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Access to Public and Private Safety Nets, and the Effects of Disability Shocks Near-Retirement Age

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Abstract

Using seven waves of data from the Health and Retirement Survey we estimate the effect of public and private safety nets on financial security near retirement. We hypothesize that these safety nets dampen the effects of disability shocks in a manner that interacts with socioeconomic status (SES). The results show a positive association between disability shocks and the receipt of public cash benefits and a negative interaction with a key SES indicator, educational attainment, especially when we restrict the analysis to the period prior to the Social Security early retirement age. We find similar, but much stronger effects on health insurance coverage. These findings are consistent with the heavy conditioning of public benefits on meeting strict means testing and disability prior to retirement age. We find contrasting results for overall effects on household income, wealth and especially financial wealth. The estimated disability shock effects on all three of these outcomes are negative and in most models highly significant, while we find positive interactions with educational attainment. These findings suggest that public safety nets are insufficient to dampen the negative effects of earnings losses associated with disability shocks among the less educated. Other factors, such as private pensions, are important in reducing the adverse financial effects of disability shocks among the more educated. When we look at gross changes in household income we find large income reductions regardless of disability status that is associated with earnings reductions only partially compensated by increased cash benefits and pensions. In contrast household wealth show gross increases regardless of disability status and SES.

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1. Introduction

The goal of this paper is to analyze the differential effect of health and disability (HD) shocks on financial well-being prior to retirement age across various socioeconomic (SES) groups with differential access to public and private safety nets. A growing body of recent literature has looked at the effect of HD shocks on various indicators such as wealth, income, and consumption. Previous studies have suggested that reductions in labor income and increased out-of-pocket medical expenses following a HD shock are the major sources of mean reductions in financial well-being in the near-retirement age population. However, little consideration has been given to differential access to safety nets across the SES spectrum. Estimates of mean effects may be misleading because of heterogeneity in access to public and private buffers against the adverse financial effects of disability shocks. In this paper we focus on the near elderly from their early fifties through approaching the Social Security Full Retirement Age (FRA). Our motivation is rooted in the interaction of two factors: the dramatically increasing incidence of disabilities among people in the fifties and early sixties and the particular pattern of gaps in safety nets near retirement age.

We hypothesize that estimated mean effects mask important relationships between SES and the magnitude of HD shock effects on various aspects of financial well-being. At the lower tail of the SES distribution, given low labor income, potential access to the SSI program as well as the progressive structure of Social Security Disability Insurance (DI) benefits provide relatively high income replacement in case of a severe HD shock, and therefore reduce the negative effect of these shocks on financial well-being. In addition, the disability-conditioned availability of Medicaid and to some extent

Medicare (for DI beneficiaries after a two-year waiting period) may actually increase access to health insurance, although out-of-pocket expenses may still be substantial relative to household income. At the higher tail of the SES distribution access to employer-based pensions and health insurance, and other sources of wealth provide some buffer against income shocks and out-of-pocket expenses, but public benefit programs play a more limited role. In contrast, the role of public and private buffers may be more ambiguous for those in the middle of the SES distribution. Some may "fall through the cracks" as a result of the combination of not qualifying for public benefits, and having only limited access to private safety nets. Others, however, may benefit from both public programs – especially after reaching age 62 when many become eligible for early retirement benefits through Social Security (Old Age and Survivor's Insurance, or OASI), and can also rely on substantial private safety nets. Access to early retirement benefits (OASI) may be an important factor in shaping both SES and disability status differences, particularly since they may be available regardless of disability. However, substantial voluntary labor force withdrawal and the early take-up of OASI benefits among the nondisabled need to be kept in mind as potentially important confounding factors.

In this paper we look at longitudinal changes in various facets of financial security by two key variables: disability status and SES. We use three operational definitions of disability status. The first is based on answers to questions on whether a doctor has ever told the respondent that he or she has ever had a particular disease. We limit ourselves to "major" health conditions.[1] For brevity we refer to this variable as "Doctor diagnosed major health condition". The second is based on self-reported health

[1] Following Smith (2005) we define cancer, heart condition, stroke, and lung disease as "major" conditions.

status (poor and fair), while the third is based on self-reported work-limiting health condition. Under each of these definitions we distinguish three disability subgroups. First, we identify *those already disabled* at the baseline interview.[2] For simplicity we refer to this group in the rest of the paper as "disabled" (D group). We divide the rest – those who are not disabled at baseline – into two groups based on the incidence of disability between the baseline and some follow-up point: *those who continue as non-disabled* (ND=>ND group) throughout the study period, and *those who move from a non-disabled state to a disabled state* (ND=>D group). Members of this third group are identified as experiencing a HD shock.

