Analyzing the relationship between health insurance, health costs, and health care utilization

Eric French and Kirti Kamboj

Introduction and summary

In this article, we provide an empirical analysis of the determinants of whether an individual purchases health insurance coverage. We describe the relationship between health insurance, health costs, and health care utilization of the elderly, using data from the Health and Retirement Survey and the Assets and Health Dynamics among the Oldest Old. We show how health costs and health care utilization depend upon access to health insurance for individuals aged 50 and older.

Given the public interest in extending health insurance coverage to those who are currently uninsured, it seems worthwhile to better understand why some people do not purchase health insurance. For example, 2000 Democratic presidential candidate Al Gore advocated that individuals aged 55–64 be allowed to "buy in" to Medicare. The idea was that eligible individuals would have to pay for Medicare coverage, but would potentially pay less than the price of privately available insurance. Medicare would potentially be cheaper because of the cost advantages associated with the group coverage that Medicare provides. By understanding the determinants of the health insurance purchase decision, we can better understand how proposed reforms may affect health insurance coverage.

First, we investigate the factors influencing a person's decision to purchase health insurance. A General Accounting Office study found that in 1998, private health insurance premiums for a family of four ranged from $3,000 to $14,000 per year. Although health care coverage can be expensive, very few households are unable to buy private health insurance. Nevertheless, many households choose to be uninsured rather than purchase private health insurance.[1] Therefore, we assume that even low-income households are able to buy basic health insurance.

Given that almost all individuals in our data are able to purchase health insurance, the most likely reason that they remain uninsured is that they expect their health costs without insurance to be significantly lower than their health costs with insurance. We test four potential reasons why this might be the case: 1) adverse selection in the insurance market—because insurers cannot distinguish between high-cost and low-cost individuals in a group—leading to potentially prohibitive costs of health insurance for healthy individuals; 2) moral hazard—the idea that if the price of something is low, people use more of it—leading to potentially prohibitive costs of general insurance; 3) potentially prohibitive administrative costs of providing health insurance for private individuals; and 4) many of the uninsured already receive explicit insurance through Medicaid and implicit insurance through hospitals that will treat indigent patients, which may obviate the need for them to purchase additional health insurance.

Most studies of the health insurance purchase decision focus on the importance of adverse selection and moral hazard as potential reasons why individuals may not purchase insurance. Our results provide evidence that neither adverse selection nor moral hazard is the key determinant of the health insurance purchase decision. We find no evidence that adverse selection makes private insurance too expensive and only moderate evidence that moral hazard may make private health insurance prohibitively expensive. However, we find significant evidence that high administrative costs drive up the price of private insurance. Moreover, we find a large amount of evidence that the existence of Medicaid and implicit insurance obviates the need for individuals to purchase additional health insurance. This last result suggests that changes

Eric French is an economist at the Federal Reserve Bank of Chicago. Kirti Kamboj is a graduate student at the University of Chicago.

in government-provided health insurance, such as allowing younger individuals to "buy in" to the Medicare program, would likely have a small effect on the health insurance coverage of older Americans. The data show that many of those currently "uninsured" already have access to low- or no-cost health care coverage from the government and hospitals.

Data: Health and Retirement Survey and Assets and Health Dynamics among the Oldest Old

We use data from the Health and Retirement Survey (HRS) and Assets and Health Dynamics among the Oldest Old (AHEAD). These two datasets are collected by the same organization and have a similar sample design for much of the sample period. Both contain detailed information on health costs, health insurance, and demographics.

The HRS is a sample of non-institutionalized[2] individuals aged 51–61 in 1992. Spouses of these individuals were also interviewed, regardless of the spouse's age. The HRS includes both a nationally representative core sample and an additional sample of blacks, Hispanics, and Florida residents. A total of 12,652 individuals in 7,608 households were interviewed in 1992 and re-interviewed in 1994, 1996, 1998, and 2000, creating up to five separate responses for each individual.

The AHEAD is a nationally representative sample of non-institutionalized individuals aged 70 and older in 1993. Like the HRS, spouses of AHEAD respondents were also interviewed, regardless of age. Also like the HRS, the AHEAD dataset includes both a nationally representative core sample and additional samples of blacks, Hispanics, and Florida residents. A total of 8,222 individuals in 6,047 households were interviewed in 1993. These individuals were interviewed again in 1995, 1998, and 2000, creating up to four separate responses for each individual.[3]

In order to assess the quality of the HRS/AHEAD data, we present means of several key variables of individuals aged 50 and older and compare them with aggregated statistics from other sources.[4]

Consider sources of insurance first. Table 1 shows that most individuals receive employer-provided insurance, including insurance from current employers, past employers, and unions, as well as from the spouse's current employer, past employers, and unions.[5] Almost all individuals over age 65, as well as those who draw disability insurance, are eligible for Medicare. Individuals with low incomes and asset levels are also eligible for Medicaid. Those not eligible for any of the above forms of insurance are faced with either purchasing private health insurance or having no insurance at all. Table 1 shows that many individuals who do not have access to government- or employer-provided health insurance choose not to purchase insurance on the private market. Of our sample, 17 percent have private insurance, while 7 percent have no insurance. Much of the remainder of this article is devoted to understanding the health insurance purchase decision for people who are neither covered by employers nor by the government.

The central variable of interest in our study is the level of health costs paid by the household. For single households, we compute this as the individual's health costs. For married households, it is the sum of the husband's and wife's health costs. Health costs are the sum of insurance premiums, drug costs, and costs for hospital, nursing home care, doctor visits, dental visits, and outpatient care. See the appendix for a more detailed description of these variables. For our sample, mean household out-of-pocket health costs are $2,527 per year and mean health costs for those aged 65 and older are $2,716. The U.S. per capita average is $2,831 for non-institutionalized households headed by an individual aged 65 or older (Federal Interagency Forum, 2000). This means that health costs in the HRS/AHEAD are likely significantly below the national average when accounting for the institutionalized population.

