Volume Title: Frontiers in the Economics of Aging

Volume Author/Editor: David A. Wise, editor

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-90304-4

Volume URL: http://www.nber.org/books/wise98-1

Publication Date: January 1998

Chapter Title: Health Events, Health Insurance, and Labor Supply: Evidence from the Health and Retirement Survey

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Chapter URL: http://www.nber.org/chapters/c7304

Chapter pages in book: (p. 301 - 350)

7 Health Events, Health Insurance, and Labor Supply: Evidence from the Health and Retirement Survey

Mark McClellan

7.1 Introduction

The economic consequences of health problems are reported to be enormous. For example, many investigators have concluded that the cost to society of common health problems such as heart disease, diabetes, and cancer is many billions of dollars per year in terms of lost work productivity, intensive medical treatments, and additional supportive care. However, these estimates have several important limitations. Few data sets have incorporated detailed information on health problems and economic circumstances such as retirement, medical and personal care expenditures, income, and wealth. Consequently, most existing studies have had to combine data from different sources, possibly missing important correlations between variables such as insurance availability and the occurrence of health problems. Many of these studies have been based on cross-sectional, descriptive comparisons of individuals with and without health problems. As a result, it is difficult to account for other differences besides health problems that might also have affected these outcomes. For example, individuals with health problems may have had chronically worse health status, or have lower-income backgrounds, or have other differences in preferences that might have led to differences in economic outcomes anyway.

Addressing these limitations of prior data for studying health and economic behavior was a major motivation for the new Health and Retirement Survey (HRS), which completed its third wave of longitudinal interviews in 1996 (Juster and Suzman 1995). Early analyses of the relatively detailed information on both health and economic outcomes collected in the HRS has already provided

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The author thanks Loren Mell for outstanding research assistance and the National Institute on Aging and the Olin Foundation for financial support. All errors are his own.

many new insights into the relationship between health status and economic outcomes (see, e.g., Bound, Schoenbaum, and Waidmann 1995). As more waves of the survey become available, the HRS promises to become an even richer foundation for understanding the interaction between health and economic outcomes.

This study uses the first two waves of the HRS to provide insights into how changes in health status affect two issues of considerable policy interest: health insurance coverage and labor supply for middle-aged Americans. These topics are linked for many reasons. The principal source of health insurance coverage for HRS respondents is private insurance, and the vast majority of private insurance coverage is obtained through employment (Employee Benefit Research Institute 1995). Indeed, the availability of health insurance coverage for middle-aged Americans with health problems, and the related problems of "job lock" or "retirement lock," has been the subject of considerable recent economic research (Gruber and Madrian 1995, 1996; Blau and Gilleskie 1997). Second, health insurance availability and the labor supply of household members in the event of health impairments are key determinants of households' capacity to smooth consumption of all other goods and services (Deaton 1992; Morduch 1995).

In addition, the methods that might be used to study both questions are similar and illustrate some of the opportunities and problems that arise in the analysis of complex questions with relatively rich data sets such as the HRS. Health problems are not "treatments" or policies that can be varied for individuals, so it may be difficult to develop methods that isolate the "effect" of health. This study uses difference-in-differences methods to examine the effects of changes in health on insurance coverage and labor supply. The amount of detail about respondents' health and economic characteristics may make it easier to identify such effects convincingly. These details also present new challenges in modeling the effects of multidimensional factors such as health status on complex decisions such as labor supply and insurance coverage.

7.2 Health Capital in Theory and Practice

Most economic studies of the consequences of health begin with a model of an individual's health capital. In Grossman's classic formulation (Grossman 1972), an individual chooses his or her investment in behaviors that influence health based on the investment's impact on discounted expected utility. Adverse health events are depreciations or negative investments in health, and they are not fully predictable. When a health change occurs, it may affect utility through many mechanisms: through its impact on individual productivity, through its impact on the utility received from consumption of various goods and services, and through its impact on the time available to enjoy these goods and services. For example, an adverse health event may either reduce or increase labor supply. If the event reduces an individual's marginal utility of in-

come—for instance, if the individual is no longer able to enjoy relatively expensive consumption activities such trips abroad or dinners out, or if the event reduces expected survival time—then it will tend to reduce labor supply. On the other hand, if the event increases an individual's marginal utility of income—for instance, because of increased demand for medications or supportive care—then it will tend to increase labor supply. The direct effects of adverse health events on an individual's productivity may cause labor supply changes in either direction, depending on the relative magnitudes of the substitution and income effects of the resulting wage change.

This discussion suggests that different kinds of changes in health may have substantially different consequences for economic behavior. Many prior studies have been unable to distinguish these different kinds of effects because the measures of health status and changes in health status available have been limited (for a review of this earlier work, see Sammartino 1987). For example, some studies of retirement have examined the impact of a single overall measure of health status—"good" versus "bad" health—and have found that bad health is a strong predictor of retirement. Yet, depending on the underlying health problems involved, an individual's overall assessment of bad health today may not be a very good guide to the consequences of the adverse health state for an individual's consumption demands, work productivity, or expected survival time.

More recent studies have examined the impact of impairments in an individual's functional capabilities on labor supply (Stern 1989; Gertler and Gruber 1997). Yet such disability-based studies do not easily capture the behavioral consequences of health events through their impact on preferences and on expectations about future health. The development of diabetes, for example, may have no consequences at all for functional status today and possibly for a number of years to come, but it may have substantial implications for an individual's demand for many types of goods and services as well as survival time.

The behavioral consequences of health events also depend on government policies and past individual actions that provide various kinds of insurance against the consequences of adverse health events for consumption. For example, an extensive literature has examined the consequences of disability insurance and the eligibility for government-provided health insurance that may accompany it for both employee reports of health status and employee responses to the development of health problems (Bound 1989, 1991; Parsons 1980, 1991; Gruber 1996). Fewer studies have examined the actual consequences of health events for health insurance coverage: When adverse health events do occur, are individuals able to retain insurance coverage, and if so how? Does the availability of insurance differ across different kinds of health problems?

For these reasons, I focus on health problems per se, rather than disability or a single summary measure of an individual's current health state. Health problems are extremely diverse. Osteoarthritis of the knees, compressed inter-

vertebral discs in the back, and coronary heart disease all have potentially different implications for an individual's demand for particular medical services and other services now and in the future, as well as potentially different implications for current and future functional capabilities. Moreover, each of these problems may vary greatly in severity, both from the standpoint of functional implications and from the standpoint of effects on demand. Additionally, different types of health problems may have different implications for the availability of insurance coverage. Unfortunately, no available data set has information on both health and economic variables and is large enough to permit detailed analysis of particular health problems. Consequently, feasible analysis of health changes requires aggregation across particular kinds of health problems.

This analysis aggregates health problems in two major dimensions. The first dimension is the extent to which the health event may lead to significant functional impairments *now*. For example, previous studies found small labor supply effects of new health conditions, particularly chronic health problems, in contrast to strong effects of functional status impairments (see, e.g., Gertler and Gruber 1997). Because of the possible consumption and life expectancy effects, as well as possible insurance eligibility effects, new health problems that do not result in functional impairments may either increase or decrease labor supply. These countervailing effects may explain why net effects on labor supply appear to be small. To address this concern, the second dimension considers the chronicity of the health problem, that is, the extent to which it is likely to remain present if not progress. As described in more detail below, this framework results in three broad classes of health problems: major health events, which frequently have major acute and long-term functional implications; new chronic illnesses, which are less likely to affect functional status dramatically today but which may have substantial long-term implications; and accidents, which may result in temporary or even permanent acute functional impairments but otherwise would be expected to have little long-term impact on preferences or future health expectations. Finally, to distinguish the effects of new health problems on expectations about consumption demands from their effects on work productivity, I consider the differential effects of new health problems that are and are not associated with current functional impairments.

This analysis presents preliminary results on the effects of new health events. It considers the economic factors that are associated with the development of new health problems, mainly to illustrate the baseline differences between individuals who do and do not experience health events. The analysis then considers the consequences of these health events for insurance coverage and labor supply for three different types of individuals: males in couples, females in couples, and single females. These three groups make up the bulk of the HRS-age population in the United States, and their different household resources and economic circumstances suggest that their responses to new

health problems may differ substantially, depending on the nature of the problem and the extent of functional impairment involved.

7.3 Data and Preliminary Comparisons by Health Status Changes

Of the original sample of 12,756 individuals in wave 1 of the HRS, 229 individuals died before wave 2 and 1,160 individuals did not participate in the wave 2 survey. An additional 794 respondents were dropped for the following reasons: deaths (229 wave 1 respondents), nonintact households between the two waves, households with two members of the same sex, households with missing family status variables, and households with capital income over $1 million.

Measures of baseline respondent characteristics, health, functional status, health insurance, pension eligibility, labor supply, income, wealth, and changes in most of these variables between the first and second survey waves (approximately two years apart) were derived from the HRS wave 1 beta and wave 2 alpha survey releases. These variables are described in more detail elsewhere (see, e.g., Smith 1995; Wallace and Herzog 1995; and related papers). Tables 7.1 through 7.3 summarize these measures for three different groups: males in couples (tables 7.1A, 7.2A, and 7.3A, including 4,244 paired couples and 138 males whose spouses did not participate), females in couples (tables 7.1B, 7.2B, and 7.3B, including 4,244 paired couples and 214 females whose spouses did not participate), and single females (tables 7.1C, 7.2C, and 7.3C; 1,293 respondents).[1] The small sample size for single males (594 individuals) precludes any detailed analysis of health events for that group.

The tables report averages for each household group, both overall and by the occurrence of each type of health event. Three broad categories of health events were constructed. *Major health events* are serious diseases that often have substantial immediate and long-term effects on health status. These major events include heart attacks, which may be fatal or lead to subsequent heart failure; strokes, which may result in substantial neurologic impairments; and new diagnoses of cancer. While cancer itself involves chronic progression, cancer treatments—including surgery but especially systemic treatments such as chemotherapy and radiation therapy—commonly have a substantial impact on well-being in the months after diagnosis. Individuals who experience these major events are also at elevated risk of further health complications from these conditions in the future. *Chronic illnesses* are diseases that typically result in progressive loss of function of an organ system, and that may place the individual at increased risk for a range of major health events as well. They include diabetes, lung diseases (e.g., chronic obstructive pulmonary disease or asthma), arthritis, back pain, or heart failure. Typically, these illnesses result

1. Results for the three types of households are presented in all tables in this paper except table 7.4: males in couples (A tables), females in couples (B tables), and single females (C tables).

in only limited functional impairments initially, but they may result in more substantial impairments over time. *Accidents* are defined in the HRS wave 2 survey as occurrences of "accident or injury" since wave 1.[2] While accidents may result in substantial temporary functional impairments and possibly long-term impairments as well, in general they do not result in progressive deterioration over time, and they have only limited direct implications for an individual's future health prognosis.

A fourth type of health problem sometimes considered in studies of older populations is *frailty,* health impairments not associated with specific diseases of any organ system but rather with the result of gradual degeneration of the functional capacity of multiple systems. While frailty is a major concern in studies of the older elderly, it is likely to be rare among HRS respondents during the period of study.[3] Thus, no measures of frailty are constructed for the analyses presented here. Finally, *mental illnesses* are also important sources of functional impairments and potentially of adverse economic consequences, but they present special issues in characterizing new diagnoses and associated functional impairments and are not considered here because of space limitations. Though information on mental illnesses in the HRS is limited, similar methods could in principle be applied to study them.

Following many previous studies of the consequences of impairments in functional status (see, e.g., Smith and Kington 1997), I summarize the many dimensions of physical functioning in a unidimensional index. The index is obtained by constructing a raw functional status score based on one point for a minor impairment and two points for a major impairment in each of the following 11 dimensions of activities of daily living: walking across the room; walking several blocks; climbing one flight of stairs without resting; climbing several flights of stairs without resting; lifting or carrying a weight of over 10 pounds; pushing or pulling large objects (such as a living room chair); picking up a dime from a table; stooping, kneeling, or crouching; getting in and out of bed without help; bathing or showering without help; and eating without help. After the initial scores were constructed for respondents in each wave, they were converted to an index with a 0–100 scale using the formula[4]

$$100 \times (\text{respondent's score})/(\text{highest score} - \text{lowest score}).$$

Table 7.1 shows that the rates of new health events differ across the population groups. For males in couple households, approximately 28 percent of respondents had at least one health event during the two-year period between

2. A separate question asked about head injuries leading to unconsciousness in particular; it was not included in this definition. A total of 72 respondents in the entire survey said "no" to the injury question and "yes" to the head injury question.

3. E.g., well under 1 percent of HRS respondents had been admitted to a nursing home for a prolonged period, and even fewer reported such chronic degenerative diseases as dementia.

