Economic Research Initiative on the Uninsured
Working Paper Series

THE ECONOMIC CONSEQUENCES OF BEING UNINSURED

Helen Levy, Ph.D.
The University of Chicago

ERIU Working Paper 12
www.umich.edu/~eriu/pdf/wp12.pdf

Economic Research Initiative on the Uninsured
University of Michigan
555 South Forest Street, 3rd Floor
Ann Arbor, MI 49104-2531

October 2002

I am grateful to John Cawley, Tom DeLeire, Paul Gertler, Michael Greenstone, Erzo Luttmer, Will Manning, Ellen Meara, David Meltzer, Anne Piehl, Bob Willis, and Aaron Yelowitz for helpful comments; to Patrick Wightman for excellent research assistance; and to the Economic Research Initiative on the Uninsured of the Robert Wood Johnson Foundation for financial support.

Abstract

I estimate the impact of being diagnosed with a serious new health condition (cancer, diabetes, heart attack, chronic lung disease, or stroke) on household wealth, food consumption and total household income for households with and without health insurance at baseline, using data from the first four waves of the Health and Retirement Study. I find that health shocks do not have a significant effect on consumption; households are able to smooth the impact of these shocks. Whether they deplete wealth in order to do so is not entirely clear; the estimated effect of a health shock on wealth is large (about $28,000) for both insured and uninsured households, but is not statistically significant. The proportional effect on wealth is estimated to be larger for uninsured households (a drop of 20 percent) than for insured households (a drop of about 2 percent), but again, neither effect is significantly different from zero. Health shocks reduce household income by about $9,000 and reduce the probability of work by about ten percentage points; the labor supply response to a shock is about the same whether or not a household has insurance. There is no evidence that the uninsured face significantly higher economic risks than the insured in the event of a health shock.

1. Introduction

What are the economic consequences of not having health insurance? Policy debates about the uninsured often focus on how lack of health insurance affects access to medical care, without considering how uninsured households will pay for the medical care they receive. Uninsured households may have to reduce their consumption, dip into their savings, and/or increase their labor supply when they experience a bad health event. Little is known about the magnitude of these effects. How do the economic losses suffered by uninsured households in the event of poor health compare to those of insured households?

In this paper, I use data from the first four waves of the Health and Retirement Study, spanning the years 1992 through 1998, to examine the economic impact of serious new health conditions on a sample of households nearing retirement age. Specifically, I analyze whether a new diagnosis of cancer, diabetes, heart attack, chronic lung disease or stroke significantly affects consumption or wealth, and how this impact differs for individuals with and without health insurance at baseline. I also look at the effects of health shocks on household income and on labor supply and earnings.

I fail to reject that new diagnoses affect household food consumption, so it appears that households are able to smooth the impact of these shocks. Whether they deplete wealth in order to do so is not entirely clear; the estimated effect of a health shock on wealth is large (about $28,000) for both insured and uninsured households, but is not statistically significant. The proportional effect on wealth is estimated to be larger for uninsured households (a drop of 20 percent) than for insured households (a drop of about 2 percent), but again, neither effect is significantly different from zero. Health shocks reduce household income by about $9,000 and reduce the probability of work by about ten percentage points. The differences between the

effect on income and work for insured versus uninsured households are not statistically significant. That is, the labor supply response to a shock is about the same whether or not a household has insurance.

2. Background: How Do Households Respond to Health Shocks and Other Economic Shocks?

Health insurance is one of many mechanisms households may use to respond to the economic shocks associated with poor health. In addition to smoothing shocks through formal insurance contracts such as health insurance, they may also rely on informal insurance arrangements like transfers from family members or the depletion of assets accumulated in anticipation of risks to income and expenses. In this context it is not clear whether health insurance will play a central role in buffering the economic impact of poor health. One possibility is that both households with and without health insurance may be vulnerable to the economic risks associated with poor health. This could occur either because health insurance does not fully cover medical expenses or because medical expenses may be small relative to wages lost due to poor health. Health insurance would be necessary but not sufficient to protect households from economic risk. On the other hand, neither insured nor uninsured households may be at risk because informal insurance arrangements – transfers from relatives to help pay medical bills, for example, or the forgiveness of debt by hospitals – may reduce the impact of the economic shock for families without health insurance. A final possibility is that given the imperfections in the insurance market, households may choose to "self-insure" by accumulating assets instead of buying formal insurance, so that the consumption of these households will be unaffected by a health shock since they have prepared for this possibility and wealth would be

expected to decrease following a health shock. Households may also smooth consumption by increasing labor supply to pay the bills associated with a health shock.

Whether health insurance plays an important role in smoothing the economic impact of poor health is therefore an empirical question. The net effect of these mechanisms in buffering health shocks can be assessed by looking at whether or not they affect household consumption, which is one measure of the household's economic well-being at a point in time; and at wealth, to determine whether consumption is maintained by depleting assets; and at labor supply, to see how households change their work behavior in response to health shocks.

A number of studies have explored the links between health, insurance, consumption and wealth. Beginning with studies that focus on the impact of health shocks on wealth, Smith (1999) compares the impact of health shocks on wealth for households with and without health insurance. Using the Health and Retirement Study and looking at the onset of serious health conditions between waves 1 and 2, he finds that household wealth declines an average of about $17,000 in response to a new condition, regardless of whether or not the household has insurance. He finds that insurance is associated with lower out-of-pocket spending ($1,912 for insured households versus $4,576 without insurance), but also lower total medical spending ($26,957 insured versus $42,166 uninsured.) Wu (forthcoming) also uses data from the first two waves of the HRS and finds a decline in married couples' wealth of about $6,500 at the median associated with serious health shocks for wives, but no significant decline for husbands. Hurd and Kapteyn (2001) find that wealth increases by a smaller amount for HRS respondents whose self-reported health status declines between waves than for those whose health improves or remains the same. They find no correlation between changes in wealth and changes in health status in similar data on an older cohort, the Asset and Health Dynamics of the Oldest Old

(AHEAD). As they (and many other authors, including Smith 1999) point out, it is not clear which direction causation runs here. This is one reason for using clearly defined health events such as new diagnoses rather than self-reported changes in health status as a measure of health "shocks," since the latter are clearly not exogenous. Adams et al. (2002) discuss the exogeneity problem at length and present empirical evidence on the links between health and wealth using data from the AHEAD.

A number of other studies examine the impact of health shocks on consumption. Cochrane (1991) uses data from the 1980 through 1983 waves of the PSID to test the hypothesis that consumption growth across households is independent of idiosyncratic shocks to income. In practice, this involves regressing changes in the natural log of food expenditures on different variables reflecting idiosyncratic shocks: involuntary job loss, weeks of job search given involuntary job loss, strike days, an involuntary move, and days of work lost by the household head due to illness (which includes days lost due to the illness of a family member). While he does not reject consumption insurance for job search, strike days, or an involuntary move, he does reject it for both involuntary job loss and days of illness. He also reports that the days of illness result is largely driven by long illnesses (greater than or equal to one hundred days), suggesting that households are well insured against short illnesses ("an obvious feature of most employment contracts") but not against longer ones.

Gertler and Gruber (2002) reach a similar conclusion about the impact of mild versus severe disability on consumption in Indonesia. Regressing changes in the natural log of non-medical consumption on measures of changes in health status and a set of demographic control variables, they find that the results depend heavily on what measure of change in health status is used. Reported illness symptoms have no effect on consumption growth; reported changes in

functional status, however, have a significant negative effect that increases with the degree of impairment. They also find that the primary pathway through which this effect operates is through lost earnings, which they point out is not surprising in Indonesia where medical care is heavily subsidized by the government.

Stephens (2001) looks at the impact over time of disability of the household head on consumption, using data from the PSID. He finds that disability does not have an immediate effect on consumption, but that household consumption falls over time for the disabled relative to the non-disabled. He also reports, however, that the drop in consumption is smaller than what would be expected based entirely on the drop in reported earnings, which suggests that there is at least some degree of insurance although whether this is the result of formal or informal mechanisms is unclear.

The bottom line in these studies of health and consumption is that household consumption is affected by health shocks, so consumption insurance is imperfect. This result is particularly striking since the null hypothesis in the literature on consumption insurance is that households are insured against idiosyncratic risks by other households—that is, that economic shocks are smoothed across different households at a point in time. As noted by Hayashi, Altonji and Kotlikoff (1996), this hypothesis has no power against the possibility that household consumption is smooth because households are self-insuring. They test this proposition directly using data on changes in consumption and past and future wages from the Panel Study of Income Dynamics they reject the consumption insurance hypothesis of full risk-sharing across households, but fail to reject that consumption is smooth because of self-insurance. Their point is particularly relevant in light of the studies discussed above that show an association between poor health and reductions in wealth, which are also consistent with the notion that there is at

least some degree of self-insurance against health shocks. Moreover, the increasing empirical support for the precautionary saving hypothesis (Hubbard, Skinner and Zeldes 1994; Palumbo 1999) reinforces the conclusion that economic risks are not shared across households by either formal or informal mechanisms. To the extent that a precautionary motive for savings exists, consumption insurance must be imperfect; moreover, empirically, looking at the impact of shocks on consumption provides no evidence on whether the mechanism for smoothing is actually consumption insurance across households. Several studies have examined explicitly the link between health insurance coverage and saving behavior, to see whether households rely on savings as a substitute for health insurance in the way predicted by the precautionary saving hypothesis. Starr-McCluer (1996) finds that households with health insurance have higher wealth than uninsured households, which is consistent either with the idea that savings do not substitute for insurance or with the idea that insurance status is not exogenous. Gruber and Yelowitz (1999) rely on the Medicaid expansions of the late 1980s and early 1990s to provide exogenous variation in health insurance coverage and find that increases in Medicaid coverage are associated with decreases in saving, suggesting that households do use saving as a substitute for formal insurance. Again, the corollary of this finding is that health shocks will lower wealth.

Finally, many studies have looked at the impact of an individual's health on his or her own labor supply. These studies are reviewed in Currie and Madrian (1999). As Currie and Madrian discuss, the estimated impact of poor health on labor supply depends on the population studied, and how both health and labor supply are measured, but effects are generally negative as one might expect. There are fewer studies that examine the impact of an individual's health on the labor supply of other family members: an "added worker effect." Charles (1999) reviews these studies, most of which find little evidence of an added worker effect. Charles uses data

from the first two waves of the HRS to analyze the same question. He uses limitations on activities of daily living as instruments for self-reported disability status and employs fixed effects estimation to account for unobservable heterogeneity in labor supply. In contrast to the earlier literature, he finds that the probability that women work and the number of hours they supply annually are significantly higher when their husbands are disabled, while men reduce their labor supply in response to wives' disability.

In light of these results, my empirical analysis will focus on three sets of questions. First, is consumption smooth when serious health shocks occur for insured or uninsured households? Second, do health shocks affect wealth and if so, do uninsured households experience greater losses? Third, how do total household income and individual labor supply respond to health shocks for insured versus uninsured households? The next section describes the data I will use to address these questions.

3. The Data

The Health and Retirement Study (HRS) consists of a panel of households that have been interviewed every two years since 1992. The target population consists of individuals born between 1931 and 1941 so that most respondents are in their fifties in the first wave of the survey. Respondents—sampled individuals born during the target period and their spouses—are asked detailed questions about employment, income, wealth, health and a variety of other topics. Basic demographic information is collected for household members of all ages, as well as for children and parents of the respondents.