One important reason why average health costs in the HRS/AHEAD data are below the national average is that individuals in the HRS/AHEAD spend far fewer nights in a nursing home. Households headed by someone aged 65 or older spend 7.2 nights in a nursing home per year in our sample versus 15.8 nights in the aggregate statistics (National Center for Health Statistics, 1999).[6] Selden et al. (2001) find that 9 percent of total aggregate health costs and 13 percent of costs paid out of pocket arise from nursing home visits.

Why is there a market for health insurance?

In the next two sections of this article, we describe some of the important determinants of the health insurance purchase decision. Then, we provide empirical evidence on these issues.

The most obvious reason people purchase health insurance is to limit uncertainty associated with catastrophic health costs.[7] The idea behind health insurance is that uncertain health expenditures are diversifiable risks. That is, health insurers provide health insurance to many individuals. While there is a great amount of uncertainty about how much insurers must pay out for any individual, there is very little uncertainty about average medical expenses for a large pool of individuals.

TABLE 1

Descriptive statistics

Variable	Mean	Standard deviation	Observations
Fraction with insurance plan			
Employer-provided	0.50	0.50	46,991
Private	0.17	0.37	46,991
None	0.07	0.25	46,991
Medicaid	0.10	0.29	46,991
Medicare	0.17	0.38	46,991
Medical costs (1998 dollars)			
Out of pocket costs	744	2,516	41,876
Drug costs	753	2,523	41,807
Insurance premiums	1,085	3,197	34,251
Total household expenses	2,527	5,057	33,005
Health care utilization			
Nights in nursing home	4.09	34.65	42,638
Nights in hospital	1.69	6.13	42,418
Doctor visits	6.95	9.99	41,757
Had outpatient surgery	0.13	0.24	42,663
Saw a dentist	0.65	0.48	36,315
Did not take prescribed drugs	0.09	0.28	36,316
Demographics			
Fraction married	0.54	0.50	46,953
Good health	0.69	0.46	41,606
Economic resources			
Assets <$50,000	0.32	0.47	45,627
Assets >$50,000<$200,000	0.34	0.47	45,627
Assets >$200,000	0.34	0.48	45,627
Income <$5,000	0.05	0.22	45,874
Income >$5,000<$30,000	0.49	0.50	45,874
Income >$30,000	0.46	0.50	45,874
Working	0.38	0.48	46,442

Sources: HRS/AHEAD data and authors' calculations.

Therefore, even if the health insurer is risk averse, by pooling health costs of many individuals together, the insurer faces very little risk. As a result, the insurer cares only about expected medical expenditures of the individual when setting the insurance premium.

Suppose that the firm's only cost of providing health insurance is medical expenditures. In other words, we ignore administrative costs to the insurer. Also, assume that there are a large number of individuals in the market, and that all of these individuals face the same distribution of health costs. If markets are perfectly competitive, the firm's expected profit is zero. If the insurer makes profits, new health insurance providers will enter the market and bid down insurance premiums to the expected health costs of the individual. Therefore, insurers will offer insurance to individuals at "actuarially fair" prices, that is, prices equal to the expected health costs that individuals face.

Assuming that individuals are risk averse, they would rather pay their expected health costs than face the possibility of extremely high health costs. Therefore, individuals will be better off purchasing actuarially fair insurance. As we noted in table 1, however, many people do not purchase insurance. The most common explanation why people do not buy insurance is that it is impossible to buy actuarially fair insurance. Next, we examine why this is so.

Why doesn't everyone purchase health insurance?

Above, we argued that people should purchase health insurance to reduce uncertainty if their expectation is that they will pay the same amount for health care whether or not they are insured. However, insured individuals are, on average, likely to pay more than the uninsured. Below, we highlight four reasons for this and cite existing evidence for each of the reasons.

First, prices of health insurance may be potentially high because of adverse selection. Adverse selection occurs when there are high health cost individuals and low health cost individuals in a group, but health insurers cannot distinguish between the two.

Recall that if markets are competitive and there are no administrative costs, insurers will set the price of health insurance equal to the average medical expenditure of individuals who purchase health insurance. If individuals with low health costs are able to reveal that, on average, they will have low health costs, health insurers will charge those individuals low insurance premiums.

However, in practice it is very difficult for insurers to distinguish between the two groups. Individuals may know whether they are "high cost." However, this information is not available to the insurer of a group plan. For example, Blue Cross/Blue Shield health insurance merely requests home address, date of birth, sex, whether the individual smokes, and whether the individual wants maternity coverage.

As a result of not being able to distinguish between high-cost and low-cost individuals, insurers charge everyone (conditional on the information listed immediately above) the same price for health insurance.[8] If only high health cost individuals purchase health insurance, and health insurers charge premiums equal to average health costs of people who buy health insurance, then the cost will be relatively high. Although low health cost individuals may value health insurance at more than the cost to insurers of providing it to

them, since they are risk averse, they may value it at less than what insurers charge to provide health insurance to high health cost people. In this scenario, the low health cost individuals will not purchase health insurance.[9]

If insurers could distinguish between high-cost and low-cost individuals, they would provide insurance to low health cost individuals at a price equal to their expected health costs. This would make low-cost individuals better off. Insurers would still charge high-cost individuals their expected health costs, making them no worse off.

