Employer-Sponsored Health Insurance for Early Retirees:
Impacts on Retirement, Health, and Health Care

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Abstract: The proportion of large employers offering retiree health insurance in the U.S. has declined by half in the past 20 years. This paper examines the potential implications of this change by estimating the effects of a retiree health insurance (RHI) offer on a comprehensive set of labor, health and health care use outcomes in the near-elderly population. An RHI offer increases the probability of early retirement by 35 percent for both men and women. While the results suggest that an RHI offer has little, if any, effect on health, there is strong evidence that RHI provides significant protection from high out-of-pocket medical costs. In the top 40 percent of the out-of-pocket spending distribution, those with an offer of retiree coverage spend 21 percent less on average. Estimates of the value of RHI of over $3,000 per year suggest that increasing opportunities for the near-elderly to purchase coverage at actuarially-fair prices through the individual market or public programs could significantly increase insurance coverage and reduce financial risk for this age group.

Keywords: employer-sponsored health insurance, early retirement, health care utilization, out-of-pocket medical spending

Many employers have stopped offering health insurance coverage to retirees in apparent

response to rapidly increasing health care costs, the aging of the American population, and recent

policy changes such as modified accounting standards governing employer-provided health

benefits. Offer rates by large employers declined from 66 percent to 33 percent between 1988

and 2007.[1] These trends have been well documented, but the implications of this decline in

coverage for older Americans, especially for future cohorts of early retirees, are not understood.

Health insurance coverage is particularly important to older individuals given their relatively

poor health, high rates of illness, and high levels and variance of medical spending. Group

health insurance coverage is valuable to the near-elderly (under age 65) since policies purchased

on the individual market tend to be very expensive or even unavailable due to pre-existing health

conditions. In addition to affecting retirement, the decline in employer-sponsored retiree

coverage may have implications for older Americans' access to health care, financial protection

from high medical costs, and their health. This paper explores how retiree health insurance

(RHI) affects all of these outcomes and what consequences we can expect from the decline in

employer offer rates.

I use individual-level panel data from the Health and Retirement Survey (HRS) from 1992-

2002 to estimate the effects of a retiree health insurance offer on near-elderly individuals aged

45-64. This large and growing age group included nearly 62 million individuals and made up 22

percent of the US population in 2000.[2] I compare outcomes over time for individuals who do

and do not report an RHI offer. The identifying assumption is that retiree health insurance offer

is exogenous, conditional on having employer-sponsored health insurance at baseline and

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[1] Large employers have 200+ workers. The Kaiser/HRET Employer Health Benefits Annual Survey, 1988-2007.
[2] In 1992, this age group included nearly 50 million individuals and made up 20 percent of the population. Author's calculations using the 1993 and 2001 Current Population Survey. At age 65, nearly all individuals become eligible for Medicare and RHI becomes a "wrap-around" benefit. As a result, this analysis of the near-elderly focuses where differences in insurance coverage are greater and where retiree health insurance coverage is most extensive.

controlling for other important covariates. I address the potential endogeneity of RHI offer with several robustness checks, and in general find that these results match the baseline estimates.

I begin my analysis by replicating estimates of the effect of RHI on early retirement from the existing literature. The paper's main contribution is the estimation of the effects of RHI on health, health insurance coverage, health care utilization, and out-of-pocket medical spending among the near-elderly. To my knowledge, the effects on these four outcomes have not been studied. The results show that RHI offer increases the probability of early retirement by 35 percent. I find no significant effects on health, a significant decrease in the probability of being uninsured, and suggestive evidence of an increase in outpatient and prescription drug utilization.

Retiree health insurance reduces out-of-pocket spending on health care among retirees by 21 percent in the top 40 percent of the spending distribution.[3] Health insurance provides important protection from high medical expenditures and the effects of health insurance on both health and financial risk protection should be examined to understand the full scope of effects. My expected utility analysis suggests that older individuals are willing to pay a significant amount for the risk protection that RHI coverage provides ($3,400/year for men and $3,100/year for women).

Taken together, the results imply that the large impact of RHI offer on retirement is unlikely to be driven by actual health consequences. While those facing early retirement without an RHI offer may not expect an immediate negative impact on health, they experience significant risk aversion with respect to health shocks and high out-of-pocket expenditures, resulting in a relatively large willingness-to-pay for retiree health insurance.

The sizeable estimates of the value of retiree health insurance suggest that the decline in employer-based private group coverage may increase demand for other forms of insurance, both

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[3] The 60th percentile of the out-of-pocket spending distribution is $1,260 per year.

via public programs and private purchase. Without changes to make these sources of health

insurance more affordable and available, the decline in RHI offer also may increase rates of

uninsurance and financial risk among the near-elderly. While it does not appear that the decline

in RHI offer will have a significant negative impact on health in the near term, continued erosion

of the employment-based health insurance system in the U.S. may have longer-term

ramifications.

Section 1: Background

This section discusses recent trends in retiree health insurance and the availability of other

types of coverage to the near-elderly in the U.S. Employment-based retiree health benefits are

an important source of coverage for early retirees who do not yet qualify for Medicare. In 2000,

57 percent of retirees ages 55 to 64 had employer-provided health insurance coverage (United

States General Accounting Office 2001b). One third of those who reported employer-sponsored

coverage were covered through a spouse who was either working or retired.

Rates of employer offer of health insurance coverage for retirees have declined significantly

over the past two decades. Surveys of employers find that between 1988 and 2007 the

percentage of large firms (200 workers or more) that offered health benefits to active workers

that also offered health benefits to retirees declined from 66 percent to 33 percent (Kaiser Family

Foundation and Health Research and Educational Trust 2007).[4] Some employers have stopped

offering retiree health coverage entirely, especially for future retirees, while many others

continue to offer coverage but have made changes to restrict eligibility and benefits (Fronstin,

2005).

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[4] Over the period of analysis in this paper, rates of RHI offer have declined from 46% (1991) to 36% (2002) of large
firms.

Employers tend to make changes to retiree benefits by eliminating coverage for new workers or future retirees (Schieber 2002, Fronstin 2005). New firms may decide not to offer retiree coverage at all. Though individuals are not particularly likely to lose coverage over time, employers may offer different retiree benefits to different cohorts of workers. As a result of this cohort effect, the shares of *current* retirees reporting employer-sponsored retiree coverage have remained relatively constant since 1994 (Fronstin 2001, United States General Accounting Office 2001a). However, the decline in employer offer rates will mainly affect *future* cohorts of retirees and portends much lower coverage rates in the future.

A number of recent private and public-sector policy changes likely influenced the decline in employer offer rates. In 1993, the Financial Accounting Standards Board required employers to account for the costs of promised future benefits, prompting many to reexamine their sponsorship of retiree health benefits.[5] The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 may impact retiree coverage for prescription drugs. Despite financial incentives that subsidize costs for employers that continue to offer prescription drug coverage, there is concern that they may drop coverage or reduce it to the level provided under Medicare Part D (Fronstin 2005). Recent decisions by the U.S. Court of Appeals for the Third Circuit and judicial action on an Equal Employment Opportunity Commission rule have limited employers' ability to offer different benefits to Medicare-eligible and early retirees. Large employers and AARP have expressed concern that increased costs may induce employers to drop or reduce coverage for all retirees (Freudenheim 2005, Pear 2005).

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[5] Financial Accounting Statement 106 required publicly-held, private-sector firms to use accrual accounting instead of pay-as-you-go reporting. Similar accounting standards will be implemented for state and local government employers starting in December 2006. The potential decline in RHI offer rates in the public sector provides further motivation for understanding the implications.

Health insurance is particularly valuable to older individuals due to their higher likelihood of health problems and their higher health care spending. Adults ages 55-64 are nearly twice as likely to report being in fair or poor health and to have medical expenses in the top quintile as those ages 35-44 (Table D1). Furthermore, as new medical treatments become available and health care costs continue to rise rapidly, health insurance will become more valuable to older individuals.

While other forms of coverage are available to protect older individuals against the financial costs associated with the health risks described above, they tend to be quite expensive and difficult to get.[6] Collins et al. (2006) report that 55 percent of adults ages 50 to 64 with health insurance purchased on the individual market spend $3,600 or more annually on premiums and nearly half have per-person annual deductibles of at least $1,000. Insurance costs may be even higher, or the policies unavailable entirely, for those individuals with pre-existing medical conditions (Pollitz, et al. 2001). Public sources of coverage are available to low-income individuals and those receiving Disability Insurance, but tend to be less generous than employer-sponsored group coverage.[7]

Significant attention has been paid to older workers using Disability Insurance (DI) as a way to exit the labor force (Bound and Waidmann 1992, Stapleton and Burkhauser 2003, Autor and Duggan 2006). My analysis, however, is based on individuals who report employer-sponsored coverage at baseline. Only 12 percent of individuals with employer-sponsored coverage apply for DI, compared to 39 percent of those who do not. Receipt rates are 5 and 12 percent,

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[6] In 2000, 15 percent of retirees ages 55 to 64 had public coverage, 12 percent purchased private individual coverage, and 17 percent were uninsured (United States General Accounting Office 2001b).
[7] Health care providers are less likely to accept Medicaid. Medicare often covers fewer services and charges higher copayments/coinsurance than group coverage.

respectively.[8] So while labor force exit via the DI program is an important phenomenon more generally, it does not appear to be as prominent among the subgroup that has employer-sponsored coverage.

Section 2: Related Literature

2.1 Health Insurance and Retirement

Early studies of how health insurance affects retirement used reduced-form models and found that retiree health insurance increases the probability of retirement before age 65 by 50 percent or more (Madrian 1994, Karoly and Rogowski 1994).[9] Later papers provide suggestive evidence of large effects of employer-sponsored health insurance on retirement expectations and of spouse's eligibility for Medicare at age 65 on own retirement (Hurd and McGarry 1999, Madrian and Beaulieu 1998). All of these studies lack good controls for firm-level and individual characteristics correlated with both health insurance and retirement (i.e., pension incentives, individual preferences for leisure) which potentially bias the results upward. Studies which have used more convincing sources of exogenous variation in health insurance (Gruber and Madrian 1995, 1996) tend to confirm the basic results from the earlier studies, albeit with a slightly smaller magnitude.[10]

Structural models of the determinants of retirement can better account for pension incentives and tend to estimate smaller effects of RHI (Gustman and Steinmeier 1994, Lumsdaine, et al. 1994, Rust and Phelan 1997). However, their results are sensitive to assumptions about the

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[8] Among the 1,923 individuals who have not applied for DI in 1992 but apply between 1994 and 2002, 58 percent have no employer-sponsored insurance, 14 percent have ESI but no RHI offer, and 29 percent have both ESI and an RHI offer. Author's calculations using the Health and Retirement Survey, 1992-2002.

[9] These studies use variation in self-reported RHI offer to identify the effect.

[10] These papers estimate that the availability of COBRA coverage increases the early retirement hazard by about 32 percent. We expect the magnitude of the effect to be smaller than that of RHI since the length of COBRA coverage is limited and individuals must pay the full cost. COBRA availability varies by state and year, due to the timing of state and federal policies.

valuation and accrual patterns of RHI and several studies rely on imputed data. Other studies

exploit longitudinal data available in the Health and Retirement Survey to examine individual's

behavior over time. Blau and Gilleskie (2001) find that RHI increases the retirement rate by 26-

80 percent, with no differential effects by age or health status. French and Jones (2004) find that

the positive effect of RHI on retirement rises and then falls with age, peaking at age 61.

Given the range of empirical strategies and data sources, this body of work provides strong

evidence that health insurance has a large, positive effect on retirement. However, the

generalizability of the findings are somewhat limited given that the vast majority of these studies

look only at men and some focus on non-representative sub-populations. Retiree health

insurance benefits have also become much less generous since the 1980's and early 1990's when

the data used in these studies were collected.

This paper contributes to this literature on a number of fronts. Detailed individual-level data

on pension benefits helps account for the associated retirement incentives that plagued the early

reduced-form studies.[11] I also use a nationally representative sample that includes both men and

women and a longer time series than others who have analyzed this issue using the HRS. I use a

number of specification checks, including propensity score weighting, to address potential

correlation between retiree health insurance and individual preferences for retirement.

2.2 Health Insurance and Health

The vast majority of existing research that examines the effect of health insurance on the

health of older individuals focuses on the effect of Medicare. Several studies that examine

Medicare's implementation in 1966 find increases in hospitalization rates, a significant decline in

out-of-pocket spending for those in the top quartile of the out-of-pocket spending distribution,

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[11] The correlation coefficient between RHI and having a pension is only 0.0472 in my sample (i.e., conditional on having employer-sponsored health insurance).

and improvements in some measures of health status, but small negative effects or no effects on mortality (Dow 2002, Finkelstein and McKnight 2005, Meara, et al. 2005).[12] Using more current data, several studies identify Medicare's effect by comparing adults on either side of the eligibility discontinuity at age 65 and find a reduction in differences in preventive screening rates and an increase in hospital admissions, but no significant changes in treatments for specific diseases or evidence of a discrete shift in mortality rates (McWilliams, et al. 2003, Card, et al. 2004).[13]

To my knowledge, Cutler and Vigdor (2005) is the only paper looking at the effect of health insurance on health among the elderly that does not study Medicare. They find large effects of health insurance on self-reported health and difficulty with activities of daily living, but not on mortality, among the near-elderly.[14] Most of the evidence from studies that focus on non-elderly populations suggests small, positive effects of insurance coverage on health outcomes among "marginal" populations: infants, the sick, and the poor. However, there is also evidence to suggest that health insurance may not cause measurable improvements in health (Levy and Meltzer 2004).

My analysis focuses on the effect of retiree health insurance on health outcomes, health insurance coverage, health care utilization, and out-of-pocket medical spending for the near-elderly population. To my knowledge, the effect of RHI on these outcomes has not been studied. The wide range of health outcomes available in the Health and Retirement Survey allows me to address the effects on morbidity and quality of life and to examine a more diverse set of health

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[12] Lichtenberg's (2002) descriptive analysis shows that utilization of ambulatory and inpatient care increase at age 65 and that Medicare is associated with an increase in survival rates.

