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4 Does Medicare Eligibility Affect Retirement?

Brigitte C. Madrian and Nancy Dean Beaulieu

4.1 Introduction

Concern over the lack of portability associated with employer-provided health insurance has precipitated a recent flurry of research activity on the effects of health insurance on labor market outcomes. Several estimates suggest that the costs associated with changing doctors and losing coverage for preexisting conditions are sufficient to deter individuals from changing jobs. These costs may be particularly important for older individuals contemplating retirement because a departure from the labor force may involve not only a change in doctors or lack of coverage for preexisting conditions but a complete loss of access to employer-provided group health insurance.

Although all individuals are eligible for government-provided group health insurance—Medicare—upon reaching age 65, most individuals state a desire to retire before age 65 (Employee Benefit Research Institute 1990). In contrast with social security, however, there is no early retirement age before 65 when individuals qualify for Medicare. For some, this is not an issue because their employers provide postretirement health insurance benefits. The majority of workers, however, are not entitled to such benefits because their employers do not offer them. It is these workers whom we would expect to be most concerned about how early retirement will affect their health insurance coverage.

Understanding the role of health insurance in retirement decisions is important because the government is currently trying to encourage later retirement by increasing the social security normal retirement age to 67 over the next

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several years. There has been some talk about increasing the age of Medicare eligibility correspondingly. Health care reform that makes health insurance more portable from work to retirement may undermine this goal, however, if the potential loss or change in health insurance coverage that currently exists is a significant deterrent to retirement.

While determining the effect of health insurance on retirement is important in its own right, properly accounting for the role of health insurance may also matter in accurately assessing the effects of other factors that have been more extensively studied. For example, previous research by others has concluded that the financial incentives associated with pensions and social security explain a significant fraction of observed retirement behavior; however, these two factors consistently underestimate the retirement that occurs at age 65. One explanation for this "excess" retirement is that individuals wait to retire until they are eligible for Medicare. Separating the effect of social security on retirement at age 65 from that of Medicare is difficult, however, since eligibility for Medicare coincides with the social security normal retirement age of 65. Correctly modeling the role of Medicare may therefore be important in assessing the effects of social security on retirement.

Much of the emerging literature on health insurance and retirement has examined the impact of employer-provided retiree health insurance on retirement, concluding that such health insurance constitutes a significant inducement for early retirement. In contrast, there is little compelling evidence on the effect of Medicare. This paper considers the role of Medicare in the retirement decision and aims to present evidence on whether it, too, impacts this decision.

4.2 The Relationship between Health Insurance and Retirement

4.2.1 Evidence on the Relationship between Health Insurance and Retirement

Table 4.1 summarizes the recent research that considers the relationship between health insurance and retirement. These studies have used several different data sets and a variety of statistical approaches to estimate how health insurance affects retirement. Five of the nine studies listed consider the effect of retiree health insurance on retirement (Madrian 1994; Headen, Clark, and Ghent 1995; Karoly and Rogowski 1994; Gustman and Steinmeier 1994a; Hurd and McGarry 1996). Because such insurance enables individuals to leave the labor force while maintaining the same health insurance coverage available while working, it eliminates the cost associated with giving up one's employer-provided health insurance on retirement. All other things equal, individuals with access to retiree health insurance should thus be expected to retire earlier than individuals without access to such coverage. Indeed, using data from the Current Population Survey (CPS), the National Medical Expenditure Survey (NMES), the Survey of Income and Program Participation (SIPP), the Retire-

Table 4.1 **Estimates of the Effect of Health Insurance (HI) on Retirement**

Study	Data and Sample	Estimation	Results
Rust and Phelan (1997)	Data: RHS Sample: Men 58–63 in 1969 with data through 1979 and no private pension	Structural model of age at retirement *HI variable: 0/1 employer nonretiree HI, 0/1 other HI*	Employer nonretiree HI increases probability of working until 65; Medicare explains spike in retirement hazard at 65 not explained by social security
Gruber and Madrian (1996)	Data: CPS Merged Outgoing Rotation Group 1980–90 Sample: All men 55–64	Probit for being currently retired *HI variable: continuation coverage*	One year of continuation coverage increases probability of being retired by 20 percent
Hurd and McGarry (1996)	Data: HRS Wave I Sample: Men 51–61 and women 46–61, work more than 35 hours/week	Nonlinear regressions for probability of retiring before 62 or 65 *HI variables: 0/1 employer HI and 0/1 retiree HI*	Employer HI increases expected probability of working past 62 or 65; retiree HI decreases these probabilities
Gruber and Madrian (1995)	Data: CPS March 1980–90; SIPP 1984–87 panels Sample: Men 55–64, initial workers	CPS: Probit for retiring during the past year SIPP: Retirement hazard *HI variable: continuation coverage*	One year of continuation coverage increases retirement hazard by 30 percent
Headen, Clark, and Ghent (1995)	Data: CPS August 1988 Sample: All men 55–64 and all women 55–64	Ordered probit for length of time retired *HI variable: 0/1 retiree HI*	Retiree HI increases probability of being retired by 6 percentage points
Madrian (1994)	Data: NMES (1987); SIPP 1984–86 panels Sample: Men 55–84, retired	Truncated regression for age at retirement; probit for retiring before 65 *HI variable: 0/1 retiree HI*	Retiree HI decreases age at retirement by one year; increases probability of retiring before 65 by 7.5 percentage points
Karoly and Rogowski (1994)	Data: SIPP 1984, 1986, and 1988 panels Sample: Men 55–62, initial civilian nongovernmental workers	Probit for retiring during SIPP panel *HI variable: imputed 0/1 retiree HI*	Retiree HI increases retirement hazard by 50 percent
Gustman and Steinmeier (1994a)	Data: RHS Sample: Men 58–63 in 1969 with data through 1979	Structural model of age at retirement *HI variable: imputed value of retiree HI*	Retiree HI delays retirement until age of eligibility, then accelerates it; overall, decreases

(*continued*)

Table 4.1 (continued)

Study	Data and Sample	Estimation	Results
			retirement age by 3.9 months
Lumsdaine, Stock, and Wise (1994a)	Data: Proprietary firm administrative data Sample: Men and women, initial workers	Structural model of age at retirement *HI variable: imputed value of Medicare*	Value of Medicare has little effect on age at retirement

ment History Survey (RHS), and the Health and Retirement Survey (HRS), all five of these studies estimate that retiree health insurance does encourage early retirement.