Cutler and Zeckhauser (2000) survey the evidence on adverse selection. They argue that empirical work has repeatedly documented its importance when comparing insurers that offer multiple plans. For example, individuals who opt for Medicare health maintenance organizations (HMOs) (that offer less generous service than most Medicare plans but cover some services, like drug costs, that most Medicare plans do not cover) are more likely to have consumed few medical services in the past than those who do not opt for Medicare HMOs.

Many researchers also cite the high price of privately provided health insurance as evidence that adverse selection does drive up the price of health insurance. For example, Gruber and Madrian (1995) document that Blue Cross/Blue Shield health insurance for a family of four in New England costs $10,310 in 1998 dollars.[10]

However, it is not clear in the above example that individuals who buy Blue Cross/Blue Shield are any less healthy than those who decide not to purchase insurance. Moreover, many studies that consider the health insurance purchase decision have found relatively little evidence that adverse selection exists in the market for health insurance (see Cardon and Hendel, 2001, for example).

The second reason insurance may be so expensive is the cost of administering plans for large employers. Administrative costs account for 10 percent to 15 percent of the costs of the health plans (Cutler and Zeckhauser, 2000). However, these costs are potentially higher for insurance plans administered to small groups of people. For example a Congressional Budget Office (U.S. Congress, 1988) study found that large firms (10,000+ workers) pay 35 percent less than small firms (one to four workers). Gruber and Madrian (1995) argue that this price difference reflects some combination of adverse selection and administrative costs. Given that it is not obvious that adverse selection is more serious for small employers than large employers, it is likely that the cost difference is largely from the lower administrative costs at large firms. Pauly (1986) finds that administrative costs may account for 50 percent of the cost of "Medigap" health insurance plans.[11]

Moral hazard is the third reason health insurance costs are high. Moral hazard is a consequence of downward sloping demand curves: If the price of a good becomes cheaper, people buy more of that good. People purchase health insurance to reduce the costs of medical procedures. For example, many "indemnity" plans like Blue Cross/Blue Shield allow people to obtain whatever health care they wish, but the insurer pays most of the price. If individuals have a 20 percent co-payment, then the price of medical services is only 20 percent of what it would be without insurance. This potentially leads people to use medical services that are of very little value to them. Recall that if markets are competitive, then the price of health insurance is equal to expected medical expenses of purchasers of health insurance plus administrative costs. The high level of medical services consumed by insured individuals will be reflected in the price of health insurance.

Evidence from the RAND Health Insurance Experiment (Manning et al., 1987) suggests that a 1 percent rise in the price of health care services results in a .2 percent reduction in the quantity of health care services consumed, or a price elasticity of .2. Given that the price of health care services differs greatly between those with and without insurance, moral hazard potentially leads insured individuals to consume far more medical services than is ideal, leading to expensive medical insurance.

A final reason many people may find private medical insurance expensive is that they already receive insurance from the government or through hospitals. Medicaid provides insurance to individuals with low income and assets. Moreover, hospitals that receive federal funding cannot turn away indigent patients. Therefore, individuals with low income and assets do not need to purchase insurance. They already have it provided explicitly by Medicaid or implicitly by hospitals. This explanation has received less attention than the other explanations (see Cutler and Gruber, 1996, for an exception). However, as shown in the empirical work below, this may be an important oversight.

With these explanations in mind, table 2 describes the problems associated with universal government insurance relative to employer-provided health insurance and private insurance. The main advantage of nationalizing health insurance, such as expanding Medicare to all individuals aged 55 and older, is to overcome adverse selection problems.[12] Because the

government would expand coverage to everyone, both the healthy and unhealthy would be covered. Indeed, Akerlof (1970) points out that most individuals aged 65+ were uninsured before Medicare was passed into law and argues that adverse selection was one reason for the low insurance rates of these people. However, nationalizing health care would do little if anything to overcome high administrative costs or moral hazard. Administrative costs would potentially be the same for insurance plans administered by large private industries and the government. And moral hazard is inherent in the very nature of insurance contracts and is not specific to the insurance provider. Therefore, arguments in favor of nationalizing health insurance must rest on the assumption that adverse selection exists in the marketplace for health insurance coverage and partly on the assumption that, because of risk aversion, health insurance makes people better off.

Health insurance coverage, health costs, and health care utilization

In this section we provide some new empirical evidence on the four potential reasons individuals do not purchase health insurance We find no evidence of adverse selection and limited evidence in favor of moral hazard and high administrative costs. Instead, we believe the main reason some individuals do not purchase insurance is that they are already receiving insurance, either through the government or implicitly through hospitals.

In order to assess the importance of administrative costs, we compare individuals with private insurance with individuals with employer-provided insurance. Recall that Cutler and Zeckhauser (2000) find that administration accounts for 10 percent to 15 percent of the total cost of health insurance at large firms. Our goal is to find out whether individuals who purchase private insurance face significantly higher administrative costs than those who receive health insurance through their employer.

Table 3 shows household health costs by age group and health insurance type. For households headed by someone aged 50–64, health insurance premiums are $1,154 per year for those with employer-provided plans. The Employee Benefit Research Institute (1999) reports that employers contribute an average of $3,288 to their employees' health insurance. Therefore, the total cost of employer-provided insurance premiums is the sum of the employee contribution plus the employer contribution, or $4,442. Compare this amount with insurance premiums for households headed by individuals aged 50–64 with private insurance. These households spend $4,067, on average.