4. In both waves, the lowest raw functional status score was zero and the highest was 22 (the highest possible score).

Table 7.1A **Respondent Characteristics for Couple Males**

Characteristic	All Respondents	Male Health Event Occurrence					
		None	All Types	Major Event	Chronic Illness	Accident	Death
Sample size	4,364	3,134	1,230	276	837	233	93
(%)	(100%)	(71.8%)	(28.2%)	(6.3%)	(19.2%)	(5.3%)	
Age[a]	57.1	56.9	57.6	59.1	57.4	56.4	60.1
	(4.7)	(4.6)	(4.8)	(4.9)	(4.7)	(4.5)	(6.2)
White	84.5	85.1	83.0	85.2	82.0	83.3	83.1
Black	8.0	7.9	8.1	8.0	8.0	6.8	13.2
Latino	5.5	5.1	6.5	5.1	7.2	7.7	3.4
Education in years[a]	12.5	12.6	12.1	11.9	11.9	12.3	11.3
	(2.9)	(2.8)	(3.0)	(2.8)	(3.1)	(2.9)	(2.9)
		Male Health and Functional Status					
History of major health event	13.7	11.2	20.0	39.1	20.3	11.5	52.6
History of chronic illness	58.0	56.8	61.0	74.8	56.4	70.1	75.9
Wave 1 functional status index[a]	6.5	5.5	9.1	14.9	9.4	7.6	24.4
	(10.8)	(9.6)	(12.9)	(15.9)	(13.2)	(12.5)	(18.6)
Change in functional status index[a]	−0.55	−1.3	1.3	3.4	1.4	1.8	
	(8.4)	(7.0)	(10.9)	(14.5)	(10.6)	12.5)	
		Male Social Security and Pension Eligibility					
Participation in social security	93.4	93.3	93.7	93.3	92.8	95.4	94.7
Participation in private pension	57.6	57.1	59.0	53.1	58.5	65.3	44.9

[a]Numbers in parentheses are standard deviations.

Table 7.1B **Respondents Characteristic for Couple Females**

Characteristic	All Respondents	Female Health Event Occurrence					
		None	All Types	Major Event	Chronic Illness	Accident	Death
Sample size	4,370	3,237	1,133	153	808	245	37
(%)	(100%)	(74.1%)	(25.9%)	(3.5%)	(18.5%)	(5.6%)	
Age[a]	53.2	53.0	53.7	54.9	53.7	52.9	54.3
	(5.0)	(5.1)	(4.9)	(4.7)	(4.9)	(4.8)	(4.8)
White	84.5	85.1	82.8	84.6	81.8	83.4	72.2
Black	7.9	7.6	8.7	5.9	9.4	9.4	18.6
Latino	5.6	5.3	6.6	7.4	7.0	4.9	7.2
Education in years[a]	12.4	12.5	12.1	11.6	11.9	12.5	10.6
	(2.4)	(2.3)	(2.5)	(2.3)	(2.6)	(2.1)	(2.4)
		Female Health and Functional Status					
History of major health event	9.9	9.0	12.7	29.5	11.1	13.5	56.7
History of chronic illness	57.1	57.1	57.3	70.0	53.9	63.3	72.2
Wave 1 functional status index[a]	9.2	8.5	11.4	16.4	11.5	11.1	30.7
	(10.9)	(10.2)	(12.6)	(14.5)	(12.5)	(13.6)	(16.0)
Change in functional status index[a]	−1.5	−2.2	0.75	4.0	0.84	0.39	
	(8.7)	(7.6)	(11.1)	(13.5)	(10.4)	(13.7)	
		Female Social Security and Pension Eligibility					
Participation in social security	89.2	89.5	88.1	87.3	87.5	88.8	91.8
Participation in private pension	51.9	51.8	52.0	48.6	51.9	52.4	46.2

[a]Numbers in parentheses are standard deviations.

Table 7.1C **Respondent Characteristics for Single Females**

		Health Event Occurrence					
	All Respondents	None	All Types	Major Event	Chronic Illness	Accident Death	
Sample size	1,293	882	411	63	288	112	27
(%)	(100%)	(68.2%)	(31.8%)	(4.8%)	(22.3%)	(8.7%)	
Age[a]	55.8	55.8	55.8	56.5	56.2	54.9	56.1
	(2.8)	(2.9)	(2.7)	(2.8)	(2.6)	(2.8)	(2.6)
White	68.6	70.7	63.7	67.3	61.7	64.1	59.7
Black	21.9	20.5	25.1	24.6	25.8	24.9	34.3
Latino	6.7	5.9	8.6	7.0	8.9	9.4	3.0
Education in years[a]	12.1	12.2	11.6	11.3	11.5	11.6	11.5
	(2.7)	(2.6)	(2.7)	(2.7)	(2.8)	(2.4)	(1.7)
		Health and Functional Status					
History of major health event	14.0	13.1	16.1	32.7	18.0	15.5	49.3
History of chronic illness	67.5	65.6	72.0	91.8	67.1	76.7	79.1
Wave 1 functional status index[a]	13.3	12.0	16.5	27.3	16.1	18.4	28.8
	(13.8)	(13.3)	(14.4)	(17.6)	(14.0)	(16.1)	(16.6)
Change in functional status index[a]	−0.81	−1.9	1.6	5.7	1.4	1.3	
	(9.8)	(8.4)	(12.0)	(14.8)	(12.2)	(10.9)	
		Social Security and Pension Eligibility					
Participation in social security	92.6	92.4	93.0	96.5	94.0	90.3	88.1
Participation in private pension	55.8	54.7	58.6	71.3	53.3	60.2	59.3

[a]Numbers in parentheses are standard deviations.

waves 1 and 2. These events consisted of major acute events in 6.3 percent, new chronic illnesses in 19.2 percent, and accidents in 5.3 percent. Approximately 26 percent of couple females had health events, including major acute events in 3.5 percent, new chronic illnesses in 18.5 percent, and accidents in 5.6 percent. Health event rates were higher among single females. Almost 32 percent of single females had events, consisting of major acute events in 4.8 percent, new chronic illnesses in 22 percent, and accidents in 8.7 percent. Around 2 percent of both males and females in couples had health events in more than one category, and around 4 percent of single females had health events in more than one category.

7.3.1 Respondent Demographic Characteristics, Health Characteristics, and Pension Eligibility

In all three groups, individuals who have major acute events are somewhat older than average, and individuals who have accidents tend to be younger. Education levels were lower for virtually all health event groups. Most respondents also had a history of health problems at the beginning of the survey. For example, 58 percent of males reported at least one chronic health problem in wave 1, and 14 percent had experienced previous major health events. Among females in couples, 57 percent had chronic health problems in the baseline interview, and 10 percent had experienced major health events. The baseline health status of single females was worse: 68 percent had chronic health problems, and 14 percent had prior major health events.

Table 7.1 shows that the occurrence of different types of health events is at least weakly correlated with most of these individual characteristics. For all three groups, individuals who experienced major health events were slightly older (over one year older on average for couples, and 0.8 years older on average for single females), less educated, and significantly more likely to have had health problems and worse functional status at baseline. Individuals in couples who developed new chronic illnesses were also slightly older and less educated—though differences in these respects were more modest than for major health events—and had slightly worse baseline functional status. In contrast, single females with new chronic illnesses were slightly younger than average, perhaps because the baseline prevalence of chronic problems in this group was significantly higher to begin with. For all groups, individuals experiencing accidents were somewhat younger than those who did not have accidents but also had worse baseline health status compared to those who remained healthy between the two survey waves.

Table 7.1 begins to illustrate the consequences of health events by presenting average changes in functional status. For respondents with no new health events, functional status improved slightly on average (-1.3 points for couple males, -2.2 points for couple females, and -1.9 points for single females), so that average reported functional status for the whole sample actually improved slightly between waves 1 and 2. Health events were associated with significantly different trends in functional status. Individuals experiencing major

health events reported declines in function on average. For females, the difference in trends compared to those without health events was around +6 to +7 points; for males, the difference in trends was around +5 points. The tables also confirm that the development of chronic illness is less likely to be associated with substantial decrements in function between the survey waves: while the trends are worse compared to those without health events, the difference in trends is only around +2 to +3 points. Similarly, accidents are also associated with small increases in functional impairment on average.

Finally, table 7.1 reports some general summary information on pension eligibility for each of the health status groups. Approximately 93 percent of couple males and single females are eligible for or expect to receive social security benefits, and a slightly lower percentage of couple females report current or future social security eligibility. These fractions do not differ much across the health event groups. Current or future private pension eligibility differs somewhat more across the health groups. For example, among couple males, approximately 53 percent of respondents with major health events and 65 percent of respondents with accidents report that they expect pension benefits at some time in the future. Somewhat fewer women report private pension eligibility, with similar correlations across the health event groups.

7.3.2 Health Insurance

Table 7.2 reports information on health insurance coverage and changes in health insurance coverage for the different health status groups. Baseline rates of insurance coverage were lower for both single and couple females than for males. They were slightly lower for males with health events compared to those without health events. Reflecting baseline health status, however, the sources of baseline health insurance coverage differed substantially between the groups. Males with health events were significantly less likely to be covered by private insurance (especially private insurance with retirement benefits) and were much more likely to be covered by Medicare (25 percent of those who experienced major events and 13 percent of those with new chronic illnesses, compared to 9 percent of those without health events). Couple females who had health events were much less likely to be covered by Medicare or Medicaid at baseline, and their coverage rates with private insurance were only slightly lower than those for couple females without health events. On the other hand, single females with health events had considerably lower private insurance coverage rates at baseline, and significantly higher rates of Medicare and especially Medicaid coverage.[5] These tabulations suggest that a relatively large portion of major health events for couple males and for single females involve government health insurance programs, while private insurance cover-

5. Some of the Medicare coverage, particularly for males, is the result of age eligibility for Medicare. For example, approximately 6 percent of male respondents in wave 1 and 9 percent of respondents in wave 2 were age 65 or older, and approximately 12 percent with major health events in wave 1 and 16 percent with major health events in wave 2 were age 65 or older. Elderly individuals are omitted from the regressions in tables 7.5 through 7.8 below.

Table 7.2A **Health Insurance Coverage Rates for Couples by Male Health Event Status**

Coverage	All Respondents	Male Health Event Occurrence: None	All Types	Major Event	Chronic Illness	Accident
		Male Health Insurance				
Uninsured at wave 1	8.4	8.2	9.0	9.5	9.1	10.9
Private with retirement health insurace at wave 1	51.6	52.8	48.5	40.8	48.7	49.6
Private, no retirement health insurance at wave 1	27.3	27.9	26.0	19.7	26.1	27.2
Medicare insurance at wave 1	10.4	9.2	13.3	24.7	13.5	7.7
Medicaid insurance at wave 1	0.51	0.38	0.83	1.5	0.88	0.27
Change in uninsured	−1.7	−1.5	−2.4	−6.3	−2.0	−1.8
Change in private with retirement health insurance	−0.81	−0.67	−1.2	−0.95	−0.39	−1.1
Change in private, no retirement health insurance	−3.5	−3.2	−4.3	−5.9	−4.3	−2.4
Change in Medicare insurance	5.4	4.8	6.9	10.3	6.2	4.2
Change in Medicaid insurance	0.47	0.31	0.88	1.3	0.73	0.55
		Female Health Insurance				
Uninsured at wave 1	10.7	10.1	12.3	16.0	11.8	15.5
Private with retirement health insurance at wave 1	53.9	54.7	51.8	50.6	52.1	49.9
Private, no retirement health insurance at wave 1	30.6	31.0	29.7	26.3	29.9	28.8
Medicare insurance at wave 1	2.3	2.0	3.0	2.6	3.1	2.2
Medicaid insurance at wave 1	1.1	0.89	1.6	2.8	1.6	1.9
Change in uninsured	−1.5	−1.3	−2.0	−3.9	−1.7	−3.5
Change in private with retirement health insurance	1.6	1.7	1.4	1.5	0.48	2.7
Change in private, no retirement health insurance	−1.9	−2.0	−1.4	−2.7	−0.88	−0.71
Change in Medicare insurance	1.8	1.9	1.4	1.6	1.7	0.70
Change in Medicaid insurance	0.14	0.08	0.29	0.96	0.04	0.00

Table 7.2B **Health Insurance Coverage Rates for Couples by Female Health Event Status**