This paper uses the four completed waves of the HRS for which final data are available: 1992, 1994, 1996, and 1998. The initial sample consists of 7,607 households. I restrict the

analysis in this paper to the subsample of 4,422 households in which there are no changes to the household head or spouse over the four survey waves and no missing data on the main variables of interest. This excludes households in which one or both respondents die and households that experience a divorce, marriage or remarriage. While changes in household composition are a potentially important response to health shocks and may also have an independent effect on household economic well-being, I do not examine these here.[1]

All monetary values are inflated to 1998 dollars using the CPI-U. Where available, the analysis uses values imputed by the HRS staff.[2] Otherwise, invalid observations—monetary and otherwise—are coded as missing. The HRS variables used in the analysis are defined as follows:

Consumption: The HRS does not provide a measure of consumption that is consistent in waves one through four. In the first and second waves, 1992 and 1994, respondents are asked about food stamps received in the month prior to the interview, as well as spending on food consumed at home, food eaten away from home and food delivered to the home during the same period. The measure of consumption that I use is the sum of these. However, in 1996 the question about food spending other than food stamps was asked at the household level rather than at the individual level as in waves one and two. This may have caused the increase in reported food spending in wave three that will be evident in the descriptive statistics. There is no reason to think that this change in reporting is correlated with either insurance status of new diagnoses of illness in a way that would bias the results. By 1998 the questions on food consumption had been phased out altogether, so the analysis of consumption relies on fewer observations than the analyses of wealth and labor market outcomes.

[1] The death of one spouse has important economic implications for the spouse who survives; see Weir et al. (2000) for evidence on income and wealth of widows.

[2] Documentation on the process used to impute missing values is available on the HRS website: www.umich.edu/~hrswww

Wealth: Wealth is the sum of housing wealth (= property value – housing debt) and non-housing wealth. Non-housing wealth is the sum of other real estate, business equity, stocks, bonds, Individual Retirement Accounts (IRAs), liquid assets, vehicles, and other assets, minus other debts. This variable refers to the household's wealth at the time of the survey. It does not include the present value of pension wealth.

Household income: Total household income is the sum of wages and salaries earned by both head and spouse, pensions, annuities and government transfers such as Unemployment Insurance, Social Security and welfare, capital income, other sources of income such as alimony and child support, assistance from friends or family members, and income earned by other household members in the calendar year prior to the survey.

Individual labor earnings: Respondents are asked about their total labor earnings in the calendar year prior to the survey.

Labor market variables: Respondents are asked if they are working for pay at the time of the survey; this is my measure of whether or not a person is working. Individuals who are working are also asked about their usual hours on their main job and second job, if they have a second job; the measure of hours I use is the sum of usual hours on the first two jobs. Respondents who are working are also asked about usual weeks worked during the year.

Health shocks: Respondents are asked at baseline (1992) if they have ever been diagnosed with cancer, diabetes, heart disease, chronic lung disease or a stroke. In each of the three waves following 1992, respondents are asked if since the previous interview they have been diagnosed with any of these conditions. Individuals are labeled as healthy if they have never been diagnosed with one of these conditions, sick if they ever report any one of these conditions.

Being sick is therefore an absorbing state: that is, a respondent who has ever been diagnosed with one of these conditions is defined to be "sick" forever after.

Health insurance: In each wave of the HRS, respondents are asked about the status of their health insurance coverage. Respondents who report employer-sponsored or individually purchased insurance, and/or public insurance such as Medicare or Medicaid are classified as insured. As I will discuss in more detail later, I rely on information about insurance coverage of the household head and spouse, if any, at wave 1 to characterize households as "insured" or "uninsured" for purposes of this analysis.

Other demographic variables in the HRS: The HRS includes data on the size and demographic composition of the household, including the age and education of both the head and spouse and number of other household members in each wave.

All statistics are estimated using the wave 1 sampling weights associated with each household (for household-level variables) or individual (for individual-level variables).

Descriptive statistics

Table 1 presents descriptive statistics as of wave 1 for the households used in the analysis (that is, households where both the household head and the spouse, if any, are observed in all four waves with non-missing data for key variables of interest). Mean wealth at wave 1 for this subsample is about $246,000 (in 1998 dollars). Married couple households have, on average, more than twice the wealth of households with an unmarried head ($300,681 versus $125,773). Median wealth is much lower than mean wealth: $111,000 overall, $148,050 for couples and $41,400 for singles.

Average food spending in wave 1 is $426 and average annual household income is $51,211. As with wealth, mean household income of married-couples households is more than twice that of singles: $61,271 versus $28,944. About 75 percent of household heads and 63 percent of spouses are working at the time of the wave 1 survey; heads usually work about 44 hours per week and spouses about 37. The average worker in the sample works full-year (mean of 49 weeks for heads and 48 weeks for spouses).

Most households – 83.2 percent – have health insurance for both the head and spouse (if there is a spouse). Single heads are less likely than married heads to have insurance at wave 1 (81.1 percent versus 90.5 percent). A surprisingly large fraction of households – forty percent – have either a head or a spouse who has been diagnosed with one of the five serious conditions (cancer, diabetes, heart attack, chronic lung disease or stroke) when they are first interviewed at wave 1. The remaining sixty percent are at risk of experiencing a new diagnosis.

Table 2 presents the patterns of diagnosis, or "diagnosis histories," observed over the four waves of the survey, for all households and by their insurance status. The diagnosis history shows whether or not a household has either a head or a spouse diagnosed with a serious condition in each wave. For example, a diagnosis history of 0011 means the household remained "healthy" (no diagnosis) through waves 1 and 2 but reported a new diagnosis in wave 3. Since new diagnosis is considered an absorbing state, diagnosis histories such as 0100 are by definition not possible. In each wave, about one-tenth of the sixty percent of households who were initially healthy will report that either the head or the spouse (if any) received a serious new diagnosis since the previous wage. The result is that by wave 4, only about forty-two percent of households remain healthy. Combined with the forty percent who begin the first interview already having received one of more of these diagnoses (a diagnosis history of 1111), this means

that 18 percent of households have a head or spouse who receives a new diagnosis during the six years that elapse between wave 1 and wave 4. Table 2 also shows these patterns separately for households where both the head and spouse are insured at wave 1 and where one or both are uninsured at wave 1. Somewhat surprisingly, these patterns of diagnosis are very similar for households where both head and spouse (if any) are insured and households that have an uninsured head or spouse, as shown in the last two columns of table 2. For both types of household, about forty percent enter the sample with a head or spouse who already has a serious condition. Conditional on entering the sample healthy, the probability of a shock occurring over the next six years is about thirty percent for both insured and uninsured households.

The bottom two panels of table 2 show diagnosis histories by insurance status for heads and for spouses separately. Insurance status here is defined as the *individual's* insurance status at wave 1, rather than reflecting the insurance status of the other household respondent as in the first panel. Spouses are more likely than heads to enter the sample healthy and to remain that way throughout all four waves. This most likely reflects the fact that spouses are by definition all women, who tend to remain healthy longer than men do, while three-quarters of household heads are men. Again, patterns of diagnosis are fairly similar for insured versus uninsured individuals, although the similarity of the household-level patterns discussed above masks slight differences that become evident when heads and spouses are examined separately. Insured heads are slightly less likely than uninsured heads to enter the sample with a diagnosis (29.3 percent versus 31.4 percent). Conditional on entering the sample healthy, insured and uninsured heads are about equally likely to experience a health shock over the next six years: about 24 percent of either insured or uninsured heads experience a health shock. In contrast, insured spouses are *more* likely than uninsured spouses to enter the sample with a diagnosis (23.2 percent versus

21.9 percent). Insured spouses are also *less* likely than uninsured spouses to experience a shock, conditional on entering the sample healthy. About 15 percent of insured spouses and 17 percent of uninsured spouses who enter the sample healthy experience a shock by wave 4. Although these differences in the patterns of health shocks between the insured and uninsured highlight the possibility that insurance and health shocks are simultaneously determined, the differences are far smaller than (for example) the differences between the health status of the uninsured and insured that might be observed in a sample that included households of all ages rather than one defined so narrowly on the basis of age.

I categorize each household based on its diagnosis history as "healthy" (never receiving a diagnosis: diagnosis history 0000), "chronic" (someone in the household had already been diagnosed with a condition at wave 1: diagnosis history 1111) or "shock" (a new diagnosis occurs sometime between waves 1 and 4 in a previously healthy household: diagnosis histories 0111, 0011 and 0001). Table 3 summarizes the wave 1 characteristics of households by these health status categories and their wave 1 insurance status. Of particular interest is the initial economic status of uninsured households who are initially healthy and who will subsequently experience a new diagnosis: how much do these households have to lose? Table 3 shows that these households have mean wealth of $167,113 and median wealth of $50,000 at wave 1; their average household income is about $32,000. Seventy percent of heads and fifty percent of spouses in this group are working. So the answer is that they have quite a lot to lose. Estimates of the impact of uninsured health shocks will have to be evaluated relative to these initial levels among the group at risk.

Wave 1 characteristics by health status and insurance are also interesting because they shed light on the a number of baseline differences between these groups. First, it is immediately

evident in table 3 is that uninsured households regardless of their diagnosis history have lower wealth and household income and lower rates of work than insured households. Uninsured households are simply different from insured households on nearly every economic dimension. Second, among both insured and uninsured households, wealth and income are lower for households where someone has already been diagnosed with a serious condition at wave 1. This is, of course, consistent with either the notion that poor health lowers wealth accumulation and earnings or that low economic status is bad for health. Third, among insured households, those that will experience a new diagnosis look similar to those that will remain healthy throughout. In particular, their median wealth is very similar (about $134,000), earnings of head and spouse (if any) are similar (about $30,000 and $18,000 respectively); and household characteristics like household size, age of head, and fraction nonwhite are similar. On the other hand they are not identical. The fraction working and the mean education level of the head are different: individuals in households that will remain healthy are more likely to be working at wave 1 and the heads have higher levels of education. The similarities are important since they suggest that what I define to be health shocks may truly be "shocks:" unexpected events assigned randomly to households. But to the extent that there are differences in observable characteristics at wave one, the assumption that these health shocks are exogenous may be incorrect. Among uninsured households, for example, those who will experience a new shock have lower wealth and income to start out, as well as lower rates of work, than those who will remain healthy, suggesting that particularly among the uninsured what we measure as "shocks" may in fact be correlated with existing conditions and behaviors that have already begun to determine economic outcomes - or be determined by the household's economic status – well before the "shocks" are observed in our sample.

Overall, the statistics in table 3 confirm what we might already have suspected to be true: that the economic situation of insured and uninsured households is quite different. This fact will be very important for understanding the impact of health shocks on the evolution of households' economic well-being. In addition, within insured or uninsured households, those who will subsequently experience a shock also look somewhat different from those who will not, though this is less true for the insured than for the uninsured.

Table four explores the evolution of the outcome variables of interest for households by their insurance status and diagnosis history. The first panel of table four contains mean wealth at each wave by insurance status and diagnosis history. For the insured, regardless of diagnoses, average wealth increases consistently. For the uninsured, average wealth is almost as likely to decrease as to increase, although these decreases are not clearly correlated, in this simple table, with the timing of diagnoses. This table highlights the fact that the insured and uninsured have different economic status not just at a point in time, as shown in table 3, but over time. This is true even for households that remain "healthy" by my definition: among insured households that never experience a new diagnosis, average wealth increases from $286,010 at wave 1 to $482,930 in wave 4. For uninsured households that remain healthy the change is from $266,553 to only $316,174. The changes in median wealth show a similar pattern: an increase from $133,500 to $186,000 for insured healthy households and from $73,000 to $76,000 for uninsured healthy households. The important point here is that the time path of wealth is quite different for households with and without health insurance, even in the absence of health shocks.

The third panel of table four presents similar statistics on consumption. Measured consumption for all households increases sharply in wave 3; this is most likely the result of the questionnaire change discussed above. The fourth panel of table four presents similar statistics

on household income, which do not reveal a clear pattern. The fifth panel of table four presents similar statistics on whether or not the household head works, which underscore the facts that (1) sick people are less likely to work, at any point in time, and (2) the probability of working declines over time for all subgroups in this sample.

