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Abstract

The loss of health insurance may be an important component of the cost of retirement, especially for workers without retiree health insurance coverage. The authors find that insurance costs significantly reduce retirement rates for full-time wage and salary workers ages 51 to 61. Simulations suggest that a \$1,000 increase in the net present value of health insurance premium costs reduces the probability of early retirement by 0.17 percentage points for men and by 0.24 percentage points for women, corresponding to elasticities of -0.22 and -0.24 , respectively. The authors' models predict that expanding the Medicare program to cover those aged 62–64 would increase retirement rates for workers with employer-sponsored coverage who lack retiree benefits, if the government subsidizes their coverage. However, the impact would be small, increasing overall retirement rates by only 7%.

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HEALTH INSURANCE COSTS AND EARLY RETIREMENT DECISIONS

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The loss of health insurance may be an important component of the cost of retirement, especially for workers without retiree health insurance coverage. The authors find that insurance costs significantly reduce retirement rates for full-time wage and salary workers ages 51 to 61. Simulations suggest that a \$1,000 increase in the net present value of health insurance premium costs reduces the probability of early retirement by 0.17 percentage points for men and by 0.24 percentage points for women, corresponding to elasticities of -0.22 and -0.24 , respectively. The authors' models predict that expanding the Medicare program to cover those aged 62–64 would increase retirement rates for workers with employer-sponsored coverage who lack retiree benefits, if the government subsidizes their coverage. However, the impact would be small, increasing overall retirement rates by only 7%.

The link between employment and health insurance in the United States limits coverage options for most early retirees. Most workers receive health benefits from their employers, but they often forfeit their insurance when they retire. Individuals who retire before they are eligible for

Medicare can have difficulty acquiring coverage in the private market. Because many near-elderly adults have pre-existing health conditions, private insurers often deny them coverage or charge premiums that are unaffordable. To increase coverage rates among the near-elderly, some policy-makers have proposed a Medicare buy-in plan that would allow those below the age of full eligibility to purchase Medicare coverage. Other initiatives would lower the after-tax cost of private nongroup plans by providing tax breaks for those who purchase private coverage.

A drawback of these proposals is that they might encourage early retirement. As society ages and concerns intensify about the burden of supporting the retired popu-

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A data appendix with additional results, and copies of the computer programs used to generate the results presented in the paper, are available from the first author at the Urban Institute, 2100 M Street, N.W., Washington, DC 20037.

lation, policies that discourage work at older ages merit special scrutiny. Recent research suggests that the high cost of replacing employer-sponsored health benefits may deter workers from retiring before they are eligible for Medicare benefits. Some employers offer health benefits to their retirees, and studies have found that the availability of these benefits increases retirement rates. The introduction of Medicare buy-in plans and other initiatives that lower insurance costs might encourage workers who are not offered retiree health benefits by their employers to drop out of the labor force.

This paper estimates the effects of health insurance costs on early retirement decisions, using data from the Health and Retirement Study (HRS) on a sample of full-time workers ages 51 to 61. We measure the insurance costs associated with retirement as the increase in premium costs that workers would pay if they retire, compared to what they would pay if they remain at work. We then use the results of the model to simulate the impact on retirement of potential health insurance reforms, including an expansion of the Medicare program to individuals as young as 62, tax credits for insurance premium expenses, and extensions of the federally mandated period during which employers must provide continuation coverage to former workers.

Background

Economic theory predicts that workers weigh the benefits of increased leisure time against the costs of lost labor market compensation when making retirement decisions. For many workers younger than 65, the loss of job-related health benefits is an important cost of retiring. Some workers receive retiree health insurance (RHI) from their employers or get coverage through their spouses, but for others the alternatives to employer-sponsored coverage after retirement are generally expensive. Under federal law, former employees at firms with 20 or more workers are entitled to continuation coverage for up to 18 months. However, the worker is responsible for 102% of

the employer's premium cost during this period. After continuation coverage runs out, retirees are forced to turn to the private nongroup market if they are still ineligible for Medicare. Nongroup policies are generally expensive, especially for those with pre-existing medical conditions (Chollet and Kirk 1998).

Even for workers with RHI benefits, health insurance costs often rise after retirement. Post-retirement health benefits are typically less generous and require more cost sharing than benefits provided to active workers. For example, large firms that offered health benefits in 1995 paid, on average, 77% of the health insurance premium costs for active workers but only 52% of premium costs for retired workers (Foster Higgins 1996). Moreover, the fraction of workers eligible for retiree health benefits has been declining in recent years. Between 1991 and 1999, the proportion of large employers offering RHI benefits to pre-65 retirees fell from 88% to 76% (Hewitt Associates 2000).