Coverage	All Respondents	Female Health Event Occurrence			
		None	All Types	Major Event	Chronic Illness	Accident
		Female Health Insurance				
Uninsured at wave 1	10.9	10.8	11.1	13.3	12.0	10.5
Private with retirement health insurance at wave 1	53.6	54.1	52.3	49.1	52.1	54.8
Private, no retirement health insurance at wave 1	30.9	31.2	30.0	28.8	28.9	29.0
Medicare insurance at wave 1	2.2	1.7	3.7	5.7	4.0	3.3
Medicaid insurance at wave 1	1.1	0.93	1.6	1.5	1.6	1.8
Change in uninsured	−1.5	−1.4	−2.0	−4.9	−1.6	−2.7
Change in private with retirement health insurance	1.5	1.3	2.0	0.65	1.4	2.1
Change in private, no retirement health insurance	−1.8	−1.4	−3.0	−5.4	−2.4	−4.0
Change in Medicare insurance	1.8	1.5	2.8	5.9	2.2	2.8
Change in Medicaid insurance	0.18	0.15	0.28	4.0	0.40	0.26
		Male Health Insurance				
Uninsured at wave 1	8.4	8.3	8.8	8.7	9.7	8.9
Private with retirement health insurance at wave 1	50.9	50.9	51.1	50.0	50.1	54.0
Private, no retirement health insurance at wave 1	27.8	28.2	26.5	23.9	25.5	25.6
Medicare insurance at wave 1	10.5	10.4	10.7	14.8	10.9	8.7
Medicaid insurance at wave 1	0.51	0.51	0.51	0.42	0.49	0.51
Change in uninsured	−1.7	−1.5	−2.2	−1.8	−2.5	−2.9
Change in private with retirement health insurance	−0.87	−0.45	−2.1	−3.6	−1.6	−4.8
Change in private, no retirement health insurance	−3.6	−3.7	−3.3	−3.4	−3.3	−1.5
Change in Medicare insurance	5.5	5.1	6.7	5.5	6.2	8.5
Change in Medicaid insurance	0.47	0.27	1.1	2.7	1.3	0.26

Table 7.2C **Health Insurance Coverage Rates for Single Females**

Coverage	All Respondents	Health Event Occurrence				
		None	All Types	Major Event	Chronic Illness	Accident
Uninsured at wave 1	16.4	16.7	15.7	12.1	15.9	19.8
Private with retirement health insurance at wave 1	39.2	39.8	37.6	38.6	35.3	39.8
Private, no retirement health insurance at wave 1	28.5	29.9	25.2	18.1	26.9	18.8
Medicare insurance at wave 1	5.9	4.9	8.0	7.3	8.1	9.8
Medicaid insurance at wave 1	8.0	6.2	11.9	20.6	12.5	10.2
Chane in uninsured	−0.69	−0.55	−1.0	−2.4	−0.53	−1.3
Change in private with retirement health insurance	−0.60	−0.39	−1.1	−4.7	−2.6	−3.2
Change in private, no retirement health insurance	−1.3	−1.5	−0.63	−5.9	−0.66	−1.3
Change in Medicare insurance	3.0	2.4	4.2	15.8	6.0	2.7
Change in Medicaid insurance	−0.41	−0.32	−2.1	−3.6	−2.4	−1.0

age (in many cases involving a spouse's employer) is more important for couple females who experience health events.

Differences in changes in insurance coverage between wave 1 and wave 2 provide further insights into the availability of insurance coverage for different types of new health events. For males experiencing health events, uninsurance rates declined slightly, so that 7 percent of males with and without health events reported no insurance coverage in wave 2 despite the slightly higher baseline uninsurance rate for the group with health events. The decline was substantial for males with major health events: the insurance rate increased by 6 percent, so that 4 percent were uninsured at wave 2. This increase in insurance coverage occurred despite a substantial decline in coverage by private insurance without retirement benefits (a reduction of 6 percent, compared to a reduction of only 3 percent for couple males with no health events). The reduced private insurance coverage was entirely offset by increases in Medicare and, to a lesser extent, primary Medicaid coverage. For couple males with chronic illnesses and accidents, coverage trends did not differ much from those for males with no health events.

The magnitude of differences in insurance coverage changes for females experiencing health events was somewhat smaller across the groups, compared to males. Couple females with health events had a decline in uninsurance rates slightly greater than that reported for females without events, and as with males the decline was particularly large for females with major health events. Also as with males, the decline occurred despite some reduction in coverage through private insurance that did not provide retirement benefits, because of increased coverage by Medicare and Medicaid. Medicare and Medicaid were also relatively important sources of increased insurance coverage among couple females with new chronic illnesses or accidents. For single females, increased Medicare coverage was particularly important in maintaining high insurance rates, especially for those with major health events. Finally, table 7.2A also shows that insurance coverage for female spouses of males with health events improved slightly over time, again because of relative increases in Medicare and Medicaid coverage.

7.3.3 Respondent Labor Supply, Income, and Wealth

Table 7.3 summarizes baseline labor supply, income, and wealth, as well as average changes in these economic variables, for the same groups presented in tables 7.1 and 7.2. The baseline differences across the groups in wave 1 are largely as expected from the demographic and health differences reported in table 7.1. Individuals who experienced health events were significantly less likely to be working in wave 1, and they were more likely to report being retired.[6] In part as a result of the lower work hours, their labor earnings

6. Note that a substantial number of individuals who report zero hours also report that they are not retired.

Table 7.3A **Labor Supply, Income, and Wealth for Couples by Male Health Event Status**

		Male Health Event Occurrence				
	All Respondents	None	All Types	Major Event	Chronic Illness	Accident
		Male Labor Supply (%)				
Working >1,200 hours/year at wave 1	68.5	70.9	62.4	45.7	61.3	74.7
Working ≤1,200 hours/year at wave 1	5.3	5.3	5.2	4.4	5.2	4.4
Working zero hours at wave 1	26.2	23.8	32.4	49.9	33.4	20.9
Self-reported retirement at wave 1	20.6	19.2	24.2	36.2	23.7	14.5
Change in working >1,200 hours/year	−7.4	−6.3	−10.2	−17.3	−7.8	−9.3
Change in working ≤1,200 hours/year	0.9	1.0	0.8	−0.9	0.8	1.1
Change in working zero hours	6.5	5.3	9.4	18.3	7.0	8.2
Change to self-reported retirement	11.0	10.7	11.7	14.6	9.7	9.6
		Female Labor Supply (%)				
Working zero hours at wave 1	38.7	38.2	39.8	43.2	38.8	41.2
Change to working zero hours	3.7	3.2	4.9	6.1	3.7	3.6
		Household Income[a]				
Male labor income at wave 1	33,059	34,307	29,844	23,621	28,170	33,984
	(42,174)	(42,186)	(42,027)	(45,952)	(38,878)	(37,794)
Female labor income at wave 1	12,803	13,048	12,170	11,434	12,426	11,470
	(14,765)	(15,144)	(13,740)	(12,450)	(13,929)	(13,507)

Nonlabor income at wave 1	18,718	18,610	18,995	20,330	19,134	15,967
	(33,508)	(35,651)	(27,309)	(24,257)	(28,962)	(22,073)
Total household income at wave 1	64,579	65,966	61,009	55,384	59,729	61,421
	(56,902)	(58,337)	(52,963)	(52,524)	(52,160)	(45,354)
Change in male labor income	−5,047	−4,505	−6,444	−6,899	−4,876	−8,165
	(44,076)	(42,816)	(47,128)	(35,448)	(49,806)	(37,865)
Change in female labor income	−200	−529	647	−414	1,203	767
	(15,313)	(13,259)	(19,583)	(11,575)	(22,654)	(10,193)
Change in nonlabor income	10,214	10,083	10,550	8,179	9,224	12,380
	(50,632)	(50,568)	(50,813)	(46,020)	(48,780)	(52,915)
Change in total household income	4,966	5,049	4,754	867	5,551	4,982
	(66,172)	(66,463)	(65,451)	(57,096)	(70,142)	(41,710)
		Household Wealth[a]				
Housing assets at wave 1	109,511	112,154	102,704	84,333	98,057	107,311
	(97,207)	(96,776)	(98,081)	(70,914)	(95,242)	(105,232)
Nonhousing assets at wave 1	214,478	228,810	177,569	132,840	181,432	145,815
	(479,985)	(510,181)	(390,985)	(340,039)	(411,761)	(249,796)
Household net worth at wave 1	302,188	320,657	254,628	197,280	254,262	227,555
	(529,828)	(564,794)	(425,336)	(375,456)	(441,206)	(299,595)

Note: Numbers in parentheses are standard deviations.

[a]In current dollars.

Table 7.3B **Labor Supply, Income, and Wealth for Couples by Female Health Event Status**

		Female Health Event Occurrence				
	All Respondents	None	All Types	Major Event	Chronic Illness	Accident
		Female Labor Supply (%)				
Working >1,200 hours/year at wave 1	50.1	51.0	47.2	40.9	44.6	53.9
Working ≤1,200 hours/year at wave 1	11.3	11.6	10.7	11.2	11.1	9.5
Working zero hours at wave 1	38.6	37.4	42.1	47.9	44.3	36.7
Self-reported retirement at wave 1	6.3	6.2	6.8	4.2	7.1	5.1
Change in working >1,200 hours/year	−3.2	−2.6	−5.1	−8.4	−4.8	−4.6
Change in working ≤1,200 hours/year	−0.7	−0.3	−1.8	−5.3	−1.9	−0.8
Change in working zero hours	3.9	2.9	6.9	13.7	6.7	5.4
Change to self-reported retirement	6.9	6.3	8.7	13.5	9.1	5.6
		Male Labor Supply (%)				
Working zero hours at wave 1	26.3	25.3	29.1	35.0	29.7	26.0
Change to working zero hours	6.5	6.5	6.4	5.3	5.4	9.9
		Household Income[a]				
Male labor income at wave 1	31,861	33,286	27,717	20,999	28,054	26,590
	(36,173)	(38,782)	(27,068)	(19,414)	(28,612)	(21,671)
Female labor income at wave 1	12,813	13,084	12,023	9,429	11,385	13,323
	(14,864)	(15,187)	(13,882)	(10,688)	(13,261)	(15,316)

Nonlabor income at wave 1	18,688	18,628	18,865	15,451	18,184	18,661
	(33,484)	(34,928)	(28,979)	(17,131)	(25,101)	(22,102)
Total household income at wave 1	63,362	64,999	58,604	45,879	57,623	58,574
	(52,242)	(54,832)	(43,764)	(27,092)	(42,360)	(34,509)
Change in male labor income	−4,384	−4,520	−3,987	−3,587	−4,047	−3,127
	(38,641)	(42,657)	(23,683)	(13,510)	(25,246)	(20,264)
Change in female labor income	−195	−15	−718	−909	−824	243
	(15,372)	(16,424)	(11,857)	(10,370)	(12,384)	(10,938)
Change in nonlabor income	9,910	10,097	9,367	10,242	8,296	15,634
	(50,321)	(50,256)	(50,524)	(39,796)	(42,007)	(67,929)
Change in total household income	5,332	5,563	4,662	5,746	3,425	12,660
	(63,678)	(65,788)	(57,246)	(39,873)	(50,904)	(71,306)
		Household Wealth[a]				
Housing assets at wave 1	108,238	110,497	101,670	86,804	94,858	112,335
	(96,014)	(99,133)	(86,264)	(64,427)	(73,799)	(100,414)
Nonhousing assets at wave 1	209,989	214,590	196,611	150,481	198,972	189,777
	(463,453)	(472,008)	(438,077)	(282,031)	(468,437)	(384,503)
Household net worth at wave 1	296,777	304,269	275,000	217,936	271,539	274,967
	(511,868)	(522,968)	(478,441)	(327,118)	(500,916)	(440,412)

Note: Numbers in parentheses are standard deviations.

[a]In current dollars.

Table 7.3C **Labor Supply, Income, and Wealth for Single Females**

	All Respondents	Health Event Occurrence				
		None	All Types	Major Event	Chronic Illness	Accident
		Labor Supply (%)				
Working >1,200 hours/year at wave 1	61.3	64.0	55.1	46.2	54.0	50.8
Working ≤1,200 hours/year at wave 1	6.5	6.8	5.9	3.5	5.7	7.1
Working zero hours at wave 1	32.2	29.2	39.0	50.3	40.2	42.1
Self-reported retirement at wave 1	6.6	7.5	4.7	5.8	3.7	8.4
Change in working >1,200 hours/year	−7.0	−6.2	−8.7	−10.5	−9.5	−3.9
Change in working ≤1,200 hours/year	0.7	1.4	−1.0	−3.5	−1.2	−1.9
Change in working zero hours	6.3	4.9	9.7	14.0	10.7	5.8
Change to self-reported retirement	6.8	6.8	6.8	4.7	7.1	5.2
		Household Income[a]				
Labor income at wave 1	16,066	16,770	14,453	10,819	13,205	15,376
	(13,803)	(14,423)	(12,281)	(10,768)	(11,764)	(12,738)
Nonlabor income at wave 1	12,646	12,443	13,110	12,690	14,236	11,484
	(19,185)	(17,995)	(21,537)	(22,710)	(22,992)	(14,461)

Total household income at wave 1	28,712	29,213	27,563	23,509	27,441	26,860
	(22,835)	(22,173)	(24,196)	(24,177)	(25,524)	(18,258)
Change in labor income	−1,362	−1,302	−1,498	−572	−1,731	−1,923
	(11,329)	(12,124)	(9,411)	(7,746)	(7,344)	(12,947)
Change in nonlabor income	596	1,262	−930	−1,454	−1,757	768
	(23,861)	(25,026)	(21,122)	(23,983)	(21,479)	(18,293)
Change in total household income	−766	−41	−2,428	−2,025	−3,488	−1,155
	(25,135)	(26,451)	(22,018)	(24,639)	(21,309)	(21,416)
		Household Wealth[a]				
Housing assets at wave 1	56,966	61,203	47,255	39,372	43,208	49,389
	(68,208)	(73,845)	(53,394)	(47,758)	(47,428)	(57,372)
Nonhousing assets at wave 1	58,818	60,155	55,753	32,233	66,920	27,507
	(135,361)	(129,900)	(146,531)	(74,211)	(169,217)	(50,612)
Household net worth at wave 1	102,666	110,542	84,617	58,625	92,521	57,627
	(167,608)	(166,400)	(169,438)	(101,758)	(191,571)	(81,002)

Note: Numbers in parentheses are standard deviations.