4. The Impact of Health Shocks for Insured versus Uninsured Households

In order to estimate the impact of health shocks on the various economic outcomes of interest, I estimate household fixed-effects regressions with consumption, wealth and income as dependent variables. The fixed-effects estimates are not subject to bias arising from time-invariant unobservable characteristics that differ across insured and uninsured households. In effect, the impact of a shock is identified by comparing the economic status of a given household before an economic shock with the economic status of the same household after a shock has occurred. Identification does not rely on a comparison of economic outcomes across households that do and do not experience shocks, as in an OLS regression. The fixed-effects specification is:

$$\begin{aligned} Y_{ht} = {} & a_h + b \cdot (new\ diagnosis_{ht}) + \\ & c \cdot (new\ diagnosis\ to\ a\ household\ member\ who\ was\ uninsured\ at\ wave1_{ht}) + \\ & d \cdot head's\ age_{ht} + f \cdot (head's\ age_{ht})^2 + \\ & g \cdot head\ is\ working_{ht} + \\ & h \cdot number\ of\ other\ people\ in\ household\ h + e_{ht} \end{aligned} \qquad (1)$$

where h indexes households and t indexes survey waves. This model constrains the coefficients on age, age squared, the number of others in the household and the head's age to be the same for insured and uninsured households. Since these variables may in fact have quite different effects

for the two types of households, I also estimate an unconstrained version of the model that allows these coefficients to differ for insured and uninsured households:

$$
\begin{aligned}
Y_{ht} = {} & a_h + b \cdot (new\ diagnosis_{ht}) + \\
& c \cdot (new\ diagnosis\ to\ a\ household\ member\ who\ was\ uninsured\ at\ wave1_{ht}) + \\
& d_0 \cdot (head's\ age_{ht}) + f_0 \cdot (head's\ age_{ht})^2 + \\
& g_0 \cdot (head\ is\ working_{ht}) + \\
& h_0 \cdot (number\ of\ other\ people\ in\ household\ h) + \\
& d_1 \cdot (household\ h\ is\ uninsured\ at\ wave1) \cdot head's\ age_{ht} + \\
& f_1 \cdot (household\ h\ is\ uninsured\ at\ wave1) \cdot (head's\ age_{ht})^2 + \\
& g_1 \cdot (household\ h\ is\ uninsured\ at\ wave1) \cdot (head\ is\ working_{ht}) + \\
& h_1 \cdot (household\ h\ is\ uninsured\ at\ wave1) \cdot (number\ of\ other\ people\ in\ household\ h) + e_{ht}
\end{aligned}
\tag{2}
$$

In both the constrained and unconstrained specifications, the coefficient *b* on the new diagnosis dummy is the estimate of the impact of a health shock to an uninsured person. The coefficient on the diagnosis*uninsured variable, *c*, is the estimate of the additional impact when the health shock occurs to an uninsured person, so that $b+c$ is the total impact of a shock for the uninsured.

There are two important points to notice about the measurement of insurance coverage in these regressions. The first is the distinction between household-level and individual-level measures of insurance coverage. The unit of observation for these regressions is the household-wave, and in the unconstrained regressions the control variables (employment status of the household head, age of head, number of others in the household) are interacted with a household-level variable measuring whether the household has either a head or a spouse who does not have insurance at wave 1. The term measuring the differential impact of the health shock for the uninsured, however, is defined at the individual level: did a shock occur to a person who was

insured at wave 1? This distinction affects only households where one respondent has insurance at wave 1 and the other does not. For example, suppose that at wave 1 the household head has insurance and his spouse does not. In wave 2 the head reports that he has been diagnosed with cancer. I would measure this event as a health shock to an insured individual, while the household would be considered an "uninsured" household. About ten percent of married couples (n = 307) have one spouse who is insured and one who is uninsured at wave 1.

The second important point about the treatment of health insurance coverage is that I characterize households and individuals based on their status at wave 1. I do this because I am interested in the net effect of health shocks over time, starting with cohorts of people who are insured or uninsured at baseline. Of course, one of the effects of a health shock may be that individuals gain or lose insurance coverage. By specifying the regressions in this way, I do not control for these effects. Instead, I measure the bottom-line effect of all the consequences of a health shock including any mediating changes in insurance status. Descriptive statistics on changes in insurance status by diagnosis history, shown in table 5, reveal three things. First, that insurance coverage is quite persistent: more than ninety percent of individuals who have insurance coverage at wave 1 remain covered throughout the entire period. Second, that lack of insurance coverage is less persistent: only about a quarter of the individuals who have no insurance coverage in wave 1 remain uninsured throughout the entire period. About half of those who are uninsured in wave 1 get coverage by wave 2 and remain insured through wave 4. Third, looking at transitions into and out of insurance coverage, there does not appear to be a pattern of losing coverage following a new diagnosis. On the contrary, for any diagnosis history, the likelihood of a transition into insurance coverage in the period after a diagnosis is about twice the probability of a transition out of coverage. To the extent that changes in insurance status mediate

the impact of health shocks, they are more likely to soften the blow. A detailed analysis of the impact of new diagnoses on insurance coverage is a subject for future research. For the time being it is reasonable to conclude based on the statistics in table five that loss of insurance following a new diagnosis is unlikely to be a major factor affecting the results of my analysis.

Table six presents regression results for the constrained and unconstrained models with consumption as the dependent variable. I fail to reject the constrained model ($p = 0.8265$), which is consistent with the idea that the age profile of food consumption is similar for insured and uninsured households – an idea that is both plausible a priori and supported by the descriptive statistics on consumption in table 4. For the sake of consistency with subsequent results, I will discuss results from the unconstrained model (column 2). A new diagnosis is estimated to increase consumption by $33 for insured households and to decrease it by $24 for uninsured households; neither coefficient is statistically significant. Thus, I fail to reject the hypothesis that consumption is smooth in response to new diagnoses regardless of insurance status. Ideally, it would be desirable to have additional measures of household consumption. Food is likely to be a relatively inelastic category of consumption and therefore offers a weak test of the consumption smoothing hypothesis. But the evidence based on this test suggests that households are able to smooth consumption in response to health shocks.[3] This is also true when the model is estimated without controlling for changes in the employment status of the head (results not reported).

The next question is whether this smoothing is achieved by depleting wealth. Table seven presents the results of both the constrained and unconstrained models with wealth as the

[3] Estimating the regression with the dependent variable measured as the natural logarithm of food spending (as in, for example, Cochrane [1991]) yields coefficients (standard errors) of 0.031 (0.038) on the new diagnosis variable and -0.067 (0.129) on the new diagnosis*uninsured variable. Thus, the formal test of the consumption insurance hypothesis fails to reject the hypothesis.

dependent variable. The constrained model corresponding to specification 1 suggests that a new diagnosis lowers the wealth of insured households by about $20,000, but this effect is not statistically significant. Uninsured households, by contrast, experience a large, significant loss of about $68,000 in wealth in response to a new diagnosis in the constrained model. The next column shows the effect of allowing the age profile of wealth to differ for insured and uninsured households: here, the estimated effect of a new diagnosis is a large but statistically insignficant reduction in wealth of $28,000 for both insured and uninsured households (p = 0.287). The difference between the constrained and unconstrained models is striking: allowing the age profile of to differ for insured versus uninsured households makes a big difference to the estimated effect of a new diagnosis. The intuition for why this matters so much is that increases in wealth over time are much lower for uninsured households even in the absence of a health shock. In the unconstrained model, the coefficients on age and age squared for insured households suggest an average increase of $23,564 at age 60 (= 45,884 – 2*60*186), while the implied average increase for the uninsured is only $2,759 per year (= [45,884 – 24,765] – 2*60*[186-33]). Constraining these coefficients to be the same for the insured and the uninsured in effect makes the "diagnosis * uninsured" dummy absorb some of the lower age profile for the uninsured, since new diagnoses by definition occur over time. The result is a large coefficient on the uninsured * diagnosis variable in the constrained model.

This difference in the age profiles of wealth and the potential for misinterpreting the coefficient in the constrained model strongly suggest that the unconstrained specification is preferable a priori. This is confirmed by an F-test; the null hypothesis that the coefficients on the interaction terms are all jointly equal to zero can be rejected with p = 0.034 so the unconstrained specification is preferred.

The log specification yields results that are slightly different. Again the difference between the constrained and unconstrained models is dramatic, with the constrained specification being rejected ($p = 0.284$). In the unconstrained specification (column six of table seven), new diagnoses result in a small (two percent) statistically insignificant loss of wealth for insured households and a large (20 percent) but still statistically insignificant drop in wealth for uninsured households. Where the model estimated with the dependent variable in levels suggested about the same dollar decline in wealth for insured and uninsured, the log model suggests a much larger proportional decline for the uninsured. This difference is likely the result of two factors. First, the log transformation effectively reduces the influence of outliers on the regression coefficient. Second, a drop in wealth of a given magnitude has a larger proportional effect for the uninsured since as we have already seen, the initial levels of wealth for uninsured households are much lower. A loss of $28,000 means more to an uninsured household (whose median wealth is $50,000 among those who experience a shock) than to an insured household (whose median wealth is 101,000 among those who experience a shock).[4] The differences between the level and log specifications are therefore important and both sets of results are interesting. This leads to an ambiguous conclusion about the nature of consumption smoothing, however. While both sets of results support the conclusion that the uninsured rely on wealth depletion to maintain smooth consumption (although admittedly without much precision), whether or not households with formal health insurance also rely on wealth depletion is unclear. The estimates with wealth measured in levels as the dependent variable are consistent with the idea that the insured deplete their wealth just as much as the uninsured do, in absolute terms.

[4] Another possibility is that the restriction of the sample to observations with positive wealth only that is imposed by the log specification results in the difference. We can rule this possibility out by noting that results from the model estimated in levels using only the sample with positive wealth, shown in columns 3 and 4 of table 6, are very similar to the results estimated using the full sample.

The results with the natural log of wealth measured as the dependent variable allow us to reject with some precision the hypothesis that the insured lose a significant fraction of their wealth in response to a new diagnosis.

The next questions are how household income and individual labor supply respond to new diagnoses. Table eight presents fixed-effect regression results for models with household income and the natural log of household income as dependent variables. Columns one and two of table eight present coefficients from the constrained and unconstrained models, respectively, with household income measured in levels as the dependent variable. Although the constrained model is not rejected in this case, again I will discuss the results from the unconstrained model for the sake of consistency. The fixed-effects regression results suggest that household income drops significantly - by nearly $9,000 - in response to a new diagnosis for insured households and by a smaller amount for uninsured households, although the difference in the coefficients for the insured and uninsured is not statistically significant. Recall that mean household income at wave one for households that will experience a shock is about $58,000 for the insured and $31,500 for the uninsured. The same model estimated with the dependent variable estimated in logs suggests a statistically significant drop of about 8.6 percent in household income for both insured and uninsured households in response to a new diagnosis. Table nine presents supporting results from similar regressions with the different components of household income as dependent variables; only the coefficients on the new diagnosis and new diagnosis * uninsured variables are reported. These regressions show that the only two components of household income that are significantly affected by a health shock are earnings of the head and spouse, which decline by about $4,600 for insured households and $2,100 for uninsured households; and, for insured households, capital income, which drops by about $4,000. The drop in earnings of the head and

spouse therefore explains about half of the total drop in household income. The loss in capital income is consistent with the earlier result that these households have lost some of their wealth. Other components of income (most notably transfers from other households, which we might have expected to increase if consumption insurance were effected by informal transfers from other households) do not change much for either insured or uninsured households in response to a health shock.

To shed light on the decline in earnings documented in table nine, I estimate individual-level fixed-effects models using data on all respondents for the following labor market outcomes: earnings, doing any work at the time of the survey, usual hours on main job if working, usual weeks on main job if working, and total individual earnings. As above, I estimate both constrained and unconstrained versions of each regression where the constrained version requires the coefficients on age and number of others in the household to be equal for insured and uninsured individuals. The specification of the constrained model for each outcome W is:

$$\begin{aligned} W_{it} = {} & a_i + b \cdot (\textit{individual has new diagnosis}_{it}) + \\ & g \cdot (\textit{health shock}_{it} \cdot \textit{individual is uninsured at wave1}) + \\ & d \cdot \textit{individual's age}_{it} + l \cdot (\textit{individual's age}_{it})^2 + \\ & p \cdot \textit{number of other people in household} + h_{it} \end{aligned} \tag{3}$$

where i now indexes individuals and t again indexes survey waves. The specification of the unconstrained model is:

$$W_{it} = a_i + b \cdot (individual\ has\ new\ diagnosis_{it}) + \quad (4)$$
$$g \cdot (health\ shock_{it} \cdot individual\ is\ uninsured\ at\ wave1) +$$
$$d_0 \cdot individual's\ age_{it} +$$
$$l_0 \cdot (individual's\ age_{it})^2 +$$
$$p_0 \cdot number\ of\ other\ people\ in\ household +$$
$$d_1 \cdot (individual\ i\ is\ uninsured\ at\ wave\ 1) \cdot individual's\ age_{it} +$$
$$l_1 \cdot (individual\ i\ is\ uninsured\ at\ wave\ 1) \cdot (individual's\ age_{it})^2 +$$
$$p_1 \cdot (individual\ i\ is\ uninsured\ at\ wave\ 1) \cdot number\ of\ other\ people\ in\ household + h_{it}$$

Table ten presents results from individual-level fixed effects regressions with individual labor earnings as the dependent variable. The unconstrained model suggests a significant decline of about $2,500 for the insured and a smaller though not significantly different decline for the uninsured. The drop in the labor earnings of the newly diagnosed household member, then, explains slightly more than half of the drop in earnings of the head plus earnings of the spouse documented in table nine. This means that a new diagnosis for a married person must either be correlated with a new diagnosis for the person's spouse, or must directly cause lower earnings for the spouse (for example, a wife quits her job to take care of her husband after his heart attack). I will return to this issue later.