Two of the studies assess whether continuation of coverage mandates, which allow individuals to maintain their employer-provided health insurance for a limited period of time after retirement, have a similar impact on retirement (Gruber and Madrian 1995, 1996). Using data from the SIPP and the CPS, this research concludes that such mandates also encourage early retirement.

Only two studies focus on the role of Medicare in the retirement decision: Rust and Phelan (1997) and Lumsdaine, Stock, and Wise (1994a). Using data from the RHS on men without pensions, Rust and Phelan find that individuals with employer-provided health insurance that does not continue past retirement are much less likely to retire than those who have other forms of health insurance (including retiree health insurance) or no health insurance; this effect, however, is smaller after age 65, when these individuals become eligible for Medicare, than before. Overall, they conclude that Medicare explains almost all of the excess spike in the retirement hazard at age 65 after the financial incentives associated with social security have been accounted for.

Using administrative data from a single large employer, Lumsdaine et al. reach the opposite conclusion—that Medicare has little effect on retirement. This result is surprising given the consistent results from the previously mentioned studies suggesting that other forms of health insurance are important factors in deciding when to retire. It is difficult, however, to extend the conclusions in Lumsdaine et al. to the population as a whole because the firm that employed all of the individuals in their data set provided postretirement health insurance benefits. With the opportunity to continue their employer-provided health insurance after retirement, it is not surprising that Medicare would not affect the retirement decisions of these particular individuals.

4.2.2 The Role of Medicare in the Retirement Decision

What role should Medicare play in the retirement decision? The answer depends on a variety of factors. While Medicare has several features that distin-

guish it from the health insurance policies typically provided by employers or in the private market, there are three characteristics that are important in assessing its effect on retirement. The first is eligibility. All individuals, whether retired or not, are eligible for Medicare on reaching age 65. As mentioned earlier, although the age of Medicare eligibility corresponds to the social security normal retirement age, there is no corresponding early accessibility to Medicare if individuals choose to start receiving their social security benefits early, between the ages of 62 and 65 (although some individuals younger than 65 may also receive Medicare coverage if they are eligible for disability benefits).

A second feature distinguishing Medicare from many other insurance plans is that there are no exclusions for preexisting conditions; all medical conditions are covered from the first day of eligibility onward, whether or not individuals have previously sought treatment for these conditions. A third characteristic of Medicare that differentiates it from other forms of health insurance is that coverage is available *only to individuals.* There is no provision allowing for coverage of spouses, children, or other dependents of individuals who are themselves eligible for Medicare coverage.

The interaction between these characteristics of the Medicare program and the availability of employer-provided health insurance for active employees as well as retirees implies that Medicare will have different effects on the retirement decisions of individuals depending on their own health insurance and family situations. For individuals working in jobs that do not provide health insurance, there is no health insurance loss from early retirement. While these individuals may welcome Medicare coverage, it should not affect their retirement decisions; they will receive Medicare on turning 65 regardless of when they retire from their jobs.

Similarly, individuals who work for employers that do provide health insurance for their active employees and who have the option of maintaining this health insurance when they retire should not have their retirement decisions affected by Medicare. Their health insurance situation will be the same whether or not they are retired, both before age 65, when they have access to employer-provided health insurance, and after, when they have access to both Medicare and employer-provided health insurance.

The individuals who should possibly have their retirement decisions affected by Medicare are those who have employer-provided health insurance while employed but who do not have access to employer-provided retiree health insurance on retirement. For these individuals, retiring before age 65 may involve a loss or change in health insurance coverage. To the extent that losing one's employer-provided health insurance is costly, these individuals have an incentive to postpone retirement until age 65. If, however, these individuals have dependents, then retirement, even at age 65, will involve a loss of health insurance coverage for some members of the family. Such individuals

Table 4.2 **Health Insurance Coverage of Non–Medicare-Eligible Women (percent)**

	Husband's Age	
Health Insurance	Below 65	65 or Above
Private	83.5	80.0
Employer provided	74.5	52.1
Other group	1.2	5.8
Nongroup	6.0	22.4
Medicare	0.7	4.3
Medicaid	2.0	1.7
CHAMPUS	10.5	11.5
No health insurance	12.0	14.5

Source: Authors' calculations using data from the 1987 National Medical Expenditure Survey.

may thus find it in their interest to further postpone retirement until their family members can be covered by other forms of health insurance.

Table 4.2 illustrates the differences in the sources of health insurance coverage for women not yet categorically eligible for Medicare stratified on the basis of whether their husbands are younger or older than age 65. Although non–Medicare-eligible wives of Medicare-eligible husbands are only slightly more likely to be uninsured than wives of non–Medicare-eligible husbands (14.5 percent vs. 12.0 percent), the sources of their health insurance coverage are very different. They are much *less* likely to be covered by employer-provided group health insurance (52.1 percent vs. 74.5 percent) and much *more* likely to be covered by private nongroup health insurance (22.4 percent vs. 6.0 percent). These numbers suggest that a significant fraction of women lose access to employer-provided group health insurance when their husbands retire. Many are able to substitute nongroup health insurance coverage. However, this may be quite costly (especially if individuals have preexisting conditions), and there are likely many women who would find themselves without health insurance except for the fact that their husbands continue to work after age 65 in order to maintain coverage for their wives.

4.2.3 Identifying the Effect of Medicare on Retirement

The discussion above suggests that one possible identification strategy that could be used to estimate the effect of Medicare on retirement is to compare the retirement behavior of three groups of individuals: (1) those whose employers do not provide health insurance, (2) those whose employers provide health insurance to both active employees and retirees, and (3) those whose employers provide health insurance to active employees but not to retirees. If maintaining health insurance coverage is valuable, then, all other things equal, those in the third group should be least likely to retire before age 65. If Medi-

care provides coverage that is as valued as employer-provided health insurance, then after age 65 there should be no difference in the likelihood of being retired for these three groups.[1]

There are two problems with empirically implementing this identification strategy. The first is that there are no currently available longitudinal data sets that allow us to observe the type of health insurance available to individuals before they retire and to subsequently track their retirement behavior.[2] While the new HRS will make this type of analysis possible, it will not be feasible until more waves of the data have been released.

