactive medical care, and hospitalization.

Medical care visits were recalled by the respondent and recorded at each of the four

interview rounds. Respondents were given calendars to aid memory recall in recording visits between rounds of data collection. Information from each recalled visit included conditions, reason for visit, provider name and address, and detailed expenditure data. Reactive ambulatory medical visits were measured using the sum of three variables: 1) the number of outpatient hospital visits to a physician; 2) number of medical visits not in an outpatient hospital setting to a physician; and 3) number of visits to an emergency room. Visits in these three categories were considered reactive if the reason for visit was not preventive or proactive in nature. Therefore, reactive visits did not include general checkups, vision exams, maternity care, or immunizations. General checkups that were associated with conditions (for example, heart disease, cancer treatment, etc.) were included as reactive visits. On average, respondents reported approximately three reactive visits.

Proactive or preventive medical care visits were measured using the same method as the reactive medical visits, but proactive visits were limited to those that were identified as a vision exam, maternity care visits, immunization, or general checkup not associated with a condition. The proactive medical care variable used a cumulative count of outpatient visits to a physician and the number of medical visits not in an outpatient setting to a physician. Unlike reactive visits, proactive visits were not prevalent. The average number of preventive visits was less than one.

Two measures of hospitalization were used. The first measured the number of hospital stays and the second indicated the number of nights spent in the hospital. Approximately 9% of the sample had at least one hospital stay.

Independent Variables

Insurance. Private health insurance is distinctly different from public health care

coverage. The circumstances under which one becomes privately insured are most often employment-related whereas financial need and family composition (and in some cases disability) are requirements for public insurance. As such, private and public insurance are treated separately in the analysis. Because research indicates that persons with insurance for part of the year use health care services at the rates of the insured when they are insured, and at the rate of the uninsured when they do not have insurance,⁶ a further distinction is made between having an insurance status for the entire year and part of the year. Therefore, five mutually exclusive dichotomous variables were created to measure type of insurance. All persons were classified hierarchically as having one of the following insurance statuses: 1) uninsured for the full year; 2) private insurance for the full year; 3) private insurance for part of the year and uninsured for the remainder; 4) Medicaid coverage for the full year; and 5) Medicaid coverage for part of the year.

Respondents who indicated private health insurance were asked multiple probes to indicate type of health care coverage. The full name of employer, family business, union, or some other group, or the name of the insurance company was recorded. Respondents who indicated that they were covered by CHAMPUS/CHAMPVA were included in this study as the privately insured since the government-operated program for military personnel more closely approximates private insurance programs than public. The variable for full year private insurance was coded 1 if the respondent had private coverage all year. The majority of respondents were privately insured for the entire year (72%). Part year private insurance was coded 1 if the respondent had part year coverage and was uninsured for the remaining period. Approximately 9% of respondents had private insurance for part of the year and were uninsured for the remainder.

Because public insurance covers the sick

and disabled in addition to the AFDC population, the sample of persons ages 18–64 with public insurance was restricted to respondents who were covered under AFDC or some similar program, thereby eliminating persons qualifying for Medicaid due to Supplemental Security Income (SSI) or medically needy status. This was done to eliminate outliers to which the mean is the most sensitive. Respondents who indicated that they were covered by Medicaid were asked to show their Medicaid (or other source of public payment) card for verification and to confirm the type and date of coverage. The full year Medicaid insurance variable was coded 1 if the person was covered the entire year. A total of 580 persons (3.5%) received public insurance for the entire year. Sources of public insurance in addition to Medicaid included state or local medical assistance.

Part year Medicaid coverage was coded 1 if the respondent received public coverage for a portion of the year; the remainder of the year could be uninsured or privately insured, or a combination of all three statuses. In all, 298 persons had part year public insurance (1.8%) which differentiated it from the part year private and uninsured group.

Respondents without any form of insurance (i.e. no employer paid CHAMPUS/CHAMPVA, Medicare, Medicaid or other public assistance) were coded 1 if uninsured for the entire study period. Approximately 14% of the sample were uninsured.

Maternity Utilization. To measure typical utilization, a variable was added to control for utilization related to maternity conditions for women. A dichotomous variable was created to denote pregnancy and coded 1 if a woman was pregnant in 1987.