In order to shed further light on the decline in earnings, table eleven presents results of models with work, hours, weeks and hourly wage as dependent variables[5]. The first two columns of table eleven, estimated using the full sample, have a dummy variable equal to one if the individual is working at the time of the survey. As was the case with wealth, the underlying time path of labor supply is very different for the insured than the uninsured. The age coefficients in the unconstrained model imply an annual decrease at age 60 in the probability of

[5] Recall that these are measured at the time of the interview while earnings are measured for the calendar year prior to the interview.

work of 3.4 percentage points for the insured (= 0.2296 – 2 * 60 * 0.0022) and 14.1 percentage points for the uninsured (= [0.2296 + 0.0011] – 2 * 60 * [0.0022 + 0.0009]). Not surprisingly, the constrained specification is rejected with p = 0.0005. The unconstrained specification suggests that a new diagnosis reduces the probability of work by about nine percentage points for the insured and by about eleven percentage points for the uninsured, although the difference between these effects is not statistically significant. None of the other labor market outcomes conditional on working (hours, weeks or wage) is significantly affected by a new diagnosis, as shown in columns three through eight of table eleven. The only effect of a new diagnosis on an individual's labor market outcomes is to reduce the probability of work.[6]

Effects for husbands versus effects for wives in married couples

Wu (forthcoming) documents the fact that between waves one and two of the HRS, new diagnoses for wives in married couples have a larger negative effect on wealth than do diagnoses for husbands.[7] To explore this possibility further, I estimate the impact of diagnoses for heads and spouses on wealth, consumption, income and earnings of married couples. I too find that diagnoses to spouses have a larger impact on wealth than do diagnoses to heads, although the differences are mostly not statistically significant. Table twelve presents these results. For households with health insurance, a new diagnosis to the head results in a (statistically insignificant) reduction in wealth of about $37,000; diagnoses to spouses are associated with a loss of $52,000 in wealth (also statistically insignificant). The effects for uninsured households

[6] In light of the significant effect of a new diagnosis on work, we might wonder how the results on wealth, consumption and income reported in tables six through nine would change if estimated without controlling for work status of the household head. In fact, re-estimating the models for wealth consumption and income without controls for the head's work status yields almost identical results. The largest change is the effect on ln(household income), where the estimated effect for the insured without controlling for work status is a 10.8 percent drop (compared with 8.6 percent in the regressions with work status controls reported in table 8).

[7] In a married couple, head and spouse are by definition synonymous with husband and wife.

are smaller; the loss in wealth associated with a new diagnosis to an uninsured head is only about $3,000 and to an uninsured spouse is about $28,000. Again, the standard errors associated with the estimates are very large, so that none of the estimates is significantly different from zero, nor can very large effects on wealth be ruled out.

The effect of a new diagnosis on household income is larger for spouses than for heads as well. A new diagnosis for an insured spouse results in a significant drop in household income of about $10,000. With the dependent variable measured as the natural log of household income the effect of a new diagnosis to an insured spouse is also a significant drop of 0.15. The effects for insured heads are smaller: a significant drop of $6,803 in levels and an insignificant drop of 0.0667 in logs. The differences between the effects for insured and uninsured heads and spouses are all estimated too imprecisely to say with any confidence that being uninsured affects heads differently from spouses.

Unlike Charles (1999), I do not find evidence of an added worker effect for married women whose husbands experience a health shock. A new diagnosis for an insured head lowers his earnings by about $2,400 and his wife's earnings by about $1,900. The effects of a wife's diagnosis on her own and her husband's labor supply are smaller but also negative: a reduction of about a thousand dollars for both the head and the spouse, though these coefficients are not statistically significant. Again, the coefficients on the interactions of diagnosis with uninsured are too imprecisely estimated to draw firm conclusions from them.

The probability of work (table thirteen) also shows no evidence of an added worker effect. Indeed, consistent with the reductions in earnings for both members of a couple in response to a new diagnosis for either that were documented in table twelve, we see very small and statistically insignificant effects of a spouse's diagnosis on the probability that her husband works (an

increase of about three percentage points, with a standard error equal to 2.6 percentage points) and an effect of zero of head's diagnosis on a spouse's labor supply. The effects on own labor supply are slightly larger for insured heads than insured spouses: a drop of about eleven percentage points for insured heads and seven percentage points for insured spouses. The interaction terms suggest a larger negative effect on own labor supply for uninsured heads and a net effect for uninsured spouses that is close to zero, but again the coefficients are imprecisely estimated and we cannot rule out that the effect is the same for insured and uninsured individuals. There are no significant effects of either heads' of spouses' diagnoses on their own or their partner's hours or weeks, conditional on working.

5. Conclusion

The results of this study can be summarized as follows. First, I cannot reject that household consumption remains smooth in the face of serious health shocks. Second, the evidence on whether this smoothing relies on wealth depletion rather than true cross-household consumption insurance is mixed. The impact of new diagnoses on wealth is estimated imprecisely and depends on the functional form of the dependent variable. The mean effect for both insured and uninsured households is about a $28,000 reduction in wealth. The log specification suggests a two percent reduction for insured households and a twenty percent reduction for uninsured households, but none of these estimates is significantly different from zero. These results are consistent with the idea that uninsured households rely more heavily on wealth depletion to smooth consumption in the event of a shock, but we cannot rule out the hypothesis that wealth is not affected by shocks for either group. Third, insured households have income that is about $9,000 per year lower after a shock occurs; about half of this is due to a reduction in earnings of

the household head and spouse and the other half due primarily to lower capital income. Fourth, both insured and uninsured individuals are about ten percentage points less likely to work as a result of a shock. Shocks have no significant effect on hours, weeks or wages conditional on continuing to work. Finally, I find no evidence of an "added worker effect" in response to a shock for married couples.

For both insured and uninsured households, the magnitude of the mean change in wealth is much larger than can be explained by the drop in income associated with a shock. This discrepancy suggests that out-of-pocket medical expenses may be high for both insured and uninsured households that experience a health shock. Alternatively, the effect on wealth may reflect an accelerated rate of gift-giving among those who experience a health shock: serious diagnoses like cancer and heart attacks may serve as a wake-up call to begin giving one's wealth away. While everyone knows that you can't take it with you, a serious health shock may provide information about how soon that may happen. Distinguishing between the impact of health shocks on out-of-pocket medical expenses and their effect on inter vivos transfers remains a subject for future research.

Another interesting lesson from this analysis concerns the importance of allowing the underlying trends in wealth and other economic outcomes to differ for the insured and uninsured. This is important econometrically because failure to do so by estimating only the constrained model yields a misleadingly large estimate of the impact of health shocks for uninsured households. Substantively, this suggests that the underlying economic landscape of an uninsured household is very different from that of an insured household – even in the absence of health shocks. Insurance coverage, clearly, is not exogenous to a household's economic situation. Accurate inference cannot be drawn from an analysis that relies on a comparison of outcomes

across insured and uninsured household or even one that requires that insured and uninsured to behave "similarly" on dimensions other than insurance. Understanding the variation in insurance coverage – what it is that makes some individuals insured and others uninsured – is a high priority for future research.

6. Refererences

Adams, Peter, Michael D. Hurd, Daniel McFadden, Angela Merrill and Tiago Ribeiro. 2002. "Healthy, Wealthy and Wise? Tests for Direct Causal Paths between Health and Socioeconomic Status," forthcoming, *Journal of Econometrics*.

Burkhauser, Richard V. and Paul J. Gertler, editors. 1995. "Special Issue: The Health and Retirement Study, Data Quality and Early Results," Journal of Human Resources, 30(5).

Charles, Kerwin. 1999. "Sickness in the Family: Health Shocks and Spousal Labor Supply," manuscript, University of Michigan.

Cochrane, John.1991. "A Simple Test of Consumption Insurance," *Journal of Political Economy* 99(5): 957 – 975.

Currie, Janet and Brigitte Madrian. 1999. "Health, Health Insurance and Labor Markets." Chapter 50 in *The Handbook of Labor Economics*, vol. 3C, Elsevier; Orley Ashenfelter and David Card, editors.

Gertler, Paul and Jonathan Gruber. 2002. "Insuring Consumption against Illness." *American Economic Review* 92(1): 51-76.

Gruber, Jonathan and Aaron Yelowitz. 1999. "Public Health Insurance and Private Savings," *Journal of Political Economy* 107(6):1249-1274.

Hayashi, Fumio, Joseph Altonji and Laurence Kotlikoff. 1996. "Risk-Sharing between and within Families," *Econometrica* 64(2): 261-294.

Hubbard, R. Glenn, Jonathan Skinner, and Stephen P. Zeldes. 1994. "The Importance of Precautionary Motives in Explaining Individual and Aggregate Saving," Carnegie Rochester Conference Series on Public Policy 40(0): 59-125.

Hurd, Michael and Arie Kapteyn. 2001. "Health, Wealth, and the Role of Institutions," working paper.

Palumbo, Michael. 1999. "Uncertain Medical Expenses and Precautionary Saving Near the End of Life," Review of Economic Studies (66):395-421.

Smith, James. 1999. "Healthy Bodies and Thick Wallets: The Dual Relation between Health and Economic Status," *Journal of Economic Perspectives* 13(2):145-166.

Starr-McCluer, Martha. 1996. "Health Insurance and Precautionary Savings," *American Economic Review* 86(1):285-295.

Stephens, Melvin, Jr. 2001. "The Long-Run Consumption Effects of Earnings Shocks," *Review of Economics and Statistics* 83(1): 28-36

Weir, David, Robert Willis and Purvi Sevak. 2000. "The Economic Consequences of Husband's Death: Evidence from the HRS and AHEAD." Paper prepared for presentation at the Second Annual Joint Conference for the Retirement Research Consortium, May 17-18 2000, Washington DC.

Wu, Stephen. Forthcoming. "The Effects of Health Events on the Economic Status of Married Couples," *Journal of Human Resources*.

Table 1
Health and Retirement Study: Households with no change to head or spouse in waves 1 - 4
Descriptive statistics on the sample at wave 1

		By marital status	
	All	Single	Couple
Wealth	$246,252	$125,773	$300,681
Wealth - median	111,000	41,400	148,050
Food spending	426.1	310.2	468.5
Household income (mean)	51,211	28,944	61,271
Earnings of head	24,939	17,730	28,196
Earnings of spouse, if any	16,093	-	16,093
Fraction of heads working	0.747	0.702	0.767
Usual hours of head if working	44.3	41.7	45.3
Usual weeks of head if working	49.4	49.0	49.6
Mean wage of head if working	36.4	20.7	43.0
Fraction of spouses working	0.629	-	0.629
Usual hours of spouse if working	37.1	-	37.1
Usual weeks of spouse if working	48.2	-	48.2
Mean wage of spouse if working	21.8	-	21.8
Head is insured	0.875	0.811	0.905
Spouse (if any) is insured	0.877	0.000	0.877
Both are insured	0.832	0.811	0.842
Head is sick	0.297	0.321	0.286
Spouse (if any) is sick	0.230	0.000	0.230
Either is sick	0.402	0.321	0.439
No. of others in household	0.847	0.885	0.830
Age of head	57.0	56.0	57.4
Fraction married	0.689	0.000	1.000
Head is nonwhite	0.169	0.282	0.118
Head is high school dropout	0.249	0.289	0.231
Head is high school graduate	0.321	0.336	0.315
Head has some college ed.	0.186	0.191	0.184
Head has college degree	0.105	0.070	0.121
Head has graduate education	0.139	0.114	0.150
Sample n	4,422	1,386	3,036
Row percent:	1.000	0.311	0.689

Notes: Statistics are calculated using wave 1 household sample weights.
Dollar amounts are in 1998 dollars.