A number of proposals have been advanced in recent years to increase health insurance coverage among the near-elderly. The Clinton administration proposed extending Medicare benefits to adults aged 62 to 64 who lack employment-based health insurance, as long as they pay the full cost of coverage. The Congressional Budget Office (1998) estimated that monthly premiums for those who buy into the Medicare program would be \$316 in 1999. In addition, participants would face monthly surcharges of up to \$30 on their Medicare premiums from ages 65 to 84. Senate Democrats proposed a similar buy-in plan in 2001. Another set of proposals would offer tax incentives for the purchase of insurance coverage. For example, the Bush administration proposed tax credits of up to \$1,000 for individuals and \$2,000 for families to offset premium costs for low-income Americans. Other reform initiatives would increase the length of time during which employers would be required by federal law to offer former workers unsubsidized continuation coverage (known as COBRA coverage).

These proposals might lead workers to retire early. Lowering the Medicare eligibility age to 62 through a buy-in program would reduce the length of time during which early retirees without RHI benefits would need to purchase expensive continuation or nongroup coverage to avoid becoming uninsured, and thus would likely encourage them to retire early. Tax breaks for the purchase of insurance coverage would reduce the cost differential between subsidized health benefits received before retirement and less generous RHI coverage, unsubsidized continuation coverage, or nongroup coverage. In addition, reforms requiring employers to extend continuation coverage for additional months would delay the need to purchase nongroup coverage, which is generally more expensive than unsubsidized group plans.

A series of recent papers has concluded that the availability of health insurance after retirement encourages workers to withdraw from the labor force. Using longitudinal data from the HRS, Blau and Gilleskie (2001) found that men between the ages of 51 and 61 who were eligible for post-retirement health benefits were substantially more likely to exit from employment than men without such benefits. Their estimates of the impact of RHI increased with age and were larger when the employer paid the full cost of RHI coverage than when the costs were shared between the employer and the retired worker. Rogowski and Karoly (2000) reached similar conclusions. They found that retirement rates in the HRS were 68% larger for men with RHI offers than for men who had health benefits while working but were not eligible for benefits during retirement. In earlier work using the Survey of Income and Program Participation (SIPP), Karoly and Rogowski (1994) found that the availability of RHI increased retirement rates by about 8 percentage points, representing a 50% increase in the baseline retirement probability. Gustman and Steinmeier (1994), however, found that the effects of post-retirement health benefits were quite small, accelerating retirement for men by only 1.3 months.

Other studies have found that the availability of Medicare benefits and government-mandated continuation coverage can affect retirement behavior. Rust and Phelan (1997) concluded that individuals who stand to lose their employer-provided health insurance when they retire often wait until they become eligible for Medicare before withdrawing from the labor force. Madrian and Beaulieu (1998) found that retirement hazards among married men ages 55 to 69 were higher for those with Medicare-eligible spouses than for those whose spouses had not yet reached age 65, perhaps because of the expense of purchasing health insurance for spouses who were not yet old enough to qualify for Medicare benefits. Government mandates that require employers to continue insurance coverage for a certain period of time after workers leave the firm appear to encourage retirement as well. According to one estimate, continuation-of-coverage mandates increase retirement hazards by 32% (Gruber and Madrian 1995).

Although these studies document the relationship between the availability of health insurance coverage and retirement, little is known about the effects of insurance costs on labor supply. The principal contribution of this paper is to quantify the relationship between health insurance premium costs and retirement behavior. By establishing the role of premium costs in the retirement decision, we are able to assess how policy proposals that would change the cost of health insurance for retired workers might affect retirement behavior.

Methods

We quantify the effects of health insurance on labor force withdrawals by computing the premium cost associated with retirement. We define this cost as the monthly increase in health insurance premium expenses that workers would pay if they retire, compared to what they would pay if they remain at work, and compute the net present value of the stream of costs from the age at which workers are first observed

until they reach the Medicare eligibility age.

The net present value of the stream of costs, PCR , can be expressed as

$$(1) \quad PCR = \sum_{i=j+1}^T (R_i - W_i) \left(\frac{1+c}{1+r} \right)^{i-j} p_i,$$

where R_i is the monthly premium cost in month i when retired, W_i is the monthly premium cost in month i when working, j is the worker's current age in months, c is the monthly projected increase in premium costs from the current period until the worker reaches the Medicare-eligibility age, r is the real monthly interest rate, p_i is the probability that the worker will survive from the current age j to age i , and T is the eligibility age in months for subsidized Medicare benefits, currently equal to 780 (or 65 years).¹ We set the projected growth rate in premium costs equal to 6% per year, the compound annual real growth rate in individual health insurance premiums and employee contributions from 1990 to 1995 (Cowan and Braden 1997), and the annual interest rate equal to 2.8%, the intermediate assumption used by the Social Security Administration (SSA) in 1998 (Social Security Administration 1998).

The analysis measures the effect of premium costs on retirement behavior by including PCR in probit models of retirement. We then simulate the impact of several proposed health reforms by re-computing premium costs under different scenarios and using the estimated coefficients from the model to predict retirement rates.