The second problem is that all other things are not equal for individuals in the three groups described above. In particular, firms that provide health insurance also tend to provide pensions, and pensions tend to have provisions that encourage retirement at particular ages. Thus, using individuals whose employers provide retiree health insurance as a "control" in assessing the retirement behavior of individuals whose employers provide health insurance but not retiree health insurance will not be valid unless it is possible to adequately account for the differential pension incentives that individuals in these two groups face. Once again, the HRS will allow for this type of analysis when sufficient waves of the data are available, but currently the only data sets with detailed pension information either come from a single firm (as used in several papers by Lumsdaine, Stock, and Wise) or do not also include adequate information on health insurance (as is the case with the Survey of Consumer Finances data used by Samwick, 1993).

Rust and Phelan circumvent this latter problem by restricting their sample to individuals who report having no pension. The earlier discussion on how Medicare should affect retirement suggests another possible identification strategy, however. Because Medicare is provided only to individuals and not to their dependents, there will still be a health insurance cost associated with retiring at age 65 if an individual has dependents who are covered by his or her employer-provided health insurance. Thus, we can determine whether Medicare has an effect on retirement by comparing the retirement behavior of individuals with and without dependents who obtain health insurance from that individual's employment.

Because the majority of individuals who provide health insurance to other

1. In fact, Medicare is much less generous than the typical employer-provided health insurance policy. Thus, there may still be some value in maintaining one's employer-provided health insurance even after becoming eligible for Medicare.

2. The RHS does include some information on health insurance coverage. Rust and Phelan (1994) and Gustman and Steinmeier (1994a) have used these data to infer what type of health insurance coverage was available to individuals before they retired. Gustman and Steinmeier, however, have substantially lower health insurance coverage rates than found in data sets typically cited as sources of health insurance coverage such as the NMES or the SIPP. In contrast, Rust and Phelan have coverage rates than are substantially higher for their subset of the population than is found in these other sources. Thus, the health insurance data in the RHS appear to be somewhat unreliable.

family members are men, this paper focuses on the retirement behavior of men. Although some older men nearing the age of retirement still have dependent children at home, most do not. The majority, however, are married. The identification strategy used in this paper will be to compare the retirement behavior of men who have spouses older than age 65 and are thus already eligible for Medicare with the retirement behavior of men whose spouses are not yet eligible for Medicare.

Consider a simple specification for the retirement hazard of an individual covered by employer-provided health insurance that does not continue into retirement:

$$\begin{aligned} \Pr(\text{Retire}_t \mid \text{Not retired}_{t-1}) &= \alpha\,(\text{Demographic characteristics}) \\ &+ \beta\,(\text{Own financial incentives}) \\ &+ \gamma\,(\text{Spouse's financial incentives}) + \varepsilon \end{aligned} \tag{1}$$

The function $\alpha(\cdot)$ may contain such factors as age, health status, marital status, education, and other things that would affect the value of leisure. The function $\beta(\cdot)$ includes financial variables that directly affect one's retirement:

$$\beta_1 \cdot \begin{pmatrix} \text{Social} \\ \text{security} \end{pmatrix} + \beta_2 \cdot \begin{pmatrix} \text{Private} \\ \text{pension} \end{pmatrix} + \beta_3 \cdot \begin{pmatrix} \text{Medicare} \\ \text{eligibility} \end{pmatrix} + \beta_4 \cdot \begin{pmatrix} \text{Other} \\ \text{wealth} \end{pmatrix}. \tag{2}$$

$\beta(\cdot)$ could also include other factors such as an individual's earning capacity. Recent research suggests that both the level of pension and social security wealth and expected future accruals affect retirement. The function $\gamma(\cdot)$ would include a similar vector of variables for the individual's spouse that may also impact the individual's retirement decision: the social security and pension incentives that encourage one spouse to retire at a particular age may also provide liquidity that enables the other spouse to retire as well; similarly, whether a spouse is eligible for Medicare will affect the amount of wealth that can be used to finance nonhealth consumption during retirement in the same way that an individual's own Medicare eligibility does.

Because Medicare eligibility coincides with the social security normal retirement age for most individuals, and with the normal retirement age of many private pension plans, it is difficult to separately identify β_1, β_2, and β_3 in equation (2) above. Similarly, if a spouse has worked and also qualifies for a pension or social security in her own right, it will be difficult to separately identify γ_1, γ_2, and γ_3. There is, however, a nontrivial fraction of older women who have never participated in the labor force. For men married to these women, there are no financial benefits associated with a wife's retirement that would also encourage their own retirement. If a woman has never worked, she can only claim social security benefits based on her husband's earnings, and

she can only do so *after* her husband begins to claim benefits himself. In this case, $\gamma_1 = \gamma_2 = 0$ and the effect of a spouse's Medicare eligibility, γ_3, can be identified.

If men value health insurance coverage of themselves and their wives equally, then $\gamma_3 = \beta_3$ and the effect of own Medicare eligibility is identified as well. If men value their own health insurance coverage more than that of their wives, then γ_3 will provide a lower bound on the effect of own Medicare eligibility on retirement.

Note that this identification strategy is essentially based on the spouse's age since, with the exception of those with disabilities, eligibility for Medicare occurs at age 65. Thus, all other things equal, retirement rates should be higher among men with wives who are age 65 or older than among men with wives who are younger than 65.

4.3 Data

We use data from the 5 percent public use samples of the 1980 and 1990 censuses. The primary advantage of census data is that they afford a large sample size. This is particularly important given the identification strategy outlined above based on whether a spouse is eligible for Medicare. Figure 4.1 shows the distribution of the differences between husband's age and wife's age in the census. Over half of the men in figure 4.1 have spouses who are the same age or between one and four years younger than themselves. Because the distribu-