Table 2
Health and Retirement Study
Evolution of diagnoses, waves 1-4, by wave 1 insurance status

	Insurance status at wave 1		
	Insured	Uninsured	Total
"Diagnosis history" of household (head and spouse, if any)			
0000	0.418	0.421	0.420
0001	0.072	0.061	0.063
0011	0.037	0.054	0.052
0111	0.068	0.062	0.063
1111	0.405	0.402	0.402
Sample n	3,619	803	4,422
Row percent:	0.832	0.168	1.000
"Diagnosis history" of head			
0000	0.517	0.540	0.537
0001	0.063	0.063	0.063
0011	0.035	0.051	0.049
0111	0.066	0.052	0.054
1111	0.319	0.294	0.297
Sample n	3,810	612	4,422
Row percent:	0.862	0.138	1.000
"Diagnosis history" of spouse			
0000	0.656	0.654	0.654
0001	0.053	0.034	0.037
0011	0.048	0.036	0.038
0111	0.036	0.042	0.041
1111	0.207	0.234	0.230
Sample n	2,624	412	3,036
Row percent:	0.877	0.123	1.000

Notes: Column percents are calculated using wave 1 household sample weights.

Table 3
Health and Retirement Study
Descriptive statistics on panel with no changes to head or spouse, observed all four waves

	Head and spouse (if any) insured			Head or spouse uninsured		
	Healthy	Chronic	Shock	Healthy	Chronic	Shock
Wealth - mean	$286,010	$207,173	$255,383	$266,553	$227,279	$167,113
Wealth – median	133,500	101,000	135,000	73,000	43,000	50,000
Food spending	419.1	433.9	439.1	411.2	409.3	413.3
Household income (mean)	57,289	49,057	57,973	41,838	34,024	31,566
Earnings of head	31,441	21,732	29,866	17,506	9,348	13,051
Earnings of spouse, if any	18,877	15,931	17,069	12,035	8,545	9,821
Household heads:						
Fraction working	0.844	0.664	0.794	0.741	0.576	0.697
Mean usual hours if working	44.4	44.5	45.2	43.9	41.0	42.6
Mean usual weeks if working	49.6	49.5	50.1	48.5	47.5	47.8
Mean wage if working	30.8	51.9	36.9	20.4	21.3	17.4
Spouses:						
Fraction working	0.709	0.625	0.635	0.550	0.415	0.488
Mean usual hours if working	37.8	37.0	37.3	34.8	33.7	36.8
Mean usual weeks if working	48.3	48.2	48.5	46.7	47.9	50.1
Mean wage if working	20.7	16.4	39.3	23.0	14.3	7.0
Head is insured	1.000	1.000	1.000	0.245	0.276	0.246
Spouse is insured	1.000	1.000	1.000	0.179	0.256	0.222
Head and spouse, if any, are insured	1.000	1.000	1.000	0.000	0.000	0.000
Head is sick	0.000	0.731	0.000	0.000	0.775	0.000
Spouse is sick	0.000	0.533	0.000	0.000	0.484	0.000
Either is sick	0.000	1.000	0.000	0.000	1.000	0.000
No. of others in household	0.8	0.7	0.8	1.3	1.1	1.2
Age of head	56.0	57.9	57.3	56.0	57.8	56.3
Fraction married	0.601	0.757	0.787	0.566	0.724	0.677
Head is nonwhite	0.145	0.149	0.146	0.279	0.276	0.294
Head is high school dropout	0.158	0.256	0.242	0.363	0.492	0.446
Head is high school graduate	0.329	0.346	0.283	0.299	0.265	0.341
Head has some college ed.	0.204	0.180	0.214	0.158	0.137	0.074
Head has college degree	0.127	0.099	0.118	0.080	0.031	0.079
Head has graduate education	0.182	0.120	0.143	0.100	0.076	0.060
Sample n	1,488	1,486	645	331	332	140
Row percent:	0.350	0.334	0.148	0.070	0.068	0.030

Notes: Statistics are calculated using wave 1 household sample weights.
Dollar amounts are in 1998 dollars.

Table 4
Health and Retirement Study, waves 1 - 4
Evolution of outcome variables over time, by insurance and health status

	Wave 1	Wave 2	Wave 3	Wave 4
Wealth – mean				
Insured, healthy	286,010	329,668	389,221	482,930
Insured, chronic	207,173	232,942	260,154	306,286
Insured, shock	255,383	284,338	300,990	359,929
Uninsured, healthy	266,553	246,188	273,828	316,174
Uninsured, chronic	227,279	169,558	245,232	203,885
Uninsured, shock	167,113	191,485	175,124	157,795
All insured	248,909	282,772	321,719	390,147
All uninsured	233,071	205,489	244,799	242,707
Total	246,252	269,807	308,815	365,411
Wealth – median				
Insured, healthy	133,500	160,000	173,000	186,000
Insured, chronic	101,000	120,530	123,000	134,500
Insured, shock	135,000	155,000	155,000	168,374
Uninsured, healthy	73,000	72,500	80,500	76,000
Uninsured, chronic	43,000	41,200	46,920	50,026
Uninsured, shock	50,000	39,100	33,300	38,000
All insured	121,500	143,550	150,000	158,500
All uninsured	50,000	49,218	52,150	55,000
Total	111,000	126,000	136,100	144,800
Food spending – mean				
Insured, healthy	$419	$435	$637	-
Insured, chronic	434	439	657	-
Insured, shock	439	443	712	-
Uninsured, healthy	411	391	589	-
Uninsured, chronic	409	358	578	-
Uninsured, shock	413	375	559	-
All insured	429	438	659	-
All uninsured	411	375	579	-
Total	426	428	646	-
Household income – mean				
Insured, healthy	57,289	76,346	70,231	63,563
Insured, chronic	49,057	56,450	51,239	51,226
Insured, shock	57,973	69,761	59,275	52,676
Uninsured, healthy	41,838	51,593	42,650	46,533
Uninsured, chronic	34,024	40,494	37,738	29,760
Uninsured, shock	31,566	55,804	30,109	31,556
All insured	54,105	67,186	60,658	56,675
All uninsured	36,858	47,843	38,444	37,093
Total	51,211	63,941	56,931	53,390

Table 4, continued
Evolution of outcome variables over time, by insurance and health status

Earnings of household head				
Insured, healthy	31,441	30,250	25,972	24,130
Insured, chronic	21,732	20,225	18,697	15,418
Insured, shock	29,866	31,410	24,726	19,540
Uninsured, healthy	17,506	16,578	7,882	9,131
Uninsured, chronic	9,348	7,103	6,211	7,230
Uninsured, shock	13,051	22,674	8,538	8,004
All insured	27,262	26,430	22,829	19,816
All uninsured	13,415	13,819	7,321	8,162
Total	24,939	24,314	20,227	17,861
Fraction of heads who work				
Insured, healthy	0.845	0.767	0.716	0.649
Insured, chronic	0.664	0.589	0.530	0.469
Insured, shock	0.794	0.710	0.623	0.518
Uninsured, healthy	0.741	0.700	0.674	0.653
Uninsured, chronic	0.576	0.547	0.491	0.445
Uninsured, shock	0.697	0.650	0.567	0.477
All insured	0.763	0.685	0.625	0.553
All uninsured	0.667	0.629	0.581	0.538
Total	0.747	0.676	0.618	0.551
Mean usual hours of working heads				
Insured, healthy	44.4	43.5	42.1	40.1
Insured, chronic	44.5	42.8	40.9	40.1
Insured, shock	45.2	44.7	42.0	38.8
Uninsured, healthy	43.9	41.7	41.0	40.7
Uninsured, chronic	41.0	40.1	37.3	37.7
Uninsured, shock	42.6	39.9	45.5	44.8
All insured	44.6	43.5	41.7	39.8
All uninsured	42.7	40.8	40.5	40.4
Total	44.3	43.1	41.5	39.9
Mean usual weeks of working heads				
Insured, healthy	49.6	49.2	48.6	48.4
Insured, chronic	49.5	49.4	48.9	48.2
Insured, shock	50.1	49.8	49.0	48.1
Uninsured, healthy	48.5	48.6	47.4	49.1
Uninsured, chronic	47.5	47.9	48.3	47.0
Uninsured, shock	47.8	47.4	47.7	49.0
All insured	49.7	49.3	48.7	48.3
All uninsured	48.0	48.2	47.8	48.4
Total	49.4	49.2	48.6	48.3

Table 4, continued
Evolution of outcome variables over time, by insurance and health status

Mean hourly wage of working heads				
Insured, healthy	30.8	33.2	22.7	34.7
Insured, chronic	51.9	18.9	23	23.8
Insured, shock	36.9	20.3	23.1	20.9
Uninsured, healthy	20.4	16.2	13.4	15.9
Uninsured, chronic	21.3	12.9	13.7	15.7
Uninsured, shock	17.4	10.7	9.8	14.4
All insured	39.3	25.9	22.9	28.7
All uninsured	20.2	14.1	12.9	15.6
Total	36.4	24.1	21.3	26.5

Notes: Statistics are calculated using wave 1 household sample weights.
Dollar amounts are in 1998 dollars.

Table 5
Are transitions into and out of insurance correlated with health shocks?
Distribution of individuals across insurance histories, by diagnosis history

	Diagnosis history of head (n = 4,422)					
Insurance history of head:	**0000**	**0001**	**0011**	**0111**	**1111**	**Total**
0000	0.0302	0.0181	0.0090	0.0271	0.0230	0.0261
0001	0.0121	0.0127	0.0065	0.0131	0.0116	0.0118
0010	0.0041	0.0018	0.0063	0.0000	0.0052	0.0042
0011	0.0155	0.0219	0.0234	0.0246	0.0226	0.0189
0100	0.0042	0.0023	0.0000	0.0019	0.0045	0.0038
0101	0.0044	0.0055	0.0031	0.0021	0.0073	0.0051
0110	0.0031	0.0098	0.0089	0.0000	0.0037	0.0038
0111	0.0465	0.0519	0.0307	0.0834	0.0561	0.0509
1000	0.0063	0.0077	0.0077	0.0024	0.0019	0.0049
1001	0.0084	0.0178	0.0000	0.0084	0.0085	0.0086
1010	0.0036	0.0000	0.0062	0.0000	0.0018	0.0028
1011	0.0192	0.0212	0.0426	0.0156	0.0237	0.0216
1100	0.0074	0.0029	0.0118	0.0082	0.0058	0.0069
1101	0.0228	0.0480	0.0168	0.0123	0.0135	0.0208
1110	0.0159	0.0127	0.0178	0.0176	0.0167	0.0162
1111	0.7964	0.7655	0.8093	0.7832	0.7940	0.7936
Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	Diagnosis history of spouse (n = 3,036)					
Insurance history of spouse:	**0000**	**0001**	**0011**	**0111**	**1111**	**Total**
0000	0.0272	0.0287	0.0198	0.0120	0.0276	0.0265
0001	0.0075	0.0220	0.0262	0.0125	0.0120	0.0100
0010	0.0021	0.0047	0.0000	0.0000	0.0021	0.0021
0011	0.0153	0.0075	0.0177	0.0255	0.0159	0.0157
0100	0.0018	0.0000	0.0105	0.0000	0.0010	0.0018
0101	0.0034	0.0116	0.0047	0.0000	0.0023	0.0033
0110	0.0052	0.0121	0.0000	0.0000	0.0042	0.0048
0111	0.0609	0.0927	0.0788	0.0559	0.0455	0.0590
1000	0.0119	0.0105	0.0289	0.0038	0.0093	0.0115
1001	0.0049	0.0050	0.0000	0.0000	0.0040	0.0043
1010	0.0018	0.0000	0.0109	0.0000	0.0000	0.0016
1011	0.0200	0.0229	0.0079	0.0050	0.0243	0.0200
1100	0.0106	0.0083	0.0057	0.0032	0.0105	0.0100
1101	0.0192	0.0163	0.0102	0.0247	0.0194	0.0190
1110	0.0166	0.0063	0.0092	0.0476	0.0195	0.0179
1111	0.7916	0.7513	0.7695	0.8097	0.8026	0.7926
Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Notes: Column percents are calculated using wave 1 household sample weights.