This would imply that the total cost of a private plan is slightly less than the cost of an employer-provided plan. [13] However, not only do households with private insurance spend more on insurance premiums than households with employer-provided insurance, they also have higher out-of-pocket expenses. This may reflect the higher deductibles and co-pays of private health insurance policies. When we sum up the insurance premiums paid by the individual and the firm plus what the individual pays out of pocket, the total health cost for households with employer-provided insurance is $5,489 (a $3,288 employer contribution plus total household expenses of $2,201) and the total cost for private insurance is $5,871, a difference of 7 percent. Given that administrative costs constitute about 13 percent of insurance costs for employer-provided plans, these costs make up 20 percent of private insurance costs.

Moreover, table 3 shows that households with private insurance receive fewer medical procedures than households with employer-provided health insurance. This may reflect the fact that private insurance does not usually cover pre-existing conditions. Given that those with private health insurance consume fewer medical services than those with employer-provided insurance, the cost (net of administrative cost) of private health insurance is likely lower than the cost (net of administrative cost) of employer-provided insurance. Therefore, the calculation of administrative costs above likely understates the administrative cost of private health insurance.

The second potential reason people do not purchase health insurance is adverse selection, which implies that only the most unhealthy purchase private insurance, which makes premiums prohibitively expensive for healthy people. However, the evidence presented in table 3 refutes this explanation. Fully 81 percent of people aged 50–64 with private insurance report that they are in good health. However, only 65 percent of the uninsured do likewise. Therefore, the uninsured are more likely to be unhealthy than those who purchase private insurance. Comparing those older

TABLE 2

Problems with health insurance, by payment system

	Nationalized	Employer-provided	Private
Administrative costs	yes	yes	yes
Moral hazard	yes	yes	yes
Adverse selection	no	some	yes

TABLE 3

Descriptive statistics by age group

	Employer-provided	Private	None	Medicaid	Medicare
A. Ages 50–64					
Fraction with insurance plan	0.67	0.09	0.12	0.07	0.04
Medical costs (1998 dollars)					
Non-drug out-of-pocket costs	659	1,049	599	224	994
Drug costs	513	709	585	465	1,354
Insurance premiums	1,154	4,067	110	53	366
Total household expenses	2,201	5,871	1,277	712	2,792
Health care utilization					
Nights in nursing home	0.241	0.008	0.627	5.350	1.527
Nights in hospital	1.067	0.809	0.932	3.146	2.791
Doctor visits	6.415	5.702	4.532	10.492	9.608
Had outpatient surgery	0.133	0.115	0.055	0.094	0.118
Saw a dentist	0.806	0.769	0.487	0.385	0.469
Did not take prescribed drugs	0.061	0.084	0.209	0.205	0.311
Demographics					
Fraction married	0.683	0.583	0.451	0.201	0.454
Good health	0.822	0.809	0.646	0.235	0.332
Economic resources (1998 dollars)					
Assets <$50,000	0.229	0.197	0.572	0.857	0.631
Assets >$50,000<$200,000	0.392	0.252	0.285	0.122	0.265
Assets >$200,000	0.379	0.550	0.143	0.019	0.102
Income <$5,000	0.020	0.058	0.189	0.275	0.148
Income >$5,000<$30,000	0.266	0.320	0.552	0.692	0.706
Income >$30,000	0.714	0.622	0.257	0.031	0.146
Working	0.729	0.653	0.554	0.071	0.072
B. Ages 65–79					
Fraction with insurance plan	0.37	0.22	0.01	0.10	0.30
Medical costs (1998 dollars)					
Non-drug out-of-pocket costs	732	651	605	333	647
Drug costs	669	1,394	880	585	1,055
Insurance premiums	1,255	2,408	211	149	433
Total household expenses	2,601	4,329	1,657	1,032	2,088
Health care utilization					
Nights in nursing home	1.135	0.798	0.693	10.005	1.921
Nights in hospital	1.845	1.835	2.133	3.394	1.690
Doctor visits	7.776	7.260	6.336	9.305	6.650
Had outpatient surgery	0.174	0.159	0.077	0.102	0.120
Saw a dentist	0.762	0.701	0.463	0.384	0.594
Did not take prescribed drugs	0.040	0.095	0.136	0.139	0.110
Demographics					
Fraction married	0.662	0.581	0.492	0.273	0.509
Good health	0.735	0.723	0.583	0.396	0.650
Economic resources (1998 dollars)					
Assets <$50,000	0.153	0.156	0.468	0.760	0.323
Assets >$50,000<$200,000	0.357	0.343	0.321	0.186	0.369
Assets >$200,000	0.489	0.501	0.205	0.049	0.306
Income <$5,000	0.010	0.012	0.174	0.122	0.031
Income >$5,000<$30,000	0.429	0.528	0.626	0.831	0.661
Income >$30,000	0.561	0.460	0.200	0.047	0.308
Working	0.201	0.221	0.176	0.059	0.170

than 65 who purchase private Medigap health insurance with those who only have Medicare or who have no health insurance at all, again we see that those who purchase private insurance are healthier than those with no insurance other than Medicare.[14]

The third potential reason individuals may not purchase health insurance is the moral hazard problem. Those who are insured face a low price of health care services, so they tend to consume more, which drives up the price of premiums. Therefore, controlling for health status, those who have private health insurance should consume more health care services than those who have no insurance. Table 3 shows that for households headed by someone aged 50–64, those with private health insurance are the least likely to spend a night in a nursing home or a hospital. Those 50–64 with private insurance spend .01 nights in a nursing home and .8 nights in a hospital per year, on average. Those without insurance spend .6 nights in a nursing home and .9 nights in a hospital per year, on average.