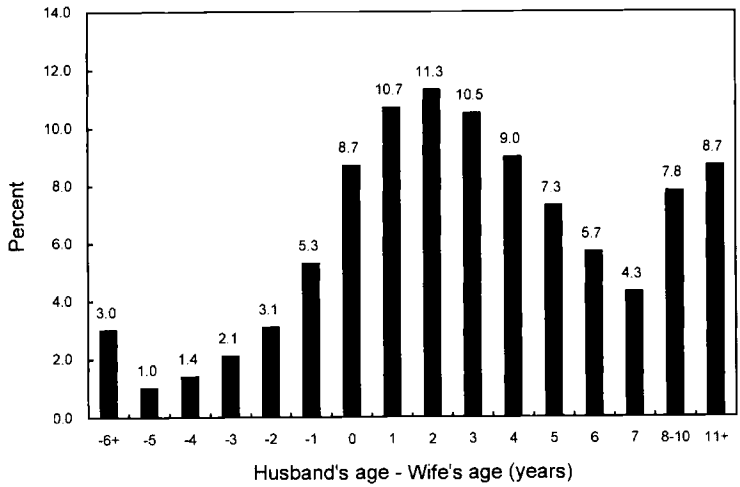

Fig. 4.1 Distribution of spousal age differences: men aged 55–69
Source: Authors' calculations using the 5 percent public use samples from the 1980 and 1990 censuses.

tion of spouse's age relative to own age is so compressed, a big data set like the census allows us to exploit a broader range of variation in spouse's age. The disadvantage of the census is that it includes no information on health insurance coverage. It is therefore impossible to compare the retirement probabilities of those with and without health insurance in order to see whether, as predicted, the effect of Medicare on retirement is confined to those who actually did have employer-provided health insurance before retirement. This, however, should bias us *against* finding an effect of Medicare on retirement since we will essentially be estimating the average of no effect among those without employer-provided health insurance or with retiree health insurance and whatever effect may exist for those with employer-provided health insurance.

The census also does not contain information on pension benefits or expected social security benefits. Rather than impute the values of these variables for individuals, we exclude them from the estimation and assume that spouse's age is uncorrelated with these factors which, by exclusion, become a part of the error term, ε. To us, this does not seem like an unreasonable assumption. We find it unlikely that men who married in their 20s and 30s chose a spouse of a specified age based on their tastes for retirement. It is more likely the case that divorce and later remarriage could be correlated with tastes for retirement or other unobserved factors such as pension benefits. For example, men with extremely generous pension benefits may be more likely to attract "trophy" spouses. We will assume, however, that these effects are small.

Spouse's age may, however, be correlated with who is in the sample. In particular, retirement-aged men who had at one time married women much older than themselves will be more likely to be widowers because their spouses are already deceased. These men will thus be excluded from the sample (divorce will cause a similar type of sample selection problem). This exclusion will be on the basis of spouse's age. As long as the assumption that spouse's age is exogenous is valid, however, this will merely result in a thinning of the sample for men with older wives. The estimates will be less precise, but they will not be biased.

The sample is restricted to married men with a spouse in the data set. We further restrict the sample to men whose wives are no more than 15 years older or 20 years younger than themselves. The restriction is imposed because, beyond this range, the cell sizes are quite small and we do not want the estimation to be driven by a few outliers. Overall, our census sample includes approximately 800,000 individuals. Summary statistics on these individuals are presented in table 4.3.

The definition of retiring in the last year is being currently out of the labor force but having worked one or more weeks in the previous calendar year. In the census, "the last year" represents a 16-month window since the census is conducted in April and the work question is asked about the previous calendar year. Using this definition, 14.4 percent of our sample retired in the last "year."

Table 4.3 **Summary Statistics**

Statistic	Value
Sample size	799,069
Race	
White	91.6%
Nonwhite	8.4
Education	
Less than high school	34.1
High school graduate	29.5
Some college	16.5
College graduate	19.9
Retired in last year (if worked last year)	14.4
Age	60.4
Age of wife	57.1
Spouse never worked	7.5

Source: Authors' tabulations using data from the 5 percent public use samples of the 1980 and 1990 censuses. Sample is all married men aged 55–69 who worked at least one week in the previous calendar year and whose spouses are not more than 15 years older or 20 years younger than themselves.

4.4 Estimating the Effect of Medicare on the Probability of Being Retired

4.4.1 Basic Results

We begin in table 4.4 by simply tabulating the retirement hazards for men whose wives are not Medicare eligible (wife's age < 65) and for those whose wives are Medicare eligible (wife's age ≥ 65). The smallest cell size is 654 for individuals who are age 55 and have a wife older than age 65. These estimates, therefore, are fairly reliable. As would be expected, the retirement hazard is small for men still in their 50s and increases quite substantially at ages 62 and 65. The typical spikes in the retirement hazard at ages 62 and 65 are not as pronounced in the census data because the definition of retirement is one that occurred within the past 16 months and the age in the table is current age rather than age at the start of this 16-month period. Thus, the retirement hazard of individuals initially aged 61 will be spread out over 62- and 63-year-olds in the table.

The retirement hazards in table 4.4 are, as we would predict, higher at all ages for those whose wives are eligible for Medicare. The absolute percentage point differential between these two hazards (the last column) appears roughly constant at about 3 or 4 percentage points. Although these results are suggestive that Medicare eligibility does encourage retirement, one could expect similar results for other reasons. For example, if women face greater financial incentives to retire at older ages and these financial rewards also make it easier for their husbands to retire, then conditional on own age, men with older wives

Table 4.4 **Retirement Hazard by Age and Wife's Medicare Eligibility**

	Wife's Age		
Age	Below 65 (1)	65 or Older (2)	Difference (1) − (2)
55	0.0468	0.0780	0.0312
56	0.0515	0.0958	0.0443
57	0.0563	0.0880	0.0317
58	0.0625	0.0903	0.0278
59	0.0700	0.0995	0.0295
60	0.0936	0.1390	0.0454
61	0.1075	0.1359	0.0284
62	0.2170	0.2859	0.0689
63	0.2254	0.2737	0.0483
64	0.2139	0.2423	0.0284
65	0.3154	0.3484	0.0330
66	0.3131	0.3425	0.0294
67	0.2915	0.3249	0.0334
68	0.2892	0.3334	0.0442
69	0.3025	0.3419	0.0394

Source: Authors' tabulations using data from the 5 percent public use samples of the 1980 and 1990 censuses. Sample is all married men aged 55–69 who worked at least one week in the previous calendar year and whose spouses are not more than 15 years older or 20 years younger than themselves.

will be more likely to retire. Alternatively, men may value their own leisure time more if their wives are retired, and this too will make husbands more likely to retire if their wives are older and more likely to be retired (for a discussion of joint retirement issues, see Hurd 1990; Gustman and Steinmeier 1994b; Blau 1994, 1995). Or, to the extent that continued work competes with the amount of time that men can spend with their wives before the health problems incumbent with age set in, men with older wives will be more likely to retire than men with younger wives. By stratifying the sample on the basis of whether wife's age is greater or less than 65, one would find a pattern of results similar to those in table 4.4 even if it were not Medicare eligibility per se but one of these other reasons that also implied that having an older spouse leads to earlier retirement.