[13] Several of these papers also consider whether the effects of Medicare vary by race/ethnicity, socioeconomic status, or previous health insurance status (Dow 2002, Card, et al. 2004, Meara, et al. 2005). Mixed results provide evidence of larger benefits from health insurance among disadvantaged groups on some outcomes (barriers to care, high blood pressure) but not on others (hospitalization rates).

[14] The increased morbidity is associated with lower rates of medical services among the uninsured.

care utilization outcomes than previous research. I also estimate the effects of retiree health insurance coverage on out-of-pocket spending and estimate individuals' willingness-to-pay for this coverage. Examining the effects on both health and financial protection provides a more comprehensive picture of how RHI affects older individuals.

Section 3: Methods

3.1 Conceptual framework

The expectation that retiree health insurance will affect the retirement decision comes out of more general models of labor market mobility when health insurance is tied to employment. "Job-lock" refers to the phenomenon of workers staying in jobs with relatively low marginal utility or marginal product of labor in order to maintain their health insurance benefits. Conditions that should give rise to job-lock include when employers are unable to discern the value employees assign to health insurance, when employees' individual valuation of insurance is heterogeneous, and when health insurance is not portable between jobs (Gruber 2000).

In the case of retirement, an individual with retiree health insurance will have health insurance benefits whether they retire or not, whereas an individual without retiree health insurance will not have health insurance benefits in retirement, unless they purchase their own coverage or qualify for some form of public coverage. As in the labor mobility case, an individual without RHI may continue working until they become eligible for Medicare at age 65, even if they have low marginal utility or marginal productivity of labor and a high valuation of leisure time. Models of labor productivity that include deferred compensation to induce optimal effort among workers note that a worker's wage will exceed her marginal productivity in the later years of her working life. From the employer's perspective, additional mechanisms

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(mandatory retirement, pension benefit design or retiree health insurance) are therefore needed to induce efficient retirement where the worker's marginal productivity equals her wage (Lazear 1979). If individuals remain at work beyond this point due to differences in health insurance coverage in working and retired states, "retirement-lock" may result in inefficiencies.[15]

In addition to impacting labor force participation and health insurance coverage, RHI may affect how individuals interact with the health care system (Figure D1). Retiree health insurance coverage tends to be more generous than individual coverage purchased on the private market, and certainly should improve access to care relative to being uninsured. More generous coverage can be expected to increase health care utilization and may decrease out-of-pocket spending on health care services. Over time at least, we can expect that increased access to health care services should have a positive impact on health.[16]

3.2 Data: The Health and Retirement Survey

I use data from the Health and Retirement Survey (HRS) from 1992-2002. Respondents are ages 51-61 in 1992, and they and their spouses are interviewed every two years, yielding a 10-year panel. The HRS covers physical and mental health, insurance coverage, financial status, family support systems, labor market status, and retirement planning.[17] See Appendix A for a detailed description of the key variables. My base sample consists of respondents who report having employer-sponsored health insurance coverage and are ages 47-63 in 1992.[18] This

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[15] This is also true if workers remain beyond the point where their marginal productivity equals their marginal utility of leisure.

[16] To the extent that some health care utilization may have iatrogenic effects, these may cancel out any positive impact of increased access on health. This may be especially true for healthier individuals as well as for any increase in use of health care services with low marginal benefit (i.e., moral hazard).

[17] I use Stata's "survey" commands to account for the complex survey design.

[18] Ages 47-63 are the middle 95% of the age distribution. Sometimes the respondent is the spouse of the HRS age-eligible individual.

coverage may come from their own or their spouse's employer. I include years from 1994 to

2002 in which the respondent is under age 65 in the analysis.[19]

3.3 Econometric Model

As Figure D1 suggests, estimating the effect of RHI offer on retirement is relatively

straightforward. In order to understand the effect of retiree health insurance on health, health

care utilization and health care spending however, I would like to estimate the following

structural model:

$$\text{Coverage}_{it} = \alpha + \beta_1 \text{Offer}_{i1} + \beta_2 \text{Year}_t + \beta_3 X_{it} + \varepsilon_{it} \qquad (1)$$

$$Y_{it} = \alpha + \delta_1 \text{Coverage}_{it} + \delta_2 \text{Year}_t + \delta_3 X_{it} + \varepsilon_{it} \qquad (2)$$

where Y_{it} is the outcome variable of interest (i.e., health status), Offer_{i1} is a binary indicator for

whether individual *i* has an RHI offer at baseline[20], Coverage_{it} is a binary indicator for whether

individual *i* has RHI coverage at time *t*, Year_t is a set of year fixed effects, and X_{it} is a vector of

covariates. This empirical analysis is complicated, however, by the endogeneity of coverage

with respect to retirement. We only observe coverage for those individuals who are already

retired and it is possible that individuals' retirement behavior is correlated with expectations

about their health care use and/or health status. While I considered several instruments for

retirement (including spouse's age, number of dependents, pension plan characteristics, and

baseline assets interacted with the stock market level in each year), none convincingly satisfied

the exclusion restriction. For example, conditional on the respondent's age, their spouse's age is

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[19] The sample size is 23,590 person*year observations, with an average of 4 observations per individual.
[20] The RHI offer refers to the reported baseline ESI coverage, so it may come from the respondent's employer coverage or their spouse's. Specifically, the 1992 and 1994 HRS ask, "Is this health insurance plan (own or spouse's employer-sponsored plan that respondent is covered by) available to people who retire?" In 1996-2002, the question is changed to "Can you continue this insurance coverage for yourself up to the age of 65?"

likely to be correlated with their health. There also may be a direct income effect of assets on health care utilization and health.[21]

Retiree health insurance *offer* is observed for everyone (both retired and not retired) and, due to high takeup rates, serves as a good proxy for coverage.[22] Furthermore, employer offer of RHI is a margin that policymakers have some control over, so understanding the intent-to-treat (ITT) effect of offer on these outcomes is important in and of itself. While retiree health insurance offer is not randomly assigned, the identifying assumption is that, conditional on having employer sponsored health insurance coverage at baseline and controlling for other important covariates, RHI offer status is not based on characteristics that are correlated with the outcome of interest. That is, in the reduced-form model:

$$Y_{it} = \alpha + \beta_1 \, \text{Offer}_{it} + \beta_2 \, \text{Year}_t + \beta_3 \, X_{it} + \varepsilon_{it} \tag{3}$$

$$\text{Corr} \, (\text{Offer}_{i1} \mid \text{ESI}_{i1}{=}1, \varepsilon_{it}) = 0$$

I conduct several robustness checks, both on subsamples and using propensity score weighting, to test this assumption. I also use plausibly exogenous changes in health to assess whether the effects of RHI offer vary by health status.

Table 1 provides support of the identifying assumption.[23] Conditional on having employer-sponsored health coverage at baseline, the group offered RHI looks very similar to the group not offered on a number of demographic characteristics, including age, sex, education, and household income. With the exception of those with an RHI offer being slightly more likely to

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[21] I also considered calculating the Wald estimate using RHI offer as an instrument for coverage. However, offer is correlated with retirement, retirement is likely to have an impact on health and health spending, and coverage is only observed for those already retired. As a result, the Wald estimate of the effect of coverage on health outcomes will conflate the impacts of offer on retirement and coverage on health.

[22] Among respondents in my sample (ages 47-63 with employer-sponsored coverage in 1992) who retire before age 65 and report an RHI offer in the current or any previous year, take-up rates range from 96% in 1994 to 82% in 2002. While a change in the survey questionnaire in 1996 makes the time series difficult to interpret, high rates in all years suggest minimal selection in the take-up decision.

[23] The history of RHI benefits is also supportive of the assumption that RHI offer is conditionally exogenous. See Appendix B.

have been diagnosed with an acute illness, there are no significant differences in health status or

out-of-pocket spending between those with and without a RHI offer at baseline. This is true for

both subjective and more objective measures of health. There are some significant differences

between the two groups, but in some cases the direction would bias my estimates toward zero

(i.e., tenure at current job). Lastly, we see statistically significant differences in baseline labor

force participation and marital status, which I control for in the regression analysis.

Section 4: Estimated effect of RHI offer on retirement

4.1 Econometric specification

I estimate the effect of retiree health insurance offer as the average difference in full-time

retirement rates between those offered and not offered RHI, conditional on having employer-

sponsored coverage at baseline and other covariates. I use a probit model:

$$\text{Pr (FullRet}_{it}) = \Phi \left(\alpha + \beta_1 \text{ Offer}_{i1} + \beta_2 \text{ Year}_t + X_{it} \beta_3 + \varepsilon_{it} \right) \tag{4}$$

where FullRet$_{it}$ is a binary indicator for whether individual i is retired full-time in year t, Offer$_{i1}$

is a binary indicator for whether individual i is offered RHI at baseline, and Year$_t$ represents a set

of year fixed effects. I restrict the sample to respondents who are not retired full-time at

baseline. The covariates X_{it} include a full set of age dummies and controls for race/ethnicity

(white, black, Hispanic), and education. Baseline covariates are marital status, self-reported

health, and spousal characteristics (age, education, and health status). I also control for

household income, household assets, pension characteristics (none, defined benefit, defined

contribution, or both and age of vesting), and industry and occupation dummies for the current

job (all at baseline).[24] I cluster the standard errors at the individual level.

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[24] There are 6 education categories, 7 for marital status, 5 for self-reported health, 13 for industry and 17 for
occupation.

The normative interpretation of the large effects I find of RHI offer on retirement will

depend, in part, on whether this effect varies by the respondent's health status. Furthermore,

before estimating the effects of RHI offer on health outcomes in retirement, I must first assess

whether there is differential selection into retirement with respect to health. To address these

issues, the key econometric concern is to find variation in health status that is plausibly

exogenous to insurance status (RHI offer). I argue that health shocks are plausibly exogenous

since, while individuals may be able to predict the probability that they will have a health shock

(and select insurance coverage accordingly), it is unlikely that they can predict the timing or

severity.[25] As a result, conditional on baseline health status, the timing and severity of the health

shock is unlikely to be correlated with RHI offer. Furthermore, if the health shock takes place

before RHI coverage is in effect (i.e., before retirement), then RHI offer and the health shock

should not be correlated via the causal pathway from coverage to health. The assumption

therefore is:

$$Y_{it} = \alpha + \beta_1 \text{ Offer }_{it} + \beta_2 \text{ HealthShock}_{it} + \beta_3 \text{ Year }_t + \beta_4 X_{it} + \varepsilon_{it} \tag{5}$$

$$\text{Corr (HealthShock}_{it} \mid \text{HealthStatus}_{i1}, \varepsilon_{it}) = 0$$

Based on the subsample of individuals who are not retired full-time in 1992, I estimate:

$$\Pr (\text{FullRet }_{it}) = \Phi \, (\alpha + \beta_1 \text{ Offer}_{i1} + \beta_2 \text{ NewChronic}_{it} + \beta_3 \text{ Offer}_{i1} * \text{NewChronic}_{it}$$

$$+ \beta_4 \text{ Year}_t + X_{it} \, \beta_5 + \varepsilon_{it}) \tag{6}$$

where FullRet$_{it}$, Offer$_{i1}$, Year$_t$, and X$_{it}$ are defined as above. NewChronic is a binary indicator

for whether individual *i* receives a *new* diagnosis of the following conditions in year *t* (before

retirement): congestive heart failure, high blood pressure, diabetes, lung disease, arthritis or a

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[25] This approach is also used by Cutler, McClellan, and Newhouse (2000) and Cutler and Vigdor (2005) to deal with selection into health insurance coverage.

psychiatric illness.[26] I estimate a similar model using acute health shocks where NewAcute is a binary indicator for a new diagnosis of a heart attack, angina, stroke or cancer in year t.[27] β_3 is the coefficient of interest, estimating the incremental effect of RHI offer, conditional on experiencing a pre-retirement health shock. I also estimate models that include lagged health shocks, and their interaction with RHI offer, in order to estimate the effect of a health shock in year t-2 on retirement in year t.

4.2 Results: Full-Time Retirement

Table 2 presents results from estimating equation 4 and shows an RHI offer has a large and significant positive effect on the probability of retiring before age 65. Without controlling for covariates, it increases the probability of retirement by 8 percentage points (40 percent, bottom of column a). Controlling for covariates, including pension characteristics that are likely to be important determinants of early retirement, decreases the estimated effect only slightly, to 7 percentage points (35 percent, column b).[28] The effect size is the same for men and women (columns d and f).[29] The age dummies between ages 53 and 64 tend to be statistically significant and increasing with age, ranging in magnitude from a 5 percentage point increase at age 53 (relative to age 48) to an increase of about 35 percentage points at age 64 (not shown).[30] In general, the industry and occupation dummies are not statistically significant.

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[26] Fifty-six percent of respondents report a chronic condition at baseline and an average of fifteen percent report a new chronic health shock each year between 1994 and 2002.

[27] Fifteen percent of respondents report an acute condition at baseline and an average of three percent report a new acute health shock each year between 1994 and 2002.

[28] The fact that the covariates change the magnitude of the offer coefficient so slightly also supports the assumption that RHI offer is conditionally exogenous to other covariates that impact early retirement.

[29] Those in good, fair or poor health are significantly more likely to be retired before age 65 than those in excellent health. Hispanic women, women with higher education and divorced women are less likely to be retired than white women, women who did not finish high school and married women, respectively. Including all covariates except the pension vesting age dummies, the pension type covariates are positive and statistically significant (DB: .0396 [.0110]; DC: .0280 [.0132]; Both: .0625 [.0329]).

[30] The magnitude and significance levels of these effects are similar for men and women. I ran a separate model that included interactions of the age dummies with RHI offer to investigate whether RHI offer has different effects at different ages. The main effects of age are positive and significant at the 5% level for ages 59 to 64, ranging in

These estimates of the effect of RHI offer are similar to those from the other studies discussed in section 2.1. Most notably, my estimate of 35 percent is only slightly larger than the 32 percent estimated effect of COBRA coverage, which provides the most convincing source of exogenous variation in health insurance coverage availability of the previous studies. One would expect the effect of RHI offer to be larger, since individuals have to pay the full cost of COBRA coverage and RHI coverage extends for a longer period.