Health Control. A construct to measure general health was added to control for persons with poor health which are known to have abnormally high levels of medical care use. Four dummy variables were created from the following question, "In general, would you say that your health is excellent, good, fair or poor?"

Sociodemographic Variables. Demographic variables used in the analysis include minority status (coded 1 if minority and 0 nonminority) and age (in years) at the final round of the survey. Approximately one-third of the sample was minority and the average age was 38. Two variables assessed socioeconomic status: education (measured in number of years completed), and poverty status defined as the ratio of family income to the poverty level, controlling for family size and the age of the head of family. In 1987, the poverty line was defined as \$11,611 for a family of four. A construct of dummy variables was used to measure five categories of poverty status: poor (income below the Federal Poverty Line), near poor (between the poverty line and 125% of poverty), low income (over 125% to 200% of the poverty line), middle income (over 200–400% of the poverty line), and high income (over 400% of the poverty line). For this analysis, persons with negative family incomes were categorized as poor.

The means for the total, full year Medicaid, and the uninsured group are shown in Table 1. Compared to the total sample, the uninsured and those with Medicaid were more likely to be minority, had significantly fewer years of education, lower family incomes, and worse health.

Results

Since full year coverage would most likely be the focus of legislation, the results pertaining to part year private insurance and part year public insurance will not be discussed.

Simple means for each insurance status are shown in Table 2. There is a marked difference in the number of hospital stays and physician visits by insurance status. The uninsured had lower average rates of utilization compared to persons with private or Medicaid coverage for the entire year. Among persons with insurance, those with Medicaid for the full year had the highest

TABLE 1. Means for Independent Variables for the Total Sample, the Uninsured, and Medicaid Recipients Ages 18 to 64

	Total (n = 16,430)	Uninsured (n = 2,248)	Medicaid (n = 580)
Age	37.79	34.67 ^a	33.78 ^a
Percent female	51	44 ^a	80 ^a
Percent minority	18	35 ^a	58 ^a
Education	12.77	11.17 ^a	10.65 ^a
Family income (\$)	39,839	20,713 ^a	14,194 ^a
Rate health			
Excellent	33	26 ^a	13 ^a
Good	54	52	48 ^a
Fair	12	19 ^a	28 ^a
Poor	2	3 ^a	11 ^a

Source: 1987 National Medical Expenditure Survey, Household Survey. Agency for Health Care Policy and Research.

^a Using Student's *t*, statistical differences between the means of the total and the uninsured or Medicaid groups were observed at *P* < .05.

average utilization with one exception: persons with private insurance for the entire year had a slightly higher average number of proactive visits.

Multivariate Analysis

A two-part model, consistent with traditional health services research^{8,17-18} was used to compare differences in use by insurance status. In the first part, logistic regression models were used to estimate the probability of having an inpatient hospital stay, reactive and proactive physician visits, respectively. In the second part, a weighted least squares regression model was used to determine the natural log of the number of

nights in a hospital or physician visits for persons who had some utilization. The simulated utilization for each person was then derived by multiplying the exponentiated predicted utilization value by the simulated probability. Finally, the predicted logarithmic values of utilization were transformed to natural scales by applying the "smearing" methodology developed by Duan et al¹⁹ to yield consistent estimates of expected utilization from log-linear equations if the error term is non-normal.

This method was used to derive two separate values: 1) the mean utilization for each insurance group; and 2) the mean utilization for the uninsured and persons with Medic-

TABLE 2. Health Services Utilization for Ages 18-64

	Hospital Stays		Reactive Physician Visits		Proactive Physician Visits	
	% With Any	Mean # Stays	% With Any	Mean # Visits	% With Any	Mean # Visits
Full year private insurance	9.2	.11	64.0	3.04	31.3	.48
Part year private insurance	7.5	.09	57.7	2.16	27.5	.37
Full year Medicaid insurance	20.3	.30	76.0	5.32	24.3	.45
Part year Medicaid insurance	18.9	.25	70.7	4.12	21.3	.31
Uninsured	5.3	.06	42.6	1.55	14.4	.19

Source: 1987 National Medical Expenditure Survey, Household Survey. Agency for Health Care Policy and Research.

aid if they were given private insurance for the entire year.