[a]In current dollars.

in wave 1 were lower as well. The differences were particularly striking for those who experienced major health events but were also notable for those with chronic illnesses. In contrast, baseline labor supply for those who experienced accidents was very similar to that for individuals without health problems.

Total household income was also lower for individuals with health events, despite some offset in some groups through greater nonlabor income. Again, differences were particularly striking for those with major health events: for couple males, total income was around $10,000 lower; for couple females, it was around $20,000 lower; and for single females, whose baseline income is less than half of that of couples, it was almost $6,000 lower. While baseline income differences are less pronounced for individuals with chronic diseases or accidents, the patterns are similar. Corresponding differences exist in baseline household assets, and especially in net worth. For example, the baseline household net worth for couple males with major health events was around $197,000 and for those with accidents was around $228,000, compared to $320,000 for those without any health events. Differences in income and wealth are more modest between females with health events and those without. Indeed, the income differences for the male spouses of couple females are larger than the differences for the females themselves. In general, a much larger share of females reported working zero hours but not being "retired," presumably reflecting their lower lifetime labor force participation rates. As with males, however, the proportion of individuals working zero hours but not reporting retirement is relatively larger for those experiencing health events.

The table also provides some preliminary insights into the association between the occurrence of health events and changes in labor supply and income. In particular, changes to zero hours and from not reporting retirement to reporting it are much higher for individuals with major health events. Moreover, there is a substantial difference in trends for actual work hours and in reported retirement for this group. For example, for couple males, 18 percent of those with major health events moved from positive to zero hours, but only 15 percent reported becoming "retired." In contrast, among those with no health events, 5 percent moved from positive to zero hours, but 11 percent reported becoming "retired." Generally, major health events had a much more pronounced effect on actual work hours than they did on reported retirement status. Indeed, for single females, a smaller share with major health events reported "retiring" than among those without health events (5 percent vs. 7 percent), but a much larger share moved to zero hours (14 percent vs. 5 percent). Individuals who experienced accidents and new chronic illnesses were somewhat more likely to switch to zero hours than those who did not, but their self-reported "retirement" decisions did not differ much (and for these groups as well, single females with health events were less likely to report retirement). If the individuals' self-reports about retirement status reflect their beliefs, they

seem to indicate that actual labor supply is much more responsive to changes in health status than are individuals' own perceptions about retirement following the occurrence of a major health event.

Health events were also associated with differences in spouse labor supply changes. In particular, the spouses of males with health events were more likely to change to zero hours of work than were spouses of males without health events (e.g., 5 percent vs. 3 percent overall, and 6 percent for spouses of men with major health events). No general patterns were evident for spouses of females with health events: men whose spouses experienced major events or new chronic illnesses were slightly less likely to retire (5 percent vs. 7 percent), and men whose spouses experienced accidents were somewhat more likely to retire (10 percent vs. 5 percent).

In association with the reduction in hours worked, labor income for individuals with health events declined more substantially between wave 1 and wave 2 compared to trends for individuals without health events. On average, these reductions in labor income were not offset by any increases in nonlabor income, except for couples with accidents.

These descriptive statistics highlight a number of important differences in trends in insurance coverage, labor supply, and income for individuals with different health experiences. The results suggest that health events may have important consequences for a range of economic outcomes. But the results also highlight considerable baseline differences among the groups with different health experiences, and significant differences across the different types of health problems. To develop a more complete understanding of the consequences of health events for trends in labor supply and insurance coverage, the remainder of the paper evaluates whether these differences in trends are robust to methods that try to compare individuals with and without health events in a more sophisticated way. These methods also permit a more sophisticated treatment of the functional consequences that may occur in association with health events.

7.3.4 Deaths

Table 7.1 also reports the number and characteristics of wave 1 survey respondents in each of the three groups that died between wave 1 and wave 2. Death rates were higher for older respondents and blacks, and those who died tended to have much lower education levels. These individuals were also in much worse health in wave 1: most had experienced major health events or chronic illnesses or both, and they had substantially worse functional status at baseline as well. Though death is obviously an important health event, households experiencing deaths are not included in the analysis that follows. The consequences of death for a household are different from the consequences of nonfatal health problems in a household member and are beyond the scope of this paper.

7.3.5 Health Events and Functional Status Changes

Table 7.4 summarizes the association between health events and functional status changes, for both males and females.[7] Table 7.4 shows that around 13 percent of all males reported an improvement in health status between waves 1 and 2, where improvement is defined as an improvement in functional status index of over 5 points. Only 9 percent of respondents had notable declines in functional status of 5 points or more: 5 percent had declines of 5 to 14 points, and 4 percent had declines of 15 points or more. The occurrence of health events was substantially correlated with these changes. Individuals with major health events were actually significantly more likely to have improvements in functional status: 17 percent of those with major health events reported improvements compared to 12 percent of those with no health events. This difference reflects the higher baseline prevalence of functional impairments in the major event group. A much larger share of the major event group (27 percent vs. 6 percent) experienced declines in function as well. Individuals with chronic illnesses and accidents had somewhat higher rates of functional decline, compared to those without events, but did not experience as severe impairments as did those with major events. Results for females were qualitatively similar, but health events of all types were somewhat more likely to lead to functional declines compared to males, and rates of improvement in functional status did not differ much among the groups.

Although table 7.4 suggests that the occurrence of health events and functional status changes are correlated, it is worth emphasizing that health events may have diverse consequences for functional status changes. Most individuals who report health events do not report decrements in function. Even among those who experienced major medical events, 73 percent of males and 65 percent of females reported no change or improvement in functional status between waves 1 and 2. Conversely, 6 percent of males and 8 percent of females who reported no new health events at all experienced functional declines. Because the share of respondents who report no health events is relatively large, a large share of respondents who report functional declines are in this category despite the low progression rate. For example, for males, approximately half of respondents reporting moderate or severe declines and approximately 45 percent of those reporting severe declines had no reported health events. This finding may result partly from measurement error and from the infeasibility of accurate survey questions about all possible health events. But it also probably results from the progression of old health problems: virtually all individuals that reported any functional decline had at least one previous chronic condition. Such long-term implications of health events imply that behavior today may be influenced by changes in expectations about future functional declines as well as changes currently associated with the health problem.

7. Results did not differ substantially between single and couple females.

Table 7.4A **Health Events and Functional Status Changes for Males**

Functional Status (FS) Change	All Males	Health Event Occurrence				
		None	All Types	Major Event	Chronic Illness	Accident
Improvement (ΔFS index < -5)	12.5	12.2	13.5	16.8	13.6	12.3
No significant change	78.6	81.7	70.4	56.4	70.0	72.1
Minor impairment ($5 \leq \Delta$FS index < 15)	5.0	4.1	7.5	11.8	8.3	4.9
Major impairment (ΔFS index ≥ 15)	3.8	2.0	8.6	15.0	8.1	10.7

Note: Columns sum to 100 percent.

Table 7.4B **Health Events and Functional Status Changes for Females**

Functional Status (FS) Change	All Females	Health Event Occurrence				
		None	All Types	Major Event	Chronic Illness	Accident
Improvement (Δ FS index < -5)	20.2	20.6	19.0	20.0	18.8	19.5
No significant change	68.2	71.2	59.8	44.7	60.1	59.6
Minor impairment ($5 \leq \Delta$FS index < 15)	7.1	5.3	12.2	19.1	12.2	10.8
Major impairment (ΔFS index ≥ 15)	4.5	2.9	9.0	16.3	8.9	10.1

Note: Columns sum to 100 percent.

7.4 Effects of Health Events: Difference-in-Differences Models

Tables 7.5 and 7.6 present estimates from difference-in-differences models of the effects of health events on insurance coverage and labor supply. In addition to individual fixed effects, the models include a number of controls for possible sources of differential trends besides the health and functional status effects of interest. The controls include age (age −45 and its square), education and its square, race (black or Latino), and private pension eligibility (eligibility for private pension benefits within one year of the wave 1 interview and eligibility for more benefits at some time in the future if work continues). Individuals aged 65 or over at the time of their wave 2 interviews were excluded. These specifications and other specifications with more complex treatment of age effects (e.g., age 62 effects for early social security eligibility) did not substantially affect the results presented here.

7.4.1 Health Insurance Coverage

Table 7.5 describes insurance coverage effects; for ease of interpretation, linear probability model results for effects on health insurance transitions are reported, with Huber-White heteroscedasticity-consistent standard errors. (Logit models gave virtually identical effect estimates.) Results are largely consistent with those reported in table 7.2 and extend them. Columns (1) and (2) describe net changes in insurance coverage for each health event group. In the model for couple males with effects for each type of health event only, individuals with new major events are slightly less likely to become uninsured (coefficient estimate of −1.5 percentage points with a *t*-statistic significant at the 10 percent level), while the estimates for the effects of chronic illnesses and accidents are smaller than 1 percentage point and insignificantly different from zero. With interactions for functional status declines included, no effects are statistically significant, though having major events and having substantial functional status declines are associated with insignificant reductions in the likelihood of losing insurance coverage. Uninsured males with major health events are significantly more likely (point estimate of 3 percentage points) to acquire health insurance coverage. In the interaction model, the occurrence of a major event regardless of functional status change remains associated with greater likelihood of obtaining health insurance (point estimate of 2.5 percentage points, *t*-statistic of 1.7), and accidents, major functional status deterioration, and interactions of functional status deteriorations with chronic illnesses and accidents are insignificantly associated with a greater likelihood of obtaining health insurance.

Columns (3) through (6) in the table consider the sources of these net changes in health insurance coverage. Those with all types of health events are insignificantly more likely to change to private insurance, and all effects are small in magnitude. The model with functional status interactions included shows that the interaction effects are concentrated in individuals with chronic

illnesses and accidents (again, the results approach but do not reach statistical significance). Respondents with major events are slightly more likely to acquire private insurance. They are much less likely to continue private insurance policies, especially if major health events occur: with no functional status decline, they are 16 percentage points more likely to leave private insurance plans. In models with separate effects for the different types of private insurance policies (not shown), the transition rates are significantly greater for private insurance plans without retirement benefits. Individuals with major events are also more likely to continue in government insurance programs. Transitions to government insurance are substantial for males with major events: with no functional status decline, the coefficient estimate is 5.5 percentage points (t-statistic of 2.9).

In contrast, individuals with chronic illnesses and accidents without functional impairments are not much more likely to acquire government insurance. When separate effects for functional status changes are included, the overall average effect for major events regardless of functional status change largely persists. However, the effect is particularly large for those with substantial functional status declines in the absence of new health events (a total effect on likelihood of government coverage of 5.5 + 13.0 = 18.5 percentage points). In contrast, accidents are not more likely to result in new government insurance coverage by the time of the wave 2 interview.

Table 7.5B shows that the results for females in couples are qualitatively similar to those for males, though with less dramatic insurance coverage responses. Women with major events and accidents are insignificantly less likely to lose health insurance coverage, with the largest effects for women with major events who experience significant functional status declines. Women with major events and accidents are also insignificantly more likely to acquire health insurance coverage. The model with functional status interactions shows that these changes are concentrated primarily in women with significant functional status declines and no new health problems, with accidents, and (to a lesser extent) with new major events. In contrast to males, couple females with functional status declines and no new health events, and with major declines due to accidents, are slightly more likely to change to private insurance. In contrast, couple females with new major events and new accidents are significantly more likely to obtain government insurance coverage or to continue it. The model with functional status interactions shows that new government-provided insurance is particularly important for women with new major events leading to functional status declines.