Similar to Smith (2005) we adopt an essentially heuristic notion of SES as an umbrella concept of several possible ways to rank the study population by some measure of resources available. We use educational status, income and wealth indicators. For summary purposes we distinguish three categories on each of these measures. On the income and wealth measures using terciles for classification seems an easy approach that has the advantage of producing balanced sample distributions. We also develop alternative classification schemes based on potential access to means-tested benefits,[3] and divide the remaining population without access to such benefits into a group with household income and annuitized wealth combined below the median and a group with

[2] Some of these people may transition from disabled to nondisabled status between subsequent waves, and may show a variety of transition patterns over time. Unfortunately, the HRS does not allow for a straightforward measurement of transitions from a disabled to a nondisabled state, because the survey instruments in some of the waves implicitly assume that disability is an absorbing state. Moreover, even if this was not the case the number of observations showing this type of transition would probably be fairly small. Thus we ignore disabled=>nondisabled transition. This is expected to introduce some downward bias in estimated differences between members of this group and others.

[3] Program-defined income and assets limits are used to determine potential access to such programs.

household income and annuitized wealth combined above the median.[4] Although we conduct a variety of sensitivity analyses, using different SES indicators and disability definitions, most of our analysis reported in this paper is based on educational attainment as the SES indicator and "doctor-diagnosed major health condition" as the disability classification variable.

The rest of the paper is organized as follows. Section 2 provides an overview of previous literature. Section 3 describes the research questions and hypotheses. The description of the data and methodology follows in Section 4. Empirical findings are presented in Section 5. Finally, Section 6 concludes with a discussion of issues for future research.

2. Previous literature

There is an emerging body of literature on the effect of HD shocks on income and wealth during the late working years prior to retirement. The existing literature mainly focuses on overall effects of HD shocks on various outcomes such as labor income, out of pocket medical expenses, wealth and asset accumulation, pensions and retirement outcomes, although some studies consider disability type, marital status, and spousal effects. However, little attention has been paid to the effects of means-tested benefits as potential buffers against HD shocks, and possible interactions between SES and HD shocks. An exception is Lindelow and Wagstaff (2005) that explicitly considers interactions between poverty status and HD shocks on income in China. They find evidence that negative health shocks are associated with an increase in unearned income

[4] Note that to create this aggregate measure of income and annuitized wealth we first derive for each household the amount of their annual annuitized wealth using a four percent withdrawal rule of assets and implicitly assume liquidity.

for the poor, but this effect is not strong enough to offset the negative impact on overall income.

There is some consideration of the role of SES and safety nets in a few other important studies that focus on the United States population. Smith (1999) provides an excellent overview of the major issues surrounding the association of the relationship between health and SES. Using data from the first 3 waves of the HRS and the AHEAD he finds that the effect of health shocks on wealth is relatively small for people with below-median income, and differences in out of pocket expenses are minor. Smith (2005) finds much smaller effects of HD shocks when using data from the Study of Assets and Health Dynamics among the Oldest Old (AHEAD) compared to data from the Health and Retirement Study (HRS), and attributes this to greater access to public safety nets, particularly Social Security and Medicare, among the older AHEAD population. He also reports developing, but does not present, interaction models considering disability shock and SES indicators. Smith notes that he did not find race, gender, ethnicity and education interaction effects, but finds that high baseline wealth and income levels lead to relatively large major health shock effects. He also finds that health shocks result in higher, rather than lower, health insurance coverage. Smith (2007) looks at a different angle -- the effect of SES on health over the life cycle -- based on PSID data. He finds that SES affects future health outcomes primarily through education and not the individual's financial resources. Ward-Batts (2001) speculates that health shocks may have relatively large impacts on the resources of wealthier households. She also notes the possible role of social programs such as Medicaid at the other end of the SES scale.