Since a stratified multistage area probability design with disproportionate sampling was used in NMES, rather than a simple random sample, sampling weights are used in the regressions to adjust for the differential selection probabilities that characterize sample observations. The weights also reflect adjustment for complete and round specific nonresponse to the survey and post-stratification to the Census Bureau's 1987 Current Population Survey (CPS) cross-classified by age, race/ethnicity, gender and poverty status.

In addition, because of the sample design, variance estimation cannot proceed under the same assumptions of simple random sampling. Therefore, several statistical programs developed by the Research Triangle Institute²⁰ were used with SAS analysis to adjust for the complex survey design and accurately estimate variance. RTILOGIT was used to derive unbiased estimates of model coefficients and standard errors for logistic regression models,²¹ SURREGR was used for linear regression analysis, and SESUDAAN was used to adjust the standard errors of the descriptive statistics to reflect the complex survey design.²²⁻²³

With respect to family level analysis, this data set was restricted to separate estimates of adults that significantly reduces the impact of intrafamily correlation on variance estimates. Moreover, research has shown that the variance estimates of NMES data produced by SURREGR do not differ greatly from other statistical software packages that deal more explicitly with the problem of intrafamily correlation.²² For these reasons, no attempt has been made to adjust for intrafamily correlation.

The results of the logistic regression for the first part of the model are shown in Table 3. Compared to the uninsured, persons with private or public insurance were more likely to enter a hospital or have a physician visit for reactive or proactive care. Other

predictors for all types of utilization included age, minority status, and self-assessed health. Health was a determinate of hospital stays and reactive visits, but had a limited effect on proactive visits. In joint tests of the proactive visit model, health status was significant at the $P < 0.10$ level, but not at the $P < 0.05$ level. Joint tests were also conducted for the poverty/income measures and showed that the construct was significant for all measures of utilization. The indicator for pregnancy in 1987 was a predictor of hospital stays and reactive visits, but not preventive visits as expected. This suggests that all maternity visits were either not captured in the question that screened for reason for visit or women had other conditions along with prenatal visits and the other conditions took precedence as the main reason for a physician visit.

Regression analysis was used to predict the log of reactive and proactive ambulatory physician visits, and number of nights spent in the hospital for the second part of the model (see Table 4). With the exception of full year Medicaid, insurance status was not a consistent predictor of access for all services. Persons with Medicaid for the full year had significantly more hospital stays and physician visits compared to the uninsured, but persons with other insurance statuses were not significantly different from the uninsured. Persons with private insurance coverage for the entire year had more reactive physician visits compared to the uninsured, however private insurance did not predict hospital stays or proactive visits.

Among the control variables, compared to persons with excellent health, those who rated their health lower were more likely to have longer hospital stays and more reactive physician visits, however health status made no difference in determining number of proactive visits in either indicator by indicator tests or joint tests of the construct. In joint tests, the poverty/income construct was not significant for any measure of utilization. Other demographic and socioeco-

TABLE 3. Logistic Regression Models to Predict Any Hospital Stays, Reactive Ambulatory Visits, and Proactive Ambulatory Visits Among Adults Ages 18–64 (n = 16,430)

	Stays	Reactive	Proactive
Age	.015 ^a	.009 ^a	.019 ^a
1 = Female	.125	.472 ^a	.857 ^a
1 = Minority	–.230 ^b	–.324 ^a	–.182 ^a
Education	–.024	.029 ^a	.073 ^a
1 = Pov 1 (poor)	.017	–.089	–.347 ^a
1 = Pov 2 (near poor)	.153	.004	–.316 ^b
1 = Pov 3 (low)	.114	–.173 ^c	–.274 ^b
1 = Pov 4 (middle)	–.060	–.058	–.167 ^a
1 = Pregnant 1987	3.194 ^a	2.386 ^a	–.064
1 = Health 2 (good)	.376 ^a	.401 ^a	–.057
1 = Health 3 (fair)	1.191 ^a	1.025 ^a	–.180 ^b
1 = Health 4 (poor)	2.196 ^a	2.022 ^a	–.221
Full year private insurance	.697 ^a	.775 ^a	.561 ^a
Part year private insurance	.433 ^b	.607 ^a	.673 ^a
Full year Medicaid	.741 ^a	1.062 ^a	.597 ^a
Part year Medicaid	.857 ^a	.934 ^a	.420 ^b
Intercept	–4.069	–1.471	–3.357
Pseudo R ²	.160	.071	.058

Source: 1987 National Medical Expenditure Survey, Household Survey. Agency for Health Care Policy and Research.