Table 7.5C presents analogous results for single females. As with couple females, those with new major events are slightly less likely to lose insurance coverage, though results generally do not reach statistical significance. There are also no significant differences on average among groups with health events in changes from uninsured to insured status. In contrast to males, single females with significant functional status declines and new major events are sig-

Table 7.5A **Health Events and Health Insurance Changes for Couple Males**

Health Changes	Change to Uninsured (1)		Change to Insured (2)		Change to Private Insurance (3)		Continue Private Insurance (4)		Change to Government Insurance (5)		Continue Government Insurance (6)	
New major	−1.5	−1.4	3.3	2.5	1.9	1.9	−14.7	−15.8	5.7	5.5	10.2	11.5
health event	(−1.5)	(−1.2)	(2.6)	(1.7)	(1.6)	(1.4)	(−6.0)	(−5.5)	(3.5)	(2.9)	(6.0)	(5.9)
New chronic	0.19	0.36	−0.00	−0.53	0.60	0.06	−1.9	−1.5	0.44	−0.09	0.87	1.0
illness	(0.30)	(0.54)	(−0.01)	(−0.63)	(0.82)	(0.07)	(−1.3)	(−0.93)	(0.44)	(−0.09)	(0.85)	(0.91)
Accident	0.73	1.0	0.92	1.1	0.92	0.48	−5.4	−6.8	0.16	0.83	1.6	1.9
	(0.68)	(0.87)	(0.68)	(0.76)	(0.72)	(0.34)	(−2.1)	(−2.4)	(0.09)	(0.44)	(0.89)	(0.99)
Minor functional												
status		0.46		−2.2		−1.3		−0.86		−0.38		5.4
impairment		(0.34)		(−1.2)		(−0.82)		(−0.25)		(−0.17)		(2.3)
Major functional												
status		−1.4		1.7		−4.5		−13.7		13.0		7.4
impairment		(−0.75)		(0.73)		(−2.1)		(−3.1)		(4.4)		(2.4)
Major event*												
Minor FS		−1.9		6.1		0.80		11.1		0.73		−13.3
impairment		(−0.56)		(1.5)		(0.20)		(1.4)		(0.13)		(−2.4)
Major event*												
Major FS		2.2		−1.2		1.0		9.0		−8.2		−4.5
impairment		(0.70)		(−0.31)		(0.27)		(1.2)		(−1.6)		(−0.86)
Chronic*Minor		0.14		2.4		5.0		−5.3		0.69		−0.23
FS impairment		(0.06)		(0.78)		(1.7)		(−0.88)		(0.02)		(−0.06)
Chronic*Major FS		−1.7		4.1		4.3		4.4		1.9		−5.8
impairment		(−0.66)		(1.3)		(1.4)		(0.70)		(0.44)		(−1.4)
Accident*Minor		−5.0		4.1		−0.82		22.5		−1.9		−6.7
FS impairment		(−1.0)		(0.66)		(−0.14)		(1.9)		(−0.24)		(−0.81)
Accident*Major		0.88		−5.7		6.4		10.2		−14.2		−3.6
FS impairment		(0.24)		(−1.2)		(1.5)		(1.1)		(−2.4)		(−0.59)

Note: Sample consists of all nonelderly couple males. Coefficients are reported in percentage points, with *t*-statistics in parentheses. Regressions also include controls for age, education, race, and private pension eligibility.

Table 7.5B **Health Events and Health Insurance Changes for Couple Females**

Health Changes	Change to Uninsured (1)		Change to Insured (2)		Change to Private Insurance (3)		Continue Private Insurance (4)		Change to Government Insurance (5)		Continue Government Insurance (6)	
New major	−1.2	−0.65	1.9	2.0	−0.59	0.32	−8.1	−6.8	7.8	5.7	3.1	3.6
health event	(−0.84)	(−0.38)	(1.1)	(0.94)	(−0.35)	(0.16)	(−2.6)	(−1.8)	(5.6)	(3.4)	(2.1)	(2.0)
New chronic	0.05	0.16	−0.38	0.16	−0.54	−0.10	−2.0	−1.7	0.06	−0.62	2.3	2.5
illness	(0.08)	(0.21)	(−0.46)	(0.18)	(−0.68)	(−0.10)	(−1.3)	(−1.0)	(0.09)	(−0.85)	(3.3)	(3.2)
Accident	−1.2	−1.9	0.89	0.59	0.37	0.36	−2.7	−1.4	2.1	2.6	1.7	1.5
	(−1.0)	(−1.5)	(0.65)	(0.39)	(0.28)	(0.24)	(−1.1)	(−0.51)	(1.9)	(2.1)	(1.5)	(1.1)
Minor functional												
status		0.29		2.6		2.9		−8.1		0.47		1.3
impairment		(0.23)		(1.6)		(1.9)		(−2.9)		(0.37)		(0.97)
Major functional												
status		0.85		4.0		1.8		−16.0		3.7		7.4
impairment		(0.47)		(1.9)		(0.88)		(−4.1)		(2.1)		(4.0)
Major event*												
Minor FS		−0.23		−1.2		−1.0		−0.79		0.58		1.9
impairment		(−0.06)		(−0.26)		(−0.23)		(−0.10)		(0.16)		(0.48)
Major event*												
Major FS		−4.2		−1.4		−7.6		7.3		10.1		−9.5
impairment		(−0.95)		(−0.27)		(−1.5)		(0.76)		(2.3)		(−2.1)
Chronic*Minor												
FS		−1.3		−4.4		−5.3		10.9		1.8		−4.2
impairment		(−0.58)		(−1.6)		(−2.0)		(2.2)		(0.81)		(−1.8)
Chronic*Major												
FS		0.08		−4.5		−0.45		−5.3		2.5		−0.26
impairment		(0.03)		(−1.3)		(−0.14)		(−0.88)		(0.90)		(−0.09)
Accident*												
Minor FS		3.4		−7.2		−6.3		4.7		−6.6		4.2
impairment		(0.90)		(−1.6)		(−1.4)		(0.57)		(−1.8)		(1.1)
Accident*												
Major FS		3.4		8.0		5.1		−5.7		−1.4		−6.4
impairment		(0.87)		(1.7)		(1.1)		(−0.67)		(−0.36)		(−1.6)

Note: Sample consists of all nonelderly couple females. Coefficients are reported in percentage points, with *t*-statistics in parentheses. Regressions also include controls for age, education, race, and private pension eligibility.

Table 7.5C **Health Events and Health Insurance Changes for Single Females**

Health Changes	Change to Uninsured (1)		Change to Insured (2)		Change to Private Insurance (3)		Continue Private Insurance (4)		Change to Government Insurance (5)		Continue Government Insurance (6)	
New major	−1.7	−3.0	0.10	3.5	−2.9	−1.6	−13.7	−9.4	8.7	10.4	13.4	9.1
health event	(−0.54)	(−0.74)	(0.03)	(0.84)	(−1.1)	(−0.47)	(−2.4)	(−1.3)	(2.9)	(2.7)	(3.1)	(1.7)
New chronic	−1.1	−1.4	−1.7	−3.1	−0.69	−2.2	0.23	−0.77	1.2	1.7	0.57	1.4
illness	(−0.69)	(−0.74)	(−0.98)	(−1.6)	(−0.49)	(−1.4)	(0.08)	(−0.23)	(0.78)	(0.98)	(0.26)	(0.56)
Accident	−0.04	1.2	−0.36	−1.0	−0.85	1.5	−4.8	−4.4	0.59	−1.3	1.5	3.8
	(−0.02)	(0.44)	(−0.15)	(−0.38)	(−0.42)	(0.67)	(−1.1)	(−0.92)	(0.26)	(−0.52)	(0.46)	(1.0)
Minor functional status		2.2		−0.30		−3.9		−3.4		1.8		6.5
impairment		(0.69)		(−0.09)		(−1.4)		(−0.59)		(0.59)		(1.5)
Major functional status		2.8		5.3		−2.2		−29.8		20.7		4.5
impairment		(0.78)		(1.4)		(−0.70)		(−4.6)		(6.1)		(0.93)
Major event*Minor FS impairment		−3.3		−7.2		−4.0		−25.4		5.8		29.9
		(−0.36)		(−0.75)		(−0.53)		(−1.6)		(0.66)		(2.4)
Major event*Major FS impairment		5.8		−17.3		−3.9		14.3		−21.8		−0.02
		(0.73)		(−2.1)		(−0.55)		(0.98)		(−2.9)		(−0.00)
Chronic*Minor FS impairment		0.48		7.4		10.0		2.2		1.6		−8.8
		(0.09)		(1.3)		(2.2)		(0.22)		(0.30)		(−1.2)
Chronic*Major FS impairment		−0.48		4.7		5.9		22.1		−15.3		−6.8
		(−0.08)		(0.78)		(1.1)		(2.1)		(−2.7)		(−0.85)
Accident* Minor FS impairment		−2.1		5.7		−4.7		−6.6		16.0		−17.0
		(−0.27)		(0.71)		(−0.70)		(−0.47)		(2.2)		(−1.6)
Accident* Major FS impairment		−10.3		−0.59		0.35		18.2		−8.9		−10.9
		(−1.3)		(−0.07)		(0.05)		(1.3)		(−1.2)		(−1.0)

Note: Sample consists of all nonelderly single females. Coefficients are reported in percentage points, with *t*-statistics in parentheses. Regressions also include controls for age, education, race, and private pension eligibility.

nificantly less likely to acquire health insurance coverage. Instead, they are (insignificantly) more likely to continue private insurance coverage. Women with new chronic illnesses and functional status declines are also more likely to change to or continue private insurance coverage.

Taken together, the results on insurance coverage trends suggest that individuals with functional declines and new health events are less likely to continue private insurance plans than are those without new events or functional declines associated with existing illnesses. Rather, increased uptake of government-provided insurance is the primary source of an increase in insurance coverage rates following the occurrence of these health events. However, coverage changes differ significantly across health problems.

7.4.2 Labor Supply

Table 7.6 summarizes the effects of health events on changes in labor supply, using three different measures of labor supply: trends in whether the respondent provides any hours of work, trends in annual hours of work, and changes in self-reported "retirement" status. Only individuals who were working greater than zero hours in wave 1 are included in the analysis. As in table 7.5 for insurance coverage, the results show that different types of health events have different implications for labor supply.

For couple males, major health events have large impacts on labor supply: compared to changes in labor supply for individuals without events, rates of changing to zero hours are 26.3 percentage points higher, and hours worked decline by more than 600. These effects are concentrated in individuals with functional status impairments, particularly if those impairments occur in the setting of a new major health event. Males who experience new major events associated with substantial functional declines are more than 75 percentage points more likely to go to zero hours, and these individuals have average declines in work hours more than 1,700 hours greater than males with no health events. Reductions to zero work hours are also somewhat more common for males with chronic illnesses, provided that they are associated with minor or major functional impairments. Individuals with new chronic illnesses associated with minor reductions in function are 13.9 percentage points more likely to go from positive to zero hours, and those with major reductions are 35.3 percentage points more likely to go to zero hours. Accidents do not lead to significantly greater declines in actual labor supply overall, and even those associated with substantial functional declines are associated with only a 21 percentage point greater probability of moving to zero work hours.

In contrast to these substantial effects on actual labor supply, effects of health events on self-reported retirement status are modest. Those with major health events are only slightly (and insignificantly) more likely to report being retired, and even those with major events and substantial functional declines are only 7.1 percentage points more likely to report being retired. Those with new chronic illnesses and substantial functional declines are actually less

Table 7.6A **Health Events and Labor Supply Changes for Couple Males**

Health Changes	Full or Part Time to Zero Hours		Change in Work Hours per Year		Change to Self-Reported Retirement	
New major health event	26.3	17.4	−629	−412	2.27	3.6
	(8.7)	(5.0)	(−5.8)	(−3.3)	(1.0)	(1.1)
New chronic illness	1.8	−0.98	−1	61	−1.3	−0.55
	(1.1)	(−0.58)	(−0.02)	(1.0)	(−0.88)	(−0.36)
Accident	2.1	0.61	−173	−127	−2.0	−2.0
	(0.80)	(0.22)	(−1.9)	(−1.3)	(−0.87)	(−0.79)
Minor functional status impairment		0.10		−200		−3.6
		(0.03)		(−1.4)		(−1.0)
Major functional status impairment		32.1		−660		11.1
		(5.8)		(−3.3)		(2.2)
Major event*Minor FS impairment		10.2		−157		1.2
		(1.0)		(−0.44)		(0.13)
Major event*Major FS impairment		25.8		−719		−7.6
		(2.7)		(−2.1)		(−0.89)
Chronic*Minor FS impairment		13.8		−209		2.8
		(2.1)		(−0.87)		(0.47)
Chronic*Major FS impairment		3.2		−56		−17.3
		(0.43)		(−0.21)		(−2.6)
Accident*Minor FS impairment		0.24		2.25		−0.31
		(0.02)		(0.04)		(−0.02)
Accident*Major FS impairment		−10.8		−3		−4.0
		(−1.2)		(−0.01)		(−0.49)

Note: Sample consists of all nonelderly couple males working part time or full time in wave 1. Numbers in parentheses are *t*-statistics. Regressions also include controls for age, education, race, and private pension eligibility.