TABLE 3 (CONTINUED)

Descriptive statistics by age group

	Employer-provided	Private	None	Medicaid	Medicare
C. Ages 80 and older					
Fraction with insurance plan	0.23	0.28	0.01	0.16	0.32
Medical costs (1998 dollars)					
Non-drug out-of-pocket costs	1,773	1,241	477	646	1,018
Drug costs	765	1,230	1,086	391	944
Insurance premiums	832	2,033	73	165	345
Total household expenses	3,198	4,431	1,141	1,123	2,281
Health care utilization					
Nights in nursing home	16.168	12.622	25.198	44.476	12.279
Nights in hospital	2.638	2.366	1.984	3.275	1.975
Doctor visits	7.446	7.094	6.055	8.442	6.146
Had outpatient surgery	0.151	0.132	0.102	0.080	0.099
Saw a dentist	0.631	0.558	0.422	0.274	0.454
Did not take prescribed drugs	0.019	0.055	0.094	0.060	0.066
Demographics					
Fraction married	0.369	0.309	0.294	0.140	0.266
Good health	0.560	0.592	0.564	0.359	0.586
Economic resources (1998 dollars)					
Assets <$50,000	0.214	0.241	0.433	0.804	0.391
Assets >$50,000<$200,000	0.375	0.376	0.328	0.154	0.341
Assets >$200,000	0.410	0.382	0.239	0.039	0.265
Income <$5,000	0.010	0.024	0.209	0.123	0.056
Income >$5,000<$30,000	0.640	0.719	0.657	0.867	0.789
Income >$30,000	0.350	0.257	0.134	0.010	0.155
Working	0.018	0.044	0.029	0.008	0.040

Sources: HRS/AHEAD data and authors' calculations.

These findings are not consistent with the moral hazard explanation. However, those with private insurance on average have more doctor visits, are more likely to have outpatient surgery, are more likely to see a dentist, and are less likely to not take prescribed drugs than those without insurance. These findings are consistent with moral hazard. These patterns hold when comparing those older than 65 with private insurance with those older than 65 who have either Medicare insurance or no insurance. The privately insured older than 65 are less likely to spend time in a nursing home or in a hospital, but have more doctor visits, are more likely to have outpatient surgery, are more likely to see a dentist, and are less likely to not take prescribed drugs than those without insurance or those who only have Medicare.

One possible reason those with private insurance are less likely to spend the night in a nursing home or a hospital than those who are uninsured is that the privately insured are healthier. For two people with equal health, the person with private insurance is potentially more likely to spend time in a nursing home or a hospital than the person without insurance. We return to this issue when conducting our multivariate analysis in the next section. Another possible reason that complements the previous explanation is that hospitals may have a difficult time turning away those without insurance who are very ill. However, it is easy for dentists and doctors offering elective surgery to turn away the uninsured.

The final explanation why people do not purchase health insurance is that they receive implicit insurance through the government and hospitals. One testable implication of this hypothesis is that those without insurance pay less for a unit of health care services than those with insurance. As discussed previously, table 3 provides evidence that those without health insurance consume only slightly fewer health care services than those with private insurance. Note, however, that those aged 50–64 with no insurance spend only $1,277 per year on health care, versus $5,871 per year for those with private insurance. This difference in costs is not completely an artifact of differences in insurance premiums either. Those who have no insurance spend less on out-of-pocket expenses such as drugs and co-pays than those with private insurance.

We also note that households with no insurance are more likely to have low assets and low income than those with private insurance. This is important for two reasons. First, if an individual is indigent, public and non-profit hospitals must treat them. Therefore, low-asset individuals have implicit insurance through hospitals. Second, individuals with low assets are potentially eligible for Medicaid.

Individuals receiving Medicaid insurance consume more medical services and spend less on health care than any other group. That expenditures by Medicaid beneficiaries, who have low income and assets, are low is not surprising. After all, the government spent $10,243 per Medicaid beneficiary aged 65 or older and $9,097 per blind or disabled individual in 1998 (U.S. House of Representatives, 2000).

One way to test whether Medicaid is a significant source of insurance for the uninsured is to estimate the probability that a household that is uninsured becomes covered by Medicaid health insurance two years later. For uninsured households headed by someone aged 50–64, there is a 9.2 percent probability that they will be covered by Medicaid two years later. For households that purchase private insurance, there is only a 2.6 percent probability that they will be covered by Medicaid two years later. This shows that individuals with "no" insurance are more likely to be covered in the near future. This may mean that individuals who believe that they will be eligible for Medicaid in the event of a household emergency feel less compelled to purchase private health insurance than those who do not believe that they will be eligible for Medicaid.

Multivariate analysis of determinants of health costs

As noted above, we find that the total cost of employer-provided insurance plans (that is, the sum of costs paid by both employees and employers) is similar to that of private plans for households headed by individuals younger than 65. We also find that those with no insurance pay much less for medical care than those with private insurance. However, these comparisons are difficult to interpret because there may be important differences in the quality of care provided across health care plans. Even though having private insurance leads to higher health costs than having no insurance, having private insurance may also lead to a significantly higher quality of care. In this section, we use multivariate regressions to control for the quality of health care received. Although we cannot control for all aspects of health care quality, we can control for many of the determinants of health costs, such as nights in a hospital or nursing home. In this analysis, we aim to explain differences in costs of different types of health insurance, controlling for health care utilization.

Table 4 presents estimates of some of the determinants of health costs for the three age groups. Each age group has two columns, the first one with the health care utilization and health status measures and the second one without. By controlling for health care utilization in the regressions, we can assess whether differences in health care utilization explain differences in health costs among households with different types of insurance.