Table 6
Effect of new diagnosis on consumption in the HRS, waves 1-4

	Consumption	
Independent variables:	(1)	(2)
New diagnosis	35.13	33.01
	(24.65)	(24.74)
New diagnosis to person who was uninsured at wave 1	-75.73	-56.73
	(73.27)	(76.60)
Age of head	-26.11	-27.46
	(49.44)	(55.73)
(Age of head)^2	0.74	0.76
	(0.41)	(0.46)
Head is working	12.95	11.44
	(14.78)	(18.29)
Number of other people in household	49.88	48.38
	(31.36)	(36.79)
Age of head * Anyone uninsured at wave 1	-	8.54
		(81.66)
(Age of head)^2 * Anyone uninsured at wave 1	-	-0.12
		(0.69)
Head is working * Anyone uninsured at wave 1	-	5.83
		(23.60)
Number of other people in household * Anyone uninsured at wave 1	-	15.20
		(48.14)
p-value on F test	-	0.8265
Household fixed effects included?	Y	Y
Number of households	4,376	4,376
Number of obs. (household-waves)	11,169	11,169

Notes: Statistics are calculated using wave 1 household sample weights.
Dollar amounts are in 1998 dollars.

Table 7
Effect of new diagnosis on wealth in the HRS, waves 1 - 4

	Dependent variable:					
	Wealth		Wealth (observations with wealth>0 only)		ln(wealth)	
Independent variables:	(1)	(2)	(3)	(4)	(5)	(6)
New diagnosis	-20,029	-28,460	-24,057	-31,667	-0.0094	-0.0236
	(25,470)	(26,755)	(27,586)	(28,822)	(0.0425)	(0.0424)
New diagnosis to person who was uninsured at wave 1	-68,627	379	-73,652	-3,962	-0.3364	-0.2054
	(20,141)	(29,404)	(22,364)	(33,427)	(0.1432)	(0.1510)
Age of head	43,300	45,884	45,454	46,747	0.1642	0.1647
	(27,141)	(33,278)	(29,985)	(35,957)	(0.0758)	(0.0888)
(Age of head)^2	-193	-186	-198	-181	-0.0010	-0.0010
	(210)	(259)	(231)	(279)	(0.0006)	(0.0007)
Head is working	-811	430	-3,574	-2,184	-0.0187	-0.0156
	(6,092)	(6,934)	(8,711)	(10,071)	(0.0148)	(0.0159)
Number of other people in household	1,090	7,695	516	9,173	-0.0073	-0.0082
	(14,921)	(18,389)	(16,428)	(19,793)	(0.0292)	(0.0306)
Age of head	-	-24,765	-	-20,362	-	-0.0216
* Anyone uninsured at wave 1		(43,373)		(48,520)		(0.1494)
	-		-		-	
(Age of head)^2		33		-11		-0.0001
* Anyone uninsured at wave 1	-	(346)	-	(386)	-	(0.0012)
Head is working	-	-11,286	-	-13,296	-	-0.0226
* Anyone uninsured at wave 1		(12,321)		(17,267)		(0.0399)
	-		-		-	
Number of other people in household		-24,351		-36,724		0.0383
* Anyone uninsured at wave 1	-	(23,308)	-	(26,739)	-	(0.0933)
p-value on F test	-	0.0340	-	0.0583	-	0.0284
Household fixed effects included?	Y	Y	Y	Y	Y	Y
Number of households	4,422	4,422	4,289	4,289	4,289	4,289
Number of obs. (household-waves)	17,688	17,688	16,174	16,174	16,174	16,174

Notes: Statistics are calculated using wave 1 household sample weights.
Dollar amounts are in 1998 dollars.

Table 8
Effect of new diagnosis on household income in the HRS, waves 1 - 4

	Dependent variable:			
	Household income		ln(HH income)	
Independent variables:	(1)	(2)	(3)	(4)
New diagnosis	-8,504	-8,724	-0.0727	-0.0862
	(2,759)	(2,803)	(0.0445)	(0.0445)
New diagnosis to person who was uninsured at wave 1	3,497	5,776	-0.0767	0.0077
	(6,883)	(7,478)	(0.1162)	(0.1259)
Age of head	17,850	18,804	0.4715	0.4341
	(3,729)	(4,489)	(0.0777)	(0.0833)
(Age of head)^2	-144	-151	-0.0043	-0.0040
	(31)	(37)	(0.0006)	(0.0007)
Head is working	2,823	2,567	0.0636	0.0574
	(1,020)	(1,066)	(0.0137)	(0.0146)
Number of other people in household	9,288	9,865	0.3206	0.3223
	(2,007)	(2,386)	(0.0318)	(0.0342)
Age of head	-	-6,565	-	0.2323
* Anyone uninsured at wave 1		(7,849)		(0.1458)
(Age of head)^2	-	50	-	-0.0021
* Anyone uninsured at wave 1	-	(66)	-	(0.0012)
Head is working	-	830	-	0.0214
* Anyone uninsured at wave 1		(2,760)		(0.0363)
Number of other people in household	-	-2,759	-	0.0136
* Anyone uninsured at wave 1	-	(3,552)	-	(0.0902)
p-value on F test	-	0.6843	-	0.0552
Household fixed effects included?	Y	Y	Y	Y
Number of households or individuals	4,422	4,422	4,422	4,422
Number of obs. (household- or individual-waves)	17,688	17,688	17,541	17,541

Notes: Statistics are calculated using wave 1 household sample weights.
Dollar amounts are in 1998 dollars.

Table 9
Effect of new diagnosis on components of household income in the HRS, waves 1 - 4

	Dependent variable:							
	Earnings of head & spouse	Unem-ployment insurance/ Workers' comp.	Social security & Pension income	SSI/ Welfare	Capital income	Other sources of income	Income of other household members	Transfers
Independent variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
New diagnosis	-4,601	-113	113	12	-3,849	-111	-608	-95
	(1,881)	(71)	(537)	(55)	(1,902)	(71)	(1,367)	(169)
New diagnosis to person who was uninsured at wave 1	2,524	-256	-284	294	4,193	-263	195	321
	(5,594)	(309)	(948)	(200)	(5,315)	(199)	(1,899)	(275)
Household fixed effects included?	Y	Y	Y	Y	Y	Y	Y	Y
Number of households	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422
Number of observations (household-waves)	17,688	17,688	17,688	17,688	17,688	17,688	17,688	17,688

Notes:

1. Regressions correspond to equation (2) in text and include the following additional regressors: age of household head, age^2 of household head, number of other people in the household, and the interactions of each additional regressor for a dummy variable for whether the household head or spouse is uninsured at wave 1.
2. Statistics are calculated using wave 1 household sample weights.
3. Dollar amounts are in 1998 dollars.

Table 10
Effect of new diagnosis on individual earnings in the HRS, waves 1 - 4

	Dependent variable:	
	Individual earnings	
Independent variables:	(1)	(2)
New diagnosis	-2,738	-2,556
	(1,177)	(1,191)
New diagnosis to person who was uninsured at wave 1	2,698	1,372
	(2,835)	(2,797)
Age of head	10,062	11,328
	(1,515)	(1,686)
(Age of head)^2	-93	-105
	(13)	(14)
Head is working	-	-
Number of other people in household	62	126
	(332)	(386)
Age of head * Anyone uninsured at wave 1	-	-10,079
		(3,290)
(Age of head)^2 * Anyone uninsured at wave 1	-	88
		(28)
Head is working * Anyone uninsured at wave 1	-	-
Number of other people in household * Anyone uninsured at wave 1	-	-266
		(680)
p-value on F test	-	0.0030
Household fixed effects included?	Y	Y
Number of individuals	6,705	6,705
Number of obs. (individual-waves)	26,820	26,820

Notes: Statistics are calculated using wave 1 household sample weights.
Dollar amounts are in 1998 dollars.

Table 11
Effect of new diagnosis on the probability of work and on hours, weeks and wages for workers in the HRS, waves 1 - 4

	Dependent variable:							
	Any work		Hours		Weeks		Wage	
Independent variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
New diagnosis	-0.1023	-0.0932	-1.16	-0.96	-0.37	-0.26	0.77	1.04
	(0.0203)	(0.0204)	(0.69)	(0.70)	(0.51)	(0.52)	(4.87)	(5.49)
New diagnosis * Uninsured at wave 1	0.0532	-0.0187	5.15	3.26	2.66	1.53	2.88	-0.24
	(0.0559)	(0.0580)	(1.98)	(2.06)	(1.19)	(1.33)	(3.95)	(6.01)
Age	0.2168	0.2296	7.53	7.84	2.72	2.58	-0.24	-0.37
	(0.0246)	(0.0262)	(1.14)	(1.20)	(0.75)	(0.79)	(6.25)	(7.27)
Age^2	-0.0021	-0.0022	-0.07	-0.07	-0.03	-0.02	0.00	0.01
	(0.0002)	(0.0002)	(0.01)	(0.01)	(0.01)	(0.01)	(0.05)	(0.06)
Number of other people in household	-0.0067	-0.0058	0.04	0.10	-0.02	0.03	10.18	12.12
	(0.0048)	(0.0054)	(0.20)	(0.22)	(0.14)	(0.15)	(13.13)	(15.72)
Age * uninsured at wave 1	-	0.0011	-	-2.23	-	1.74	-	4.88
		(0.0006)		(3.63)		(2.52)		(9.09)
Age^2 * uninsured at wave 1	-	-0.0009	-	0.02	-	-0.01	-	-0.05
		(0.0121)		(0.03)		(0.02)		(0.08)
Number of others * Uninsured at wave 1	-	-4.7301	-	-0.32	-	-0.29	-	-11.88
		(0.7141)		(0.47)		(0.30)		(15.73)
p-value on F test on interactions	-	0.0005	-	0.0359	-	0.1432	-	0.6266
Person fixed effects included?	Y	Y	Y	Y	Y	Y	Y	Y
Number of people	6,705	6,705	5,022	5,022	5,022	5,022	5,001	5,001
No. of observations (person-waves)	26,820	26,820	15,977	15,977	15,977	15,977	15,388	15,388

Notes: Statistics are calculated using wave 1 household sample weights.
Dollar amounts are in 1998 dollars.

Table 12
Are the effects of a new diagnosis symmetric for head and spouse in married couples?
Effects on wealth, consumption, household income and earnings in the HRS, waves 1 - 4

	Dependent variable:							
	Wealth	Wealth if >0	ln(wealth)	Food	Household income	ln(hh inc.)	Head's earnings	Spouse's earnings
Independent variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
New diagnosis for head	-37,463	-41,723	-0.0585	-1.88	-6,803	-0.0667	-2,406	-1,906
	(33,837)	(34,685)	(0.0465)	(27.19)	(3,279)	(0.0528)	(1,743)	(1,303)
New diagnosis for spouse	-51,838	-50,806	-0.0613	33.40	-10,083	-0.1526	-1,117	-700
	(39,732)	(41,793)	(0.0509)	(36.60)	(4,077)	(0.0588)	(2,138)	(1,112)
New diagnosis for head	34,531	38,501	-0.0443	-37.20	12,680	0.0169	2,572	-3,259
and head is uninsured at wave 1	(42,677)	(44,803)	(0.2236)	(67.12)	(9,093)	(0.1907)	(5,112)	(2,667)
New diagnosis for spouse	24,140	19,663	-0.1458	-75.01	8,294	-0.0890	-167	28
and spouse is uninsured at wave 1	(51,238)	(56,388)	(0.1821)	(139.78)	(10,282)	(0.2058)	(5,274)	(2,792)
Household fixed effects included?	Y	Y	Y	Y	Y	Y	Y	Y
Number of households	3,036	3,020	3,020	3,029	3,036	3,036	3,036	3,036
Number of observations (household-waves)	12,144	11,737	11,737	8,063	12,144	12,096	12,144	12,144

Notes:

1. Regressions include the following additional regressors: age of household head, age^2 of household head, number of other people in the household, and the interactions of each additional regressor for a dummy variable for whether the household head or spouse is uninsured at wave
2. Statistics are calculated using wave 1 household sample weights.
3. Dollar amounts are in 1998 dollars.