Table 7.6B **Health Events and Labor Supply Changes for Couple Females**

Health Changes	Full or Part Time to Zero Hours			Change in Work Hours per Year			Change to Self-Reported Retirement	
New major health event	17.5	4.7	3.3	−236	45	72	6.8	3.0
	(4.4)	(0.98)	(0.70)	(−2.2)	(0.36)	(0.57)	(2.5)	(0.88)
New chronic illness	5.1	3.2	3.9	−68	−28	−39	2.8	1.3
	(2.8)	(1.6)	(2.0)	(−1.4)	(−0.53)	(−0.74)	(2.2)	(0.90)
Accident	−1.2	−3.3	−4.2	−77	−28	−16	−2.4	−3.1
	(−0.42)	(−1.1)	(−1.3)	(−1.0)	(−0.33)	(−0.19)	(−1.2)	(−1.4)
Minor functional status impariment		6.8	7.2		−231	−238		−4.0
		(1.8)	(2.0)		(−2.4)	(−2.4)		(−1.5)
Major functional status impairment		17.8	16.9		−374	−372		−2.4
		(3.1)	(3.0)		(−2.5)	(−2.5)		(−0.61)
Major event*Minor FS impairment		27.4	28.6		−666	−701		25.9
		(2.7)	(2.6)		(−2.5)	(−2.4)		(3.4)
Major Event*Major FS impairment		44.4	45.3		−782	−818		−5.2
		(3.3)	(3.5)		(−2.2)	(−2.3)		(−0.56)
Chronic*Minor FS impairment		2.0	2.5		−27	−55		10.9
		(0.32)	(0.40)		(−0.17)	(−0.33)		(2.5)
Chronic*Major FS impairment		6.1	7.3		−49	−34		12.5
		(0.69)	(0.84)		(−0.21)	(−0.15)		(2.0)
Accident*Minor FS impairment		16.1	18.0		−314	−302		8.1
		(1.8)	(2.0)		(−1.3)	(−1.3)		(1.3)
Accident*Major FS impairment		−21.7	−19.3		366	350		−0.77
		(−1.7)	(−1.5)		(1.1)	(1.0)		(−0.09)
Male retirement			11.1			−89		9.4
			(4.7)			(−1.4)		(5.6)
Male Major health event			−1.9			217		−1.1
			(−0.59)			(2.5)		(−0.59)
Male retirement*Major health event			−1.7			−556		−2.2
			(−0.24)			(−2.0		(−0.43)

Note: Sample consists of all nonelderly couple females working part time or full time in wave 1. Numbers in parentheses are *t*-statistics. Regressions also include controls for age, education, race, and private pension eligibility.

Table 7.6C **Health Events and Labor Supply Changes for Single Females**

Health Changes	Full or Part Time to Zero Hours		Change in Work Hours per Year		Change to Self-Reported Retirement	
New major health event	12.3	−4.0	−241	141	−3.5	−8.1
	(1.8)	(−0.49)	(−1.1)	(0.51)	(−0.79)	(−1.5)
New chronic illness	9.4	8.5	−256	−204	−0.92	−0.16
	(3.0)	(2.5)	(−2.4)	(−1.8)	(−0.44)	(−0.07)
Accident	9.8	9.2	−160	−182	1.4	1.1
	(2.1)	(1.8)	(−1.0)	(−1.1)	(0.45)	(0.32)
Minor functional status impairment		13.4		−219		−0.57
		(2.0)		(−0.93)		(−0.12)
Major functional status impairment		29.5		−325		5.2
		(3.4)		(−1.1)		(0.90)
Major event*Minor FS impairment		56.2		−336		20.7
		(2.3)		(−0.40)		(1.2)
Major event*Major FS impairment		21.8		−984		11.9
		(1.3)		(−1.7)		(1.1)
Chronic*Minor FS impairment		−21.8		229		−4.6
		(−1.8)		(0.55)		(−0.55)
Chronic*Major FS impairment		2.7		−472		−11.9
		(0.21)		(−1.1)		(−1.4)
Accident*Minor FS impairment		−10.0		139		7.1
		(−0.56)		(0.23)		(0.60)
Accident*Major FS impairment		−2.5		308		−11.3
		(−0.13)		(0.46)		(−0.86)

Note: Sample consists of all nonelderly single females working part time or full time in wave 1. Numbers in parentheses are *t*-statistics. Regressions also include controls for age, education, race, and private pension eligibility.

likely than individuals without health problems to change to reporting that they are retired. The source of this discrepancy with only two waves of survey data is unclear: perhaps these individuals intend to return to work, or perhaps the question is misinterpreted. Future evidence on their behavior should help resolve this question, but it suggests that health events may result in substantial dissonance between individuals' perceptions of retirement status and actual work behavior.

Table 7.6B shows that the three types of health events also have substantially different implications for the labor supply of women. For women in couples, overall effects of major health events on movements to zero hours are more modest compared to males, but major health events associated with functional declines have comparably large effects. For example, women with new major health events and major impairments are 65 percentage points more likely to go to zero hours than are women with no health events or changes in impairments, and their average reduction in hours worked is over 1,100 hours greater. Also like males, major functional declines have less effect on labor supply changes associated with accidents, and functional declines in the absence of any new health events have an impact on labor supply similar to that of new chronic illnesses. In contrast to males, effects on self-reported retirement status generally do not differ substantially from effects on actual labor supply.

The last three rows of table 7.6B consider an alternative specification that includes the effect of a spouse's health event on the labor supply of females in couples. Table 7.6A showed that major health events in males have a substantial effect on male labor supply; to the extent that these effects may reduce household income, female labor supply may respond. Table 7.6B shows little net impact on the rate of movement to zero hours once controls for male retirement are included. These specifications suggest a strong joint retirement effect, but little differential effect of spouse health events on decisions to move to zero work hours. Despite this small effect on total retirement, there is a notable effect on average work hours associated with major illness in a spouse. In particular, women whose spouses have new major health events but do not retire tend to work more hours (coefficient estimate of 217 with a t-statistic of 2.5), while those whose spouses have new major events and do retire tend to work significantly fewer hours (coefficient estimate of -428 with a t-statistic of 2.6). These results suggest the presence of offsetting hours effects for the spouses of men with major health events, and more detailed regressions of effects on changes in work hours short of retirement confirm this effect.[8] In particular, spouses of men with health events who retire, but who do not retire themselves, are somewhat more likely to move from full- to part-time work, and spouses of men with health events who do not retire are somewhat less likely to move to part-time work.

8. The results are also somewhat stronger and more precisely estimated in the propensity model of table 7.8B.

Table 7.6C reports analogous estimates for the effects of health events on labor supply changes for single females who were working in wave 1. For single females, all three types of health events as well as decrements in functional status unrelated to new health events have notable and significant effects on movement to zero work hours. As for males, interactions between major events and functional status changes are important and have complex effects. Single women with major events associated with minor decrements in function are 65 percentage points more likely to retire, and those with major events associated with large decrements in function are 47 percentage points more likely to retire. For chronic illnesses and accidents, the effects on movement to zero hours are largely independent of the changes in function associated with the event. As with males, effects on self-reported retirement status are generally much more modest and insignificant than effects on actual hours of work. In addition, effects on changes in average hours of work are somewhat different, suggesting effects on part-time work similar to those described for couple females. As with couple females, major functional status declines associated with major events have the largest effects on average hours worked.

Together, these results show that the effects of health events on labor supply depend on both the type of change in health status as well as its consequences for physical function. While accidents have only limited independent effects, major events have dramatic effects on labor supply that extend well beyond their consequences for current functional status. The effects of chronic diseases tend to be intermediate. They are less often associated with substantial short-term functional declines, but in those cases they too can have substantial effects on labor supply. Major health events in spouses may also have important consequences for the hours worked of women in couples.

7.4.3 Propensity Score Models

Tables 7.7 and 7.8 present results analogous to those in tables 7.5 and 7.6 for models based on propensity score methods. These methods use an alternative approach to account for individual differences that might lead to differences in trends for reasons other than the occurrence of health events. Individuals were classified into five propensity groups on the basis of the propensity models for the occurrence of health events. The results of these classification models are summarized in appendix table 7A.1. Despite the different modeling framework, the results are virtually identical to those presented in tables 7.5 and 7.6.

7.5 Conclusion

This analysis of new health events in middle-aged Americans in the Health and Retirement Survey suggests several conclusions about the effects of health problems. First, new health events of all types are more prevalent in individuals with lower education, incomes, and wealth and are more prevalent in indi-

Table 7.7A **Propensity Score Model of Health Events and Health Insurance Changes for Couple Males**

Health Changes	Change to Uninsured (1)		Change to Insured (2)		Change to Private Insurance (3)		Continue Private Insurance (4)		Change to Government Insurance (5)		Continue Government Insurance (6)	
New major health event	−1.5	−1.5	2.5	1.7	2.1	2.0	−14.6	−17.2	5.8	6.0	10.2	12.7
	(−1.5)	(−1.3)	(1.9)	(1.1)	(1.7)	(1.4)	(−5.2)	(−5.4)	(3.4)	(3.1)	(5.3)	(5.7)
New chronic illness	0.42	0.53	0.06	−0.60	0.57	−0.02	−0.93	−0.27	−0.19	−0.69	−0.38	−0.11
	(0.68)	(0.80)	(0.08)	(−0.70)	(0.77)	(−0.02)	(−0.55)	(−0.15)	(−0.19)	(−0.62)	(−0.33)	(−0.08)
Accident	0.76	1.0	0.82	0.95	1.2	0.88	−2.1	−3.4	−0.55	0.11	−1.5	−1.2
	(0.72)	(0.90)	(0.60)	(0.64)	(0.97)	(0.63)	(−0.73)	(−1.1)	(−0.31)	(0.06)	(−0.76)	(−0.57)
Minor functional status impairment		0.63		−2.5		−1.2		−4.7		0.29		8.1
		(0.46)		(−1.4)		(−0.71)		(−1.2)		(0.12)		(3.1)
Major functional status impairment		−0.68		2.3		−3.8		−11.4		11.7		2.6
		(−0.38)		(0.98)		(−1.7)		(−2.3)		(3.8)		(0.76)
Major event*Minor FS impairment		−1.9		6.5		0.85		15.4		−0.31		−16.2
		(−0.58)		(1.5)		(0.21)		(1.7)		(−0.06)		(−2.6)
Major event*Major FS impairment		1.8		−2.0		0.76		15.4		−8.9		−7.0
		(0.58)		(−0.51)		(0.20)		(1.8)		(−1.7)		(−1.2)
Chronic*Minor FS impairment		0.34		3.2		5.2		−2.2		−0.97		−4.4
		(0.14)		(1.0)		(1.8)		(−0.32)		(−0.24)		(−0.95)
Chronic*Major FS impairment		1.5		4.9		4.2		−2.9		3.3		−1.5
		(0.58)		(1.5)		(1.4)		(−0.41)		(0.77)		(−0.30)
Accident*Minor FS impairment		−4.3		7.0		−0.16		15.1		−1.8		−4.0
		(−0.87)		(1.1)		(−0.03)		(1.1)		(−0.22)		(−0.43)
Accident*Major FS impairment		0.17		−7.0		4.9		13.1		−13.5		−2.0
		(0.05)		(−1.5)		(1.1)		(1.3)		(−2.2)		(−0.30)

Note: Sample consists of all nonelderly couple males. Coefficients are reported in percentage points, with *t*-statistics in parentheses. Models include propensity score group effects.