First, we need to infer administrative costs. Recall that although the total cost of employer-provided insurance is similar to that of private plans for households headed by an individual younger than 65, households with employer-provided insurance consume more health care services than households with private insurance. Here, we assess whether controlling for the quantity of health care services consumed affects the estimated cost differences for the two groups. We are interested in whether the total cost of private insurance is greater than the total cost of employer-provided insurance, holding utilization constant. Column 2 in each category of table 4 provides evidence on this.

Controlling for the health utilization variables those with employer-provided insurance pay $324 more than those with no insurance.[15] Those with private health insurance plans pay $4,132 more than those who are uninsured and ($4,132 – $324 =) $3,808 more than those with employer-provided health insurance. Recall that firms contribute about $3,288 toward employees' health insurance plans. Therefore, the total cost of obtaining private health insurance is only $520 greater than the cost of obtaining private health insurance. This estimate is not much different from the difference in mean health costs described in the previous section. Therefore, our estimate of administrative costs of private health insurance above is little changed by the multivariate analysis.

Another finding in the previous section is that those who are uninsured pay much less for health care than those who purchase private insurance. However, those who purchase private insurance are also more likely to consume certain medical services, such as dentist visits. Controlling for assets, income, education, race, marital status, age, and health care utilization does not affect the difference in health costs between those who are insured and those who are uninsured. The gap between health costs for households that are privately insured and uninsured is $4,132, almost the same as the difference in mean health costs shown in table 3. Therefore, our central finding, that the uninsured are implicitly insured by hospitals and the government, is not overturned by the multivariate regression analysis.

As further evidence on the hypothesis that "implicit" insurance is important, it appears that greater household resources lead to greater health costs, even after controlling for health care utilization and health insurance. This is true when the proxy for household resources is assets, income, or education. In other words,

TABLE 4

Determinants of medical costs

	Ages 50–64		Ages 65–79		Ages 80+	
	1	2	1	2	1	2
Insurance type						
Employer-provided	430 (99)	324 (122)	240 (418)	161 (435)	1,423 (911)	1,121 (937)
Private	4,057 (135)	4,132 (160)	2,037 (421)	1,892 (437)	2,681 (905)	2,524 (932)
Medicaid	–172 (140)	–550 (165)	–241 (426)	–653 (442)	47 (912)	–681 (940)
Medicare	1,237 (168)	927 (197)	110 (416)	–26 (431)	929 (901)	787 (927)
Demographics						
High school graduate	225 (80)	161 (98)	241 (107)	228 (111)	580 (196)	400 (196)
College graduate	528 (105)	361 (130)	521 (153)	490 (159)	461 (332)	380 (329)
Age	58 (9)	48 (11)	46 (10)	31 (11)	114 (20)	78 (20)
Black	–34 (83)	7 (100)	–130 (132)	–89 (137)	–794 (251)	–783 (250)
Married	1,751 (72)	1,623 (90)	1,848 (100)	1,499 (108)	1,987 (231)	1,358 (243)
Good health	159 (83)	316 (101)	–32 (120)	70 (125)	–353 (216)	–37 (215)
Economic resources (1998 dollars)						
Assets >$50,000<$200,000	531 (97)	736 (120)	344 (142)	484 (149)	–516 (268)	–231 (267)
Assets >$200,000	32 (126)	26 (152)	30 (247)	–67 (255)	580 (387)	550 (387)
Income >$5,000<$30,000	55 (144)	11 (175)	376 (272)	247 (281)	2,038 (477)	1,854 (474)
Income >$30,000	–260 (77)	12 (95)	–38 (122)	45 (126)	–1,065 (499)	–680 (485)
Working	–2,937 (555)	–2 (2)	–2,455 (874)	19 (2)	–9,237 (1,935)	17 (1)
Health care utilization						
Nights in nursing home		66 (8)		23 (7)		44 (14)
Nights in hospital		28 (4)		41 (4)		77 (11)
Doctor visits		860 (176)		662 (196)		259 (389)
Had outpatient surgery		185 (92)		421 (107)		211 (185)
Saw a dentist		830 (126)		1,216 (162)		1,531 (377)
Did not take prescribed drugs		–2,784 (684)		–1,931 (904)		–6,989 (1,961)
Constant						
R^2	0.148	0.180	0.091	0.121	0.065	0.117

Notes: For each age category, column 1 shows results with no health utilization controls, while column 2 shows results with controls. Numbers in parentheses are standard errors.

Sources: HRS/AHEAD data and authors' calculations.

poor people seem to pay less than rich people for the same medical services. One caveat to this last finding is that more affluent households may be paying more for medical care because they are purchasing better care. For example, they are potentially spending nights in better hospitals and seeing better doctors.

Conclusion

This article provides an empirical analysis of the determinants of whether an individual purchases health insurance coverage. Using data from the Health and Retirement Survey and the Assets and Health Dynamics among the Oldest Old, we document the distribution of health costs and health care utilization of individuals aged 50 and older. We show how health costs and health care utilization depend upon access to health insurance.

Of our sample, 6.5 percent are uninsured. We consider four potential reasons for this. We show that adverse selection is unlikely to be an important factor in driving health insurance costs. There is some evidence that administrative costs and overconsumption due to moral hazard raise the cost of health insurance. However, we find a large amount of evidence that the existence of Medicaid and implicit insurance obviates the need for individuals to purchase additional health insurance. Given that many of the "uninsured" already have access to low- or no-cost health care coverage from the government and hospitals, we argue that Medicare buy-in proposals (that is, proposals to allow younger individuals to pay a premium to join Medicare) would most likely have a small effect on the health insurance coverage of older Americans.