4.3 Results: Differential Retirement by Health Status

Table 3 shows that the positive main effect of RHI offer on full-time retirement remains large and significant, controlling for both chronic and acute health shocks (6-8 percentage points). Those who experience a chronic health shock are nearly 4 percentage points less likely to retire while the large positive direct effect of an acute health shock is only seen in the lagged variable (16 percentage points).[31] There is no evidence of significant differential retirement as a function of health status, conditional on having an RHI offer.[32] This allays some concerns about the equity implications of RHI with respect to older workers who become sick and also provides the first piece of evidence to support looking at health outcomes among retirees.

Section 5: Estimated effect of RHI offer on health, health insurance coverage and health care utilization

5.1 Econometric specification

To estimate the effect of RHI offer on health and health care utilization, I use equation 4 for the binary outcomes (fair/poor health, any doctor's visit, prescription drug use, and outpatient

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magnitude from 4 to 24 percentage points. The offer*age coefficients are positive and significant only for ages 60 to 64, ranging from 8 to 17 percentage points.

[31] The negative coefficient on a chronic health shock could be due to respondents with these conditions needing to maintain their incomes to pay ongoing medical bills.

[32] This is also true conditional on not having an RHI offer.

surgery) and use a similar OLS model for the other outcome variables (change in self-reported health and change in ADLs). Covariates in the health outcomes regressions include a full set of age dummies and controls for sex, race/ethnicity, education, and baseline health status. The health care utilization models add census division (9 categories) to control for health care practice patterns that vary geographically.

To estimate the effect of RHI offer on health insurance coverage, I use a multinomial logit model so that the log odds of individual i having health insurance j relative to having employer-sponsored coverage ($j = 1$) in time t is a linear function of RHI offer, year fixed effects and other covariates.

$$\log (\Pr (HI_{itj})/\Pr (HI_{it1})) = \alpha + \beta_1 \, Offer_{i1} + \beta_2 \, Year_t + X_{it} \beta_3 + \varepsilon_{it} \qquad (7)$$

For the health insurance variable HI_{itj}, $j = 3$: employer-sponsored coverage, public coverage and uninsured. The covariates are age, sex, race/ethnicity, education, and baseline health and marital status.

There is an obvious concern with looking at the effect of RHI offer on health outcomes in retirement, since I have just shown that RHI offer has a large and statistically significant effect on retirement itself. Any differential selection into retirement based on health, or any other omitted variable that is correlated with RHI offer and health, will bias estimates based on the retired subsample. I combine several pieces of evidence to address this concern.

First, the results in Table 3 show no evidence of significant differential selection into retirement based on health status. Second, I estimate the effects of RHI offer on health outcomes for the total sample (both retired and not retired) and scale those estimates by the percent retired. This provides a sense of the magnitude of the effect among the retired group without estimating it on a selected sample. Third, I split the sample into retired and non-retired individual-years and

estimate the effects separately. Estimating the model using the not retired subsample serves as a placebo test, since RHI coverage does not take effect until after retirement. If we do not see significant effects of RHI offer among the not retired subsample, this provides evidence that the estimates from the retired subsample are free from significant selection bias.

5.2 Results: Health Status

Table 4 shows the estimated effects of RHI offer on three measures of health status: a binary indicator for self-reported fair or poor health, the change in self-reported health status between waves, and the change in the number of ADLs performed with some difficulty. For all of these outcomes, a negative coefficient indicates an improvement in health. We see no significant effect of RHI offer on any of the health measures in the total sample after controlling for covariates (columns a, d, and g). Scaling these effect sizes by the average percent retired between 1994 and 2002 (24.6 percent), I calculate implied effects of RHI offer among retirees to be a nearly 4 percentage point decline in the probability of being in fair/poor health (37 percent), no effect on the change in self-reported health, and decline of .0124 in the change in number of ADLs performed with difficulty (38 percent).

The precisely estimated null effects of RHI offer in columns b, e, and h provide evidence of no significant selection into retirement based on health. In the retired group, the results are not statistically significant at the 95 percent level due to smaller sample sizes, but they mirror the scaled effects and are suggestive of RHI offer improving health outcomes. RHI offer reduces the probability of being in fair/poor health by 3 percentage points (21 percent, column c), and

reduces the change in the number of ADLs reported by about 81 percent of the average (column i).[33]

5.3 Results: Health Insurance Coverage

Table 5 shows that RHI offer increases the probability of having employer-sponsored coverage by 5 percentage points (6 percent, column a) and decreases the probability of having public health insurance coverage by 2 percentage points (60 percent, column d).[34] On net, the probability of being uninsured declines by 3 percentage points (55 percent, column g). Scaling these effects by the average percent retired implies a 21 percentage point increase in the probability of having employer-sponsored coverage, a 10 percentage point decline in the probability of having public coverage, and an 11 percentage point decline in the probability of being uninsured among retirees. We see significant effects of RHI offer on coverage among both the not retired and retired subsamples and much larger effects among retirees, though they are not quite as large as the scaled estimates.

To better understand these effects, I estimate a multinomial logit model with a dependent variable that combines labor force status and health insurance coverage.[35] Figure 1 shows that those with an RHI offer are 18 percentage points less likely to be working full-time with employer-sponsored coverage, 5 percentage points more likely to be working part-time with ESI and 18 percentage points more likely to be retired full-time with ESI. Combined, these results

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[33] In a separate analysis that examines respondents ages 65-74, I find a statistically significant effect of RHI offer on the change in self-reported health among retirees (-0.0948, se 0.0329). The estimates of the effects on self-reported health and change in the number of ADLs reported are not significant.

[34] In separate models, I find precisely-estimated zero effects of RHI offer on DI application, DI receipt and Medicare coverage. Since I am restricting my analysis to adults under age 65, respondents who indicate Medicare coverage are assumed to be DI recipients. Control variables include age dummies, sex, race, education, baseline health status, baseline marital status, household income, household assets, pension characteristics, and fixed effects for industry, occupation and year.

[35] The dependent variable takes on 9 values: employer-sponsored coverage (ESI) and full-time work, public coverage and full-time work, uninsured and full-time work, ESI and part-time work, public and part-time work, uninsured and part-time work, ESI and full-time retired, public and full-time retired, and uninsured and full-time retired. Control variables include age dummies, sex, race, education, baseline health status and year fixed effects.

are equivalent to the 5 percentage point increase in the probability of having ESI shown in Table 5. Though the net effect of RHI offer on ESI coverage is relatively small, those with an RHI offer are more likely to have retiree coverage from their employer while those without an RHI offer are more likely to remain at work and have current worker ESI.[36]

5.4 Results: Health Care Utilization

I use measures for several different types of health care utilization, including outpatient, inpatient, and preventive care. For outpatient services, such as doctor's visits, outpatient surgery and prescription drug use, the coefficients on RHI offer are positive and significant for the total sample (Table 6). The probability of having a doctor's visit in the past 2 years increases by 1 percentage point (1 percent, column a), the probability of using prescription medications increases by 3 percentage points (4 percent, column d), and the probability of outpatient surgery increases by 2 percentage points (11 percent, column g). Scaling these effects implies effect sizes among retirees of 5 percentage points, 12 percentage points, and 8 percentage points, respectively. The coefficients on RHI offer are relatively precisely estimated zeros for the measures of inpatient care and preventive services for both men and women (not shown).

The estimated effects of RHI offer on any doctor's visit and prescription drug use are somewhat larger in magnitude among the retired subsample than the not retired group, but larger standard errors result in estimates that are only suggestive. Significant effects in the not retired group suggest there may be some selection into retirement based on preferences for outpatient surgery. It is also possible that those with an RHI offer also have more generous *current* employee health insurance benefits, allowing them to consume more health care services while

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[36] There are not significant differences in the estimated effects of RHI offer on public coverage or uninsurance across labor force participation categories.

they are still working.[37] If this is the case, we cannot interpret the coefficient on RHI offer as

"causal" per se, but the effect is likely driven by the combination of two different types of

insurance coverage (ESI and RHI) as opposed to differences in individual characteristics.

See Appendix C for the results of differential effects by health status.

Section 6: Robustness

6.1 Robustness specifications

Additional analyses presented here test the identifying assumption that RHI offer is

conditionally random. I present results that are based on a subsample of respondents with

baseline job tenure at or greater than the median (12 years), since respondents who report current

job tenure between 12 and 48 years at ages 47-63 are unlikely to have moved into jobs with an

RHI offer as they neared retirement age. I also present results based on a subsample of

individuals who are at least four years away from retirement when they report their RHI offer

status, since those who are close to retirement may be more aware of their retiree benefits.

To address concerns about other control variables that differ across the groups offered and

not offered RHI (i.e., marital status), I also rerun the main analysis using propensity score

weighting which balances observed characteristics very closely between groups (McWilliams, et

al. 2003). This approach is based on treatment assignment being unconfounded with potential

outcomes conditional on a set of observed covariates (Rosenbaum and Rubin 1983). I calculate

the propensity score with a probit model to predict RHI offer using all of the covariates in Table

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[37] This fits with Card et al.'s (2004) finding that rates of elective surgeries increase more with Medicare eligibility for those with higher rates of health insurance coverage before 65, which they attribute to the generosity of coverage.

1.[38] Individual weights equal to the probability of belonging to the opposite RHI offer group are calculated based on the propensity score. After adjustment using the new weights, all observed covariates are balanced by RHI offer status.

6.2 Robustness results

Row 2 of Table 7 shows that the estimated effects of RHI offer based on the subsample of respondents with longer job tenure are similar to the baseline specification. The effects of RHI offer on retirement are slightly larger (9 percentage points) as are the effects on health outcomes, with the change in the number of ADLs performed with difficulty declining by 0.016 for those with an RHI offer, compared to a mean increase of 0.025. The estimated effects on health insurance coverage and health care utilization are close to the baseline results.

Row 3 shows the estimates based on the subsample of respondents who are not retired full-time in 1992-1996. Although the magnitudes of the estimated effects on retirement are smaller than the baseline results, a 25 percent increase in the probability of early retirement is still substantial. The estimated effects of offer on health insurance coverage are very similar to the baseline results, as are those for two of the three health outcomes. The estimated effects on health care utilization are somewhat smaller and no longer statistically significant.

Row 4 shows the results using propensity score weighting. The estimated effects all match the baseline results very closely, with the exception of the statistical significance of the effects on any doctor's visit and prescription drug use. This suggests that the baseline estimates suffer from minimal bias due to unbalanced covariates across the two groups.

These robustness checks strengthen the conclusions from the main analysis that an RHI offer significantly increases the probability of early retirement and employer-sponsored health

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[38] Current job tenure, industry, occupation and parents' age at death are not included in the propensity score model since they are only observed for a subsample of respondents.

insurance coverage. It decreases the probability of public health insurance coverage and of being uninsured, and has no statistically significant impact on health status. The original finding of a positive effect on outpatient health care utilization is somewhat weaker.

Section 7: Risk Protection and Out-of-Pocket Medical Spending

7.1 Econometric Specification

Next I investigate whether those without RHI spend more out-of-pocket for medical care services, in essence experiencing more financial loss to protect their health. Out-of-pocket medical expenses include amounts paid for care related to hospitals, nursing homes, doctors, dentists, outpatient surgery, prescription drugs, home health care, and special facilities. The spending distributions for the total sample appear to track each other closely, but with mean differences of $786 in the top 10 percent and $1,243 in the top 5 percent. Among retirees, differences are present through more of the distribution and are much larger: $3,833 in the top 10 percent and $5,516 in the top 5 percent.[39]

Because of the skewed distribution of medical expenditures, it is useful to examine the effects of RHI offer throughout the distribution, instead of just the effect at the mean or median (Finkelstein and McKnight 2005). I calculate the residual out-of-pocket spending after controlling for individual demographics (age, sex, race/ethnicity, education, and baseline health status)

$$\text{OOP Spending}_{it} = \alpha + X_{it}\beta_1 + \varepsilon_{it} \qquad (8)$$

and then calculate the difference in residual spending between those with and without a RHI offer at each percentile *p* of the distribution.

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[39] Figure D2 shows the distributions of total out-of-pocket medical spending by RHI offer and Figure D3 shows these distributions for retirees.

$$\Delta_p = \{\text{spend}_p(\text{offer}=1) - \text{spend}_p(\text{offer}=0)\} \qquad (9)$$

7.2 Results: Out-of-Pocket Medical Spending

Figure 2 shows this centile treatment effect for the total sample and its 95% confidence

interval, calculated using the empirical standard deviation of 200 bootstrap replications of the

centile treatment estimates. Until the 60th percentile, the difference between the spending

residuals is not statistically significant. In the top 40 percent of the residual spending

distribution, however we can see a negative, increasing (in absolute value) and statistically

significant effect of RHI offer on out-of-pocket medical spending. In the top 40 percent of the

distribution, those with an RHI offer spend about $275 (6 percent) less per year out-of-pocket for

medical care than their counterparts without an RHI offer (Table D2).

Figures 3 and 4 show the results for the not retired and retired groups, respectively. The

treatment estimates are generally not significant for the not retired group, indicating no

significant selection into retirement with respect to spending. In the top 40 percent of retirees'

residual spending distribution, those with an RHI offer spend more than $1,300 less per year on

average, which is 21 percent of average spending.

These quantitatively large and statistically significant effects suggest that RHI offers

significant protection from high out-of-pocket medical costs. Even though respondents with an

RHI offer use more of some types of health care services on average, they spend less in the top

40 percent of the out-of-pocket spending distribution. These results also suggest that part of the

reason that we do not observe a significant effect of RHI offer on health is because those without

RHI spend more out-of-pocket to get the medical care that they need.