Table 7.7B **Propensity Score Model of Health Events and Health Insurance Changes for Couple Females**

Health Changes	Change to Uninsured (1)		Change to Insured (2)		Change to Private Insurance (3)		Continue Private Insurance (4)		Change to Government Insurance (5)		Continue Government Insurance (6)	
New major health event	−1.6	−1.2	1.9	1.6	−0.44	0.26	−5.3	−3.1	7.1	5.0	1.8	2.3
	(−1.1)	(−0.68)	(1.1)	(0.75)	(−0.26)	(0.13)	(−1.6)	(−0.79)	(5.0)	(2.9)	(1.2)	(1.3)
New chronic illness	0.10	0.11	−0.11	0.36	−0.45	−0.06	−2.4	−1.4	0.04	−0.69	2.0	2.0
	(0.14)	(0.15)	(−0.12)	(0.39)	(−0.56)	(−0.07)	(−1.5)	(−0.83)	(0.06)	(−0.93)	(2.9)	(2.6)
Accident	−0.72	−1.4	−0.67	0.30	0.26	0.21	−1.4	0.41	1.7	2.2	0.95	0.62
	(−0.64)	(−1.1)	(−0.49)	(0.20)	(0.19)	(0.14)	(−0.53)	(0.14)	(1.5)	(1.8)	(0.82)	(0.48)
Minor functional status impairment		0.33		2.9		3.0		−9.9		0.89		1.4
		(0.25)		(1.9)		(2.0)		(−3.4)		(0.70)		(1.0)
Major functional status impairment		1.0		4.8		2.2		−19.2		4.1		7.3
		(0.56)		(2.2)		(1.1)		(−4.7)		(2.3)		(4.0)
Major event*Minor FS impairment		−0.18		−0.52		−0.43		0.05		0.26		1.2
		(−0.05)		(−0.11)		(−0.10)		(0.01)		(0.07)		(0.30)
Major event*Major FS impairment		−3.7		−0.62		−7.2		3.7		10.4		−8.9
		(−0.84)		(−0.12)		(−1.4)		(0.37)		(2.4)		(−2.0)
Chronic*Minor FS impairment		−0.95		−4.4		−5.2		10.2		1.5		−4.1
		(−0.42)		(−1.6)		(−1.9)		(2.0)		(0.67)		(−1.7)
Chronic*Major FS impairment		0.50		−4.3		−0.18		−8.4		2.7		1.0
		(0.18)		(−1.3)		(−0.06)		(−1.3)		(1.0)		(0.36)
Accident*Minor FS impairment		3.1		−6.5		−5.9		1.1		−6.1		5.0
		(0.82)		(−1.4)		(−1.3)		(0.13)		(−1.7)		(1.3)
Accident*Major FS impairment		2.9		7.5		4.9		−3.7		−1.9		−6.5
		(0.72)		(1.6)		(1.1)		(−0.41)		(−0.50)		(−1.6)

Note: Sample consists of all nonelderly single females. Coefficients are reported in percentage points, with *t*-statistics in parentheses. Models include propensity score group effects.

Table 7.7C **Propensity Score Model of Health Events and Health Insurance Changes for Single Females**

Health Changes	Change to Uninsured (1)		Change to Insured (2)		Change to Private Insurance (3)		Continue Private Insurance (4)		Change to Government Insurance (5)		Continue Government Insurance (6)	
New major health event	−2.0	−3.2	−0.75	2.6	−3.6	−2.6	−6.7	−2.9	8.0	9.7	8.3	4.5
	(−0.63)	(−0.79)	(−0.23)	(0.61)	(−1.3)	(−0.73)	(−1.1)	(−0.36)	(2.6)	(2.5)	(1.9)	(0.80)
New chronic illness	−1.0	−1.4	−1.6	−3.3	−0.78	−2.4	−0.73	−0.27	1.2	1.4	0.57	0.50
	(−0.62)	(−0.74)	(−0.96)	(−1.7)	(−0.55)	(−1.5)	(−0.23)	(−0.08)	(0.75)	(0.81)	(0.25)	(0.20)
Accident	0.21	1.4	−0.47	−0.27	−1.6	2.2	−4.1	−3.7	0.20	−1.5	−2.0	0.15
	(0.09)	(0.54)	(−0.19)	(−0.10)	(0.80)	(0.96)	(−0.89)	(−0.73)	(0.09)	(−0.60)	(−0.59)	(0.04)
Minor functional status impairment		2.4		0.06		−4.3		−10.8		2.1		11.0
		(0.78)		(0.02)		(−1.6)		(−1.8)		(0.72)		(2.5)
Major functional status impairment		3.0		6.3		−2.2		−34.0		29.0		5.0
		(0.84)		(1.7)		(−0.69)		(−4.8)		(6.2)		(1.0)
Major event*Minor FS impairment		−4.8		−8.9		−4.7		−14.5		4.9		21.8
		(−0.52)		(−0.92)		(−0.44)		(−0.86)		(0.56)		(1.7)
Major event*Major FS impairment		6.0		−16.9		−3.1		14.7		−21.6		−0.27
		(0.76)		(−2.0)		(−0.44)		(0.93)		(−2.8)		(−0.03)
Chronic*Minor FS impairment		0.93		9.2		11.2		−6.5		3.5		−3.2
		(0.17)		(1.6)		(2.4)		(−0.63)		(0.67)		(−0.43)
Chronic*Major FS impairment		−0.10		4.2		5.9		22.8		−15.1		−6.4
		(−0.02)		(0.69)		(1.2)		(2.0)		(−2.7)		(−0.79)
Accident*Minor FS impairment		−1.7		5.0		−4.7		−5.0		16.0		−15.9
		(−0.22)		(0.62)		(−0.69)		(−0.33)		(2.2)		(−1.5)
Accident*Major FS impairment		−10.7		−0.60		1.1		16.3		−9.0		−10.1
		(−1.4)		(−0.07)		(0.16)		(1.0)		(−1.2)		(−0.92)

Note: Sample consists of all nonelderly single females. Coefficients are reported in percentage points, with *t*-statistics in parentheses. Models include propensity score group effects.

Table 7.8A **Propensity Score Model of Health Events and Labor Supply Changes for Couple Males**

Health Changes	Full or Part Time to Zero Hours		Change in Work Hours per Year		Change to Self-Reported Retirement	
New major health event	25.5	16.9	−609	−396	2.7	4.0
	(8.2)	(4.8)	(−5.6)	(−3.2)	(0.95)	(1.2)
New chronic illness	1.0	−1.5	25	80	−1.9	−0.99
	(0.63)	(−0.84)	(0.43)	(1.3)	(−1.3)	(−0.62)
Accident	2.3	0.91	−167	−119	−2.2	−2.2
	(0.85)	(0.33)	(−1.8)	(−1.2)	(−0.91)	(−0.84)
Minor functional status impairment		0.47		−195		−2.6
		(0.12)		(−1.4)		(−0.72)
Major functional status impairment		29.6		−600		7.8
		(5.2)		(−3.0)		(1.5)
Major event*Minor FS impairment		12.6		−243		2.1
		(1.2)		(−0.68)		(0.23)
Major event*Major FS impairment		25.6		−723		−9.0
		(2.6)		(−2.1)		(−1.0)
Chronic*Minor FS impairment		11.5		−162		0.13
		(1.7)		(−0.67)		(0.02)
Chronic*Major FS impairment		3.4		−57		−16.5
		(0.46)		(−0.21)		(−2.4)
Accident*Minor FS impairment		−6.8		357		−9.2
		(−0.43)		(0.63)		(−0.63)
Accident*Major FS impairment		−7.7		−105		−0.83
		(−0.82)		(−0.32)		(−0.10)

Note: Sample consists of all nonelderly couple males working part time or full time in wave 1. Numbers in parentheses are *t*-statistics. Models include propensity score group effects.

Table 7.8B Propensity Score Model of Health Events and Labor Supply Changes for Couple Females

Health Changes	Full or Part Time to Zero Hours			Change in Work Hours per Year			Change to Self-Reported Retirement	
New major health event	18.4	5.8	4.5	−255	25	54	7.4	4.3
	(4.6)	(1.2)	(0.93)	(−2.4)	(0.20)	(0.42)	(2.6)	(1.2)
New chronic illness	4.8	2.7	3.5	−63	−18	−30	2.5	1.0
	(2.6)	(1.4)	(1.8)	(−1.3)	(−0.35)	(−0.57)	(1.9)	(0.71)
Accident	−2.5	−4.6	−5.4	−47	0	13	−3.5	−4.4
	(−0.88)	(−1.4)	(−1.7)	(−0.62)	(0.00)	(0.15)	(−1.7)	(−1.9)
Minor functional status impairment		6.7	7.1		−227	−235		−3.8
		(1.8)	(1.9)		(−2.3)	(−2.4)		(−1.4)
Major functional status impairment		18.6	17.6		−387	−382		−1.9
		(3.3)	(3.1)		(−2.6)	(−2.6)		(−0.47)
Major event*Minor FS impairment		27.6	29.1		−679	−715		26.6
		(2.7)	(2.7)		(−2.5)	(−2.5)		(3.4)
Major event*Major FS impairment		41.2	42.4		−712	−751		−10.0
		(3.1)	(3.2)		(−2.0)	(−2.2)		(−1.0)
Chronic*Minor FS impairment		2.5	3.0		−38	−65		10.6
		(0.40)	(0.48)		(−0.23)	(−0.39)		(2.3)
Chronic*Major FS impairment		6.3	7.7		−73	−62		12.8
		(0.71)	(0.89)		(−0.31)	(−0.27)		(2.0)
Accident*Minor FS impairment		16.0	18.9		−314	−329		10.7
		(1.8)	(2.1)		(−1.4)	(−1.4)		(1.6)
Accident*Major FS impairment		−22.4	−19.9		400	376		−2.8
		(−1.7)	(−1.6)		(1.2)	(1.1)		(−0.31)
Male retirement			12.3			−115		11.4
			(5.2)			(−1.8)		(6.6)
Male major health event			−0.84			196		−0.21
			(−0.26)			(2.3)		(−0.09)
Male retirement*Major health event			−5.1			−485		−6.3
			(−0.72)			(−2.6)		(−1.2)

Note: Sample consists of all nonelderly couple females working part time or full time in wave 1.
Numbers in parentheses are *t*-statistics. Models include propensity score group effects.

Table 7.8C **Propensity Score Model of Health Events and Labor Supply Changes for Single Females**

Health Changes	Full or Part time to Zero Hours		Change in Work Hours per Year		Change to Self-Reported Retirement	
New major health event	15.4	−1.5	−316	63	−1.1	−5.8
	(2.1)	(−0.18)	(−1.4)	(0.22)	(−0.24)	(−1.0)
New chronic illness	9.6	8.8	−233	−178	−0.97	−0.13
	(2.9)	(2.5)	(−2.2)	(−1.5)	(−0.45)	(−0.05)
Accident	8.9	8.5	−147	−181	−0.36	−0.80
	(1.8)	(1.7)	(−0.92)	(−1.1)	(−0.11)	(−0.23)
Minor functional status impairment		13.4		−261		−0.44
		(1.9)		(−1.1)		(−0.09)
Major functional status impairment		33.1		−444		6.4
		(3.7)		(−1.5)		(1.1)
Major event*Minor FS impairment		64.8		−463		29.9
		(2.5)		(−0.54)		(1.7)
Major event*Major FS impairment		18.2		−891		9.2
		(1.1)		(−1.6)		(0.81)
Chronic*Minor FS impairment		−21.6		179		−5.8
		(−1.7)		(0.42)		(−0.68)
Chronic*Major FS impairment		−2.9		−317		−13.9
		(−0.22)		(−0.71)		(−1.5)
Accident*Minor FS impairment		−10.5		225		7.7
		(−0.58)		(0.37)		(0.63)
Accident*Major FS impairment		−5.3		468		−12.4
		(−0.27)		(0.70)		(−0.91)

Note: Sample consists of all nonelderly single females working part time or full time in wave 1. Numbers in parentheses are *t*-statistics. Models include propensity score group effects.

viduals with other prior health conditions as well. These relationships persist after adjusting for age. Second, health events may be quite heterogeneous in nature, and thus in their consequences for functional status and expectations about future functional status, consumption, and survival. Only a minority of new health events lead to substantial short-term functional impairments, even for major events such as heart attacks and strokes. Old health problems (and possibly health problems for which information was not obtained in the HRS) are also important in explaining functional declines.

Third, different types of health events have quite different consequences for health insurance coverage and labor supply. Major health events have particularly large effects on retirement decisions, and these effects go well beyond the consequences of the events for functional status. For example, males with major events associated with major functional status declines leave the labor force at rates over 40 percentage points higher than males with major functional status declines in the absence of new health events. New chronic illnesses have milder, though significant, effects on increasing rates of labor force exit beyond their association with functional declines alone. In contrast, health problems that are unlikely to have long-term consequences for health (accidents) are not associated with additional labor force departures. Though these health events have enormous significance for labor force departure rates, they have only modest impact on individuals' self-reported retirement status, especially for males in couples and single females. Examining the subsequent labor supply of individuals with these events is thus a question of considerable importance for understanding the long-term impact of health events.

In conjunction with their effects on labor supply, health events also have substantial effects on health insurance coverage, especially for males. Health events are associated with small increases in the probability of having health insurance, despite the fact that they tend to lead to reductions in private insurance coverage, particularly for males and for individuals without retiree insurance coverage. These reductions in private insurance coverage are offset by increased coverage through government insurance programs, primarily Medicare, as a result of qualification through the disability insurance system. These insurance changes are more related to the actual occurrence of disability than the labor supply changes, though major health events do lead to more switches to government insurance regardless of functional status change.

These substantial effects of health events on labor supply and health insurance coverage raise further questions. What are the consequences for household expenditures on medical care and other types of consumption? Do the events substantially alter wealth accumulation? What are the long-term implications of these events for households, including the spouses of individuals with health events? Further analysis of the HRS should provide additional insights into these and other questions about the economic consequences of health events.