Omitted group is Pov 5 (high income), HEALTH 1 (excellent), and full year uninsured.

^a *P* < .001.

^b *P* < .01.

^c *P* < .05.

nomics factors were not significant predictors across models and there was a great deal of variation in the R² for each model.

The uninsured and persons with Medicaid have distinct population characteristics (Table 1). Both groups on average are younger, have lower levels of education, have lower family incomes, and a larger percentage are minority and rate their health lower compared to the entire sample. Using the results of the two part model, mean utilization was calculated for the individuals in each insurance group (Table 5).

Compared to all other insurance groups, the uninsured have the lowest estimated mean utilization for all service types. Although the mean number of hospital stays was less than 1 for all insurance groups, the average number of nights spent in the hospital for the uninsured was extremely low (0.331) compared to persons with private insurance for the full year (0.563) or Medicaid (1.624). For reactive conditions, the esti-

mated mean number of visits for the uninsured was 1.6 visits compared to the 3 for persons with private insurance and slightly over 5 for Medicaid recipients. Like hospital stays, the average number of proactive visits, regardless of age or insurance status, was less than 1. The average probability (Appendix Table 1) and mean utilization was lowest for the uninsured and highest for persons with private insurance.

The effect of extending private coverage to the individuals in the uninsured and the Medicaid groups (i.e., setting the value of the insurance to full year private insurance for each person while all other insurance values are set to 0) is shown in Table 6 along with the estimate for the current insurance status from Table 5. For the effect of this change on the probability for each insurance group that is now given private insurance, but the other characteristics of the group remain unchanged, see Appendix Table 2. Extending full year insurance to the uninsured

TABLE 4. Regression Models for ln (Number of Nights in a Hospital, Number of Reactive Ambulatory Visits, and Number of Proactive Ambulatory Visits) Among Adults Ages 18–64

	Stays (n = 1,346)	Reactive (n = 10,009)	Proactive (n = 4521)
Age	.010 ^a	.008 ^a	.001
1 = Female	.037	.114 ^a	.057 ^a
1 = Minority	.051	–.110 ^a	–.004
Education	.004	.018 ^a	.006 ^c
1 = Pov 1 (poor)	.015	–.039	–.028
1 = Pov 2 (near poor)	.024	–.036	–.004
1 = Pov 3 (low)	–.147 ^c	.024	–.034
1 = Pov 4 (middle)	–.005	–.001	–.042 ^c
1 = Pregnant 1987	–.146 ^c	.907 ^a	.152 ^b
1 = Health 2 (good)	.181 ^b	.176 ^a	–.014
1 = Health 3 (fair)	.328 ^a	.522 ^a	.038
1 = Health 4 (poor)	.535 ^a	1.145 ^a	.038
Full year private insurance	.032	.222 ^a	.037
Part year private insurance	–.030	.072	–.009
Full year Medicaid	.277 ^c	.350 ^a	.135 ^b
Part year Medicaid	.407 ^c	.194 ^c	–.013
Intercept	.748	.058	.077
R ²	.094	.140	.018

Source: 1987 National Medical Expenditure Survey, Household Survey. Agency for Health Care Policy and Research.

Omitted group is Pov 5 (high income), HEALTH 1 (excellent), and full year uninsured.

^a *P* < .001.

^b *P* < .01.

^c *P* < .05.

significantly (i.e., results of Student’s *t* test yielded *P* < .05) increased mean utilization for all types of service—specifically, 69% for reactive physician visits, 60% for preventive visits, and 83% for number of nights hospitalized. Utilization for persons with Medicaid decreased with the extension of full year private insurance by 24% for hospitalization, and less than 20% for ambulatory physician visits. Despite the decreases for the Medicaid enrollees, their levels of use for hospitalization and reactive visits continued to exceed that of the privately insured.

Discussion

Currently, the uninsured use fewer health care services compared to the insured, and persons with Medicaid coverage have higher utilization compared to those with private coverage, controlling for sociodemographic, health and lifestyle factors. The results of this analysis show that utilization would increase for the uninsured if private

insurance benefits were extended, whereas utilization would decrease for those with Medicaid, however, the magnitude depends on the type of care.