7.3 The value of retiree health insurance

In order to understand the value of this risk protection to individuals, I conduct a utility analysis using the empirical distributions of out-of-pocket spending among retirees with and without an RHI offer. I examine men and women separately and focus on the 60-64 age group, since we can expect less selection into retirement with respect to health and medical spending than for younger individuals. For each individual, I take 50 random draws from the out-of-pocket medical spending distribution of those offered RHI. I repeat this process using the distribution for the not offered group.[40] Expected utility is given by:

$$EU_{igo} = 1/50 \ \Sigma \ u \ (y_{ig} - m_{go}) \qquad \text{and} \qquad EU_{ign} = 1/50 \ \Sigma \ u \ (y_{ig} - m_{gn})$$

where y_{ig} is household income for individual i in age/sex group g, and m_{go} (m_{gn}) is out-of-pocket medical spending drawn from the offered (not offered) distribution for group g. I calculate each individual's certainty equivalent under the two distributions, which is the amount of money that makes the individual as well off as facing the risk of out-of-pocket medical expenditures.

$$u \ (CE_{igo}) = 1/50 \ \Sigma \ u \ (y_{ig} - m_{go}) \qquad \text{and} \qquad u \ (CE_{ign}) = 1/50 \ \Sigma \ u \ (y_{ig} - m_{gn})$$

The risk premium, or willingness to pay, for full insurance under each risk distribution is the difference between the individual's household income and their certainty equivalent. The risk premium for retiree health insurance therefore, is the difference between the two risk premia. I use a constant relative risk aversion utility function with a preferred coefficient of relative risk aversion equal to 3. Due to the inherent uncertainty of the value of this parameter, I also present a range of results using coefficients of risk aversion of 1 and 5.[41]

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[40] To avoid draws from the spending distribution that are very high (or even higher than) income, I cap out-of-pocket spending at 90 percent of income. Capping at 80 (or 95) percent of income generates lower (higher) willingness-to-pay estimates, but they are of the same order of magnitude as those presented here. Many of the capped draws are likely to be legitimate spending amounts (I do not allow for savings or borrowing in my model, which many people will draw on to pay medical bills). The results presented here are therefore likely to be an underestimate of the willingness to pay for retiree health insurance.
[41] The results are substantively similar using a constant absolute risk aversion utility function and a central risk-aversion parameter of 0.00021 (Manning and Marquis, 1996).

Table 8 provides the mean certainty equivalent and mean risk premia across individuals. Retired men ages 60-64 are willing to pay $8,929 per year for full insurance against the risk in the not offered distribution and $5,101 for the offered distribution. This suggests that the value of RHI coverage for this subgroup is $3,828. Retired women ages 60-64 are willing to pay $3,797 for insurance against the differential risk between the two distributions. After accounting for the fact that those with an RHI offer spend less on average ($465 for men and $673 for women), men's value of the risk reduction associated with RHI is about $3,400 per year and women's is about $3,100 per year.[42] Given the capping procedure, these estimates should be treated as conservative estimates of the value of retiree health insurance. The small probability of catastrophic medical expenses is exactly the type of risk that health insurance is designed to prevent against, and these very large expenses are effectively eliminated from the capped distributions.[43]

These sizeable estimates of the willingness-to-pay for retiree health insurance suggest that policies aimed at correcting market imperfections in the individual health insurance market could increase coverage rates for the near-elderly. Approximately 12 percent of retirees aged 55-64 currently purchase insurance coverage on their own (United States General Accounting Office 2001b). Average premiums for individuals aged 50-64 are $3,300 and are nearly $4,000 for those aged 60-64.[44] Loading fees in the individual insurance market are approximately 40

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[42] An alternative procedure that averages household income and out-of-pocket spending draws across years within individuals yields similar, though slightly smaller, estimates: $2,400 for men and $2,100 for women.

[43] For men, the difference in mean spending is nearly 9 times as large in the total distribution as in the capped distribution, and the standard error of the not offered spending distribution is more than an order of magnitude larger in the total distribution than in the capped. For women, the differences are not as large but are still substantial.

[44] "Average" premiums are difficult to calculate, due to the wide variety of deductibles, upper payment limits, exclusions and coinsurance policies for individual market health insurance policies as well as varying state regulations. These figures come from averaging results from a number of studies that calculate average premiums for actual individual market policies or for quotes for standardized individuals and plan types (America's Health Insurance Plans 2005, Collins, et al. 2006, Gabel, et al. 2002, Hadley and Reschovsky 2002, Musco and Wildsmith 2002, Simantov, et al. 2001, U.S. GAO 1998).

percent (Pauly, Percy, Herring 1999). My willingness-to-pay estimates for 60-64 year old retirees suggest that decreasing loading fees in the individual market to 20 percent would bring the average premium in line with the average willingness-to-pay, which could substantially increase take-up rates by the near-elderly. Policies that enable individuals to buy into public insurance programs at actuarially fair rates could provide another venue for the near-elderly to obtain coverage.

Section 8: Conclusions and Policy Implications

This paper examines the effects of retiree health insurance offer on labor force and health outcomes in the near-elderly population. The results imply that the large impact of RHI offer on retirement is unlikely to be driven by actual health consequences. That is, while those facing early retirement without an RHI offer may not expect an immediate negative impact on health, they experience significant risk aversion with respect to health shocks and high out-of-pocket expenditures. Early retirees without an RHI offer may manage to protect their health, but may spend a lot more to do so. Though the health and medical expenditure risks are relatively small, they are important enough for this age group to result in a relatively large willingness-to-pay for retiree health insurance.

I find that RHI offer increases the probability of early retirement by about 35 percent for both men and women. This effect is robust to adding important covariates including individual and spousal demographics, job characteristics, income and pension information, as well as controlling for a health shock. There is no evidence of significant differential early retirement based on health status.

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To my knowledge, this analysis is the first to estimate the effects of RHI on health, health insurance coverage, health care utilization, and out-of-pocket medical spending among the near-elderly. The results suggest that RHI offer has little, if any, effect on health, either among the entire near-elderly population or among the group most likely to be affected – individuals who experienced health shocks. RHI offer decreases the probability of being uninsured by 55 percent, while increasing the probability of employer-sponsored coverage and decreasing the probability of public coverage. Considering labor force participation and health insurance coverage jointly, those with an RHI offer are significantly more likely to have employer-sponsored coverage in retirement and those without an offer are more likely to maintain their employer-sponsored coverage by continuing to work full-time. There is suggestive evidence that individuals with an RHI offer are more likely to visit the doctor, use prescription drugs on a regular basis and have outpatient surgery. There is no evidence of differences in inpatient or preventive care utilization.

The estimates of the effect of RHI offer on out-of-pocket medical spending are a key part of the analysis. Those with an RHI offer are better protected from high out-of-pocket medical costs, on average spending $1,300 less in the top 40 percent of the spending distribution (21 percent). This suggests that part of the reason we see no significant effect of RHI offer on health may be because the near-elderly without retiree coverage spend more out-of-pocket to get the care they need. This highlights the role of health insurance as protection from high medical expenditures and that the effects of health insurance on both health and financial risk protection need to be examined to understand the full scope of effects. The utility analysis suggests that men ages 60-64 are willing to pay approximately $3,400 for the risk protection that RHI provides, and women in the same age group are willing to pay about $3,100.

In order to quantify the implications of the decline in employer RHI offer rates, I calculate a weighted average of the decline across different firm size categories.[45] This average decline in offer rates of 43 percent suggests a 15 percent decline in early retirement rates, assuming no other changes. Labor force participation rates among men aged 55-64 have declined by 19 percent since 1960 and as the cohorts of workers affected by the decline in RHI offer rates age, as much as 80 percent of this decline in labor force participation could be reversed. Among women in this age group, labor force participation rates have increased by 50 percent, and this change could be magnified by as much as 30 percent.[46]

The change in early retirement rates will have an uncertain effect on the efficiency of retirement patterns, depending on how productive older workers are, whether employers can adjust on other margins such as wages, and how employers use other mechanisms (i.e., pension design) to induce efficient retirement in the face of rising wage profiles. From the perspective of individual workers, my results suggest that the decline in RHI offer rates may keep some individuals at work beyond the point where their marginal utility of leisure time exceeds their marginal productivity. The decline in early retirement rates may have some positive effects from the standpoint of social efficiency however, as individuals continue to pay into the Social Security system, rather than draw from it. Future research that addresses these issues will be valuable in understanding the normative implications of the effects of the decline in RHI offer rates on early retirement. While it was beyond the scope of this analysis, further research that addresses how changing patterns of retiree health insurance coverage affect joint retirement and

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[45] I use data on the decline in RHI offer rates by firm size from the Kaiser/HRET Employer Health Benefits Annual Survey, 1988-2007 and calculate the share of adult employment (ages 20-50) from the 2001 Current Population Survey.

[46] Labor force participation rates are from the Statistical Abstract of the United States, 1980, 2000, and 2006. The labor force participation rate among men aged 55-64 declined from 85 percent in 1960 to 69 percent in 2004. For women aged 55-64, rates increased from 37 percent in 1960 to 56 percent in 2004.

health insurance coverage in two-earner families is key to understanding the full implications of the changing structure of employer-sponsored health insurance.

My results also suggest that the decline in RHI offer rates will result in significant changes in insurance coverage and financial risk protection for the near elderly. The 43 percent decline in offer rates implies a 29 percent increase in the probability of being uninsured and a 5 percent increase in the probability of being in the top 35 percent of the out-of-pocket spending distribution, ceterius paribus. The sizeable willingness-to-pay estimates for RHI coverage suggest that much of the projected increase in uninsured rates among the near-elderly could be averted if loading fees for individual market policies were reduced and the near-elderly were able to buy into group coverage at actuarially fair prices. Decreasing loading fees by half could bring average individual market premiums to the level of average willingness-to-pay for the near-elderly, which could have a significant impact on take-up rates of individual insurance. Policies that stabilize employer-based group coverage, address imperfections in the individual insurance market and deal with the insurance needs of the near-elderly through public insurance programs will be important as the impacts of the decline in RHI offer rates become manifest in the coming years.

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Figure 1

Estimated Effects of RHI Offer on Employment and Health Insurance
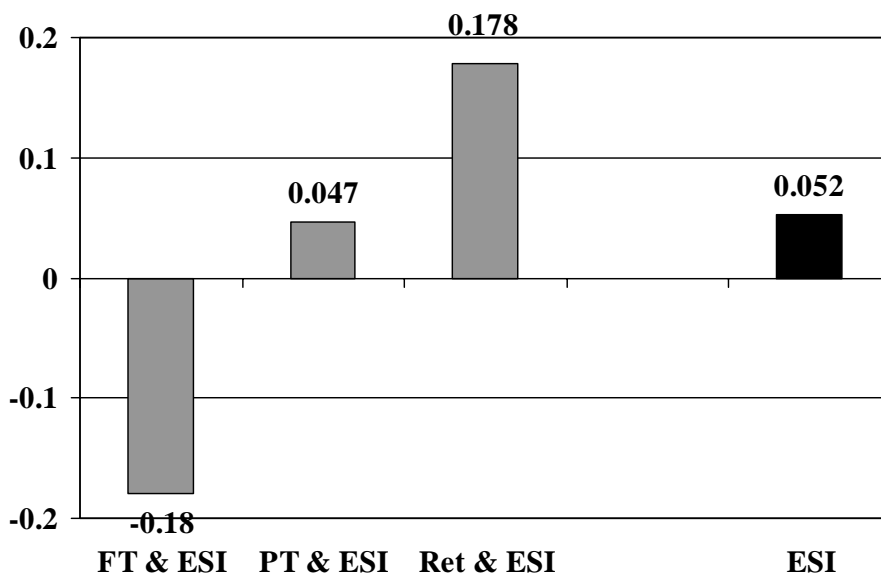
Marginal effects from multinomial logit models. All coefficients are statistically significant at p<.001.
The left three bars are from a model where the dependent variable has 9 work/HI values. The right-hand bar is from a model where the dependent variable has 3 HI values.

Figure 2

Figure 3

Out of Pocket Medical Spending Residuals
Less than age 65, Not Retired, Covariate Adjusted