One way to gauge the importance of these alternative explanations is to look at the pattern of retirement rates associated with spouse's age. Consider the following general specification for a retirement hazard that incorporates all three of the above explanations:

$$(3)\quad \Pr(\text{Retire}_t|\text{Not retired}_{t-1}) = \alpha\begin{pmatrix}\text{PDV}\\ \text{assets}\end{pmatrix} + \beta\begin{pmatrix}\text{Spouse not}\\ \text{working}\end{pmatrix} + \gamma\begin{pmatrix}\text{Age of}\\ \text{spouse}\end{pmatrix} + \varepsilon.$$

A spouse's ineligibility for Medicare will operate through the $\alpha(\cdot)$ function above, affecting the retirement hazard by decreasing the present discounted value (PDV) of assets that can be used to finance nonhealth consumption. If the discount rate is positive and the relationship between assets and retirement is linear, then, conditional on own age, the effect of spouse's age on the retirement hazard will be as pictured in figure 4.2A. Before the spouse reaches age 65, the retirement hazard should decline as the spouse is younger and has successively more years before becoming eligible for Medicare. The rate of de-

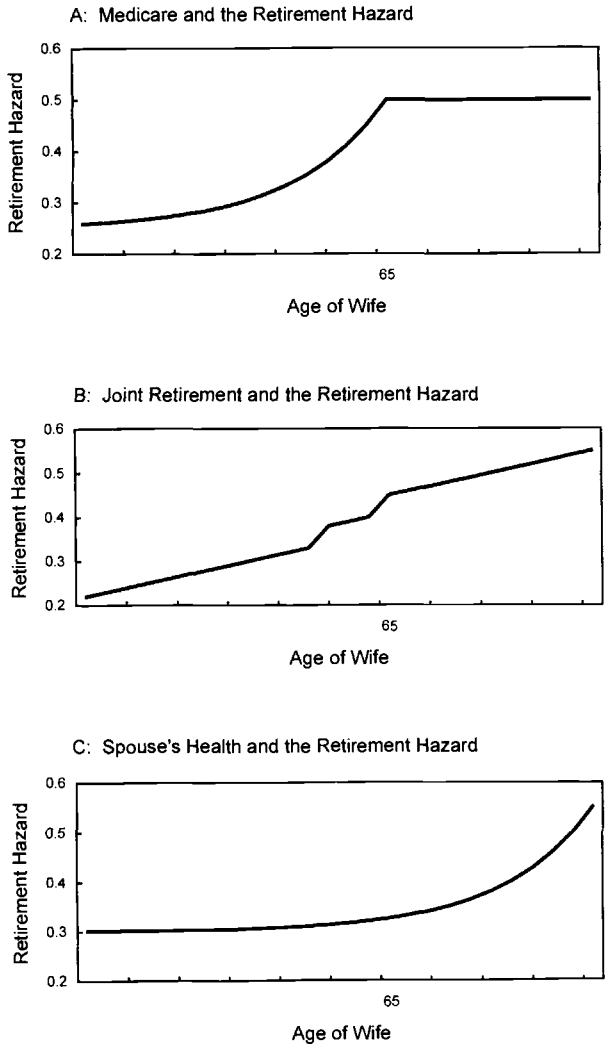

Fig. 4.2 Factors affecting the retirement hazard

cline should slow, however, as expected medical and/or insurance expenditures in the future are discounted. After the spouse is 65, however, there is no further health insurance cost in terms of leaving the spouse without employer-provided health insurance; thus, the hazard rate should not change with spouse's age after the spouse reaches age 65.

Joint retirement considerations will affect the retirement hazard through the $\beta(\cdot)$ function in equation (3). If they are the primary force behind the retirement hazard's increasing with spouse's age, we should see a steady increase in retirement probabilities as the spouse gets older and is herself more likely to retire. We might expect to see especially large increases as the spouse reaches ages 62 and 65 and faces the incentives associated with social security that increase the retirement hazard at these ages (see fig. 4.2B). To the extent that most women have already retired by age 65, the joint retirement hypothesis would not be inconsistent with a constant hazard after the spouse has reached age 65; if there are continued incentives for women to retire after age 65, however, and enough women are still working at this age, then the joint retirement explanation should be associated with increasing retirement hazards with respect to spouse's age even after the spouse is age 65.

Finally, the $\gamma(\cdot)$ function in equation (3) characterizes the effect of spouse's health on retirement. If it is spouse's health that is driving the results in table 4.4, then the retirement hazard should be increasing at an *increasing* rate in spouse's age, as shown in figure 4.2C, as health becomes progressively worse (and mortality more likely) with age.

To examine which of these alternatives appear to be borne out in the data, figure 4.3 graphs the retirement hazards of men at various ages against the

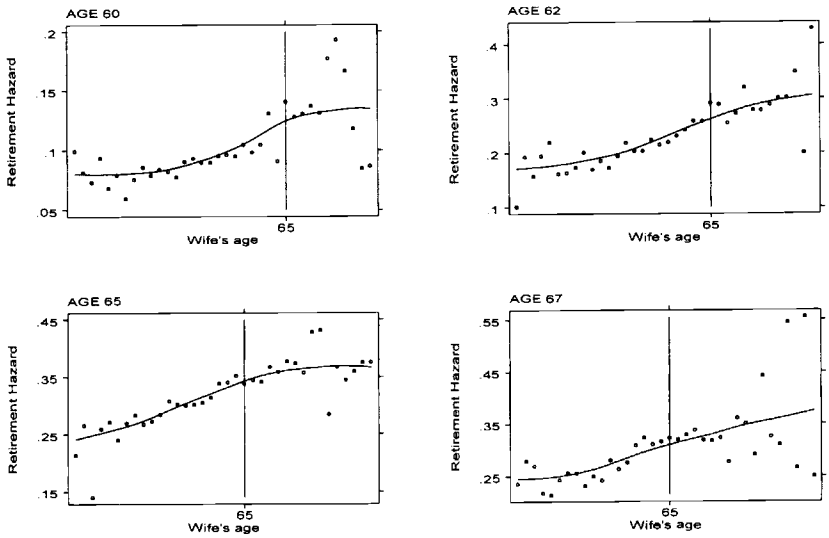

Fig. 4.3 Retirement hazard by wife's age

differences between their ages and their spouses' ages (the ages shown in fig. 4.3 are 60, 62, 65, and 67).[3] The circles in the graph give the actual retirement rates calculated from the 1980 and 1990 censuses for each age difference. The vertical line gives the age at which the wife becomes eligible for Medicare; thus, this line shifts to the right as the age considered in the graph increases. The line drawn through the circles in the graph is a nonparametric weighted smoothed mean (with bandwidth = 0.7). This smoothing was done to decrease the noise in the retirement rates in the tails of the age difference distribution.