As a percent of the use by the privately insured, the uninsured received 54% of reactive physician visits. This was consistent with previous research by Long and Rodgers⁶ (63%) and Spillman⁸ (48–55%). After extending private insurance, the use increased for the uninsured group to 90% relative to the privately insured, resulting in an average of one more physician visit per year. For those with Medicaid, use relative to the privately insured was 176% before the insurance change and decreased to 147% after extending private insurance. The result for the Medicaid group was a decrease of almost one fewer reactive visits per year, however the utilization still exceeded that of the privately insured by more than one visit (4.4 for the Medicaid vs. 3.0 for the privately insured).

TABLE 5. Estimated Means for Expected Health Care Utilization Among Adults Ages 18–64 (n = 16,430)^a

	Reactive Visits	Proactive Visits	Hospital Nights
Full year private	3.010	.472	.563
Full year uninsured	1.612	.204	.331
Full year Medicaid	5.283	.406	1.624
Part year private	2.260	.387	.396
Part year Medicaid	3.882	.305	1.617

Note: Persons with private insurance had significantly different ($P < .05$) utilization for all types of insurance compared to the uninsured or persons with Medicaid for the entire year.

Source: National Medical Expenditure Survey, 1987. Agency for Health Care Policy and Research.

^a The means of a given insurance group were derived from a multiplicative function, such that

$$(1/n) \sum_i \hat{y}_i = a \cdot b$$

where: $a = \exp[X_i B] \hat{\phi}$; where e^{x^b} is the retransformation of the natural log for number of visits in the model $\ln \hat{y}_i = xB + e_i$; and $\hat{\phi} = (1/n) \sum_{i=1}^n \exp(\hat{e}_i)$ is a “smearing” factor equal to the exponentiated residuals from the log-linear equation. See Duan et al. (1982, pp. 29–33 and Appendix). For an empirical application see Mueller and Monheit (1988). b is the simulated probability of having a given form of utilization.

This study found that the uninsured as a group received 43% of the proactive or preventive visits of the privately insured. Medicaid enrollees received 86% of preventive care relative to those with private insurance. After extending private insurance to these groups, proactive visits increased to 69% for the uninsured, but dropped to 76% for the Medicaid group relative to use of the privately insured. Regardless of the changes, the result for all groups was an average of less than one preventive visit.

For hospitalization, these findings indicate that the uninsured received 56% of the average utilization of the insured. This is higher than previous estimates given by

Long and Rodgers⁶ (31%) and Spillman⁸ (12–20%) using earlier data (1980 and 1984, respectively). The smaller gap between the privately insured and the uninsured recorded here may reflect a more recent trend toward shorter length of hospital stays for all insurance groups.^{24–25} After extending private insurance to the uninsured, total hospital nights for the uninsured group increased to 108% of private use. For Medicaid recipients, extending private insurance decreased the numbers of hospital nights, resulting in utilization that was 220% of that used by the privately insured group. Sub-

TABLE 6. Effect of Extending Full Year Private Health Care Insurance

	Current Estimated Means ^a	Extension of Full Year Private
Full year uninsured		
Reactive physician visits	1.612	2.717
Proactive physician visits	.204	.327
Hospital nights	.331	.606
Full year Medicaid recipients		
Reactive physician visits	5.283	4.419
Proactive physician visits	.406	.359
Hospital nights	1.624	1.236

Note: Although not shown, persons with private insurance had significantly different ($P < .05$) utilization for all types of service compared to the uninsured.

Source: National Medical Expenditure Survey, 1987. Agency for Health Care Policy and Research.

^a The means of a given insurance group were derived from a multiplicative function, such that

$$(1/n) \sum_i \hat{y}_i = a \cdot b$$

where: $a = \exp[X_i B] \hat{\phi}$; where e^{x^b} is the retransformation of the natural log for number of visits in the model $\ln \hat{y}_i = xB + e_i$; and $\hat{\phi} = (1/n) \sum_{i=1}^n \exp(\hat{e}_i)$ is a “smearing” factor equal to the exponentiated residuals from the log-linear equation. See Duan et al. (1982, pp. 29–33 and Appendix). For an empirical application see Mueller and Monheit (1988). b is the simulated probability of having a given form of utilization.

stantively, the change in insurance generated hospitalization means that continued to be less than one night for the uninsured, and slightly over one night for Medicaid enrollees.