Figure 4

Out of Pocket Medical Spending Residuals
Less than age 65, Retired, Covariate Adjusted
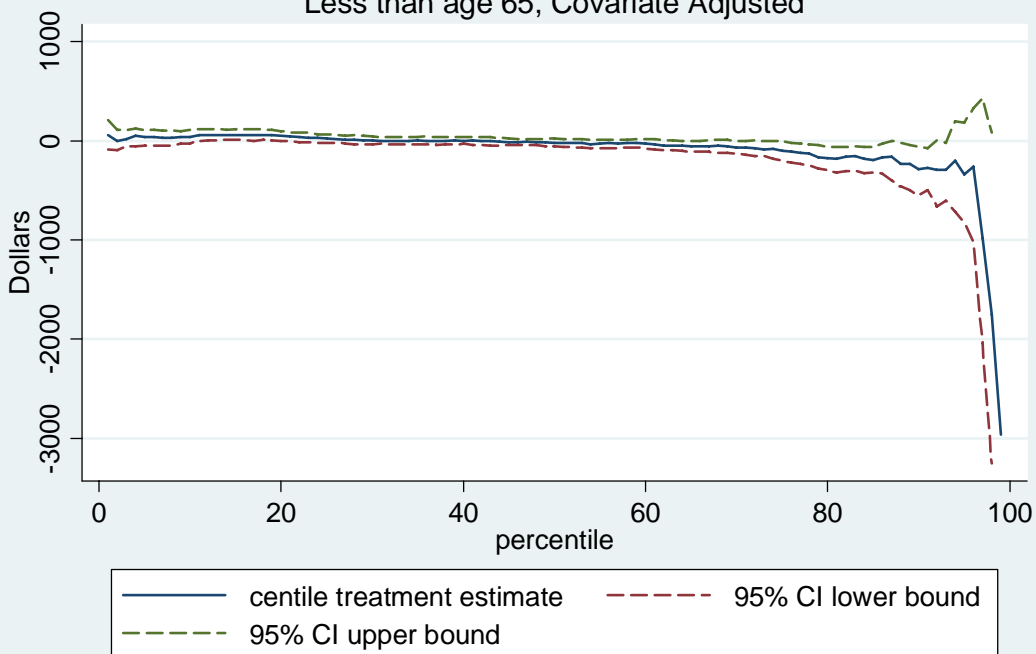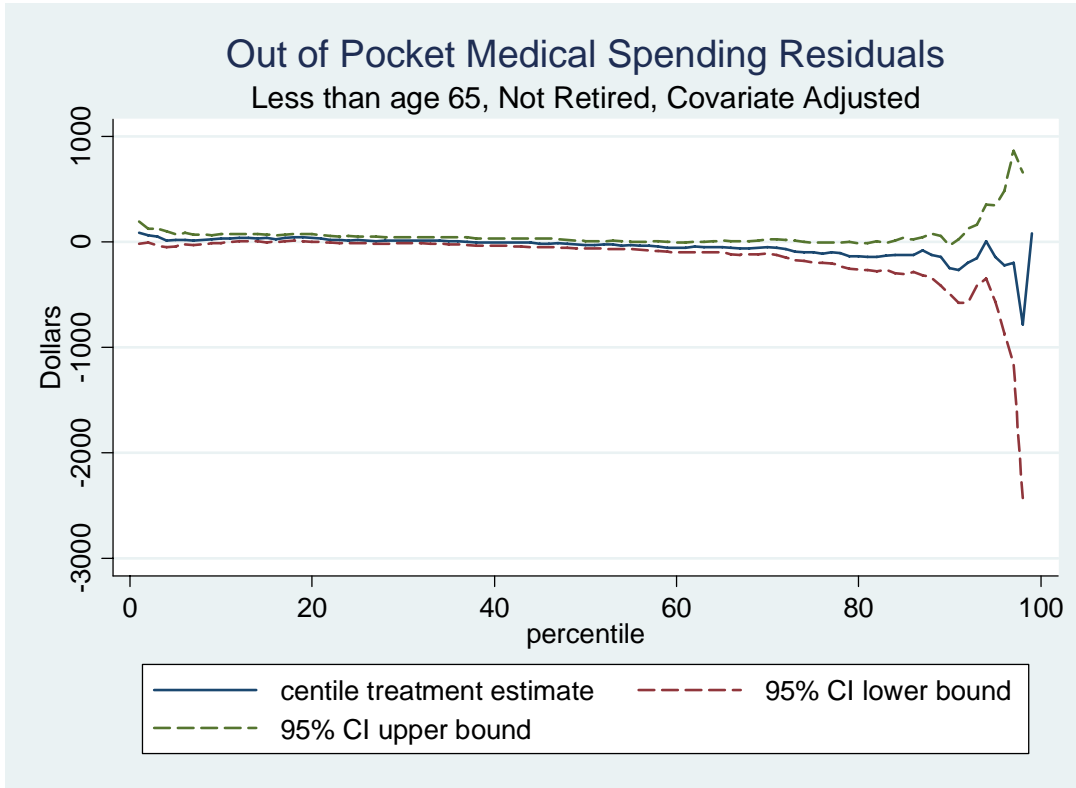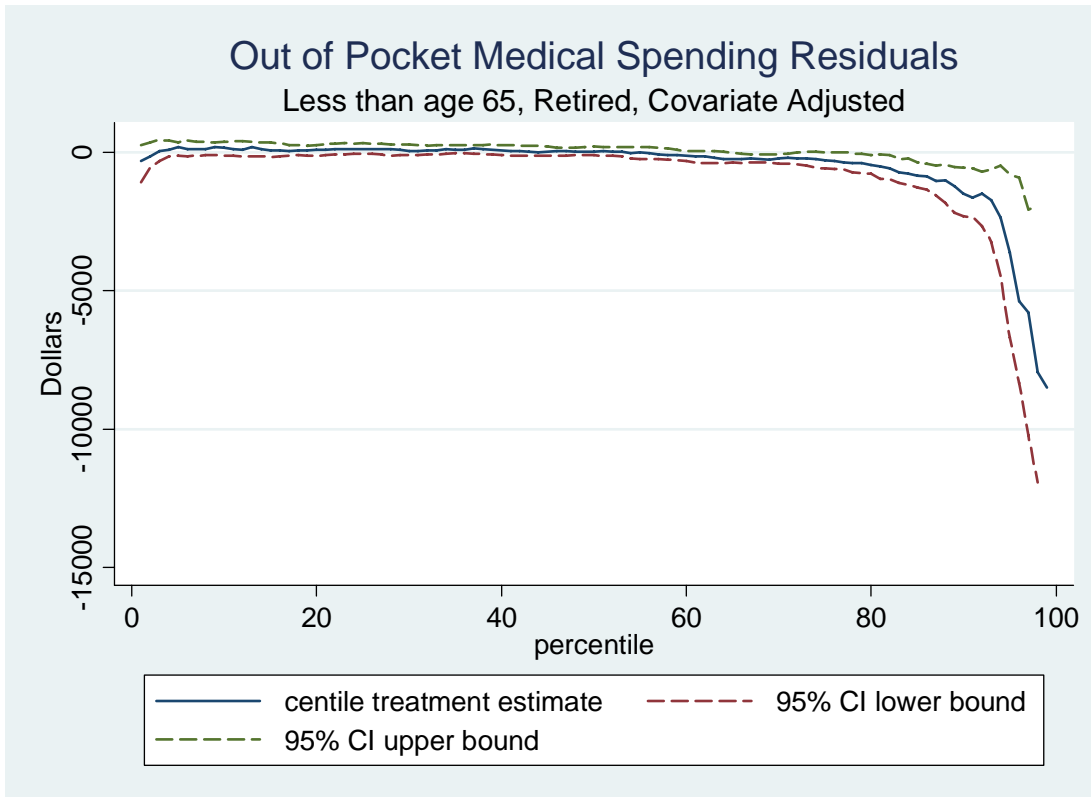
Table 1
Summary Statistics 1992
Ages 47-63

	Total with ESI in wave 1		ESI plan covers retirees		ESI plan doesn't cover retirees		p-value
	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	
Respondent Demographics							
age	55.2	0.051	55.4	0.061	54.8	0.098	<0.01
female	53%	0.006	51%	0.008	55%	0.013	0.03
white	89%	0.003	90%	0.004	86%	0.007	<0.01
black	7%	0.002	7%	0.003	8%	0.005	
hispanic	3%	0.002	3%	0.002	6%	0.005	
education	12.9	0.033	13.0	0.039	12.7	0.068	<0.01
total household income	$57,501	641	$58,190	739	$55,658	1416	0.11
Marital Status							
married	83%	0.005	85%	0.006	77%	0.011	<0.01
partnered	2%	0.002	1%	0.002	2%	0.003	
separated/divorced	10%	0.004	8%	0.005	14%	0.009	
widowed	3%	0.003	3%	0.003	5%	0.006	
never married	3%	0.002	3%	0.003	3%	0.004	
Census Region							
northeast	23%	0.004	21%	0.005	27%	0.010	<0.01
midwest	27%	0.004	28%	0.005	23%	0.009	
south	32%	0.004	32%	0.005	33%	0.010	
west	19%	0.004	19%	0.004	17%	0.009	
Labor Force Status							
works full-time	65%	0.006	61%	0.008	73%	0.011	<0.01
works part-time	10%	0.004	9%	0.005	11%	0.008	
unemployed	1%	0.001	1%	0.002	1%	0.002	
partly retired	4%	0.003	5%	0.003	2%	0.004	
fully retired	12%	0.004	14%	0.006	5%	0.006	
disabled	1%	0.001	1%	0.001	1%	0.003	
not in labor force	8%	0.004	9%	0.004	7%	0.006	
tenure at current job*	14	0.161	15	0.206	12	0.276	<0.01
have applied for DI/SSDI	0%	0.000	0%	0.000	0%	0.001	0.79
have received DI/SSDI	2%	0.002	2%	0.002	2%	0.003	0.03
covered by union	26%	0.007	28%	0.008	21%	0.012	<0.01
number employees at location	660	41	702	49	582	85	0.22
total number employees	30,613	1,466	31,948	1,741	26,043	2,763	0.07
Self-reported Health Status							
excellent	27%	0.006	27%	0.007	26%	0.011	0.57
very good	33%	0.006	33%	0.007	33%	0.012	
good	27%	0.006	28%	0.007	27%	0.011	
fair	10%	0.004	9%	0.005	11%	0.008	
poor	3%	0.002	3%	0.003	4%	0.004	
health limits work	14%	0.004	14%	0.005	13%	0.008	0.31
Other Health Status Measures							
chronic illness	56%	0.006	57%	0.008	54%	0.013	0.053
acute illness	15%	0.005	16%	0.006	12%	0.008	<0.01
number of ADLs difficult	0.027	0.003	0.024	0.004	0.029	0.006	0.44
mother alive*	45%	0.006	45%	0.008	44%	0.013	0.56
father alive*	18%	0.005	18%	0.006	18%	0.010	0.48
mother age at death*	69	0.254	69	0.310	69	0.501	0.74
father age at death*	68	0.198	68	0.241	68	0.378	0.42
out-of-pocket health spending	$1,311	62	$1,292	75	$1,381	130	0.55
Obs	6445		4606		1839		

Significance tests for continuous and binary variables were performed with an adjusted Wald test
(approximate F statistic) and for categorical variables with a Pearson Chi-Sq test adjusted for survey design.
P-values for Chi-Sq tests for industry (13 categories) and occupation (17 categories) are both <0.01.
Standard errors are adjusted for survey design and are clustered at the individual level.
* Subsamples: race/ethnicity (6345), tenure at current job (5022), mother alive (6391), father alive (6318),
mother age at death (3526), father age at death (5186).

Table 2
Estimated Effect of Retiree HI Offer on Full-Time Retirement
Employer-Sponsored Health Insurance and Not Full-Time Retired in 1992
Less Than Age 65

Full-Time Retired

	Total		Men		Women	
	a	b	c	d	e	f
Offer	0.0762 ***	0.0698 ***	0.0877 ***	0.0653 ***	0.0650 ***	0.0730 ***
	0.0087	0.0102	0.0133	0.0144	0.0112	0.0133
female	-0.0214 *	-0.0026				
	0.0102	0.0133				
Race/Ethnicity						
black	-0.0075	-0.0243	-0.0060	-0.0318	0.0034	-0.0090
	0.0128	0.0144	0.0217	0.0230	0.0161	0.0182
hispanic	-0.0330	-0.0347	-0.0094	-0.0006	-0.0471 *	-0.0620 *
	0.0172	0.0191	0.0266	0.0285	0.0226	0.0247
Education						
high school	0.0002	-0.0019	0.0217	0.0436 *	-0.0172	-0.0503 *
	0.0126	0.0155	0.0185	0.0203	0.0167	0.0215
some college	-0.0202	-0.0268	-0.0256	-0.0046	-0.0206	-0.0636 **
	0.0140	0.0170	0.0201	0.0227	0.0186	0.0227
college	-0.0218	-0.0344	0.0007	0.0165	-0.0291	-0.0793 **
	0.0175	0.0206	0.0259	0.0302	0.0234	0.0249
more than college	-0.0078	-0.0165	0.0021	0.0493	0.0025	-0.0574 *
	0.0179	0.0230	0.0264	0.0340	0.0247	0.0287
Marital Status						
married, sp. absent	-0.0315	-0.0097	0.0128	0.0197	-0.0721	0.0261
	0.0512	0.0598	0.0721	0.0748	0.0593	0.0872
partnered	-0.0291	-0.0456	-0.0226	-0.0462	-0.0547	-0.0552
	0.0261	0.0287	0.0351	0.0368	0.0362	0.0385
separated	0.0182	0.0551	-0.0509	0.0914	0.1025	-0.0691
	0.0577	0.0785	0.0588	0.0965	0.1180	0.0872
divorced	0.0431	0.0322	0.0819	0.1481	0.0232	-0.1354 *
	0.0501	0.0631	0.0619	0.0838	0.0905	0.0605
widowed	0.0768	0.0289	0.2520 *	0.1929	0.0822	-0.1170
	0.0577	0.0663	0.1132	0.1127	0.1027	0.0606
never married	0.0596	0.0674	-0.0147	0.0629	0.1187	-0.0578
	0.0574	0.0739	0.0612	0.0899	0.1124	0.0871

Estimated Effect of Retiree HI Offer on Full-Time Retirement
Employer-Sponsored Health Insurance and Not Full-Time Retired in 1992
Less Than Age 65

Full-Time Retired

	Total		Men		Women	
	a	**b**	**c**	**d**	**e**	**f**
Self-Reported Health						
health very good	0.0020	-0.0009	0.0121	0.0033	-0.0079	0.0000
	0.0112	0.0124	0.0170	0.0175	0.0144	0.0165
health good	0.0502 ***	0.0451 **	0.0714 ***	0.0543 **	0.0288	0.0332
	0.0125	0.0145	0.0190	0.0204	0.0157	0.0186
health fair	0.1614 ***	0.1510 ***	0.1632 ***	0.1005 **	0.1547 ***	0.1943 ***
	0.0197	0.0237	0.0302	0.0328	0.0255	0.0328
health poor	0.1545 ***	0.1111 *	0.1993 ***	0.1532 *	0.1166 **	0.0555
	0.0351	0.0501	0.0537	0.0648	0.0445	0.0658
Financial Variables						
household income	0.0002 *	0.0001	-0.0001	-0.0002	0.0005 ***	0.0004 **
	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001
household assets	0.0000 *	0.0000	0.0000	0.0000	0.0000 *	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DB pension		0.2007		0.0520		0.0169
		0.1370		0.0597		0.0386
DC pension		0.2178		0.0331		0.0217
		0.1614		0.0570		0.0339
Both pension		0.2555		0.0132		0.0919
		0.1761		0.0697		0.0652
cons	-1.8144 **	-6.6127 ***	-6.4444 ***	-6.1782	-1.9493 **	-5.6292 ***
	0.5575	0.5758	0.4753	.	0.6448	0.7903
Offer w/o covars	0.0805 ***		0.0895 ***		0.0731 ***	
	0.0085		0.0131		0.0112	
N	19904	13747	8757	6486	11147	7261

* p<0.05; ** p<0.01; *** p<0.001
Marginal effects from probit models.
Standard errors are adjusted for survey design and are clustered at the individual level.
Mean percent retired full-time (if not retired full-time at baseline): 20% total, 21% men, 20% women.
Omitted categories are white, less than high school, married, excellent health, no pension, and 1994.
Year dummies are in all models and are all positive and statistically significant.
Columns a, c, and e include age dummies and controls for the spouse's age, education and health status. Columns b, d, and f add industry (13) and occupation (17) dummies, as well as dummies for the earliest age at which the respondent can receive their pension.