Data

The primary source of data for our study is the HRS, a longitudinal survey of middle-aged Americans conducted by the University of Michigan for the National Institute

on Aging. In 1992, the HRS interviewed a nationally representative sample of men and women born between 1931 and 1941 and their spouses (regardless of age), and it has resurveyed them every two years. The baseline survey gathered data on 9,825 persons ages 51 to 61. The second wave of interviews was successfully completed in 1994 for 8,843 respondents. We restrict our sample to wage and salary workers who were employed full-time (35 or more hours per week) in 1992 and who were re-interviewed in 1994. We drop from our sample self-employed and part-time workers, many of whom had already partially retired and left the career job (Ruhm 1990), because their labor force withdrawal decisions are likely to differ from those of full-time wage and salary workers. We also eliminate the handful of full-time workers with Medicare or Medicaid coverage at baseline, because they are likely to exhibit unusual retirement patterns. After we drop cases with missing data, our sample consists of 1,673 men and 1,394 women.

One of the innovative features of the HRS is the availability of information on retiree health benefits. The survey asked respondents a detailed series of questions about their current health insurance coverage and the availability of those benefits during retirement. Respondents who reported employer-sponsored health insurance coverage were asked whether they received it through their own current or former employer or through the spouse's employer. The survey also asked how much they contributed toward the premium cost of their health benefits in 1994, but not in 1992. In addition, the HRS collected information about whether the plan was available to retirees and their spouses, whether retirees paid all, some, or none of the costs, and whether health insurance costs paid by retired employees were higher than, lower than, or the same as those paid by active employees.

Premium Cost of Retirement

We combine health insurance information from the HRS with data from other

¹We assume that both R_i and W_i are paid with after-tax dollars, although some persons are in fact able to make before-tax contributions to their health plans while working. Because we are unable to account properly for the preferred tax treatment that some health insurance costs receive, we may underestimate the premium cost of retirement for some workers.

surveys to measure the monthly premium cost associated with retirement. The premium cost to retire is set equal to zero for uninsured workers and those who purchase nongroup coverage, because their coverage options do not change when they retire. For workers with RHI offers, the premium cost to retire equals the difference in premium contributions made by active workers and retirees, which can be substantial. For workers who receive coverage through their own employers but are not offered RHI benefits, the premium cost to retire changes over time. For the first 18 months, when COBRA continuation coverage is available, it equals the difference between COBRA payments and premium contributions made while employed. From month 19 until the eligibility age for Medicare, the premium cost to retire equals the difference between premium payments for private nongroup plans and premium contributions made while employed.

For workers who receive coverage from the current employers of their spouses, the premium cost to retire depends on how spouses coordinate their retirement decisions. If married workers make retirement decisions independently of their spouses, the premium cost to retire will be zero for workers with spousal coverage, because their coverage will not change if they drop out of the labor force. However, if spouses instead perfectly coordinate their decisions and retire together, the premium cost to retire for workers with spousal coverage can be substantial and will depend on whether the spouse has an RHI offer that can cover both partners. Because many spouses do appear to coordinate their retirement decisions (Blau 1998; Coile 2000; Favreault and Johnson 2002; Gustman and Steinmeier 2000), we assume that spouses retire together.² When RHI benefits are

available, the premium cost for workers with spousal coverage equals the difference in spousal coverage premiums between active workers and retirees. When RHI benefits are not available, the worker can obtain COBRA coverage through the spouse's employer for 18 months, but then must purchase nongroup coverage.

The computation of the premium cost to retire is data-intensive and involves a series of imputations. For workers in the same plan in 1992 and 1994, we set premium contributions for employer-sponsored health benefits equal to the amount the workers reported in 1994, deflated by 6% per year. For workers who changed plans, we impute premiums using a regression model of contributions based on the 1994 wave of the HRS. Premium contributions by retirees for RHI coverage are imputed by combining information in the HRS about whether respondents paid all, some, or none of the premiums with data from the 1995 Foster Higgins Survey of Employer-Sponsored Plans. We compute COBRA payments as 102% of total premiums for employer-sponsored coverage, which we model with data from a 1991 employer survey from the Health Insurance Association of America. Predictions from the model are bounded from below by the level of employee contributions to the plan. Finally, we impute nongroup premium costs for our sample from a 1991 Urban Institute survey of Blue Cross/Blue Shield plans. We assign the mean premium cost within gender, age, and geographical region categories to all respondents in our sample. However, we also inflate premium estimates by 50% for those with minor or moderate chronic health conditions and by 200% for those with more severe health conditions, because most nongroup plans are risk-rated (Chollet and Kirk 1998).³

²We test the sensitivity of our results to the assumption of joint retirement behavior by married couples by re-estimating the premium cost to retire under the assumption that spousal retirement decisions are independent of each other. As reported in the appendix (available from the authors on request), the esti-

mated effects of premium costs on retirement behavior are not sensitive to assumptions about whether spousal retirement decisions are jointly made.

³A data appendix available from the authors describes the derivation of the premium cost to retire in more detail and tests the sensitivity of our findings to many of our assumptions.