APPENDIX: CODING TWO HEALTH COST VARIABLES

This appendix describes the coding of the two main health cost variables used in our analysis: medical costs paid by the individual and total costs of medical treatment. Medical costs paid by the individual are equal to the sum of drug costs, out-of-pocket expenses on items other than drugs, and insurance costs. The total cost of medical treatment is the total cost of medical services (whether or not the individual pays for those services) plus drug costs.

During waves one and two, members of the HRS and AHEAD samples were asked different sets of questions. Wave three includes only HRS respondents. During waves four and five, HRS and AHEAD respondents were asked the same questions.

Health cost information for wave one of the HRS is limited to insurance premiums. The insurance premium question only refers to insurance purchased directly from an insurance company or through a membership organization, such as the American Association of Retired Persons (AARP). It does not include employee contributions to employer-provided insurance plans. Given that the information is incomplete, we do not include wave one information. From wave two onward of the HRS, however, we are able to compute the total cost of medical treatment, the out of pocket expenses, the drug costs, the cost of the insurance, and the total medical costs the individual pays.

In wave two, the insurance premium question includes employee contributions to employer-provided insurance plans and insurance directly purchased or through a membership organization.

In wave two, respondents were asked whether they had any hospital stays, nursing home stays, or visits to a doctor. If they answered yes to any of these questions, they were then asked both the total cost and out of pocket cost for the visit or stay.

Also in wave two, respondents were asked whether they purchased medicines prescribed by a doctor. If they did, they were asked how much these medicines cost per year. It is not clear whether the cost measure refers to the cost paid by the individual or what the pharmacy charges the individual and the insurer. Nevertheless, we use this variable to determine the drug costs variable, which is also added into the total costs variable.

For wave three onward, total health costs and out of pocket costs are clarified to include the amount paid for doctors, hospitals, nursing homes, outpatient surgery, dental expenses, in-home medical care, and special facilities and services. Note that the costs (both out-of-pocket and total) of outpatient surgery, dental expenses, in-home care, and special facilities and services are not included in wave two.

The procedure for determining the insurance costs also changes for HRS waves three through five. The insurance premium variable is now the sum of premiums of all employer-provided insurance, Medicare through HMO plans, supplemental plans, private/AARP/professional coverage, and long-term care plans. Note that in wave two, Medicare insurance costs are missing.

For wave one of the AHEAD dataset, we can determine the out-of-pocket and total costs. The out-of-pocket costs include the costs of nursing home stays as well as "any part of hospital and doctor bills and any other medical or dental expenses in the last 12 months." We infer that drug costs are included in this measure, although respondents were not asked directly about drug costs. AHEAD wave one also asked what policies besides Medicare respondents have, including long-term care policies, and how much they paid yearly for such policies. From this, we determine the insurance costs of the respondent. We do not use wave one in our analysis in this article, however, because the source of health insurance is incomplete.

For wave two of the AHEAD dataset, imputation procedures for total costs, and out of pocket costs, insurance costs, drug costs, and medical costs are the same as in waves three through five of the HRS.

NOTES

[1]Blue Cross/Blue Shield is willing to cover most people, although its plans often do not cover pre-existing conditions.

[2]Institutionalized individuals include individuals in nursing homes.

[3]In 1998 and 2000, individuals in the HRS and AHEAD (as well as an additional sample of older individuals) were asked the same questions. In the HRS and AHEAD waves before 1998, many of the questions asked were the same across the two datasets, allowing us to merge the datasets. Because the health insurance and health cost data are incomplete in wave one of both datasets, we use waves two through five in our analysis here.

[4]Health costs and health care utilization in the survey instrument are for the past two years or since the individual was last interviewed. We divide health costs and health care utilization measures by the number of years since the individual was last interviewed, or by two if the individual was never previously interviewed. We dropped individuals with missing information on their health insurance coverage. This reduced the original sample from 49,843 person-year observations to 46,991 person-year observations. However, we kept individuals with missing information on other variables. There are 33,005 observations with health cost information.

[5]Employer-provided insurance includes individuals with federally provided health insurance plans through the Veterans Administration and the Post Office. It does not include Medicare or Medicaid. Individuals with federally provided health insurance also have rather similar characteristics to people with employer-provided insurance. The main difference is that households with federal insurance tend to spend less on insurance premiums.

[6]Because the HRS/AHEAD sample was drawn from the non-institutionalized population—which excludes individuals in nursing homes—it is not surprising that the number of nights in a nursing home is lower in the HRS/AHEAD sample than the national average. Nevertheless, many HRS/AHEAD household members do enter a nursing home after they are initially interviewed.

[7]There are other explanations for why people purchase health insurance. One is that people who purchase health insurance through their employer pay for it with pre-tax dollars. If individuals face a 30 percent tax rate, they will be indifferent between spending $1,000 on medical expenses pre-tax and $700 post-tax. Unless they have very large medical expenses, making them eligible to deduct medical expenses on taxes, they will pay for any medical procedures not covered by employer-provided health insurance on a post-tax basis. Therefore, there are important tax advantages to employer-provided insurance. Another reason is that health maintenance organizations potentially have market power in the market for medical services and thus can bargain with hospitals for lower prices.

[8]Note, however, that pre-existing conditions, such as cancer, are usually not covered by private health insurance plans.

[9]Note that if everyone purchased health insurance, average medical expenses would fall. Therefore, if low-cost individuals value health insurance at more than the cost of providing insurance to them, two equilibriums potentially exist: one in which health insurance is purchased only by high-cost individuals (resulting in high health insurance premiums), the other in which health insurance is purchased by everyone and the price of health insurance premiums lies between the costs of high- and low-cost individuals.

[10]Gruber and Madrian (1995) document that Blue Cross/Blue Shield was $8,640 in 1993. We adjusted this number to 1998 dollars using the medical care component of the Consumer Price Index.