Table 3

Estimated Effect of Retiree HI Offer on Full-Time Retirement: Health Shocks

Employer-Sponsored Health Insurance in 1992

Less Than Age 65

	Chronic Health Shock		Acute Health Shock	
	a	b	c	d
Chronic Health Shock				
Offer	0.0649 ***	0.0843 ***	0.0672 ***	0.0818 ***
	0.0107	0.0135	0.0104	0.0126
Health Shock	-0.0368 *	-0.0390	0.0562	0.0571
	0.0185	0.0231	0.0439	0.0553
Offer*Shock	0.0258	-0.0183	-0.0393	-0.0800
	0.0253	0.0288	0.0401	0.0455
Health Shock (2 yr lag)		0.0320		0.1559 *
		0.0245		0.0620
Offer*Lagged Shock		-0.0373		-0.0670
		0.0256		0.0501
N	12,366	9,516	12,085	9,387

* p<0.05; ** p<0.01; *** p<0.001

Marginal effects from probit models.

Standard errors are adjusted for survey design and are clustered at the individual level.

Included sample is not retired full-time at baseline.

Controls: sex, age, race, education, marital status, baseline health status, spouse's age, education and baseline health, pension, pension vesting age, industry, occupation, household income and assets, and year.

Table 4
Estimated Effect of Retiree HI Offer on Health Outcomes
Employer-Sponsored Health Insurance in 1992
Less Than Age 65

	Fair/Poor Health (not f/p health in 1992)			Change in Self-Reported Health (ranges -4 to 4)			Change in ADLs Performed with Some Difficulty (ranges -5 to 5)		
	Total a	Not Retired b	Retired c	Total d	Not Retired e	Retired f	Total g	Not Retired h	Retired i
Offer	-0.0083	-0.0089	-0.0308	0.0001	-0.0038	-0.0038	-0.0030	0.0026	-0.0396
	0.0068	0.0069	0.0179	0.0079	0.0091	0.0262	0.0049	0.0053	0.0223
female	-0.0026	0.0051	-0.0314 *	-0.0149 *	-0.0081	-0.0437 *	0.0063	0.0080	0.0019
	0.0062	0.0064	0.0138	0.0073	0.0089	0.0205	0.0043	0.0048	0.0139
black	0.0368 ***	0.0331 **	0.0494 *	0.0516 ***	0.0495 ***	0.0601	0.0152	0.0096	0.0232
	0.0103	0.0109	0.0204	0.0111	0.0139	0.0322	0.0082	0.0085	0.0254
hispanic	0.0528 **	0.0575 **	0.0547	0.0427 **	0.0574 **	-0.0049	0.0005	0.0077	-0.0283
	0.0176	0.0182	0.0390	0.0161	0.0202	0.0558	0.0116	0.0111	0.0434
high school	-0.0547 ***	-0.0458 ***	-0.0924 ***	-0.0625 ***	-0.0746 ***	-0.0358	-0.0073	0.0025	-0.0381
	0.0079	0.0085	0.0159	0.0116	0.0145	0.0318	0.0077	0.0087	0.0232
some college	-0.0606 ***	-0.0518 ***	-0.0996 ***	-0.0738 ***	-0.0893 ***	-0.0362	-0.0011	0.0099	-0.0424
	0.0072	0.0076	0.0159	0.0126	0.0157	0.0362	0.0082	0.0091	0.0255
college	-0.0690 ***	-0.0571 ***	-0.1198 ***	-0.1042 ***	-0.1162 ***	-0.0951 *	0.0028	0.0011	0.0055
	0.0069	0.0074	0.0155	0.0153	0.0186	0.0423	0.0093	0.0091	0.0309
more than college	-0.0758 ***	-0.0696 ***	-0.1091 ***	-0.1120 ***	-0.1352 ***	-0.0508	0.0004	0.0005	-0.0005
	0.0068	0.0070	0.0158	0.0138	0.0169	0.0384	0.0089	0.0089	0.0293
health very good	0.0482 ***	0.0443 ***	0.0693 **	-0.1272 ***	-0.1456 ***	-0.0642 *	0.0055	0.0091 *	-0.0067
	0.0096	0.0100	0.0209	0.0088	0.0104	0.0280	0.0036	0.0041	0.0130
health good	0.1748 ***	0.1593 ***	0.2240 ***	-0.2625 ***	-0.2959 ***	-0.1712 ***	0.0260 ***	0.0216 ***	0.0310 *
	0.0114	0.0121	0.0239	0.0097	0.0119	0.0286	0.0051	0.0061	0.0152
health fair				-0.3624 ***	-0.4154 ***	-0.2614 ***	0.0917 ***	0.0814 ***	0.0774 **
				0.0146	0.0207	0.0342	0.0132	0.0159	0.0288
health poor				-0.5088 ***	-0.5650 ***	-0.4097 ***	0.1549 ***	0.1356 **	0.1621 *
				0.0268	0.0430	0.0491	0.0328	0.0518	0.0703
cons	-6.8972 ***	-6.9820 ***	-5.2450 ***	0.3188 *	0.3690 *	0.0834	0.0517	0.0428	0.0758 *
	0.2318	0.4359	0.5056	0.1492	0.1588	0.0450	0.0622	0.0671	0.0348
Offer w/o covars	-0.0887 *			0.0011			-0.0058		
	0.0418			0.0085			0.0050		
Offer scaled by percent retired	-0.0366			0.0002			-0.0124		
R squared				0.0389	0.0442	0.0319	0.0082	0.0080	0.0189
N	18870	14249	4285	21504	15691	5294	21496	15684	5296

* p<0.05; ** p<0.01; *** p<0.001
Marginal effects from probit models (fair/poor health), OLS models for change in self-reported health and change in ADLS.
Standard errors are adjusted for survey design and are clustered at the individual level.
Rates of fair/poor health (not in fair/poor health at baseline): 10% total, 8% not retired, 15% retired.
Mean change in self-reported health: .081 total, .086 not retired, .071 retired. Mean change in ADLs: .032 total, .025 not retired, .049 retired.
Mean percent retired: 22.6% if not in fair/poor health at baseline, 24.6% total.
Age and year dummies are included in all models. Omitted categories are white, less than high school, excellent health, and 1994.

Table 5
Estimated Effect of Retiree HI Offer on Health Insurance Coverage
Employer-Sponsored Health Insurance in 1992
Less Than Age 65

	ESI			Public			Uninsured		
	Total a	**Not Retired** b	**Retired** c	**Total** d	**Not Retired** e	**Retired** f	**Total** g	**Not Retired** h	**Retired** i
Offer	0.0516 ***	0.0307 ***	0.1369 ***	-0.0240 ***	-0.0133 ***	-0.0589 ***	-0.0277 ***	-0.0174 ***	-0.0781 ***
	0.0060	0.0057	0.0173	0.0044	0.0040	0.0120	0.0041	0.0040	0.0129
age	-0.0039 ***	-0.0038 ***	-0.0009	0.0025 ***	0.0027 ***	0.0005	0.0014 ***	0.0011 *	0.0003
	0.0008	0.0009	0.0015	0.0006	0.0007	0.0010	0.0004	0.0005	0.0010
female	-0.0104 **	-0.0109 *	-0.0081	0.0080 **	0.0084 **	0.0055	0.0024	0.0025	0.0026
	0.0041	0.0044	0.0077	0.0028	0.0031	0.0050	0.0027	0.0029	0.0056
Race/Ethnicity									
black	-0.0108	-0.0066	-0.0152	0.0091	0.0007	0.0230 *	0.0017	0.0060	-0.0078
	0.0069	0.0073	0.0123	0.0053	0.0049	0.0103	0.0042	0.0051	0.0067
hispanic	-0.0175	-0.0152	-0.0454 *	0.0014	0.0035	-0.0012	0.0161 *	0.0117	0.0466 *
	0.0092	0.0100	0.0225	0.0054	0.0066	0.0096	0.0067	0.0068	0.0197
Education									
high school	0.0178 ***	0.0155 **	0.0214 *	-0.0104 ***	-0.0099 **	-0.0123 *	-0.0073 *	-0.0056	-0.0091
	0.0047	0.0054	0.0086	0.0031	0.0036	0.0053	0.0032	0.0036	0.0063
some college	0.0193 ***	0.0148 **	0.0305 ***	-0.0101 **	-0.0103 **	-0.0105	-0.0091 **	-0.0045	-0.0200 ***
	0.0049	0.0054	0.0089	0.0033	0.0036	0.0057	0.0033	0.0038	0.0062
college	0.0217 ***	0.0182 **	0.0291 **	-0.0149 ***	-0.0148 ***	-0.0123 *	-0.0068	-0.0034	-0.0168 *
	0.0053	0.0060	0.0103	0.0031	0.0034	0.0060	0.0041	0.0048	0.0073
more than college	0.0296 ***	0.0259 ***	0.0314 **	-0.0144 ***	-0.0110 **	-0.0189 ***	-0.0153 ***	-0.0150 ***	-0.0124
	0.0050	0.0055	0.0103	0.0034	0.0039	0.0060	0.0033	0.0034	0.0082
Self-Reported Health									
health very good	0.0068	0.0010	0.0185	-0.0050	-0.0026	-0.0067	-0.0018	0.0017	-0.0117
	0.0051	0.0055	0.0103	0.0036	0.0040	0.0067	0.0034	0.0036	0.0075
health good	-0.0002	-0.0019	0.0027	0.0004	0.0013	0.0010	-0.0002	0.0006	-0.0037
	0.0054	0.0059	0.0106	0.0038	0.0043	0.0073	0.0036	0.0039	0.0071
health fair	-0.0230 *	-0.0099	-0.0297	0.0172 *	0.0078	0.0248	0.0059	0.0021	0.0049
	0.0094	0.0093	0.0169	0.0076	0.0071	0.0136	0.0052	0.0055	0.0094
health poor	-0.0613 ***	-0.0711 **	-0.0380	0.0421 **	0.0514 **	0.0270	0.0192	0.0197	0.0110
	0.0188	0.0248	0.0258	0.0152	0.0197	0.0207	0.0105	0.0159	0.0146
Marital Status									
married, sp. absent	-0.0263	-0.0457	0.0314	0.0034	0.0212	-0.0329 ***	0.0230	0.0245	0.0015
	0.0415	0.0529	0.0295	0.0219	0.0341	0.0037	0.0298	0.0328	0.0293
partnered	-0.0032	-0.0013	-0.0322	-0.0140 **	-0.0090	-0.0207 **	0.0172	0.0102	0.0529
	0.0145	0.0129	0.0553	0.0049	0.0063	0.0077	0.0132	0.0109	0.0533
separated	-0.0016	-0.0064	0.0016	-0.0035	-0.0023	0.0002	0.0051	0.0087	-0.0018
	0.0174	0.0210	0.0266	0.0115	0.0167	0.0156	0.0126	0.0131	0.0192
divorced	-0.0096	-0.0024	-0.0587 *	0.0018	-0.0005	0.0151	0.0078	0.0029	0.0435 *
	0.0083	0.0080	0.0246	0.0051	0.0053	0.0109	0.0061	0.0058	0.0215
widowed	-0.0417 **	-0.0224	-0.1320 ***	0.0182	0.0168	0.0329	0.0235 *	0.0057	0.0992 **
	0.0156	0.0161	0.0409	0.0104	0.0122	0.0226	0.0111	0.0090	0.0342
never married	0.0059	0.0172	-0.0427	-0.0065	-0.0109	0.0069	0.0007	-0.0062	0.0358
	0.0109	0.0105	0.0280	0.0067	0.0077	0.0133	0.0087	0.0072	0.0247
Offer w/o covars	0.0689 ***			-0.0306 ***			-0.0383 ***		
	0.00677			0.0046			0.0048		
Offer scaled by percent retired	0.20985			-0.0974			-0.1125		
N	20,760			20,760			20,760		

* p<0.05; ** p<0.01; *** p<0.001
Standard errors are adjusted for the survey design and clustered at the individual level.
Marginal effects from a multinomial logit model where the outcome variable takes on 3 values: ESI, Public, and Uninsured.
Mean employer coverage rates: 89% total, 91% not retired, 82% retired. Mean public coverage rates: 4% total, 3% not retired, 6% retired.
Mean uninsured rates: 5% total, 5% not retired, 7% retired. Omitted categories are white, less than high school, married, excellent health, and 1994.

Table 6
Estimated Effect of Retiree HI Offer on Health Care Utilization
Employer-Sponsored Health Insurance in 1992
Less Than Age 65

	Any Doctors Visit			Regularly Use Prescription Drugs			Any Outpatient Surgery		
	Total **a**	**Not Retired** **b**	**Retired** **c**	**Total** **d**	**Not Retired** **e**	**Retired** **f**	**Total** **g**	**Not Retired** **h**	**Retired** **i**
Offer	0.0120 *	0.0116	0.0148	0.0289 *	0.0200	0.0290	0.0205 *	0.0191 *	0.0156
	0.0056	0.0061	0.0117	0.0120	0.0132	0.0214	0.0080	0.0091	0.0169
female	0.0483 ***	0.0456 ***	0.0516 ***	0.1654 ***	0.1780 ***	0.1260 ***	0.0167 *	0.0126	0.0295 *
	0.0052	0.0057	0.0094	0.0108	0.0123	0.0173	0.0077	0.0091	0.0142
black	0.0150 *	0.0175 *	0.0048	-0.0222	-0.0217	-0.0096	-0.0624 ***	-0.0548 ***	-0.0804 ***
	0.0067	0.0074	0.0135	0.0163	0.0186	0.0256	0.0099	0.0123	0.0170
hispanic	-0.0135	-0.0096	-0.0309	-0.0912 ***	-0.0903 ***	-0.0742	-0.0571 ***	-0.0523 ***	-0.0531
	0.0108	0.0118	0.0214	0.0247	0.0273	0.0421	0.0143	0.0161	0.0325
high school	0.0329 ***	0.0341 ***	0.0326 ***	0.0629 ***	0.0778 ***	0.0355	0.0141	0.0208	0.0011
	0.0061	0.0068	0.0102	0.0153	0.0177	0.0233	0.0117	0.0140	0.0200
some college	0.0451 ***	0.0485 ***	0.0362 ***	0.0964 ***	0.1177 ***	0.0426	0.0426 **	0.0504 **	0.0233
	0.0055	0.0060	0.0100	0.0163	0.0183	0.0266	0.0140	0.0168	0.0242
college	0.0564 ***	0.0537 ***	0.0651 ***	0.1349 ***	0.1539 ***	0.0960 ***	0.0659 ***	0.0799 ***	0.0382
	0.0051	0.0059	0.0076	0.0179	0.0201	0.0286	0.0179	0.0213	0.0344
more than college	0.0574 ***	0.0596 ***	0.0512 ***	0.1109 ***	0.1283 ***	0.0781 **	0.0663 ***	0.0804 ***	0.0411
	0.0047	0.0050	0.0088	0.0172	0.0193	0.0285	0.0168	0.0201	0.0285
health very good	0.0158 **	0.0190 **	0.0048	0.0812 ***	0.0870 ***	0.0540 *	0.0089	0.0130	0.0041
	0.0058	0.0063	0.0111	0.0126	0.0142	0.0211	0.0100	0.0113	0.0200
health good	0.0366 ***	0.0344 ***	0.0385 ***	0.1855 ***	0.1883 ***	0.1536 ***	0.0470 ***	0.0446 ***	0.0463 *
	0.0052	0.0059	0.0094	0.0123	0.0141	0.0200	0.0112	0.0129	0.0214
health fair	0.0534 ***	0.0607 ***	0.0366 ***	0.2727 ***	0.2829 ***	0.2203 ***	0.0823 ***	0.0851 ***	0.0687 *
	0.0047	0.0047	0.0096	0.0113	0.0141	0.0163	0.0182	0.0220	0.0300
health poor	0.0660 ***	0.0680 ***	0.0583 ***	0.2967 ***	0.3076 ***	0.2384 ***	0.1529 ***	0.1602 ***	0.1279 **
	0.0034	0.0041	0.0074	0.0111	0.0153	0.0152	0.0288	0.0395	0.0404
cons	0.1689	0.4764	-7.1434	-1.1754	-1.1397	-6.5868	-0.9168	-1.0128	-0.5198
	0.3779	0.4103	0.4089	0.3500	0.3707	0.5011	0.3964	0.1949	0.7819
Offer w/o covars	0.0135 *			0.0262 *			0.0232 **		
	0.0056			0.0127			0.0081		
Offer scaled by percent retired	0.0488			0.1176			0.0833		
N	21482	15629	5258	21762	15779	5370	15497	10877	4219