Social Security and Pension Wealth

Information from Social Security earnings records and employer-sponsored pension providers is available for many HRS respondents. About 75% of respondents gave permission to link their survey responses to administrative data from SSA. Descriptions of employer-sponsored pension plans were also collected from plan providers for about two-thirds of respondents with pension coverage.

We use Social Security earnings records and the pension parameters supplied by plan providers to estimate retirement wealth, defined as the present value of the future stream of benefits that workers would receive from Social Security and employer-sponsored pensions if they left work at the time of the survey. We impute earnings records and pension plans for those with missing data. Estimates of retirement wealth based on administrative and provider data are generally superior to those based on respondent self-reports, because many workers have only limited knowledge of their future retirement benefits (Gustman et al. 1999; Mitchell 1988). However, we base estimates of wealth from defined contribution (DC) pension plans on self-reports of the account balance in the plan, because provider data on DC plans do not appear to generate reliable estimates of the account balance (Johnson, Sambamoorthi, and Crystal 2000).

Retirement Models

We estimate probit models of retirement to measure the impact of the premium cost to retire on labor force attachment at midlife. The dependent variable is set equal to one if the respondent was retired in 1994, zero otherwise. We define retirement as working fewer than 20 hours per week at the time of the 1994 interview and not actively looking for employment. We use this threshold because many employers do not offer health benefits to those who work fewer than 20 hours. (We find similar results when we use a threshold of zero hours per week.) Approximately 12.9% of men and 15.3% of women working full-

time in 1992 had retired by the time of the 1994 interview. We estimate models separately for men and women, because retirement behavior differs by gender.

The covariates in the model include *PCR* and variables describing the health, economic, and demographic characteristics of respondents, all measured in 1992. We measure health by the number of functional impairments reported by each respondent and a series of binary variables indicating the respondent's self-reported overall health status. We also include measures of the change in health status, which is an important predictor of retirement behavior (Bound et al. 1999). In particular, we include the increase in the number of functional impairments from 1992 to 1994 and an indicator for whether respondents reported that their health was worse in 1994 than in 1992. Economic variables in the model include the annual wage on the current job and wealth, defined as the sum of Social Security, employer-sponsored pension, and financial wealth, excluding housing equity. For married couples, we sum the wealth of the husband and wife and divide by the square root of two, to account for economies of scale in household production. The model also controls for differences in age, marital status, race, education, and the number of months between the two survey interviews.⁴

⁴The endogeneity of premium costs could potentially bias our estimates. Workers who anticipate retiring early because of health problems or leisure preferences may seek jobs that offer generous RHI benefits and low *PCR*. In that case, the *PCR* coefficient in the retirement model may reflect the effects of unobservable health problems or leisure preferences on retirement decisions instead of the effects of health insurance costs. We test for the endogeneity of *PCR* by generating its predicted value, computing the residuals, and including the residuals in the retirement equation. We find that the residuals are statistically insignificant in the retirement model for men and women, suggesting that we can treat *PCR* as exogenous. In addition, we find no evidence that workers with access to RHI benefits through their own employers or their spouses' employers have more health problems than workers without RHI offers. In probit models of access to RHI benefits, measures of self-reported health status, the presence of chronic health conditions, and the number of functional impairments are all statistically insignificant.

Adjusting for Measurement Error

Our estimate of *PCR* is imprecise, biasing downward the estimated effect of premium costs on retirement. We use instrumental variable techniques to attempt to correct our estimates for measurement error. We model *PCR* as a function of insurance coverage, serious health conditions, and all of the other independent variables in the retirement model, and then re-estimate the retirement models after replacing the actual value of *PCR* with its predicted value. For comparison purposes, we also report results without measurement error corrections.⁵

Our instruments are binary variables for coverage (RHI offers, employer-sponsored coverage without RHI offers, and spousal coverage) and the presence of serious medical conditions. These variables affect insurance costs but do not directly affect retirement decisions. The first-stage regressions indicate that coverage type and medical conditions are strong predictors of the net present value of the stream of premium costs associated with retirement. Workers with serious medical conditions have significantly higher values of *PCR* than do workers without serious conditions. In addition, the presence of employer-sponsored coverage without RHI offers doubles *PCR* for both men and women, relative to those who lack employer-sponsored coverage altogether. Insurance coverage does not significantly affect retirement decisions when the model controls for premium costs. In addition, controlling for health and functional status, medical conditions do not significantly affect labor force participation, which is not surprising, since many

adults with chronic conditions are able to work productively. The model predicts premium costs fairly well, with an adjusted R-squared of 0.338.⁶

Predicting Effects of Selected Reform Proposals

We use the results of our models to predict the effects on early retirement decisions of policies that would expand Medicare coverage to include those ages 62 to 64, provide tax breaks for insurance premium costs, and extend the period of federally mandated continuation coverage. We model each policy initiative as a change in the premium cost to retire and use the new premium costs to predict retirement rates.