The graphs for ages 60, 62, and 65 show a pattern not inconsistent with that in figure 4.2A: roughly constant for spouses older than 65 and decreasing at a decreasing rate with spouse's age less than 65. None of the graphs gives any suggestion of the retirement pattern in figure 4.2C that would prevail if spousal health concerns were a predominant consideration in retirement decisions. None of the graphs is completely inconsistent with the joint retirement hypothesis.

We can parameterize the patterns shown in figure 4.3 with the following regression:

$$\begin{aligned}\Pr(\text{Retire} \mid \text{Not retired}_{t-1}) = {} & \beta_1 \cdot \underline{\text{Age}} + \beta_2 \cdot \underline{\text{Age}} \\ & * [\ln(65 - \text{Wife's Age}) \mid \text{Wife} < 65] \\ & + \beta_3 \cdot \underline{\text{Age}} * (\text{Wife} \geq 65) + \beta_4 \cdot \underline{\text{Age}} \\ & * (\text{Wife's Age} - 65).\end{aligned} \tag{4}$$

In this regression, Age is a vector of age dummies and the coefficient vector β_1 will give a baseline retirement hazard for each age. The second term, [ln(65 − Wife's Age) | Wife < 65], equals zero if wife's age is 65 or older and equals the log of (65 − Wife's Age) if wife's age is less than 65. This term is meant to capture the decreasing retirement hazard with respect to wife's age for wives younger than 65 shown in figure 4.2A. The third term is a dummy variable for whether or not wife's age is 65 or older. Finally, the fourth term is the preceding dummy variable interacted with the difference between wife's age and age 65 for Medicare-eligible women. The coefficient β_4 will thus measure whether there is any slope in the retirement hazard with respect to wife's age for men with wives older than 65. Note that the last three terms in equation (4) are all interacted with the vector of age dummies so that each variable will be associated with a vector of coefficients for each age between 55 and 69.

Table 4.5 presents the coefficients from estimating equation (4) using ordinary least squares. The regression coefficients tell a story similar to that of figure 4.3. The vector of constant terms, β_1, increases with age and exhibits the familiar spikes at both age 62 and age 65. The β_2 coefficients are all nega-

3. Note that these are not mutually exclusive arguments for why men with older wives are more likely to be retired. Indeed, there are men who probably make retirement decisions for all of the reasons suggested.

Table 4.5 **Effect of Spouse's Age and Medicare Eligibility on Retirement**

	Independent Variable			
Age	Constant (β_1)	ln(65 − Wife's Age) if Wife < 65 (β_2)	Wife ≥ 65 (β_3)	Wife's Age − 65 if Wife ≥ 65 (β_4)
55	.0704	−.0094	.0074	.0002
	(.0080)	(.0031)	(.0205)	(.0083)
56	.0775	−.0107	.0074	.0058
	(.0075)	(.0030)	(.0190)	(.0067)
57	.0740	−.0075	.0074	.0032
	(.0069)	(.0029)	(.0157)	(.0049)
58	.0871	−.0110	−.0108	.0063
	(.0063)	(.0027)	(.0142)	(.0041)
59	.0947	−.0115	.0017	.0013
	(.0056)	(.0026)	(.0123)	(.0033)
60	.1210	−.0135	.0161	.0007
	(.0052)	(.0025)	(.0108)	(.0026)
61	.1431	−.0187	−.0164	.0038
	(.0048)	(.0024)	(.0086)	(.0023)
62	.2747	−.0326	.0075	.0016
	(.0042)	(.0023)	(.0082)	(.0020)
63	.2705	−.0278	−.0101	.0057
	(.0040)	(.0029)	(.0074)	(.0017)
64	.2453	−.0211	−.0042	.0006
	(.0038)	(.0023)	(.0065)	(.0016)
65	.3619	−.0337	−.0221	.0044
	(.0039)	(.0024)	(.0059)	(.0014)
66	.3551	−.0321	−.0150	.0012
	(.0044)	(.0028)	(.0061)	(.0013)
67	.3302	−.0305	−.0090	.0016
	(.0050)	(.0033)	(.0065)	(.0013)
68	.3356	−.0372	−.0156	.0052
	(.0060)	(.0038)	(.0071)	(.0012)
69	.3382	−.0287	.0010	.0009
	(.0066)	(.0044)	(.0079)	(.0011)

Source: Authors' calculations using data from the 5 percent public use samples of the 1980 and 1990 censuses. Sample is all married men aged 55–69 who worked at least one week in the previous calendar year and whose spouses are not more than 15 years older or 20 years younger than themselves. The sample size is 799,069, and the $R^2 = 0.219$.

tive and significant (with t-statistics ranging from 2.6 to 14.4) and increase in magnitude with own age from roughly −.010 for ages less than 60 to −.030 for ages greater than 65. These coefficients confirm the hypothesis that at all ages men with wives not yet eligible for Medicare are less likely to retire the younger are their spouses. We might also expect the magnitude of the coefficients to increase with age as spouse's lack of Medicare eligibility should have a greater absolute effect on the retirement hazard for men who themselves have

a greater likelihood of retiring. The β_3 and β_4 coefficients in table 4.5 show no strong patterns, change in sign, and are generally insignificant (only 6 of the 30 coefficients have *t*-statistics exceeding 2 in magnitude). These results suggest that the retirement hazard is roughly constant with respect to wife's age once the wife is 65 or older and eligible for Medicare.