* p<0.05; ** p<0.01; *** p<0.001
Marginal effects from probit models. Standard errors are adjusted for the survey design and are clustered at the individual level.
Average percent retired: 24.6%. Rates of doctor visits: 93% total, 93% not retired, 94% retired.
Rates of prescription drug use: 67% total, 64% not retired, 76% retired. Rates of outpatient surgery: 19% total, 18% not retired, 21% retired.
All survey questions for the health care utilization measures refer to use in the past two years.
Age and geographic region dummies are included in all models. Omitted categories are white, less than high school, excellent health, and 1994.

Table 7

Estimated Effect of Retiree HI Offer on Full-Time Retirement, Health, Health Insurance Coverage and Health Care Utilization: Alternative Specifications

Employer-Sponsored Health Insurance in 1992

Less Than Age 65

	Full-Time Retirement			Health			Health Insurance Coverage			Health Care Utilization		
	Total	Men	Women	F/P Health	Change self-reported health	Change ADLs	Employer-Sponsored Coverage	Public Coverage	Uninsured	Doctor's Visits	Rx Use	Outpatient Surgery
1. baseline specification												
Offer	0.0698 ***	0.0653 ***	0.0730 ***	-0.0083	0.0001	-0.0030	0.0516 ***	-0.0240 ***	-0.0277 ***	0.0120 *	0.0289 *	0.0205 *
	0.0102	0.0144	0.0133	0.0068	0.0079	0.0049	0.0060	0.0044	0.0041	0.0056	0.0120	0.0080
N	13,747	6,486	7,261	18,870	21,504	21,496	20,760	20,760	20,760	21,482	21,762	15,497
2. tenure>=median												
Offer	0.0900 ***	0.0883 ***	0.0854 ***	-0.0155	0.0039	-0.0164 *	0.0400 ***	-0.0234 ***	-0.0165 ***	0.0100	0.0131	0.0319 *
	0.0152	0.0209	0.0219	0.0110	0.0134	0.0083	0.0082	0.0062	0.0050	0.0091	0.0192	0.0126
N	7,593	4,030	3,563	7,871	8,665	8,665	8,389	8,389	8,389	8,675	8,773	6,272
mean of outcome	0.250	0.253	0.246	0.092	0.084	0.025	0.918	0.025	0.039	0.934	0.673	0.185
3. not retired waves 1-3												
Offer	0.0477 ***	0.0454 *	0.0504 **	-0.0085	0.0320 *	-0.0105	0.0431 ***	-0.0292 ***	-0.0139 **	0.0065	0.0105	0.0140
	0.0145	0.0210	0.0188	0.0103	0.0151	0.0093	0.0092	0.0079	0.0048	0.0072	0.0157	0.0106
N	5,584	2,540	3,044	7,230	7,785	7,786	7,425	7,425	7,425	7,796	7,901	7,898
mean of outcome	0.194	0.214	0.177	0.110	0.107	0.015	0.871	0.047	0.047	0.939	0.722	0.184
4. propensity score weighted												
Offer	0.0696 ***	0.0657 ***	0.0743 ***	-0.0084	0.0008	-0.0003	0.0468 ***	-0.0184 ***	-0.0285 ***	0.0096	0.0198	0.0210 *
	0.0109	0.0152	0.0138	0.0068	0.0080	0.0051	0.0054	0.0033	0.0042	0.0056	0.0123	0.0083
N	13,406	6,269	7,137	18,494	21,022	21,014	20,340	20,340	20,340	20,995	21,270	15,156

* p<0.05; ** p<0.01; *** p<0.001

Probit models are used for retirement, fair/poor health and utilization outcomes. The estimates for health insurance coverage are marginal effects from a multinomial logit model.

Standard errors are adjusted for the survey design and are clustered at the individual level.

Full-time retirement regressions are conditional on not being full-time retired at baseline.

Fair/poor health regression is conditional on not being in fair/poor health at baseline.

Full-time retirement controls: sex, age, race, education, marital status, baseline health status, pension, industry, occupation, household income and assets, and year.

Health controls: sex, age, race, education, baseline health status, and year.

Health insurance coverage controls: sex, age, race, education, marital status, baseline health status, and year.

Health care utilization controls: sex, age, race, education, baseline health status, geographic region, and year.

Median tenure at baseline is 12.3 years.

Models in row 3 are restricted to individuals who are not full-time retired in waves 1-3 and to years 1998, 2000, and 2002.

The propensity score is calculated using a probit model to predict RHI offer based the following control variables (at baseline): age, sex, race, education, household income, marital status, census region, labor force participation, self-reported health, whether health limits work, DI application, DI receipt, any chronic illness, any acute illness, and parents' mortality.

Table 8
Estimates of Willingness-to-Pay for Retiree Health Insurance Coverage
Employer-Sponsored Health Insurance in 1992
Less Than Age 65

	Retired Men 60-64			**Retired Women 60-64**		
Coefficient of relative risk aversion	1	3	5	1	3	5
Certainty Equivalents						
Not offered mean	$49,796	$44,008	$38,854	$43,726	$37,741	$32,713
Offered mean	50,742	47,836	44,844	45,011	41,539	38,221
Willingness-to-Pay						
Not offered mean	3,141	8,929	14,083	3,826	9,810	14,839
Offered mean	2,195	5,101	8,093	2,540	6,013	9,331
WTP difference	946	3,828	5,990	1,285	3,797	5,508
N		1911			1894	

Spending Distributions					
Capped	**Mean**	**SE**		**Mean**	**SE**
Not Offered	2,288	4,674		2,762	5,008
Offered	1,824	4,020		2,089	4,051
Difference	465			673	
Total					
Not Offered	5,920	63,861		3,790	14,646
Offered	1,953	4,677		2,357	6,920
Difference	3,967			1,433	

Spending draws are capped at 90 percent of income.
The certainty equivalent and willingness-to-pay estimates are based on the capped spending distribution. Information on the total (uncapped) distribution is provided only for comparison.

APPENDIX A

The key independent variable, RHI offer, is a binary indicator for whether the respondent is able to continue their current employer-sponsored health insurance coverage in retirement.[47] I define retirement (as an outcome) as retired full-time based on the labor force status variable constructed by the RAND Center for the Study of Aging (St. Clair, et al., 2004).[48] I measure health outcomes by self-reported health (5-point scale), the change in self-reported health between waves, and the change in the number of activities of daily living (ADLs) with which the respondent indicates experiencing some difficulty.[49]

Health insurance coverage is categorized as employer-sponsored coverage from either the respondent's or spouse's employer, public coverage (Medicare, Medicaid or VA/Champus coverage) or uninsured.[50] The variables used to measure health care utilization include any doctor's visit, number of doctor's visits, any hospital stay, number of hospital stays, number of nights in the hospital, outpatient surgery, regular use of prescription drugs, and any dental visit.[51] Questions about preventive care use are asked beginning in 1996, and I group these into gender-specific measures of any preventive care use in the previous two years.[52]

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[47] I include respondents who report RHI offer consistently in 1992 and 1994 and those for whom I can identify a reason why their answers are different between waves (i.e., changed source of coverage, changed job). These additional restrictions drop 6.5% of the sample, but this group is not significantly different based on observable characteristics.

[48] If the respondent is not working and not looking for work and there is any mention of retirement, labor force status is defined as retired.

[49] Activities of daily living include dressing, bathing, eating, using the toilet, and walking across a room, among others.

[50] The 18 percent of observations where the respondent reports both employer-sponsored and public coverage are coded as having employer-sponsored coverage.

[51] In 1992, these utilization measures referenced the previous year, but from 1994 onward, they ask about care used in the previous two years.

[52] Cholesterol test, flu shot, breast exam, mammogram and Pap smear for women; cholesterol test, flu shot and prostate exam for men.

APPENDIX B

Retiree health insurance benefits began in the 1950's and 1960's and were used by employers to attract workers in competitive labor markets and to encourage early retirement (Atkins 1994).[53] However, medical care and health insurance costs were lower, life expectancies shorter, and there were few retirees relative to current workers at this time. As a result, RHI benefits cost very little and were an afterthought to pensions, viewed as a "throwaway" benefit and a "good-will gesture" (Rappaport and Malone 1994). By the early 1980's, 86 percent of medium and large employers were offering active employees some retiree health insurance benefits (Schieber 2002). Many employers began to restrict or eliminate benefits in the late-1980's and early-1990's, but most were reluctant to drop benefits for current retirees and for older employees near retirement (Schieber 2002), which is relevant for the cohort I examine in this paper.

While RHI benefits are somewhat concentrated among large, profitable firms with unionized workers with long tenures, 1988 data show that some firms in nearly every industry offer RHI benefits (Warshawsky, et al. 1993) and that offer rates are fairly constant across firm size (Kaiser Family Foundation and Health Research and Educational Trust 1999). Firm-level data from 1992 shows that only 30-40 percent of the cross-sectional variation in RHI offer is accounted for by firm size, industry and geographic region.[54] This suggests there is a significant amount of variation in RHI offer that is unrelated to these factors which may be correlated with worker preferences for retirement or their health expectations.

While it is reasonable to expect that workers consider health insurance availability when choosing jobs, it is less obvious that they think about the coverage that will be available to them when they retire. In the 1992 HRS, the average tenure at the current job among older workers ages 47-63 is 14

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[53] Using RHI benefits as an incentive for early retirement became even more important after the 1967 Age Discrimination in Employment Act made age discrimination and mandatory retirement (for most occupations) illegal.
[54] Author's calculations using data from the 1992 Annual Survey of Employer-Sponsored Health Benefits, conducted by the Health Research and Educational Trust. The range depends on whether county or standard metropolitan statistical area is used as the measure of geographic region.

years, suggesting that most workers have been in their job for a long time before approaching

retirement. In fact, 22 percent of respondents ages 40-44 did not know whether retiree health

insurance was offered by their employer, and 12 percent of workers ages 55-64 did not know.[55] This

indicates a fair amount of myopia in terms of retirement benefits even in middle age. Gustman and

Steinmeier (2004) find similar incomplete and incorrect knowledge about employer-sponsored pension

benefits.

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[55] Respondents who do not know if they are offered RHI are not included in the analysis.

5.5 Results: Differential Effects by Health Status

Though we see only suggestive effects on health and outpatient utilization rates, this may be an artifact of the majority of the sample being in fairly good health. To the extent that causal effects of RHI offer on health and health care use exist, we are more likely to see them in the subgroup in poor health. I use health shocks as described in section 4.1 as an exogenous source of variation in health status to test for differential effects of RHI offer.

There is no main effect of RHI offer on health and the health shocks themselves worsen health (Table C1, columns a, b, and c). Conditional on experiencing a health shock, there is no significant evidence of a differential effect of RHI offer on health. Columns d, e, and f show that controlling for a health shock, RHI offer decreases the probability of being uninsured by about 2 percentage points, while the effects on ESI and public coverage are somewhat larger than in Table 5 (+8 and -6 percentage points, respectively). The health shocks themselves have no significant effect on health insurance coverage, nor is there an incremental effect of RHI offer conditional on a health shock. RHI offer has a positive effect on the probability of prescription drug use and outpatient surgery (columns g, h, and i). Since the survey questions on health care utilization refer to the 2 years prior to the interview, the results for the lagged health shocks are most informative and tend to show positive effects on outpatient utilization. In the two years following a chronic health shock, the probability of a doctor's visit increases by 3 percentage points and the probability of using prescription drugs increases by 7 percentage points.[56] Overall, we see no incremental effect of RHI offer on health outcomes or health insurance coverage for those in poor health, but incremental effects for some utilization outcomes.

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[56] The negative and very large coefficients on current acute health shocks interacted with RHI offer are likely driven by a few observations, given the small number of people who experience acute health shocks (N=256).