We consider two different pricing schemes for Medicare participation at ages 62 to 64. We first investigate the effects of simply lowering the eligibility age from 65 to 62. Medicare beneficiaries aged 62 to 64 would pay the same monthly premium charged to elderly beneficiaries for supplemental coverage for physician services (Medicare Part B), which was \$31.80 in 1992. We then simulate the effects of a Medicare buy-in program, in which individuals aged 62 to 64 could receive Medicare coverage by paying substantial premiums. We set the premium at \$200 per month in 1992, approximately equal in real terms to the level the CBO estimated a buy-in plan in 1999 would have to charge to achieve cost-neutrality.⁷ For consistency

⁵We do not adjust our estimate of the standard error of the *PCR* coefficient in the retirement equation to reflect the fact that predicted values of insurance costs are used in place of actual values. However, Monte Carlo evidence to date indicates that the asymptotically correct standard errors are no more effective in large finite samples than the conditional standard errors, which do not take into account estimation error in right-hand-side predicted variables (Bollen, Guilkey, and Mroz 1995).

⁶We perform a Hausman test to assess the validity of our exclusion restrictions. We re-estimate the retirement probit equation with all of the exogenous variables in the model (including insurance coverage and chronic condition indicators) but excluding predicted *PCR* and compare the likelihood function for this reduced form equation with the structural equation that includes predicted *PCR*. The chi-square statistic is 6.4 for men and 3.8 for women, below the critical 95% chi-square value of 9.49 with four degrees of freedom. Thus we conclude that our instruments are valid.

⁷CBO also assumed that participants would pay monthly surcharges on their Medicare premiums of about \$23 from ages 65 to 84, to cover the costs of adverse selection into the buy-in program. To simplify our model, we do not incorporate the post-65 surcharges into our estimates.

Table 1. Health Insurance Premium Costs and Retirement Rates by Type of Insurance, for Full-Time Workers Aged 51–61.^a

Type of Insurance	% of Sample	Mean Monthly Premium When Working	Mean Monthly Premium When Retired, Month 1 ^b	Mean Premium Cost to Retire, Month 1 ^b	Mean Premium Cost to Retire, Month 19 ^b	Mean NPV of Premium Cost to Retire	% Who Retire within Two Years
<i>Men</i>							
RHI Offer ^c	66.2%	\$57	\$155	\$98	\$107	\$13,447	14.3%
Employer-Sponsored, No RHI Offer ^c	17.4	63	257	193	263	33,060	7.4
Spousal Coverage	6.5	69	278	209	239	28,187	12.8
Private Nongroup	3.0	287	287	0	0	0	12.9
Uninsured	6.9	–	–	0	0	0	12.4
<i>Women</i>							
RHI Offer ^c	50.0	38	124	86	94	11,200	13.8
Employer-Sponsored, No RHI Offer ^c	19.8	38	196	158	255	29,658	11.1
Spousal Coverage	17.4	86	212	126	141	19,803	21.1
Private Nongroup	4.7	305	305	0	0	0	18.2
Uninsured	8.0	–	–	0	0	0	20.0

^aThe sample is restricted to full-time wage and salary workers ages 51–61 in 1992. Workers with public insurance and those who did not know whether they had RHI are also excluded. Workers are considered to be retired if they reported working fewer than 20 hours per week and were not actively seeking employment in 1994. Costs and insurance status are measured at the time of the 1992 interview. Estimates are based on information from 1,673 men and 1,394 women.

^bThe month refers to the number of months after the retirement decision.

^cRHI = retiree health insurance.

Source: Authors' computations from the 1992–94 Health and Retirement Study.

with the Clinton buy-in proposal, we assume that only those without access to employer-sponsored coverage could participate. Because members of our sample reach age 62 in different years, we adjust the Medicare premiums by 6% per year so that they are constant in real terms for all respondents.

We also model the retirement effects of increasing the period of federally mandated continuation coverage from 18 months to 36 months and of providing federal income tax credits of up to \$1,000 per person for premium costs that individuals pay for employer-sponsored or private nongroup coverage. For workers with sufficiently large premiums, the tax credits could reduce annual insurance costs by up to \$1,000. Moreover, the annual premium cost to retire could fall by up to \$1,000 for workers

who pay no premiums as active employees but pay at least \$1,000 in premiums after retirement.

Results

Table 1 reports mean premium costs and retirement rates for our sample by type of coverage. Fully 66% of men and 50% of women employed full-time as wage and salary workers have employer-sponsored coverage with RHI offers.⁸ About one in six

⁸Because our sample is restricted to respondents who were re-interviewed in 1994, and respondents who left the sample had lower rates of insurance coverage than workers who remained in the sample, RHI coverage rates observed in our sample are somewhat higher than the rates observed in a random sample of full-time workers. Our estimates also un-

men and one in five women have employer-sponsored coverage that does not continue after retirement. Only 7% of men receive insurance through their spouses' employment, compared with 17% of women. Only a few percent of full-time workers purchase nongroup coverage as their sole source of health insurance, while 7% of employed men and 8% of employed women are uninsured.