[11]Medigap plans are private health insurance plans that cover health costs that Medicare does not cover, such as co-pays. Note that Medigap plans likely have high administrative costs because Medigap only pays for the smaller expenses that Medicare does not cover.

[12]However, Gore's "buy in" proposal still might have had problems, given that the buy in would be voluntary. Healthy individuals would potentially not buy into Medicare.

[13]Nevertheless, $4,067 is surprisingly small given that Gruber and Madrian (1995) found that Blue Cross/Blue Shield charged over $10,000 in 1998 dollars for private health insurance for a family of four in New England.

[14]Note that differences in health costs amongst the different health insurance groups fall greatly after age 65. Private health insurance premiums fall from $4,067 for those aged 50–64 to $2,408 for those aged 65–79. This is not surprising given that after age 65, Medicare becomes the primary source of health insurance. Private insurance pays many of the costs that Medicare does not pay. This is why these health insurance plans are also often referred to as "Medigap" plans.

[15]The omitted category in these regressions is an uninsured, low-asset, low-income, white individual, who dropped out of high school.

REFERENCES

Akerlof, G., 1970, "The market for 'lemons': Quality uncertainty and the market mechanism," *Quarterly Journal of Economics*, Vol. 84, No. 3, pp. 488–500.

Arrow, K., 1963, "Uncertainty and the welfare economics of medical care," *American Economic Review*, Vol. 53, No. 5, pp. 941–973.

Cardon, J., and I. Hendel, 2001, "Asymmetric information in health insurance: Evidence from the National Medical Expenditure Survey," *RAND Journal of Economics*, Vol. 32, No. 3, pp. 408–427.

Cutler, D., and J. Gruber, 1996, "Does public insurance crowd out private insurance?," *Quarterly Journal of Economics*, Vol. 111, No. 2, pp. 391–430.

Cutler, D., and R. Zeckhauser, 2000, "The anatomy of health insurance," in *Handbook of Health Economics*, A. Culyer and J. Newhouse (eds.), New York: John Wiley and Sons, pp. 563–643.

Employee Benefit Research Institute, 1999, *EBRI Health Benefits Databook*, Washington, DC.

Federal Interagency Forum on Aging-Related Statistics, 2000, "Older Americans 2000: Key indicators of well-being," Hyattsville, MD, report.

Feenberg, D., and J. Skinner, 1994, "The risk and duration of catastrophic health care expenditures," *Review of Economics and Statistics*, Vol. 76, No. 4, pp. 633–647.

French, E., and J. Jones, 2002a, "The effects of health insurance and self-insurance on retirement behavior," Federal Reserve Bank of Chicago, mimeo.

_____, 2002b, "On the distribution and dynamics of health costs," Federal Reserve Bank of Chicago, mimeo.

Gruber, J., and B. Madrian, 1996, "Health insurance and early retirement: Evidence from the availability of continuation coverage," in *Advances in the Economics of Aging*, D. A. Wise (ed.), Chicago, University of Chicago Press, pp. 115–143.

_____, 1995, "Health Insurance availability and the retirement decision," *American Economic Review*, pp. 938–948.

Gustman, A., and T. Steinmeier, 1999, "Effects of pensions on savings: Analysis with data from the health and retirement study," *Carnegie-Rochester Conference Series on Public Policy*, pp. 271–324.

Hubbard, R., J. Skinner, and S. Zeldes, 1995, "Precautionary saving and social insurance," *Journal of Political Economy*, Vol. 103, pp. 360–399.

_____, 1994, "The importance of pre-cautionary motives in explaining individual and aggregate saving," *Carnegie-Rochester Series on Public Policy*, pp. 59–125.

Manning, Willard G., Joseph P. Newhouse, Naihua Duan, Emmett B. Keeler, Arleen Leibowitz, 1987, "Health insurance and the demand for medical care: Evidence from a randomized experiment," *American Economic Review*, Vol. 77, No. 3, June, pp. 251–277.

National Center for Health Statistics, 1999, "Health, United States, 1999," Washington, DC, report.

Palumbo, M., 1999, "Uncertain medical expenses and precautionary saving near the end of the life cycle," *Review of Economic Studies*, Vol. 65, No. 2.

Pauly, Mark, 1986, "Taxation, health insurance, and market failure," *Journal of Economic Literature*, Vol. 24, No. 2, pp. 629–675.

Rust, J., and C. Phelan, 1997, "How Social Security and Medicare affect retirement behavior in a world of incomplete markets," *Econometrica*, Vol. 65, pp. 781–831.

Selden, T., L. Levit, J. Cohen, S. Zuvekas, J. Moeller, D., McKusik, and R. Arnett, 2001, "Reconciling medical expenditure estimates from the MEPS and NHA, 1996," *Health Care Financing Review*, Vol. 23, No. 1.

Smith, J., 1999, "Healthy bodies and thick wallets: The dual relationship between health and economic status," *Journal of Economic Perspectives*, Vol. 13, No. 2, pp. 145–166.

U.S. Congress, Congressional Budget Office, 1988, *Costs and Effects of Extending Health Insurance Coverage*, Washington, DC.

U.S. Congress, General Accounting Office, 2000, *Private Health Insurance: Potential Tax Benefit of a Health Insurance Deduction Proposed in H.R. 2990, No.* GAO/HEHS-00-104R, April 21.

U.S. House of Representatives, Committee on Ways and Means, 2000, *The 2000 Green Book: Background Material and Data on Programs within the Jurisdiction of the Committee on Ways and Means*, Washington, DC: Government Printing Office, No. WMCP 106-14.