Although, the findings of this study suggest that the uninsured population will increase utilization and the Medicaid population will have lower utilization with the average private insurance coverage, caution is advised in interpreting these results in regard to the actual effect under health care reform. Ultimately, any effect on utilization for these populations depend on the changes health care reform renders in services covered, access to care, and cost sharing mechanisms. The Medicaid population will be particularly sensitive to the interplay among these factors. Currently, Medicaid is federally mandated to cover inpatient and outpatient hospital services, laboratory and x-ray, rural health and skilled nursing facilities, physician services, early and periodic screening, home health, and family planning services.²⁶ Despite the relative generosity of coverage available to Medicaid enrollees, presently physicians are not required to accept Medicaid patients and the low levels of Medicaid reimbursement motivate providers to limit the number of Medicaid patients.²⁷ If private insurance under reform offers a package that is less generous compared to that currently offered Medicaid recipients, and payment to providers for Medicaid patients is at the same rate as private insurance, the result may be no change in utilization due to a trade-off in decreased services and increased access to care. Numerous outcomes for utilization can be deducted from various combinations of these factors.

Current standards of private insurance include co-payments and deductibles which have been found to affect health care use for private patients.²⁸⁻²⁹ However, cost-sharing for public patients largely does not exist. Again, the effect on utilization of a \$2 or \$5 co-pay per physician visit must be considered in combination with type of service and

access issues for public patients. Moreover, whether the setting is fee-for-service or HMO will also impact utilization.

A further caveat is that this study has accounted for some differences in the populations due to demographics, socioeconomics and health status, but there may be others that affect utilization. Research has shown that the uninsured and Medicaid populations have poorer health compared to the privately insured. Private health insurance may not insure that these groups use health services at the same rate as those currently insured under private policies. More research is needed identify other characteristics that affect health care use.

This study contributes to the discussion of the ramifications of extending private insurance to the uninsured or persons on Medicaid, but suggests a much needed research agenda to fully understand the ramifications of insurance on health care utilization.

Acknowledgments

The author thanks Brenda Spillman and Pamela Farley Short for their helpful comments and suggestions on earlier drafts. Social and Scientific Systems Inc. of Bethesda, Maryland provided programming assistance.

References

1. Davis K, Rowland D. Uninsured and underserved: Inequities in health care in the United States. *Milbank Q* 1983;61:149.
2. Freeman HE, Blendon RJ, Aiken LH, et al. Americans' report on their access to health care. *Health Aff* 1987;Spring 6:6.
3. Monheit AC, Hagan MM, Berk ML, et al. The employed uninsured and the role of public policy. *Inquiry* 1985;22:348.
4. Robert Wood Johnson Foundation. Access to Health Care in the U.S.: Results of a 1986 Survey. Special Report #2. Princeton, New Jersey, 1987.
5. Andersen R, Chen M, Aday LA, et al. Health status and medical care utilization. *Health Aff* 1987;Spring 6:137.
6. Long SH, Rodgers J. The effects of being uninsured on health care service use: estimates from the survey of income and program participation working paper N. 9012. Washington, DC: U.S. Bureau of the Census, 1990.
7. Long SH, Settle RF. Cutbacks in Medicaid eligibility under the Omnibus Budget Reconciliation Act of

1981: Implications for access to health care services among the newly ineligible. Report, HCFA Contract No. 500-83-0058. January, 1985.

8. Spillman BC. The impact of being uninsured on utilization of basic health care services. *Inquiry* 1992;29:457.

9. Buczko W. Hospital utilization and expenditures in a Medicaid population. *Health Care Financ Rev* 1989;11:35.

10. Rowland D, Lyons B. Triple jeopardy: rural, poor, and uninsured. *Health Serv Res* 1989;23:975.

11. Hahn B, Lefkowitz DC. Annual Expenses and Sources of Payments for Health Care Services. AHCPR Pub. No. 93-0007. National Medical Expenditure Survey Research Findings 14, Agency for Health Care Policy and Research. Rockville, MD: Public Health Service, 1992.

12. Buczko W. Physician utilization and expenditures in a Medicaid population. *Health Care Financ Rev* 1986;8:17.

13. Lillard LA, Manning WG, Peterson CE, et al. Preventive medical care. Manuscript prepared for the Health Care Financing Administration, U.S. Department of Health and Human Services by the Rand Corporation, 1986.