Mitchell and Phillips (2001) look at patterns of Disability Insurance (DI) coverage near retirement. Using data from the Health and Retirement Study (HRS) linked to Social Security administrative data, the authors find that substantial proportion of older women, blacks, and less educated individuals are not DI insured.[5] Almost two-thirds of those who reports having a work limiting disability are not DI insured. However, the data analysis ignores potential disability program coverage under the SSI program.[6] Rupp et al (forthcoming) looks at disability program coverage of the working-aged population, and consider both DI and SSI coverage. The authors find that over 1/3rd of current DI and/or SSI nonparticipants in the working-aged population would financially qualify for SSI disability benefits in the event of a severe disability shock. The authors also note that SSI supplements DI by providing cash benefits for about half of those who are not DI insured. Moreover, it provides a pathway to Medicaid during the 2-year Medicare waiting period. The potential importance of the DI and SSI disability program safety net is further highlighted by Rupp and Davies (2004) using the 1984 SIPP panel matched to SSA administrative records. They find (page 166) that 32 percent of the 1936-1941 birth cohort (still alive in 1984) who were high school dropouts - regardless of health or disability status - has ever participated in DI and/or SSI disability by age 62. The corresponding figure for those who graduated from high school or had college education is 10 percent only. Among those members of this birth cohort who reported a

[5] Generally, DI insured status requires 20 "quarters of coverage" during a 40-quarter (10 year) period ending with the quarter in which the 5-month waiting period for DI cash benefits begins. Modified rules apply to younger people. A worker receives one quarter of coverage (up to a total of four) for a designated amount of annual earnings reported from employment or self-employment. In 2008 an amount of $1,050 earnings is needed for a quarter of coverage.

[6] We use the term disability program coverage to mean either DI insured status or SSI financial eligibility for disability benefits (or both) among working-aged persons who might receive disability benefits provided they also meet the definition of "categorically eligible as disabled" which is common to the two programs.

work-preventing disability in 1984 a whopping 73 percent have ever participated in either disability program by age 62 – regardless of educational attainment. The importance of these findings – suggesting a substantial role for the DI and SSI disability programs in the safety net protecting from disabilities – arises partly because they are based on highly accurate administrative records data and not on survey reporting which is subject to substantial misreporting and potential underreporting bias.

Using SIPP data matched to administrative records, Burkhauser et al (2003) tracks the household income of working-aged DI and SSI applicants from 38 months prior to 39 month following application based on 1990-1993 SIPP panel data matched to SSA administrative records, and finds that the average applicant's labor earnings declines dramatically six month before application, but household incomes decline less dramatically. Importantly, using a comprehensive array of household income items both before and after the application enables the authors to track longitudinal changes in unearned income from a variety of private and public sources. They find substantial heterogeneity in income outcomes. Results from quartile regressions suggest that higher income households experience greater percentage declines in their post-application income. Furthermore, the authors find substantial differences between the DI and SSI applicants mainly due to the almost total lack of labor income prior to application among the later group. Consistent with differences in SSI and DI benefit structures, they find that household income replacement rates are 111 to 117 percent for SSI awardees, compared to roughly 75 percent for DI awardees. These numbers are comparable to the results of our own calculations based on the data set used by Rupp et al (forthcoming) that focus on the much broader population of individuals covered by SSA's two disability

programs. Results show that a severe disability shock leading to disability program participation among current nonparticipants would actually increase family income by about 5 percent for those who are covered by SSI only and by about 12 percent for those who are covered by both DI and SSI, in contrast to an expected about 22 percent drop for those who are DI-insured only (unpublished tabulations).

3. Research questions and hypotheses

In this paper we analyze the interaction of HD shocks and SES. We ask whether such interactions play an important role in affecting various indicators of economic well-being in addition to the well-documented main effects of each. Our intuition is that different public and private buffers -- such as means-tested programs (notably SSI and Medicaid), social insurance (such as Social Security and Medicare), employer-provided health insurance, pensions, and accumulated wealth must play very different roles for people at different levels of the SES spectrum. Our analysis has three distinct steps. First, we assess the association between SES and the incidence of disability shocks in the near elderly population. Second, we analyze *gross* changes, overall as well as for each educational attainment subgroup, our key SES indicator, associated with a HD shock using a comprehensive set of measures reflecting various aspects of economic well-being that are believed to be related to public and private safety nets in different ways. Finally, we estimate multivariate models designed to assess the *net* effects of the interaction of HD shocks and SES.