4.4.2 Alternative Explanations

Although the lack of a slope in the retirement hazard with respect to spouse's age greater than 65 is consistent with Medicare eligibility's playing an important role in retirement decisions, it is not, as mentioned earlier, completely inconsistent with a joint retirement story. This explanation for the patterns in the retirement hazard, however, relies on the premise that the wife is or at one time was working. If the effects presented in table 4.5 derive only from the financial rewards associated with the wife's collection of social security and/or pension benefits before age 65 or other joint retirement considerations, they should be confined to those men who have wives who have a history of labor force participation and there should be no effect among men whose wives have never worked. That is, in the specification of the retirement hazard in equation (4), the function $\beta(\cdot)$ will have no differential impact by spouse's age.

Because the census collects data on work history, this comparison is possible. Fortunately, a large enough fraction of the cohorts of men aged 55–69 in 1980 and 1990 had wives who reported never having worked (about 8 percent), so the comparison is feasible as well. Table 4.6 gives the retirement hazards shown in table 4.4 for the subsample of men whose wives never worked. As before, the hazards for those with spouses older than 65 tend to be greater than the hazards for those with spouses younger than 65. The wife older than 65 hazard and the differential (last column) is somewhat more noisy for those whose spouses have never worked because this stratification breaks even the census into somewhat small cell sizes for those at young ages who have Medicare-eligible spouses. For the older ages, however, the results suggest that even among those who have never worked, having a Medicare-eligible spouse increases the retirement hazard. The differential is on average smaller for those whose spouses have never worked than for those whose spouses have worked, suggesting that some of the effects in table 4.4 can perhaps be attributed to joint retirement or other considerations associated with having a spouse older than oneself.

Table 4.7 presents the regression coefficients of table 4.5 for the subsample of men whose wives never worked. The baseline retirement rate, β_1, is slightly higher for this subsample of men than for the full sample. The effect of having a spouse not yet eligible for Medicare (β_2) is, as in table 4.5, always negative, although at younger ages the coefficients are not significant. This is due in part to a significantly smaller sample, and to the fact that the coefficient estimates bounce around a little more. The overall pattern of coefficients, however, is very similar to that in table 4.5—increasing and becoming more significant

Table 4.6 **Retirement Hazard by Age and Wife's Medicare Eligibility if Spouse Never Worked**

	Wife's Age		
Age	Below 65 (1)	65 or Older (2)	Difference (1) − (2)
55	0.0656	0.0517	−0.0139
56	0.0713	0.1045	0.0332
57	0.0784	0.0722	−0.0062
58	0.0772	0.0598	−0.0174
59	0.0861	0.0943	0.0082
60	0.1092	0.1759	0.0667
61	0.1295	0.1368	0.0073
62	0.2582	0.2914	0.0332
63	0.2582	0.3152	0.0570
64	0.2447	0.2764	0.0317
65	0.3579	0.3931	0.0352
66	0.3708	0.3721	0.0013
67	0.3135	0.3530	0.0395
68	0.3269	0.3515	0.0246
69	0.3505	0.3778	0.0273

Source: Authors' calculations using data from the 5 percent public use samples of the 1980 and 1990 censuses and the 1980–94 March Current Population Survey. Sample is all married men aged 55–69 who worked at least one week in the previous calendar year and whose spouses are not more than 15 years older or 20 years younger than themselves.

with age. Similarly, the vectors of β_3 and β_4 coefficients are also similar to those in table 4.5: they jump around in magnitude, they change sign, and they are generally insignificant. Restricting the sample to men whose wives have never worked thus yields results very similar to those obtained from the full sample of men.

4.5 Conclusions

While we hesitate to draw strong conclusions about the effect of Medicare eligibility on retirement behavior because the census data used in the analysis are less than ideal, we think that the results presented in the paper are suggestive that Medicare may indeed influence the retirement decisions of men. Our main findings are as follows: (1) 55–69-year-old men with Medicare-eligible spouses have a higher retirement hazard than men without Medicare-eligible spouses. (2) The retirement hazard exhibits a pattern with respect to spouse's age that is consistent with what would be expected if Medicare were an important consideration in the retirement decision. It is inconsistent with a story that other factors more generally related to spouse's age, such as a spouse's health status, are strong determinants of retirement as the retirement hazard appears to be roughly constant after the spouse reaches age 65 rather than generally

Table 4.7 **Effect of Spouse's Age and Medicare Eligibility on Retirement if Spouse Never Worked**

	Independent Variable			
Age	Constant (β_1)	ln(65 − Wife's Age) if Wife < 65 (β_2)	Wife ≥ 65 (β_3)	Wife's Age − 65 if Wife ≥ 65 (β_4)
55	.0815	−0.0063	−.0130	−.0114
	(.0351)	(.0138)	(.0781)	(.0338)
56	.0970	−.0105	.0620	−.0253
	(.0338)	(.0137)	(.0770)	(.0242)
57	.0839	−.0023	−.0238	.0053
	(.0309)	(.0129)	(.0648)	(.0187)
58	.1169	−.0177	−.0642	.0028
	(.0274)	(.0120)	(.0581)	(.0146)
59	.1078	−.0101	−.0361	.0080
	(.0248)	(.0113)	(.0516)	(.0121)
60	.1199	−.0053	.0219	.0141
	(.0215)	(.0103)	(.0422)	(.0107)
61	.1502	−.0110	−.0251	.0045
	(.0189)	(.0096)	(.0362)	(.0083)
62	.3236	−.0377	−.0219	−.0040
	(.0167)	(.0091)	(.0309)	(.0069)
63	.2899	−.0200	−.0112	.0149
	(.0161)	(.0094)	(.0278)	(.0061)
64	.2790	−.0238	.0080	−.0050
	(.0144)	(.0089)	(.0244)	(.0058)
65	.3856	−.0208	−.0161	.0115
	(.0144)	(.0094)	(.0213)	(.0047)
66	.3943	−.0195	−.0266	.0022
	(.0151)	(.0104)	(.0210)	(.0045)
67	.3655	−.0441	−.0418	.0130
	(.0180)	(.0137)	(.0229)	(.0042)
68	.3490	−.0200	−.0059	.0032
	(.0195)	(.0143)	(.0239)	(.0037)
69	.3976	−.0434	−.0294	.0031
	(.0232)	(.0173)	(.0271)	(.0034)

Source: Authors' calculations using data from the 5 percent public use samples of the 1980 and 1990 censuses. Sample is all married men aged 55–69 who worked at least one week in the previous calendar year and whose spouses are not more than 15 years older or 20 years younger than themselves. The sample size equals 59,731 and $R^2 = 0.263$.

increasing. (3) The pattern of effects is approximately the same when the sample is confined to men whose wives have never worked. This latter group of men cannot be affected by any financial considerations inducing their wives to retire. Furthermore, having a nonworking spouse cannot differentially impact the retirement hazard with respect to spouse's age of this group because their wives have never worked. The most plausible explanation for the pattern

of retirement effects exhibited by this latter group is the Medicare eligibility of their wives. Because the effects are similar for the whole population of men regardless of spouse's work history, it is likely that Medicare is also an important determinant of retirement for all men.