Appendix

Table 7A.1 Propensity for Health Events

	Couple Males		Couple Females		Single Females	
Independent Variable	Any	Major	Any	Major	Any	Major
Intercept	−1.06	−7.44	−2.38	−8.02	−14.0	−22.8
	(1.24)	(3.46)	(0.88)	(3.42)	(9.37)	(54.2)
Age at wave 1	−0.00	0.08	0.03	0.11	0.28	0.25
	(0.02)	(0.07)	(0.02)	(0.07)	(0.19)	(0.51)
Age squared	0.00	−0.00	0.00	−0.00	−0.00	−0.01
	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)
Black	0.23	2.90	1.85	−28.7	5.19	7.77
	(1.64)	(3.23)	(1.40)	(280)	(3.31)	(48.5)
Latino	1.95	0.03	−0.43	−52.1	−0.74	−0.81
	(1.88)	(4.56)	(1.71)	(23.8)	(5.77)	(397)
Graduated high school	−0.01	0.01	−0.32	−0.37	−0.08	0.18
	(0.12)	(0.24)	(0.13)	(0.31)	(0.23)	(0.62)
Some college	−0.16	0.29	−0.44	−0.29	0.29	1.25
	(0.15)	(0.29)	(0.16)	(0.39)	(0.29)	(0.69)
Bachelor's degree only	−0.15	−0.49	−0.38	−0.35	0.07	0.73
	(0.17)	(0.43)	(0.21)	(0.56)	(0.36)	(0.97)
Post-baccalaureate degree	−0.15	0.26	−0.35	−0.43	−0.42	−0.41
	(0.17)	(0.39)	(0.24)	(0.69)	(0.39)	(1.35)
Black*Age	−0.00	0.04	−0.02	0.32	−0.11	0.03
	(0.03)	(0.05)	(0.03)	(0.15)	(0.06)	(0.16)
Latino*Age	−0.03	−0.01	0.01	0.89	−0.00	0.01
	(0.03)	(0.08)	(0.03)	(0.40)	(0.10)	(7.25)
Black*Postsecondary education	0.16	0.35	−0.20	−11.2	−0.25	−0.73
	(0.30)	(0.56)	(0.31)	(134)	(0.40)	(1.10)
Latino*Postsecondary education	0.18	0.53	0.86	−10.6	−1.52	−0.22
	(0.37)	(0.90)	(0.42)	(248)	(0.89)	(62.2)
U.S. born	−0.06	0.55	0.35	−0.13	−0.86	6.55
	(0.21)	(0.60)	(0.24)	(0.55)	(0.51)	(47.7)
Black*U.S. born	0.23	0.02	−0.57	10.7	0.79	−9.18
	(0.51)	(1.24)	(0.54)	(280)	(0.76)	(47.7)
Latino*U.S. born	−0.16	−0.15	0.17	0.59	1.65	−6.93
	(0.36)	(0.99)	(0.43)	(1.49)	(0.83)	(74.3)
Mother had postsecondary education	0.24	−2.06	−0.21	0.15	0.49	0.62
	(0.16)	(0.74)	(0.18)	(0.45)	(0.33)	(0.84)
Mother's education missing	−0.02	−0.03	−0.25	−1.60	0.58	0.93
	(0.20)	(0.37)	(0.29)	(0.74)	(0.48)	(0.85)
Black*Mother had post-secondary education	0.24	−11.86	0.87	−10.8	0.61	−5.28
	(0.16)	(1150)	(0.54)	(291)	(0.82)	(55.3)
Black*Mother's education missing	0.74	0.65	0.28	−10.7	−0.97	−9.39
	(0.48)	(1.00)	(0.54)	(170)	(0.70)	(32.0)
Father had postsecondary education	0.31	0.87	0.18	−0.61	−0.48	−0.72
	(0.15)	(0.31)	(0.16)	(0.52)	(0.35)	(1.22)
Father's education missing	0.22	0.66	−0.28	0.83	−0.52	1.28
	(0.18)	(0.34)	(0.25)	(0.47)	(0.39)	(0.68)

Table 7A.1 (continued)

Independent Variable	Couple Males		Couple Females		Single Females	
	Any	Major	Any	Major	Any	Major
Black*Father had post-secondary education	−1.56	−14.5	−0.06	−9.32	0.15	−5.78
	(1.11)	(1251)	(0.77)	(465)	(0.94)	(53.8)
Black*Father's education missing	−1.10	−2.83	0.12	0.55	1.02	−1.12
	(0.46)	(1.26)	(0.46)	(1.10)	(0.55)	(1.40)
Mother lived to age 70	−0.10	−0.23	−0.07	−0.20	−0.05	−0.55
	(0.09)	(0.20)	(0.10)	(0.27)	(0.19)	(0.47)
Mother's longevity missing	−0.32	0.48	−0.25	−12.1	−15.0	0.26
	(0.69)	(1.20)	(1.25)	(791)	(1628)	(164)
Father lived to age 70	−0.03	0.00	−0.01	−0.11	0.21	−0.07
	(0.09)	(0.18)	(0.28)	(0.25)	(0.17)	(0.45)
Father's longevity missing	0.59	−0.27	0.67	1.06	0.77	−7.52
	(0.37)	(0.82)	(0.42)	(0.74)	(0.60)	(49.1)
Household net worth 0–200,000	−0.03	−0.43	−0.01	−0.49	−0.56	−1.96
	(0.26)	(0.44)	(0.28)	(0.64)	(0.29)	(0.57)
Household net worth 200,000–1,000,000	−0.06	−0.73	−0.11	−0.28	−0.34	−1.85
	(0.27)	(0.48)	(0.29)	(0.67)	(0.37)	(0.84)
Household net worth >1,000,000	−0.27	−1.63	−0.15	0.09	−0.53	−8.43
	(0.33)	(0.78)	(0.36)	(0.88)	(0.89)	(72.9)
Household income 15,000−75,000	−0.16	−0.27	−0.26	−0.21	0.22	−0.02
	(0.20)	(0.39)	(0.23)	(0.51)	(0.22)	(0.58)
Household income 75,000–200,000	−0.26	−0.56	−0.18	−0.66	0.06	0.14
	(0.22)	(0.45)	(0.24)	(0.59)	(0.46)	(1.30)
Household income >200,000	−0.08	0.40	−0.60	−11.9	1.93	3.83
	(0.35)	(0.71)	(0.45)	(265)	(1.29)	(1.63)
History of major health event	0.40	0.92	0.19	1.03	−0.13	0.79
	(0.13)	(0.22)	(0.16)	(0.31)	(0.26)	(0.53)
History of chronic illness	−0.00	0.25	−0.12	−0.00	−0.15	1.27
	(0.09)	(0.20)	(0.10)	(0.27)	(0.18)	(0.62)
Wave 1 functional status index	0.06	0.06	0.03	0.07	0.05	−0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)	(0.05)
Functional status index squared	−0.00	−0.00	−0.00	−0.00	−0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Eligible to receive pension benefits	0.28	−0.02	0.07	0.15	−0.24	0.87
	(0.10)	(0.23)	(0.15)	(0.35)	(0.25)	(0.59)
Pension eligibility missing	0.07	0.08	0.05	−0.33	−0.05	0.35
	(0.16)	(0.34)	(0.15)	(0.49)	(0.24)	(0.68)

Note: Table presents results for logistic models with dependent variables at the column head. Numbers in parentheses are standard errors.

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Comment

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Although there is a long history of using measures of health in behavioral estimation, most often the measure is self-assessed health, and its use has been criticized because it is said to be "endogenous." For example, models of retirement may use health status as an explanatory variable, but perhaps those who

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retire report poor health simply to have a socially acceptable reason for retiring. That is, the decision to retire causes the report of poor health, not the reverse. While I find this rather implausible because self-rated health predicts retirement many years later, this paper addresses this issue by using some of the wide range of data from the Health and Retirement Survey (HRS) that are plausibly more objective. An important aspect is whether results based on these more objective measures are similar to results based on more subjective measures. The paper also augments traditional analyses of the effects of health by studying the effects of changes in health as well as cross-sectional variation in health across individuals. This is likely to be important particularly for labor force participation because workers can adapt to long-term health problems either by job sorting or by accommodation on the job. Thus, the cross-sectional variation in participation as health varies may not be large. In contrast a change in health status may lead to large effects on retirement as the costs of finding a new job or making accommodation may be rather large in comparison to the value of a few extra years of work.

The main health measures used in this paper are health events, particularly major health events, and functional limitations. In principle, these are mainly objective. However, the frequency of health events is likely to be related to socioeconomic status because the form of the questions in the HRS is "In the last two years has a doctor told you that you have had a . . ." Thus, the detection and reporting are likely to be related to intensity of the use of health care services and economic status. A number of the functional limitations, such as limitations on activities of daily living, are quite subjective: the form of the questions is "Do you have any difficulty . . ." Nonetheless, these measures are likely to be more objective than self-assessed health status, although that does not especially mean they will be better predictors of behavior.

I consider the main results to be in tables 7.3 and 7.5. Here we see that among married men who had no health event between waves 1 and 2 labor force participation fell by 5.3 percent whereas among men who had a major health event participation fell by 18.3 percent. This decline comes on top of a much lower baseline participation rate (76.2 percent vs. 50.1 percent), so that following the major event the participation rates are very different. The results for women, both married and single are qualitatively similar. When the major health event is interacted with the change in functional impairment, as in table 7.6, the effects are very large, basically predicting that anyone with major functional impairment and a major health event will no longer be in the labor force. The conclusion is that health, as measured more objectively, has a substantial effect on labor force participation, which complements earlier results about retirement based on self-assessed health. These results show that health effects are not simply ex post rationalizations for retirement.

An interesting finding that shows the potential for this line of work is the effect of health events of the husband on the labor force participation of the wife. In table 7.3A when there was a major health event wives reduced their

participation by 6.1 percent compared with a reduction of 3.2 percent when there was not a major health event. Although qualitatively consistent with the wife's leaving the labor force to care for her husband, the effect is not especially large in that there were only 276 cases out of 4,364. However as shown in table 7.6B the change in participation of wives is associated with the retirement of husbands, not with health events themselves: when husbands retired, participation by wives declined by 11.1 percent relative to wives whose husbands did not retire; yet the changes associated with the health events themselves are basically zero. This finding can be explained in two, not necessarily contradictory, ways: (1) It supports prior research that indicated a complementarity in the leisure of husbands and wives, leading to coordination of their retirement dates. (2) Even in the class of major health events there are gradations, and the most serious may lead to retirement by the husband and retirement by the wife to care for the husband. Of course both of these explanations could be relevant, although health events are unlikely to be as important quantitatively as the other determinants of retirement, such as social security and pensions.

The importance of socioeconomic status as measured by either income or wealth shows in the tables: for example, household wealth among all couples was $302,200; among couples where the husband had a major health event it was $197,300. This finding is consistent with the variation in wealth by self-assessed health.

I have some reservations about some of the results. The apparent improvement in functional status reported in table 7.1 could be due to sample selection between the waves, rather than to true average improvement in the population. The level of functional status in wave 1 was 6.5, which is about 1.4 points on average,[1] but with a standard deviation of 10.8. In that a point is assigned if a respondent has even some difficulty in performing tasks such as stooping, kneeling, or crouching, a substantial majority would have no points and be quite healthy. Thus, the index is low on average but is very highly skewed. The mean change in the index between the waves was 0.55, but with a standard deviation of 8.4. In this context the change is small: for example, it could be explained by mortality. Consider the contribution to the baseline index from the 93 husbands who died between the waves. They contributed 0.51 to the baseline level, which is about the amount of change between the waves. Furthermore, the response rate of HRS wave 2 was about 92 percent, and the nonrespondents had worse health than the average in wave 1. The highly skewed distribution at baseline and in the change, combined with differential sample retention, may well be the cause of the overall improvement. This view is reinforced by the fact that the overall patterns are the same over married men, married women, and single women.

I believe some of results are due to the special age range of the sample and

1. The index in table 7.1 is the score, which ranges from 0 to 22, multiplied by 100/22.

to a correlation between age and the probability of a health event. In particular, some of the HRS respondents were older than age 62 at baseline, and some reached age 62 between the waves. Their experience, especially with respect to labor force participation, is probably strongly influenced by their ages. For example, a health event may induce retirement or perhaps reinforce an already planned retirement that is financed by social security benefits. This option would not be available to the general population or even to the HRS respondents of younger ages. This scenario could be investigated through complete interactions with the age intervals less than 62 and 62–64. A health event inducing withdrawal from the labor force at age 62 is really about the effects of health on retirement, and the welfare effects are quite different from withdrawal from the labor force at younger ages.

A result that could benefit from additional explanation is the level and increase in Medicare coverage in table 7.2A. The sample is limited to those younger than 65, so the high level of Medicare eligibility (about 25 percent) among those who had a major event between the waves must be through the social security disability program, as it would also be for the additional 10 percent that became eligible for Medicare between the waves. This seems like a high rate of Medicare coverage. In the survey, Medicare coverage is determined from self-reports that may be subject to reporting error, but some verification could be made from data in other parts of the survey: section N has information about receipt of social security disability benefits, and section J has information about application and qualification for the social security disability program.

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