Although workers with RHI offers face substantial increases in premium costs when they retire, the average cost increase is about twice as large for workers whose employer-sponsored coverage ends upon retirement. We estimate that mean monthly premium costs would rise by \$98 in the first month of retirement for male workers with RHI offers, compared with \$193 for those with employer-sponsored coverage but without RHI offers. The mean cost differential is even larger 19 months after the retirement decision, when mandated continuation coverage runs out and individuals without RHI must turn to the private nongroup market for coverage. We estimate that at month 19, male workers with RHI offers would pay, on average, \$107 more per month for health insurance if retired than if still at work. By contrast, we estimate that mean premium costs at month 19 for men with employer-sponsored coverage but not RHI offers are \$263 higher when retired than when working. The mean net present value of the stream of premium costs is \$13,447 for men with RHI offers, compared with \$33,060 for men with employer-sponsored coverage but not RHI offers. The premium costs associated with retirement are slightly lower for women than for men, but the differences in cost by coverage type are similar for men and women.

derstate the percentage of workers with employer-sponsored coverage but not RHI because we drop respondents with employer-sponsored coverage who did not know whether their employers offered RHI. These workers reported somewhat worse health than those who remain in our sample, although the differences are not large.

Retirement rates by baseline health insurance coverage are consistent with our hypothesis that the premium cost of retirement affects the timing of labor force withdrawals. For both men and women, workers who stand to lose their insurance coverage when they stop working are less likely to retire during the two-year observation period than workers with other types of coverage or no insurance at all. For example, among men working full-time at wage and salary jobs in 1992, only 7% with employer-sponsored coverage but without RHI offers are retired in 1994, compared with 14% of men with RHI offers. Among women working full-time in 1992, 11% of those with coverage from their own employers who lack RHI offers are retired in 1994, compared with 14% of those with RHI offers and 20% of those without any coverage.

Table 2 reports results for our retirement models. The first two columns report selected parameter estimates for men and women before correcting for measurement error in premium costs, and the second two columns report estimates after correcting for measurement error. In both cases, premium costs significantly reduce the probability of retirement. After correcting for measurement error, the model predicts that a \$1,000 increase in the net present value of premium costs would reduce the probability of early retirement by 0.17 percentage points for men and by 0.24 percentage points for women. In elasticity terms, the effect of premium costs on retirement is -0.22 for men and -0.24 for women.⁹ The estimated effects are smaller when we do not correct for measurement error in premium costs. In the uncorrected models, the estimated elasticity of retirement with respect to changes in the net present value of premium costs is -0.17 for men and -0.12 for women.

Our estimates imply that RHI offers substantially accelerate retirement. To evalu-

⁹For men, a 1% increase in PCR, equivalent to \$163, would decrease the hazard of retirement by 0.028 percentage points, equal to 0.22% of the probability of retirement of 12.9%.

Table 2. Probit Estimates of Retirement.^a
(Standard Errors in Parentheses; Marginal Effects in Brackets)

Independent Variable	Estimates Not Corrected for Measurement Error		Estimates Corrected for Measurement Error	
	Men	Women	Men	Women
NPV of Premium Cost to Retire ^b	-0.820** (0.280) [-0.138]	-0.546* (0.261) [-0.117]	-1.02* (0.493) [-0.173]	-1.11** (0.472) [-0.237]
Wealth ^b	0.024* (0.010) [0.004]	0.050* (0.021) [0.011]	0.022* (0.011) [0.004]	0.049* (0.021) [0.011]
Annual Wage	0.007* (0.003) [0.001]	0.005 (0.005) [0.001]	0.007* (0.003) [0.001]	0.005 (0.005) [0.001]
Overall Health Status [Ref.: Excellent]				
Very Good	0.002 (0.120) [0.0004]	-0.197 (0.117) [-0.041]	0.006 (0.120) [0.001]	-0.191 (0.117) [-0.039]
Good	0.165 (0.121) [0.029]	-0.178 (0.124) [-0.037]	0.163 (0.120) [0.029]	-0.180 (0.125) [-0.037]
Fair	0.115 (0.176) [0.020]	0.137 (0.171) [0.031]	0.123 (0.176) [0.022]	0.155 (0.171) [0.035]
Poor	0.644* (0.265) [0.154]	0.089 (0.304) [0.020]	0.637* (0.265) [0.154]	0.088 (0.304) [0.020]
Decline in Health Status between 1992 and 1994	0.477*** (0.130) [0.101]	0.292* (0.121) [0.070]	0.468*** (0.129) [0.099]	0.285* (0.121) [0.068]
Functional Limitations	0.088* (0.035) [0.015]	0.077** (0.029) [0.017]	0.089* (0.035) [0.015]	0.077** (0.029) [0.017]
Increase in Functional Limitations from 1992 to 1994	0.094** (0.029) [0.016]	0.083** (0.024) [0.018]	0.094** (0.029) [0.016]	0.085*** (0.024) [0.018]
N	1,673	1,394	1,673	1,394
Log Likelihood	-528.9	-539.9	-531.3	-539.4
Chi-Square Statistic (25df)	206.2	112.2	201.4	113.2
Pseudo R ²	0.163	0.094	0.159	0.095

^aThe sample is restricted to full-time wage and salary workers ages 51–61 in 1992. Workers with public insurance and those who did not know whether they had RHI are also excluded. Workers are considered to be retired if they reported working fewer than 20 hours per week and were not actively seeking employment at the time of the 1994 interview. The model also controls for age, race, marital status, education, and the number of months between the survey interviews.