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Comment

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This paper addresses a question at the intersection of two important areas of economic and policy research, the economic effects of health insurance and the retirement behavior of older workers. Because health care use increases with age, it makes sense that the particulars of a worker's health care situation will have a substantial impact on his or her retirement decisions. Moreover, to the extent that Medicare eligibility affects the timing of retirement, policy proposals that would change the age of Medicare eligibility could have significant effects on the ages of retirement. Quantifying these interactions is of evident importance both to those interested the economics of aging and to Medicare policy analysts.

Before proceeding to the particulars of Madrian and Beaulieu's empirical analysis, it is useful to lay out the central economic issues of the effect of Medicare on retirement. As discussed by Madrian and Beaulieu, there is now a well-developed literature on the retirement behavior of individuals. It is well established that economic incentives have significant and, importantly, predictable effects on retirement rates. For example, defined benefit plans typically induce spikes in retirement hazards at ages of eligibility and at ages in which the present value of benefits increase sharply. Because Medicare can be thought of as another retirement benefit, in light of this literature it would be quite surprising were Medicare eligibility *not* to have an effect on retirement. Rather, the relevant economic and policy question is whether Medicare is valued by potential retirees at more than its marginal cost to the government, or at more than its private replacement cost were retirees instead to purchase health insurance on the private market. This is not implausible if individuals are risk averse about changing medical coverage or if they are unable to obtain suitable coverage because of exclusions on preexisting conditions. If a dollar of government spending on Medicare is valued more on the margin than a dollar of government spending on social security, then it would be welfare improving to reduce social security expenditures and increase Medicare expenditures.

Results already in the literature can be used to obtain a rough estimate of the effect of Medicare on retirement rates at age 65. Consider a couple with employer-provided health insurance, and suppose that private insurance for the couple costs $6,500 in 1995 dollars. If the couple values Medicare at this private replacement cost, then the availability of Medicare corresponds to an accrual of retirement benefits of $6,500 when the couple becomes eligible for Medicare. Although the estimates of the effects of a $6,500 accrual on retirement differ depending on the couple's other benefits and on the model used, a typical estimate can be obtained from the retirement models in table 4 of

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Lumsdaine, Stock, and Wise (1993), which predicts an increase in the retirement hazard by between 3 and 6 percentage points. This corresponds to approximately one-fifth to one-third of the jump in retirement hazards observed at age 65, depending on the data set. One question thus is whether Medicare eligibility in fact produces an increase in retirement rates greater than those predicted by current structural models of retirement. If so, this would be evidence either that the models are misspecified or that individuals value Medicare at more than its private replacement cost.

With these general remarks in mind, now turn to the particulars of Madrian and Beaulieu's paper. In contrast to the parametric, structural model approaches pursued by most papers on retirement, Madrian and Beaulieu take a more nonparametric approach. The thought experiment is to find two otherwise identical couples, one who will bear costs of medical insurance and one who will be eligible for some Medicare coverage. To implement this strategy empirically, one would like to have data on pensions, wages, and social security benefits, by individual. However, these variables are not observed in Madrian and Beaulieu's data set, so additional assumptions are needed to identify the effect of Medicare.

To examine the identification strategy more precisely, it is useful to refer to the authors' initial equation linking the retirement hazard to demographic characteristics, the man's financial incentives, his spouse's financial incentives, and other determinants (the error term). As Madrian and Beaulieu point out, if the spouse has never worked, then the spouse's financial incentives will be restricted to Medicare, which is strictly linked to her age. Present value calculations suggest a particular functional form for the effect on the man's retirement of this benefit as a function of spouse's age. If, furthermore, the difference between husband's age and spouse's age is uncorrelated with any of the man's (unmeasured) financial incentives, then estimation of hazard functions involving this spouse's age effect should reveal the effect of Medicare.

This is a clever idea, and surely some of what it measures is related to the effect of Medicare. One unmeasurable effect is, however, the benefits a couple would get from joint retirement, both financial (possibly some cost reductions, or from moving) and, arguably more important, nonfinancial. It stands to reason that, all else equal, the older the spouse the more likely the husband is to choose retirement, simply so the couple can enjoy their retirement together. Presumably this effect is also nonlinear in both of their ages, although the precise form of the nonlinearity is presumably hard to determine.

It is useful to contemplate a hypothetical data structure that would permit controlling for this joint retirement effect. One would be if some spouses were randomly assigned to be Medicare eligible, while some spouses were randomly denied eligibility; this random assignment would need to be done far enough in advance for the couple to incorporate it into their retirement planning. Thinking of this approach makes it clear that Medicare eligibility has two effects: the direct subsidy at a certain age, but also the disincentive effect

on savings, so that in a world without Medicare individuals would have different preretirement asset profiles. Both these effects will impact the decision to retire.

In summary, Madrian and Beaulieu's idea of quantifying the effect of Medicare eligibility using nonparametric comparisons is appealing, and the evidence they present is consistent with the view that Medicare provides a significant incentive for retirement. Some of the challenges to achieving identification arise from data limitations in the census, and these will be reduced with new data sets with greater information about retirement decisions that will soon become available. However, some of these difficulties are inherent in the nonfinancial issues surrounding joint retirement.

The set of issues surrounding health insurance and retirement are of central importance for analyzing the impact of current policy proposals such as postponing the date of Medicare eligibility and cutting back Medicare and/or social security funding. Related is whether individuals value the marginal Medicare expenditure at more than it costs the government to provide, in which case a dollar taken out of social security would arguably be more acceptable to the elderly than a dollar taken out of Medicare, all else equal. I look forward to seeing further work by Madrian and Beaulieu and others addressing these important problems.

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