Our first question is how SES relates to disability in a near-elderly population. Consistent with the findings of Smith (2007) we expect that SES is negatively associated

with both the prevalence of disability at the baseline interview, and the incidence of disability between the baseline and the follow-up conditional on being nondisabled at baseline interview. In other words, SES and disability are expected to be related to each other as people approach retirement age in two complementary ways. Low SES is associated with a higher probability of being disabled as people enter the near-retirement period of their life cycle around age 50. In addition, among those who are still nondisabled in their early 50s low SES is positively associated with the risk of disablement as they age. We look at these associations in order to provide descriptive background to the rest of our analysis, and do not intend to tease out causal effects in this paper.

Second, we analyze *gross* changes in various indicators of economic well-being associated with membership in three distinct disability groups as defined above (D, ND=>D, and ND => ND). In this descriptive analysis we use a fairly comprehensive set of indicators of economic well-being. These include poverty status, own earnings, receipt of cash benefit from public programs (SSI, DI, OASI), pensions, household income and wealth, private and public health insurance coverage, and medical out of pocket (MOOP) expenditures. We hypothesize that there is substantial heterogeneity by type of well-being indicator, disability group, and socioeconomic status. We believe that patterns of *gross* change for various subgroups are important for policy analysis on their own right, rather than providing just a prelude to the analysis of *net* changes. This is so, simply because the gross changes (in combination with the baseline values of various indicators) are the relevant measures of the economic well-being of the members of various *subgroups* of the population – regardless of the underlying causal mechanisms.

Of course, the analysis of *net* subgroup differences and the understanding of the underlying causal mechanisms are also very important from a policy perspective. This leads us to the third set of research questions. Our primary focus here is whether SES and disability shocks interact in producing various outcomes, or just display main effects (if any). In general, we hypothesize that there is substantial heterogeneity by type of well-being indicator. For example we expect the effect of HD shocks to range from large negative effects on earned income to positive effects on nonearned income items such as income from public programs, including Social Security, SSI and other welfare programs, as well as income from private pensions. We expect the effect of HD shocks on wealth to be negative due to asset spenddown and reduced savings. However, wealth also provides a buffer against declining living standards because they constitute a source of consumption alternative[7] to earned and unearned income. We anticipate a negative effect on access to private health insurance, but a positive effect on access to public health insurance, notably Medicaid and Medicare. Access to health insurance through a spouse may also compensate for the loss of own employer-provided health insurance coverage. In general we expect out of pocket medical expenditures to increase as a result of a HD shock, a factor that provides a downward pressure on income available from other sources.

[7] Asset spenddown increases the amount of cash available for current consumption compared to the scenario when only current income (or part of it) is used to finance current consumption. Likewise, if the portion of current income devoted to savings is reduced some or all of it can be used for current consumption. Outstanding debt, of course, also complicates the picture. For example, disability shocks may result in decreased debt repayment or new debt. Both would increase money available for current consumption.

While we anticipate that HD shocks will have a net negative effect on overall economic well-being,[8] we also believe that it is important to account for both negative and positive effects. Focusing on unambiguously negative effects (declining earnings, asset spenddown, and loss of private health insurance) gives a distorted picture because it ignores factors that provide a buffer (e.g. increased access to other sources of income and health insurance coverage). Our empirical analysis will allow for the assessment of the extent to which such positive factors provide a buffer, and therefore moderate the negative effects of lost earnings.

Finally, we also look at another source of heterogeneity: socio-economic status (SES). We hypothesize that the magnitude (and perhaps direction) of the various HD shocks substantially varies by SES. In general, the loss of earned income, assets, and private health insurance coverage is expected to be relatively unimportant at the lower SES tail simply because of the absence or limited extent of these at the baseline. Conversely, because of means testing and the heavy conditioning of access to public safety nets on disability status, means-tested cash programs and Medicaid are expected to be much more important at low SES levels than for the rest of the near-elderly population. At the high end of SES, private resources, particularly assets, private pensions and private health insurance, provide more important buffers. We hypothesize that the net role of public and private buffers may be more ambiguous for those in the middle group. Some may have limited access to both public and private buffers, while

[8] An important caveat is that our analysis ignores any possible direct effects of disability on consumption – with the exception of out-of-pocket medical expenses that obviously reflect both consumption needs related to the dynamics of HD shocks, and other factors such as the effect of changes in household income. Hurd and Rohwedder (2005) provide an interesting analysis of changes in consumption among the elderly, but their analysis does not address changes in consumption that may be related to disability shocks among the near elderly.

others might benefit from both. Cash benefits from OASI may play an important role in filling the gap.[9] As a result of these factors the overall effects of HD shocks on economic well-being is expected to vary by SES.