Estimated Effect of Retiree HI Offer on Health, Health Insurance Coverage and Health Care Utilization: Health Shocks
Employer-Sponsored Health Insurance in 1992
Less Than Age 65

	Health			Health Insurance Coverage			Health Care Utilization		
	F/P Health a	Change self-reported health b	Change ADLs c	Employer-Sponsored Coverage d	Public Coverage e	Uninsured f	Doctor's Visits g	Rx Use h	Outpatient Surgery i
Chronic Health Shock									
Offer	-0.0119	-0.0003	-0.0050	0.0779 ***	-0.0549 ***	-0.0230 ***	0.0046	0.0229	0.0203 *
	0.0090	0.0131	0.0070	0.0088	0.0076	0.0042	0.0070	0.0151	0.0095
Chronic health shock	0.0463 **	0.2195 ***	0.0471	0.0104	-0.0054	-0.0051	0.0392 ***	0.1350 ***	-0.0178
	0.0166	0.0451	0.0249	0.0103	0.0086	0.0054	0.0093	0.0194	0.0197
Offer*Shock	0.0224	0.0023	0.0253	-0.0046	-0.0009	0.0055	0.0176	0.0415	0.0402
	0.0182	0.0545	0.0297	0.0150	0.0118	0.0090	0.0155	0.0281	0.0275
Lagged chronic shock	0.0592 ***	-0.0845	-0.0097	-0.0061	0.0009	0.0052	0.0082	0.0817 ***	0.0359
	0.0169	0.0471	0.0268	0.0110	0.0091	0.0057	0.0116	0.0220	0.0214
Offer* Lagged shock	0.0035	0.0618	-0.0084	0.0075	-0.0066	-0.0009	0.0331 **	0.0671 *	0.0061
	0.0160	0.0563	0.0317	0.0130	0.0112	0.0063	0.0110	0.0273	0.0239
N	11948	13310	13303	16666	16666	16666	13126	13297	13290
Acute Health Shock									
Offer	-0.0081	0.0051	-0.0049	0.0778 ***	-0.0557 ***	-0.0221 ***	0.0092	0.0334 *	0.0285 ***
	0.0080	0.0112	0.0063	0.0080	0.0069	0.0039	0.0067	0.0145	0.0086
Acute health shock	0.2626 ***	0.7464 ***	0.2146	0.0163	-0.0134	-0.0028	0.0805 ***	0.2177 ***	0.2646 ***
	0.0554	0.1374	0.1144	0.0191	0.0143	0.0116	0.0032	0.0358	0.0576
Offer*Shock	-0.0079	-0.1097	-0.1269	0.0059	0.0016	-0.0075	-0.9308 ***	-0.1699 *	-0.0888 **
	0.0281	0.1590	0.1222	0.0284	0.0247	0.0131	0.0025	0.0832	0.0291
Lagged acute shock	0.1908 ***	-0.2136	-0.0391	0.0017	-0.0042	0.0025	0.0616 ***	0.1820 ***	0.0777
	0.0535	0.1215	0.1242	0.0240	0.0191	0.0130	0.0081	0.0424	0.0538
Offer* Lagged shock	-0.0100	-0.0215	0.0269	-0.0198	0.0060	0.0138	-0.0461	-0.0674	-0.0536
	0.0316	0.1501	0.1301	0.0378	0.0300	0.0220	0.1034	0.0865	0.0440
N	11818	13129	13124	16403	16403	16403	12954	13117	13111

* p<0.05; ** p<0.01; *** p<0.001

Columns a, g, h, and i use probit models. The estimates for health insurance coverage are marginal effects from a multinomial logit model.

Standard errors are adjusted for the survey design and are clustered at the individual level.

Fair/poor health regression is conditional on not being in fair/poor health at baseline.

Health controls: sex, age, race, education, baseline health status, and year.

Health insurance coverage controls: sex, age, race, education, marital status, baseline health status, and year.

Health care utilization controls: sex, age, race, education, baseline health status, geographic region, and year.

Figure D1

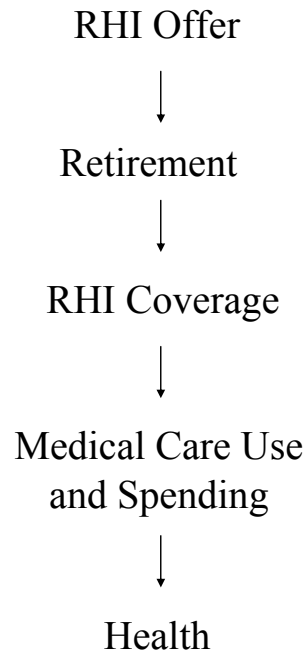RHI Offer

↓
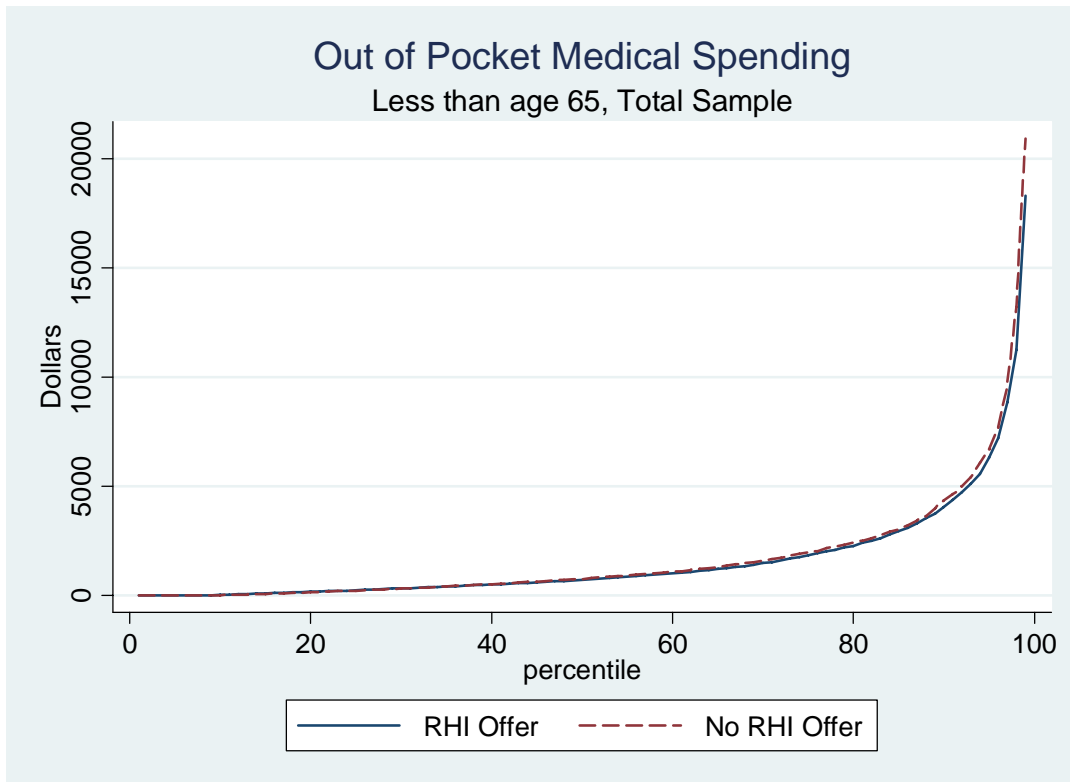
Retirement
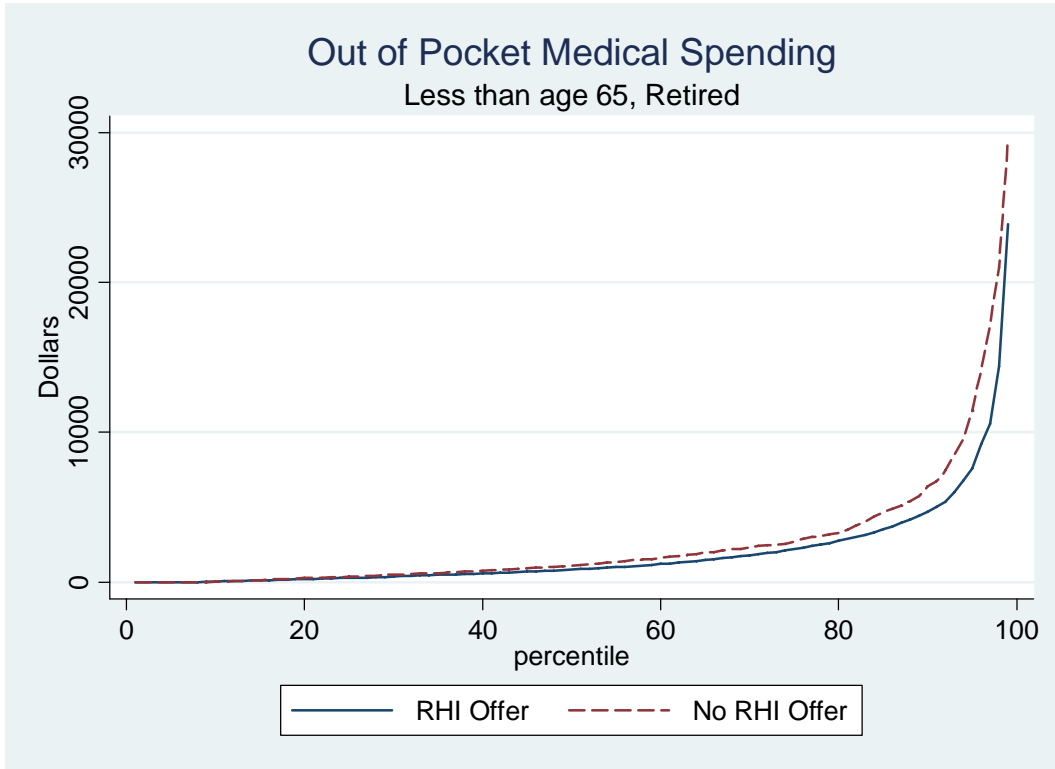
↓

RHI Coverage

↓

Medical Care Use
and Spending

↓

Health

Figure D2

Out of Pocket Medical Spending
Less than age 65, Total Sample

Figure D3

Out of Pocket Medical Spending

Less than age 65, Retired

Table D1
Health Status and Health Care Expenditures by Age, 2003

	Age			
	35-44	**45-54**	**55-64**	**65-74**
Self-reported fair/poor health	11%	15%	19%	23%
	0.60	0.68	0.97	1.06
Total health care expenditures in top quintile (~$3,000+)	19%	28%	41%	50%
	0.66	0.77	1.10	1.35
Total health care expenditures as a percent of individual income	7%	9%	16%	30%
	0.01	0.00	0.01	0.02
Total out-of-pocket health care expenditures in top quintile (~$750+)	17%	28%	41%	49%
	0.69	0.86	1.10	1.37
Total out-of-pocket health care expenditures as a percent of individual income	1%	2%	3%	5%
	0.00	0.00	0.00	0.00

Standard errors are presented below the percentages.
Agency for Healthcare Research and Quality. Medical Expenditure Panel Survey Household Component Data. Generated using MEPSnet/HC. http://www.meps.ahrq.gov/mepsnet/HC/MEPSnetHC.asp (May 26, 2006)

Table D2
Estimated Effect of Retiree HI Offer on Out-of-Pocket Medical Spending
Employer-Sponsored Health Insurance in 1992
Less Than Age 65

	Total			Not Retired			Retired		
Centile	Average Out-of-Pocket Medical Spending	Centile Treatment Estimate		Average Out-of-Pocket Medical Spending	Centile Treatment Estimate		Average Out-of-Pocket Medical Spending	Centile Treatment Estimate	
60	$1,000	-$28		$960	-$54	*	$1,260	-$131	
61	$1,046	-$34		$1,000	-$54	*	$1,320	-$146	
62	$1,098	-$48		$1,000	-$45		$1,380	-$163	
63	$1,130	-$53		$1,040	-$47		$1,440	-$196	
64	$1,180	-$49	*	$1,081	-$47		$1,488	-$245	
65	$1,220	-$58	*	$1,120	-$49		$1,524	-$236	*
66	$1,272	-$55	*	$1,168	-$57		$1,620	-$245	*
67	$1,320	-$54		$1,212	-$64		$1,680	-$231	*
68	$1,387	-$47		$1,248	-$62		$1,740	-$256	*
69	$1,450	-$57		$1,300	-$57		$1,820	-$260	*
70	$1,500	-$66	*	$1,360	-$45		$1,917	-$229	*
71	$1,560	-$69	*	$1,430	-$57		$1,980	-$204	*
72	$1,640	-$77		$1,500	-$64		$2,025	-$223	*
73	$1,720	-$86	*	$1,536	-$89		$2,144	-$226	
74	$1,788	-$80	*	$1,620	-$96		$2,210	-$246	
75	$1,870	-$101	*	$1,710	-$99	*	$2,320	-$288	
76	$1,970	-$111	*	$1,768	-$112	*	$2,404	-$308	
77	$2,000	-$121	*	$1,860	-$97	*	$2,500	-$370	
78	$2,120	-$128	*	$1,969	-$101	*	$2,600	-$394	*
79	$2,216	-$166	*	$2,000	-$138		$2,728	-$391	*
80	$2,312	-$172	*	$2,120	-$134	*	$2,880	-$457	*
81	$2,440	-$184	*	$2,220	-$139	*	$3,000	-$519	*
82	$2,527	-$159	*	$2,312	-$139		$3,138	-$591	*
83	$2,672	-$156	*	$2,450	-$131	*	$3,245	-$736	*
84	$2,800	-$178	*	$2,550	-$120		$3,480	-$769	*
85	$2,980	-$198	*	$2,700	-$125		$3,680	-$854	*
86	$3,100	-$171	*	$2,840	-$126		$3,920	-$874	*
87	$3,340	-$161	*	$3,000	-$81		$4,120	-$1,042	*
88	$3,573	-$232	*	$3,200	-$123		$4,400	-$1,025	*
89	$3,809	-$234	*	$3,478	-$142		$4,680	-$1,231	*
90	$4,100	-$289	*	$3,700	-$247	*	$5,000	-$1,494	*
91	$4,440	-$272	*	$4,000	-$264		$5,300	-$1,632	*
92	$4,824	-$297		$4,400	-$198		$5,860	-$1,500	*
93	$5,200	-$294	*	$4,800	-$156		$6,500	-$1,736	*
94	$5,760	-$202		$5,222	$10		$7,200	-$2,347	*
95	$6,449	-$338		$5,860	-$141		$8,400	-$3,633	*
96	$7,350	-$263		$6,600	-$219		$9,700	-$5,371	*
97	$9,117	-$985		$7,735	-$194		$12,000	-$5,787	*
98	$12,000	-$1,752		$10,200	-$781		$16,058	-$7,936	*
99	$19,280	-$2,966		$15,915	$84		$24,780	-$8,505	

* p<0.05
Covariate adjusted (age, sex, race, education, and baseline health status).

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