Table 13
Are the effects of a new diagnosis symmetric for head and spouse in married couples?
Effects on the probability of work, hours and weeks in the HRS, waves 1-4

	Dependent variable:					
	Head works	Spouse works	Hours if working: Head	Hours if working: Spouse	Weeks if working: Head	Weeks if working: Spouse
Independent variables:	(1)	(2)	(3)	(4)	(5)	(6)
New diagnosis for head	-0.1005	-0.0054	-1.5872	0.0858	-1.1212	-0.3375
	(0.0223)	(0.0236)	(1.0892)	(0.9630)	(0.6437)	(0.6740)
New diagnosis for spouse	(0.0248)	-0.0528	-0.4272	-1.2032	0.3655	0.8775
	0.0244	(0.0304)	(1.2033)	(1.4655)	(0.7603)	(1.1328)
New diagnosis for head	-0.1328	-0.0239	0.4883	-2.2670	4.0831	0.4902
AND head is uninsured at wave 1	(0.0790)	(0.0738)	(2.7745)	(5.8550)	(3.2095)	(1.0020)
New diagnosis for spouse	-0.0166	0.0489	3.9621	-0.7386	-0.4264	1.7868
AND spouse is uninsured at wave 1	(0.0644)	(0.0724)	(4.4954)	(5.0333)	(1.5423)	(2.5336)
Individual fixed effects included?	Y	Y	Y	Y	Y	Y
Number of individuals	3,036	2,700	2,162	1,918	2,162	1,918
Number of observations (individual-waves)	12,144	12,144	7,027	5,983	7,027	5,983

Notes:
1. Regressions include the following additional regressors: age of household head, age^2 of household head, number of other people in the household, and the interactions of each additional regressor for a dummy variable for whether the household head or spouse is uninsured at wave
2. Statistics are calculated using wave 1 household sample weights.
3. Dollar amounts are in 1998 dollars.

Table A1
Detailed statistics on consumption and the components of wealth at wave 1, by insurance and health status

	Mean	Std. Dev.	10^{th} percentile	Median	90^{th} percentile	Fraction with value >0	Mean change, wave1- 4	Median change, wave 1- 4
Food consumption								
Insured, healthy	419	217	180	400	700	1.000	229	140
Insured, chronic	433	243	200	383	720	1.000	251	210
Insured, shock	440	230	220	400	700	1.000	287	240
Uninsured, healthy	411	218	172	380	700	1.000	215	140
Uninsured, chronic	411	249	160	360	700	1.000	223	190
Uninsured, shock	410	224	206	370	620	1.000	204	220
All insured	429	229	194	400	700	1.000	250	180
All uninsured	411	229	179	375	700	1.000	214	180
Total	426	229	190	400	700	1.000	245	180
Total wealth (= housing wealth + non-housing wealth)								
Insured – healthy	286,010	624,199	10,000	133,500	590,000	0.957	196,920	37,000
Insured – chronic	208,045	416,835	100	98,000	469,000	0.902	102,447	18,500
Insured – shock	243,375	438,454	14,000	132,200	524,500	0.961	98,208	29,320
Uninsured – healthy	266,553	546,321	0	73,000	771,000	0.879	49,621	4,500
Uninsured – chronic	219,042	677,848	0	32,500	467,000	0.857	-47,127	0
Uninsured – shock	195,461	468,432	0	51,300	409,025	0.866	18,605	1,800
All insured	248,909	519,469	5,100	121,500	520,500	0.939	141,237	28,350
All uninsured	233,071	576,807	0	50,000	561,900	0.869	9,637	1,700
Total	246,252	529,491	1,900	111,000	524,900	0.927	119,159	22,000
Housing wealth (= property value – housing debt)								
Insured – healthy	73,971	85,255	0	55,000	171,000	0.818	22,771	10,800
Insured – chronic	58,123	125,607	0	45,000	150,000	0.794	16,228	6,500
Insured – shock	71,985	77,795	0	57,500	155,800	0.845	17,933	10,000
Uninsured – healthy	54,220	95,413	0	25,000	150,000	0.615	11,972	0
Uninsured – chronic	45,523	75,399	0	18,000	125,000	0.614	12,421	0
Uninsured – shock	56,781	111,085	0	25,000	141,000	0.816	19,370	0
All insured	67,952	100,135	0	51,000	160,000	0.625	8,759	10,000
All uninsured	51,952	93,613	0	21,900	142,000	0.784	17,590	0
Total	65,268	99,241	0	49,000	155,800	0.784	119,159	7,000

Table A1, continued
Detailed statistics on consumption and the components of wealth at wave 1, by insurance and health status

	Mean	Std. Dev.	10th percentile	Median	90th percentile	Fraction with value >0	Mean change, wave1- 4	Median change, wave 1- 4
Non-housing wealth								
(= other real estate + business equity + stocks + bonds + IRAs + liquid assets + vehicles + other assets – other debt)								
Insured – healthy	212,039	587,776	2,000	66,500	471,200	0.934	174,149	20,100
Insured – chronic	149,922	399,744	0	37,700	340,000	0.876	86,219	7,000
Insured – shock	171,390	414,904	2,800	61,000	415,900	0.944	80,275	13,000
Uninsured – healthy	212,332	499,200	0	18,000	647,000	0.831	37,649	1,170
Uninsured – chronic	173,519	641,311	-1,100	10,000	336,000	0.796	-59,548	-60
Uninsured – shock	138,680	407,690	0	19,000	277,000	0.820	20,200	700
All insured	180,957	491,320	666	55,000	404,200	0.916	121,867	12,900
All uninsured	181,119	531,913	0	13,030	448,000	0.816	877	500
Total	180,984	498,302	0	48,000	407,200	0.899	101,569	7,700
Other real estate								
Insured – healthy	55,878	206,305	0	0	130,000	0.364	5,758	0
Insured – chronic	41,900	194,506	0	0	89,000	0.307	17,121	0
Insured – shock	48,608	225,412	0	0	112,500	0.359	1,768	0
Uninsured – healthy	85,985	282,556	0	0	315,000	0.316	-21,064	0
Uninsured – chronic	39,145	142,989	0	0	65,000	0.238	-3,484	0
Uninsured – shock	36,437	122,803	0	0	80,000	0.285	23,983	0
All insured	49,311	206,868	0	0	110,000	0.343	8,839	0
All uninsured	58,067	210,787	0	0	115,750	0.282	-4,029	0
Total	50,780	207,534	0	0	110,200	0.333	6,680	0
Business equity								
Insured – healthy	46,223	338,783	0	0	20,000	0.130	33,112	0
Insured – chronic	29,400	215,218	0	0	10,000	0.119	3,585	0
Insured – shock	27,652	171,651	0	0	10,000	0.129	-8,486	0
Uninsured – healthy	50,228	237,248	0	0	60,000	0.219	-15,730	0
Uninsured – chronic	85,611	526,346	0	0	75,000	0.203	-60,551	0
Uninsured – shock	33,343	141,201	0	0	50,000	0.209	-15,977	0
All insured	36,081	267,068	0	0	15,000	0.126	13,259	0
All uninsured	57,854	348,013	0	0	75,000	0.211	-30,754	0
Total	39,734	282,348	0	0	25,000	0.140	5,875	0

Table A1, continued
Detailed statistics on consumption and the components of wealth at wave 1, by insurance and health status

	Mean	Std. Dev.	10th percentile	Median	90th percentile	Fraction with value >0	Mean change, wave1- 4	Median change, wave 1- 4
IRAs								
Insured – healthy	27,254	73,898	0	4,000	70,000	0.538	47,549	0
Insured – chronic	19,207	53,863	0	0	50,000	0.441	21,289	0
Insured – shock	24,160	61,511	0	1,500	60,000	0.518	34,605	0
Uninsured – healthy	14,691	48,919	0	0	40,000	0.300	16,769	0
Uninsured – chronic	7,184	24,700	0	0	20,000	0.205	10,502	0
Uninsured – shock	19,011	100,123	0	0	30,000	0.245	14,935	0
All insured	23,723	64,729	0	0	60,000	0.499	35,376	0
All uninsured	13,256	60,822	0	0	35,000	0.255	14,223	0
Total	21,967	64,203	0	0	50,000	0.458	31,827	0
Stock								
Insured – healthy	26,261	118,152	0	0	71,000	0.378	47,461	0
Insured – chronic	19,059	86,989	0	0	40,000	0.325	32,837	0
Insured – shock	22,291	109,342	0	0	50,000	0.379	42,038	0
Uninsured – healthy	15,236	65,886	0	0	25,000	0.221	43,330	0
Uninsured – chronic	15,920	75,019	0	0	10,000	0.167	-3,148	0
Uninsured – shock	18,283	93,631	0	0	12,000	0.192	-458	0
All insured	22,826	106,121	0	0	50,000	0.360	41,089	0
All uninsured	16,219	76,505	0	0	20,000	0.196	16,961	0
Total	21,718	101,779	0	0	50,000	0.332	37,041	0
Bonds								
Insured – healthy	4,249	45,657	0	0	0	0.097	5,599	0
Insured – chronic	2,458	20,500	0	0	0	0.074	3,532	0
Insured – shock	2,385	16,149	0	0	0	0.079	2,755	0
Uninsured – healthy	6,394	43,968	0	0	0	0.064	11,021	0
Uninsured – chronic	1,812	14,489	0	0	0	0.034	-447	0
Uninsured – shock	4,929	31,787	0	0	0	0.042	-3,235	0
All insured	3,195	32,933	0	0	0	0.085	4,225	0
All uninsured	4,501	33,624	0	0	0	0.049	3,659	0
Total	3,414	33,050	0	0	0	0.079	4,130	0

Table A1, continued
Detailed statistics on consumption and the components of wealth at wave 1, by insurance and health status

	Mean	Std. Dev.	10th percentile	Median	90th percentile	Fraction with value >0	Mean change, wave1- 4	Median change, wave 1- 4
Liquid assets								
Insured – healthy	27,213	110,155	47	7,000	60,000	0.909	22,799	20
Insured – chronic	20,011	47,467	0	5,000	50,000	0.849	7,690	100
Insured – shock	22,512	54,280	10	7,000	55,000	0.904	2,985	0
Uninsured – healthy	19,689	61,077	0	1,800	49,000	0.696	3,178	0
Uninsured – chronic	12,373	49,122	0	500	25,000	0.655	3,662	0
Uninsured – shock	10,275	24,385	0	900	25,000	0.620	3,399	0
All insured	23,612	81,096	0	6,000	55,000	0.887	12,975	6
All uninsured	14,913	50,250	0	1,000	35,000	0.663	3,395	0
Total	22,153	76,855	0	5,000	52,000	0.849	11,368	0
Vehicles								
Insured – healthy	17,392	57,070	1,000	10,000	30,000	0.929	2,092	500
Insured – chronic	11,809	19,098	100	8,000	25,000	0.907	1,737	0
Insured – shock	15,840	33,569	1,500	10,000	30,000	0.950	2,258	2,000
Uninsured – healthy	13,129	24,709	0	4,000	32,000	0.827	185	0
Uninsured – chronic	9,248	15,986	0	4,000	23,000	0.877	-1,052	0
Uninsured – shock	10,236	17,316	0	5,000	26,000	0.828	-363	0
All insured	15,078	41,963	800	10,000	30,000	0.926	2,005	850
All uninsured	11,116	20,424	0	4,200	28,000	0.844	-364	0
Total	14,413	39,211	300	8,500	30,000	0.912	1,607	300
Misc. other assets								
Insured – healthy	10,748	46,528	0	0	20,000	0.198	9,883	0
Insured – chronic	9,389	85,471	0	0	10,000	0.168	-1,434	0
Insured – shock	11,183	78,931	0	0	18,000	0.196	2,035	0
Uninsured – healthy	9,424	37,713	0	0	15,000	0.165	-412	0
Uninsured – chronic	6,184	27,376	0	0	7,000	0.143	-406	0
Uninsured – shock	14,315	91,325	0	0	4,500	0.126	-6,780	0
All insured	10,370	69,961	0	0	15,000	0.187	4,119	0
All uninsured	9,555	53,967	0	0	10,000	0.148	-1,988	0
Total	10,233	67,538	0	0	15,000	0.180	3,095	0