4. Data and Methodology

For this analysis we use panel data from seven waves of the Health and Retirement Study, a longitudinal, nationally representative survey of older Americans over the age of 50 and their spouses of any age. The first wave of interviews was conducted in 1992 and follow-up interviews were conducted every other year since then. The last wave that has been available for this analysis is Wave 7 which was conducted in 2004. The HRS collects a rich array of information on demographic characteristics, employment, disability, health, and wealth as well as expectations about the future.[10]

We use different sample definitions depending on whether we are interested in the cumulative effect of HD shocks between the 1992 and 2000 waves, or whether we are interested in utilizing the panel aspect of the data. For the former analysis, the sample consists of respondents who were ages 51-56 at the baseline interview in 1992 and were

[9] The role of Social Security is fairly complex here. For example, some near-elderly individuals may loose DI insured status due to sporadic labor force attachment partly as a result of progressive disablement. Some of those may potentially become financially eligible for SSI disability for the same reason, while others who reach age 62 may take early Social Security retirement at an actuarial reduction. Spousal benefits, the retirement earnings test, divorce and remarriage, and gender differences in several of these areas further complicate the picture.

[10] Furthermore, respondents in the HRS are asked to give permission to access their Social Security earning and benefits information (such data are available to researchers on a restricted basis). By 2004, the majority of respondents in the initial HRS cohort have given consent. About half of them gave consent in 1992 and the other half in 2004. The information on restricted data is particularly important since it provides information on earning history as well as SSI and DI benefits. We do not use the restricted data in the current paper, but plan to incorporate them in subsequent analyses.

alive (ages 59-64) at the follow-up interview in year 2000.[11] For our panel data analysis, the sample consists of non-disabled respondents of ages 51-59 at the baseline interview in 1992 and who were alive and less than 65 years old in any of the subsequent waves where disability shock status or transition was measured.[12] We limit the analysis to disability shocks that occur prior to reaching the age of 65, since there is a major institutional discontinuity in the safety net system related to the transition from working-aged to retirement-age. In particular, access to Medicare, SSI and Medicaid is heavily conditioned on disability prior to reaching the age of 65. None of these programs use a disability screen for persons aged 65 or over. For persons born in 1937 or before, the full retirement age (FRA) for Social Security retired worker benefits is also 65, but the FRA is scheduled to increase gradually to 67 years of age for those born after. For analyses limited to Waves 1 and 5 the increase of the FRA is empirically largely irrelevant, since the sample (born between 1936 and 1941) has not reached the FRA yet. However, since the FRA increases to 65 years and 8 months for the given birth cohort, it may affect some of the dynamics involving waves 6 and 7 more directly, since those born in 1937-1939 will be age 65-66 in 2002 or 2004. Nevertheless, our analysis is limited to persons who have not reached age 65 up till the last observation point used in this analysis.[13]

[11] Thus, those who died between wave 1 and wave 5 are excluded from the sample. People who died had systematically different baseline characteristics than survivors. In general, they reported more health problems and disabling conditions at baseline than those who survived, and have shown other characteristics associated with economic vulnerability -- such as minority status, less than high school education, low income and assets – disproportionally.

[12] Note that not all respondents are in the sample in all waves, either because they exit the panel due to death, or because of the age differences at the baseline wave coupled with our conditioning of being of less than 65 years of age in any of subsequent waves. Therefore, we are estimating our models using an unbalanced sample (i.e. the number of person-wave observations differs among our sample of respondents ages 51-59 at baseline). In addition, we also condition on respondent who report being non-disabled at the baseline on a given disability indicator (e.g. 'doctor diagnosed major health condition').