14. Lurie N, Manning WG, Peterson C, et al. Preventive care: do we practice what we preach? *Am J Public Health* 1987;77:801.

15. Woolhandler S, Himmelstein DU. Reverse targeting of preventive care due to lack of health insurance. *JAMA* 1988;259:2872.

16. Edwards WS, Berlin M. Questionnaires and Data Collection Methods for the Household Survey and the Survey of American Indians and Alaska Natives. DHHS Publication No. (PHS) 89-3450. National Medical Expenditure Survey Methods 2, National Center for Health Services Research and Health Care Technology Assessment. Rockville, MD: Public Health Service, 1989.

17. Manning WG, Morris CN, Newhouse JP, et al. A two-part model of the demand for medical care: preliminary results from the Health Insurance Study. In: van

der Gaag, Perlman M. *Health, Economics, and Health Economics*. Amsterdam: North-Holland, 1981.

18. Mueller CD, Monheit AC. Insurance coverage and the demand for dental care. *Journal of Health Economics* 1988;7:59.

19. Duan N, Manning W, Morris C, et al. A comparison of alternative models for the demand for medical care, R-2754-HHS. Santa Monica, CA: The Rand Corporation, 1982.

20. Holt M. SURREGR: Standard Errors of Regression Coefficients from Sample Survey Data. Research Triangle Park, NC: Research Triangle Institute, 1982.

21. Shah BB, Folsom RE, Harrel FE, et al. RTILOGIT: Procedure for Logistic Regression on Survey Data. Research Triangle Park, NC: Research Triangle Institute, 1987.

22. Cohen SB, Xanthopoulos JA, Jones GK. An evaluation of statistical software procedures appropriate for the regression analysis of complex survey data. *Journal of Official Statistics* 1988;4:17.

23. Cox BG, Cohen SB. *Methodological issues for health care surveys*. New York: Marcel Dekker, 1985.

24. Boutwell RC, Davidson SM, Mitchell JB. Trends in inpatient use by the elderly and other adults for selected procedures: 1982-1987. Needham, MA: Center for Health Economics Research, November 1989.

25. Farley DE. Patterns of hospital utilization among privately insured patients, 1980-1986. *Advances in the Study of Entrepreneurship, Innovation, and Economic Growth* 1990;4:207.

26. U.S. Department of Health and Human Services. Health Care Financing Administration. *Health Care Financing Program Statistics: Medicare and Medicaid Data Book, 1988*. Baltimore, MD: Health Care Financing Administration, Office of Research and Demonstrations, 1988.

27. Cromwell J, Mitchell J. An economic model of large Medicaid practices. *Health Serv Res* 1984;19:197.

28. Lohr KN, Brook RH, Kamber CH, et al. Use of medical care in the Rand Health Insurance Experiment. *Med Care* 1986;24:S72.

29. Brook RH, Ware JE, Rogers WH, et al. Does free care improve adults' health? *N Engl J Med* 1983;309:1426.

Appendix. TABLE 1. Average Probability of Having Any Use Derived from Logistic Regression Model in Table 3.

	Reactive Physician Visit	Proactive Physician Visit	Hospital Stay
Full year uninsured	.426	.144	.053
Full year private	.640	.313	.092
Part year private	.577	.275	.075
Full year Medicaid	.760	.243	.203
Part year Medicaid	.708	.213	.189

Note: Differences between probabilities for the uninsured compared to full private or full Medicaid are significant at $P < .05$ for all types of services.

Source: National Medical Expenditure Survey, 1987. Agency for Health Care Policy and Research.

Appendix. TABLE 2. Average Probabilities of Having Any Use if Full Year Private Insurance was Extended to All Persons.

	Reactive Physician Visit	Proactive Physician Visit	Hospital Stay
Full year insurance	.602	.223	.094
Full year private	.640	.313	.092
Part year private	.614	.254	.092
Full year Medicaid	.710	.236	.198
Part year Medicaid	.678	.237	.173

Note: Significant differences ($P < .05$) between persons uninsured the full year and persons with full year private insurance were observed for reactive and proactive physician visits, but not hospital stays. Differences between persons with Medicaid for the full year and private insurance were significant ($P < .05$) for all types of service.

Source: National Medical Expenditure Survey, 1987. Agency for Health Care Policy and Research.