Table A1, continued
Detailed statistics on consumption and the components of wealth at wave 1, by insurance and health status

	Mean	Std. Dev.	10th percentile	Median	90th percentile	Fraction with value >0	Mean change, wave1- 4	Median change, wave 1- 4
Other debts (negative)								
Insured – healthy	3,178	26,993	0	0	5,000	0.360	105	0
Insured – chronic	3,311	22,703	0	0	7,000	0.424	138	0
Insured – shock	3,240	25,842	0	0	5,000	0.397	-317	0
Uninsured – healthy	2,444	18,298	0	0	5,000	0.346	-372	0
Uninsured – chronic	3,957	16,524	0	0	9,000	0.445	4,625	0
Uninsured – shock	8,147	46,081	0	0	6,000	0.326	-4,696	0
All insured	3,239	25,289	0	0	6,000	0.391	20	0
All uninsured	4,363	27,573	0	0	6,000	0.374	225	0
Total	3,427	25,687	0	0	6,000	0.388	55	0

Table A2
Detailed statistics on consumption and the components of wealth at wave 1, by insurance and health status

	Mean	Std. Dev.	10th percentile	Median	90th percentile	Fraction with value >0	Mean change, wave1- 4	Median change, wave 1- 4
Earnings of head and spouse								
Insured, healthy	42,777	43,953	0	35,700	86,000	0.895	-8,626	0
Insured, chronic	33,261	32,218	0	27,500	74,000	0.829	-7,372	0
Insured, shock	42,033	39,042	2,100	36,300	80,000	0.907	-14,690	-7,000
Uninsured, healthy	24,312	46,004	0	14,000	50,000	0.827	-9,878	-2,800
Uninsured, chronic	14,932	22,370	0	7,400	39,000	0.694	-3,339	0
Uninsured, shock	19,323	27,285	0	10,600	45,000	0.723	-6,672	0
All insured	39,265	39,291	0	32,000	80,000	0.875	-9,568	-1,500
All uninsured	19,944	35,365	0	11,000	48,000	0.757	-6,900	0
Total	36,024	39,325	0	28,000	77,500	0.855	-9,120	-1,000
Unemployment Insurance & Workers' Compensation								
Insured – healthy	233	1,115	0	0	0	0.085	69	0
Insured – chronic	370	1,682	0	0	200	0.106	-109	0
Insured – shock	312	1,536	0	0	0	0.085	-71	0
Uninsured – healthy	333	1,509	0	0	300	0.108	-40	0
Uninsured – chronic	408	1,604	0	0	300	0.113	-14	0
Uninsured – shock	840	2,872	0	0	3,000	0.173	-468	0
All insured	299	1,434	0	0	0	0.093	-25	0
All uninsured	483	1,972	0	0	852	0.126	-137	0
Total	330	1,539	0	0	0	0.098	-44	0
Pensions & Social Security Income								
Insured – healthy	3,042	7,607	0	0	12,012	0.221	5,387	0
Insured – chronic	5,070	9,416	0	0	17,298	0.378	3,600	0
Insured – shock	4,510	9,588	0	0	17,665	0.303	4,718	477
Uninsured – healthy	1,876	6,831	0	0	5,100	0.188	105	0
Uninsured – chronic	2,769	5,559	0	0	9,600	0.320	-1,432	0
Uninsured – shock	2,588	7,094	0	0	8,640	0.249	-15	0
All insured	4,089	8,789	0	0	16,000	0.295	4,607	0
All uninsured	2,351	6,509	0	0	8,532	0.247	-438	0
Total	3,797	8,474	0	0	14,100	0.287	3,761	0

Table A2, continued
Detailed statistics on consumption and the components of wealth at wave 1, by insurance and health status

	Mean	Std. Dev.	10th percentile	Median	90th percentile	Fraction with value >0	Mean change, wave1- 4	Median change, wave 1- 4
SSI/welfare								
Insured – healthy	139	969	0	0	0	0.027	52	0
Insured – chronic	351	1,518	0	0	0	0.085	90	0
Insured – shock	120	827	0	0	0	0.028	92	0
Uninsured – healthy	134	957	0	0	0	0.033	245	0
Uninsured – chronic	412	1,543	0	0	0	0.092	266	0
Uninsured – shock	174	1,001	0	0	0	0.057	335	0
All insured	209	1,171	0	0	0	0.048	75	0
All uninsured	237	1,199	0	0	0	0.059	275	0
Total	214	1,176	0	0	0	0.049	108	0
Capital income								
Insured – healthy	6,825	26,332	0	300	13,500	0.570	12,276	0
Insured – chronic	5,116	21,448	0	0	12,000	0.497	10,532	0
Insured – shock	6,040	21,204	0	150	12,160	0.538	6,649	0
Uninsured – healthy	10,407	47,027	0	0	23,100	0.421	17,268	0
Uninsured – chronic	9,169	43,352	0	0	16,000	0.310	4,615	0
Uninsured – shock	4,366	19,051	0	0	10,000	0.353	10,373	0
All insured	6,046	23,582	0	145	12,400	0.537	10,381	0
All uninsured	8,496	40,557	0	0	15,000	0.367	11,335	0
Total	6,457	27,190	0	35	12,700	0.509	10,541	0
Other income of head and spouse (includes alimony and child support)								
Insured – healthy	0	0	0	0	0	0.000	485	0
Insured – chronic	0	0	0	0	0	0.000	296	0
Insured – shock	0	0	0	0	0	0.000	403	0
Uninsured – healthy	12	229	0	0	0	0.003	838	0
Uninsured – chronic	0	0	0	0	0	0.000	611	0
Uninsured – shock	140	1,672	0	0	0	0.007	-74	0
All insured	0	0	0	0	0	0.000	400	0
All uninsured	40	846	0	0	0	0.003	536	0
Total	7	347	0	0	0	0.000	423	0

Table A2, continued
Detailed statistics on consumption and the components of wealth at wave 1, by insurance and health status

	Mean	Std. Dev.	10th percentile	Median	90th percentile	Fraction with value >0	Mean change, wave1- 4	Median change, wave 1- 4
Income of other household members								
Insured – healthy	4,263	9,774	0	0	16,000	0.335	-7,119	-300
Insured – chronic	4,147	9,139	0	0	15,500	0.324	-5,632	-300
Insured – shock	4,106	9,797	0	0	15,000	0.322	-5,883	-500
Uninsured – healthy	4,705	9,294	0	0	16,000	0.409	-5,629	-2,000
Uninsured – chronic	6,264	11,721	0	0	25,000	0.431	-9,257	-3,500
Uninsured – shock	4,610	11,238	0	0	12,500	0.385	-8,975	-3,240
All insured	4,187	9,559	0	0	15,500	0.328	-6,332	-358
All uninsured	5,202	10,657	0	0	18,500	0.411	-7,668	-2,500
Total	4,357	9,758	0	0	16,000	0.342	-6,613	-800
Transfers from other households								
Insured – healthy	10	155	0	0	0	0.006	537	0
Insured – chronic	15	279	0	0	0	0.004	659	0
Insured – shock	1	40	0	0	0	0.001	280	0
Uninsured – healthy	59	669	0	0	0	0.014	443	0
Uninsured – chronic	109	1,085	0	0	0	0.023	282	0
Uninsured – shock	178	1,774	0	0	0	0.013	120	0
All insured	10	195	0	0	0	0.004	521	0
All uninsured	105	1,165	0	0	0	0.017	309	0
Total	26	510	0	0	0	0.006	486	0

Table A3
Detailed statistics on labor supply variables at wave 1

	Working respondents				All respondents			
	Mean	10th percentile	Median	90th percentile	Mean	10th percentile	Median	90th percentile
Total earnings								
Insured – healthy	31,775	3,000	25,000	60,000	27,312	0	21,000	56,000
Insured – chronic	25,121	0	21,000	52,000	19,430	0	14,500	47,000
Insured – shock	27,724	0	24,000	56,000	23,660	0	20,000	52,350
Uninsured – healthy	14,896	0	10,515	30,000	12,363	0	8,000	28,000
Uninsured – chronic	13,997	0	8,000	30,000	9,619	0	3,300	27,000
Uninsured – shock	15,145	0	11,000	30,000	11,547	0	5,200	25,000
All insured	28,506	1,000	23,500	56,000	23,308	0	18,000	52,000
All uninsured	14,633	0	10,000	30,000	11,122	0	5,700	27,000
Total	27,162	0	21,900	55,000	21,833	0	15,600	50,000
Total hours								
Insured – healthy	42.9	30.0	40.0	60.0	34.6	0.0	40.0	57.0
Insured – chronic	42.3	25.0	40.0	60.0	27.6	0.0	37.0	55.0
Insured – shock	42.7	30.0	40.0	60.0	32.0	0.0	40.0	56.0
Uninsured – healthy	39.2	20.0	40.0	60.0	24.7	0.0	29.0	50.0
Uninsured – chronic	38.7	15.0	40.0	58.0	19.0	0.0	0.0	50.0
Uninsured – shock	40.7	25.0	40.0	65.0	24.5	0.0	27.0	60.0
All insured	42.6	27.0	40.0	60.0	31.2	0.0	40.0	55.0
All uninsured	39.3	18.0	40.0	60.0	22.4	0.0	20.0	50.0
Total	42.3	25.0	40.0	60.0	30.1	0.0	40.0	55.0
Usual weeks on main job								
Insured – healthy	49.4	40.0	52.0	52.0	39.8	0.0	52.0	52.0
Insured – chronic	49.3	40.0	52.0	52.0	32.2	0.0	52.0	52.0
Insured – shock	49.7	44.0	52.0	52.0	37.2	0.0	52.0	52.0
Uninsured – healthy	48.1	36.0	52.0	52.0	30.3	0.0	48.0	52.0
Uninsured – chronic	48.0	40.0	52.0	52.0	23.5	0.0	0.0	52.0
Uninsured – shock	48.3	26.0	52.0	52.0	29.0	0.0	50.0	52.0
All insured	49.4	40.0	52.0	52.0	36.1	0.0	52.0	52.0
All uninsured	48.1	38.0	52.0	52.0	27.4	0.0	40.0	52.0
Total	49.3	40.0	52.0	52.0	35.1	0.0	52.0	52.0

Table A3, continued
Detailed statistics on labor supply variables at wave 1

	Working respondents				All respondents			
	Mean	10th percentile	Median	90th percentile	Mean	10th percentile	Median	90th percentile
Hourly wage								
Insured – healthy	22.1	5.8	15.1	33.6	17.8	0.0	11.8	31.4
Insured – chronic	45.3	5.8	13.6	29.7	29.6	0.0	8.5	25.2
Insured – shock	32.2	5.2	14.1	29.9	24.1	0.0	10.8	28.0
Uninsured – healthy	16.4	4.9	8.9	26.5	10.3	0.0	5.8	20.8
Uninsured – chronic	17.0	3.7	8.1	25.1	8.3	0.0	0.0	17.2
Uninsured – shock	12.6	3.5	7.3	17.5	7.6	0.0	5.0	14.6
All insured	32.8	5.8	14.3	31.4	23.9	0.0	10.5	28.0
All uninsured	15.9	3.9	8.2	25.1	9.1	0.0	4.4	17.5
Total	31.1	5.6	13.8	31.1	22.1	0.0	9.3	27.3