[13] Appendix Table 1 summarizes the aging of the original HRS cohort (born between 1931 and 1941) through 2004 interview.

We use three alternative ways of defining health and disability (HD) shocks. The source variables include self-reported work-limiting health condition, self-reported "poor" or "fair" health, and doctor-diagnosed major health condition as defined by Smith (1999). Values of these variables are available for each wave of the survey. We distinguish three population subgroups: those who are already disabled at the baseline, those who experience a shock during the period of interest, and those who never experienced a shock and thus were never disabled.[14] Consistent with much of the previous literature most of our analysis focuses on the last two subgroups. However, we also present some summary outcomes for the first category, because we believe that the income and wealth dynamics of those already disabled provides a useful comparison group, in addition to the usual comparison group of those who were never disabled.[15]

We look at a broad array of outcome variables such as income, wealth, pension, and health insurance coverage.[16] Following Smith (2005) we believe that medical out-of-pocket (MOOP) expenditures need to be considered. In our view, MOOP-adjusted income is an excellent summary outcome measure, because it captures the effects of the two principal sources of adverse financial consequences of a disability shock: loss of labor income and increased out-of-pocket expenditures.

[14] The exact definitions depend on the study period of interest. For example, in the descriptive analysis we focus on Wave 1 to Wave 5 disability transitions, while in the fixed and random effects modeling (to be discussed later) we define wave-to-wave disability shocks.

[15] One of the key findings of Meyer and Mok (2006) is that employment and earnings tend to fall noticeably prior to the onset of disabilities. Using the restricted administrative data matched to the HRS in future work we will be able to capture pre- and post-disability earnings history in a manner similar to their PSID-based analysis, and look at other important outcomes, such as DI and SSI receipt, death, and contributions to deferred compensation plans.

[16] We note that the income and wealth questions were initially asked in separate sections of the survey instrument in the first two waves of the survey. In Wave 3 (1996) they were integrated into one section in order to improve the quality of the income data (Hurd, Juster and Smith, 2003). These and other changes may result in nonsampling error in comparisons across waves, particularly those involving Waves 1 and 2.

We start our analysis by presenting descriptive statistics for the sample of individuals age 51-56 at the 1992 'baseline' interview (the first wave of the HRS), and at the 'follow-up' wave 5 (in 2000). Our sample consists of a cohort of individuals born between 1936 and 1941. We follow these individuals over an 8 year span until they reach 59-64 years of age in 2000. This captures a period of the life-cycle with a dramatically increasing disability incidence rate. Note that in this analysis we limit ourselves to outcomes prior to the historical Social Security full retirement age (FRA) of 65, although some will have passed the early Social Security entitlement age of 62. The age-65 cutoff is justified by two other institutional factors: both SSI and Medicare categorical eligibility as "aged" starts with the 65th birthday of the individual; SSI and Medicare participation prior to age 65 also requires that the person passes SSA's categorical disability screen. Outcomes past age 65 are also of potential interest, and would be good candidates for a follow-up study. In this paper, however, we focus on dynamics occurring prior to this important milestone.

In the descriptive part of our analysis our primary interest is in outcomes experienced by the subgroup that transitioned from a "nondisabled" to a "disabled" state between the baseline and the follow-up wave. We have two comparison groups: those who start as nondisabled in 1992 and never report a disability between 1992 and 2000, and those who were in a disabled state at the baseline.[17] We present *gross* changes (first differences or within group differences) for the three disability groups separately.

[17] Some of these people may have experienced a nondisabled state in one or several subsequent waves. We ignore this due to the fact that the disabled => nondisabled transition is not always observed in the HRS due to the preloading of previous wave information in some cases. This clearly introduces some heterogeneity. Note also that the most homogenously defined group is the nondisabled => nondisabled group; membership requires the lack of disability in all 5 waves. This makes it a particularly useful comparison group. Note only that membership in the nondisabled => disabled group requires the presence of reported disability in at least one of the four waves following the baseline. This also introduces some

Second, we estimate the *net* effects of HD shocks on the change of the outcome of interest (for example wealth) between the1992 and the 2000 wave, using probit, log linear, or Tobit models as appropriate. Gross subgroup differences may be biased due to confounding factors, such as age. In this specification, we control for baseline explanatory variables, such as age, marital status, race/ethnicity, region of residence, as well as household characteristics. In addition, we pay particular attention to controlling for a broad array of health and disability factors at the baseline.