^bMeasured in \$100,000.

*Statistically significant at the .05 level; **at the .01 level; ***at the .001 level (two-tailed tests).

Source: Authors' computations from the 1992–94 Health and Retirement Study.

ate their effects, we assign the mean value of the monthly premium cost to retire for men and women with RHI offers to workers with employer-sponsored coverage who are not offered RHI benefits and examine the

change in predicted retirement rates. If men with employer-sponsored coverage but without RHI offers faced the same mean monthly premium cost to retire as do those with RHI offers, their predicted retirement

rates would increase by 26%, based on our model that corrects for measurement error. The corresponding effect of RHI offers for women is 31%.

Other variables in our model affect the probability of retirement in expected ways. Workers who reported worse overall health in 1994 than in 1992 are more likely to retire than those who reported no decline in health status. For men, declining overall health status increases retirement rates by 10 percentage points, or 78% of the baseline rate. Retirement rates also rise with the number of functional limitations reported at baseline and with the increase in functional limitations between 1992 and 1994. Men who reported poor overall health status in 1992 are more likely to retire than those who reported excellent health. However, retirement rates for women do not vary significantly by overall health status at baseline, controlling for functional limitations and changes in health. Wealth from future Social Security benefits, employer-sponsored pensions, and financial assets also increases the probability of retirement for both men and women. Men who earn high wages are more likely to retire than are low-wage men, but wages do not significantly affect retirement decisions for women.

Impact of Proposed Health Insurance Reforms

Table 3 reports the simulated effects on retirement of several health insurance reform proposals, based on parameters from the retirement model that corrects for measurement error. The first two columns report results for the entire sample of full-time wage and salary workers, and the second two columns report results only for those workers with employer-sponsored coverage and without RHI offers. The effects are larger for the subgroup of covered workers without RHI offers because the reform proposals would substantially reduce the premium costs they face when retiring. The reforms we model would have negligible effects on the premium cost to retire for many other workers, particularly

those with RHI offers and those without any employer-sponsored health insurance coverage. For example, the Medicare buy-in proposal we consider would not be available to adults with access to employer-sponsored health benefits.

The reform proposals would have small effects on overall retirement rates for the entire sample. Lowering the Medicare eligibility age from 65 to 62 would raise retirement rates for both men and women by 7% (or by about 1 percentage point). The retirement effects of an expansion of the Medicare program would be even smaller if near-elderly adults could obtain Medicare coverage only by buying into the program and paying substantial premiums. If premiums were set at the approximately cost-neutral rate of \$200 per month in 1992, the introduction of a Medicare buy-in plan would raise overall retirement rates by only 2%. Extending COBRA coverage from 18 months to 36 months would increase retirement rates by less than 1%, while providing tax credits of up to \$1,000 for health insurance costs would increase rates by 3%.

Simulated retirement effects are larger for the subgroup of workers with employer-sponsored coverage and without RHI offers, although still modest. Lowering the Medicare eligibility age would increase retirement rates for these workers by 16% for men and 18% for women, while introducing a Medicare buy-in plan would raise rates by 10% for men and 8% for women. Tax credits would raise retirement rates by 4% for men and 7% for women. However, even among workers who depend upon COBRA coverage in retirement, doubling the number of months over which employers must provide coverage would raise retirement rates by only 2% for men and 4% for women. The high cost of COBRA coverage probably accounts for the small size of our estimated effects (Zuckerman, Haley, and Fragale 2001).

Conclusions

Many workers who receive health benefits from their employers face steep increases in health insurance costs when they

Table 3. Estimated Retirement Effects of Potential Health Insurance Reforms for Full-Time Workers Aged 51–61.^a

<i>Monthly Premium</i>	<i>Full Sample of Workers</i>		<i>Workers with Employer-Sponsored Coverage and without RHI Offers</i>	
	<i>Predicted Probability of Retirement</i>	<i>Percentage Change in Retirement Probability</i>	<i>Predicted Probability of Retirement</i>	<i>Percentage Change in Retirement Probability</i>
Men				
Current System	12.8%	—	7.4%	—
Extending Subsidized Medicare Coverage to Age 62	13.6	6.5%	8.6	16.2%
Medicare Buy-In Plan	13.1	2.3	8.1	9.5
\$1,000 Tax Credit	13.2	3.1	7.7	4.1
Extension of COBRA	12.9	0.9	7.5	1.7
Women				
Current System	15.3	—	11.1	—
Extension of Subsidized Medicare Coverage to Age 62	16.3	6.5	13.1	18.0
Medicare Buy-In Plan	15.6	2.0	12.0	8.1
\$1,000 Tax Credit	15.8	3.3	11.9	7.2
Extension of COBRA	15.4	0.7	11.5	3.6

^aThe sample is restricted to full-time wage and salary workers ages 51–61 in 1992. Workers with public insurance and those who did not know whether they had RHI are also excluded. Workers are considered to be retired if they reported working fewer than 20 hours per week and were not actively seeking employment at the time of the 1994 interview.