Third, we pool seven waves of the HRS (1992 to 2004) and estimate a fixed and random effects model of the effect of a HD shock on different outcomes of interest. The models allows for an individual effect (including both time-invariant and time varying characteristics) and time-invariant unobserved heterogeneity. We control for a set of time-varying explanatory variables such as age, marital status, region of residence, health status, etc. As mentioned above, because our interest in the present study is the segment of the life-cycle prior to the age of 65 we utilize only person-wave observations that satisfy this age constraint.[18]

5. Findings

In this section we present our empirical findings organized as follows:

- First, we assess the *prevalence of disability* at baseline, and the *incidence of disablement* between baseline and follow-up by SES,

heterogeneity. In general, heterogeneity is expected to result in some downward bias in estimates of subgroup differences.

[18] Reported estimates (point estimates, standard errors, and statistical tests) account for complex HRS sample design.

- Second, we provide a *descriptive overview of gross changes* in key outcomes of interest by disability group,
- Third, we analyze patterns of *gross changes disaggregated* by SES and disability group, and
- Fourth, we summarize the results of *multivariate analyses* designed to address the *interaction of SES and disability shocks*.

The first three of these topics are clearly descriptive, and although they involve comparisons between the three disability groups, no causality is implied. Keep in mind that the three disability groups are natural groupings of people rather than randomly assigned experimental groups. Disablement is often not a single event, but a process, it is multidimensional (no single indicator is sufficient to capture 'disability'), and there are a number of factors associated with both disablement and various outcomes. Despite these caveats we think that the presentation of gross, longitudinal changes in distributional outcomes is important from a policy perspective. Individuals approaching retirement age who do experience a disability shock are probably more interested whether they *actually* fall into poverty (conceptually, first differences) than in the abstract question of how their post-shock poverty status might compare to their *hypothetical* poverty status in the absence of such a shock (conceptually, difference-in differences between two otherwise similar groups). To some extent, the same is true for policy makers. An exclusive focus on teasing out net effects may miss some important gross changes. For example, we may find that the net effect of a disability shock is a 10 percent loss of household income, but the gross change for the subgroup of people experiencing the disability shock is 20 percent – twice as large as the estimated net effect. Of course, we are also interested in

net effects, and therefore in section 5.4 we present results of multivariate analyses designed to tease out these.

5.1. Prevalence of disabilities, disability shocks, and SES

Using "doctor diagnosed major health condition" as the disability definition, in Table 1, we assess the prevalence of disability at baseline and the incidence of disablement between the baseline and the follow-up interview by different SES indicators. Consistent with Smith (1999), we find a clear negative relationship between SES and HD status at baseline, as well as SES and the incidence of an HD shock between 1992 and 2000. This relationship is remarkably robust across different SES measures used. It is important to note here that, while not reported in the table, similar patterns exist when self-reported "poor/fair" health or "work-limiting" disability are used to determine HD status. Furthermore, the magnitude of subgroup differences tend to be much larger when these measures which are clearly more subjective than the "doctor diagnosed major condition" are used.[19]

5.2. Gross changes in income, wealth, health insurance, and out-of-pocket expenditures by disability group

We start by briefly summarizing longitudinal changes on a wide array of distributional outcomes for our three disability groups under three different definitions. Table 2 provides an overview of baseline differences and gross changes by disability group in three areas of economic security: (1) income; (2) wealth; (3) health insurance coverage. All monetary values are expressed in 1992 dollars.

[19] Data are available on request from the authors.

Two measures, household income and poverty status are directly relevant for assessing economic vulnerability. Table 2 indicates that there are substantial differences in median household income and the poverty rate at the baseline wave between the three disability subgroups.[20] Furthermore, while all three disability groups experienced a decline in median household income and an increase in the poverty rate between the baseline and the follow-up, the increase in economic vulnerability is larger for the group who experienced a disability shock between the 1992 and 2000 waves. It is important to note that these patterns are robust across the three definitions of disability.