Source: Authors' computations from the 1992–94 Health and Retirement Study.

retire before the Medicare eligibility age, either because they replace subsidized employer-sponsored coverage with unsubsidized continuation coverage and eventually with expensive nongroup health insurance, or because employers who offer RHI coverage provide less generous subsidies for health benefits to active workers than to retirees. We find that post-retirement increases in premium costs significantly reduce retirement probabilities in our sample of full-time wage and salary workers aged 51–61 at baseline. The estimated elasticity of retirement with respect to changes in the net present value of the stream of health insurance costs is -0.22 for men and -0.24 for women.

Our results imply that RHI offers increase retirement rates by 26% for men and 31% for women, because the premium cost of retirement is generally substantially lower

for individuals with RHI offers than for those with employer-sponsored coverage who are not offered RHI benefits. These findings are consistent with evidence from other studies that the potential loss of employer-sponsored coverage can lock workers into particular employment relationships (Madrian 1994) and that RHI benefits significantly accelerate retirement (Blau and Gilleskie 2001; Karoly and Rogowski 1994; Rogowski and Karoly 2000).

Policy simulations based on our model indicate that lowering the Medicare eligibility age from 65 to 62 would raise retirement rates for workers with employer-sponsored coverage who are not offered RHI benefits. Under the current system, these workers face steep increases in insurance costs when they retire before age 65. If they could receive Medicare coverage at age 62 at the heavily subsidized premium prices

that elderly beneficiaries pay, retirement rates would increase by about one-sixth for workers with employer-sponsored coverage who lack RHI offers. However, retirement effects would be more modest if near-elderly adults were instead permitted to buy into the Medicare program at prices that approximately covered the cost of services.

Our estimates may understate the effects of health insurance reform on retirement decisions. For example, variation in premium costs does not capture all of the differences in types of coverage. Employer-sponsored coverage for active workers, employer-sponsored health benefits provided to retirees, nongroup policies, and Medicare may vary by the types of services they cover and the level of deductibles and copayments they impose on plan participants. By assuming that RHI and nongroup coverage differ only in the premiums they charge, we likely understate the effects of RHI offers on retirement. We also fail to account for risk aversion in our models. Workers who are not offered RHI coverage by their employers may be concerned about their access to the nongroup insurance market after retirement. Although federal law requires insurers to cover persons who lose group coverage and forbids pre-existing condition exclusions, it does not limit the price that insurers can charge. As a result, workers may be concerned that their premiums will become unaffordable if they develop health problems during retirement, especially among those who are particularly risk-averse. For these workers, the availability of Medicare benefits at age 62 may be quite appealing and may lead them to accelerate their retirement plans substantially. Finally, the income effects associated with a reduction in the Medicare eligibility age and the other health insurance reforms we consider may encourage retirement for workers without job-related health insurance benefits.

On the other hand, workers who plan to retire early may seek out jobs that offer RHI benefits to lower the cost of retiring before the Medicare eligibility age. If that is the case, our estimates may overstate the impact of health insurance costs on retirement decisions.

Although modest, our estimates of the impact of a reduction in the Medicare eligibility age are as large as estimates of the impact of other reform proposals on early retirement rates. Most studies of Social Security reform find quite limited effects on retirement. Mitchell (1991), for example, concluded that raising the normal retirement age from 65 to 67 would lead men to delay retirement by about only three months, as would increasing the penalty for early retirement. Gustman and Steinmeier (1991) estimated that increasing the Social Security delayed retirement credit from 3% to 8% per year and eliminating the Social Security earnings test would increase labor force participation rates by about 3.5% per year for persons ages 65 to 69 and would raise the average retirement age by only about three weeks. Mandating that all employers offer defined benefit pension plans to their workers would increase the cumulative probability of retirement between the ages of 50 and 70 by 4.9 percentage points (Samwick 1998). If the baseline retirement probability is 81%, then this tremendous expansion in pension coverage would increase retirement rates by only 6%.¹⁰ Judged by these standards, then, reducing the Medicare eligibility age can have relatively large effects on retirement.

¹⁰Samwick (1998) did not report the baseline cumulative retirement probability from age 50 to age 70. We estimate the retirement probability by dividing the labor force participation rate for men ages 70–74 by the rate at ages 50–54, as reported by the Bureau of the Census (1996), and subtracting the quotient from 1.

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