With respect to total household wealth, Table 2 shows that there are substantial baseline differences among the three disability groups in the expected direction (we presents the means only, but this is true for the medians as well). This makes it somewhat difficult to evaluate the relative magnitude of changes between groups; the magnitude of absolute ($) changes is dominated by the large baseline advantage of the ND=>ND group. However, two clear patterns emerge. First, household wealth has increased for all three disability groups. Second, those already disabled experienced the smallest increase. Since a substantial portion of total assets may be in housing, we also present statistics for non-housing wealth and find similar patterns.

Finally, looking at health insurance coverage from any source, public or private, we find that overall coverage is roughly comparable for the three disability groups at baseline, albeit the ND=>ND group appears to have a higher coverage rate when the two more subjective disability classifications are used. In contrast to the lack of striking baseline differences in coverage, the two groups affected by disability experience

[20] We report the mean statistics as well, but because of their sensitivity to outliers, we discuss the median results only.

substantial increase in health insurance coverage between the baseline and the follow-up wave, while the nondisabled group experiences a consistent, albeit small decline in coverage. Health insurance coverage appears to be the only outcome indicator where the ND=>D group does not show a disadvantage compared to ND=>ND group.

To get a clearer picture of the relative magnitude of changes in various indicators that affect financial well-being, Table 3 expresses changes in various outcomes as a percent of baseline household income. Results clearly show that, as expected, the major factor that negatively affects near-retirees' financial well-being is the loss in earned income. The relative magnitude of the reduction is clearly most substantial for those who experienced a disability shock. Yet, the non-trivial decline in earning for the ND=>ND group suggest that voluntary labor force withdrawal regardless of disability is an important factor for this age group.

Increased public benefits, pension income, and the substantial increases in wealth across the board mitigate the effect of earning losses to some extent, with public benefits playing an unambiguously larger role among those experiencing a disability shock compared to those who stayed nondisabled. Still, when both respondents' earnings loss and increased benefits are considered, the negative net effect remains substantial, especially for those who experienced a HD shock. Overall, differences among the disability groups do not substantially change even when household incomes are adjusted for MOOP expenditures and annuitized wealth is also considered.

5.3. Gross changes in outcome indicators by disability and SES group

In this section we examine gross changes in key outcomes stratified by educational attainment.[21] Table 4 indicates that, as expected, regardless of disability group, there are substantial differences in baseline household income by educational attainment, whereas within each SES group, baseline differences across disability subgroups are relatively muted. There is a clear negative relationship between educational attainment and the magnitude of changes in household income with high school dropouts experiencing the largest decline in median income regardless of disability status. Interestingly, the difference between the ND=>D and ND=>ND subgroups, both at the mean and at the median, appear to be smallest for high school graduates compare to other SES groups.

The SES differences are even more striking when we look at poverty rates. High school dropouts seem to have a triple disadvantage: the highest probability of baseline poverty, the largest percentage point increase in poverty between baseline and follow-up regardless of disability, and the strongest vulnerability to the negative financial effects of disablement as measured by the difference in the percentage point change in the poverty rate between the ND=>D and ND=>ND groups.

The triple disadvantage of high school dropouts is similarly present when we look at earnings in Table 5. Not surprisingly, the percent with nonzero earnings at baseline is lower for high school dropouts, especially for the disabled (D) group. Furthermore, the magnitude of changes between baseline and follow-up in the proportion with nonzero

[21] To keep the discussion manageable, we limit ourselves to a single disability shock classification: "doctor diagnosed major health condition." We prefer this measure because of its objectivity. However, we note that there is a potential selectivity issue here; those with better access to health care may be more likely to report a "doctor diagnosed health condition." This may be particularly problematic for an analysis by SES status. However, Table 1 has shown a negative association between SES and both the baseline prevalence of disability and the incidence of disablement using this definition.

earnings is relatively larger for high school dropouts. As anticipated, there is a clear negative association between educational attainment and the drop in the percent with nonzero earnings across disability subgroups. Across the education spectrum, it is evident that the ND=>D group experienced the sharpest decrease in the percent with nonzero earnings, whereas for the nondisabled group the decline was less pronounced. As a result, the differences in percentage point change between the ND=>D and ND=>ND groups show a strong negative association with SES (about 15 and 10 percentage point difference, respectively, for those in the bottom and top education group). Similar patterns are observed with respect to the drop in average (unconditional) earnings. The ND=>D group among high school dropouts experienced a 71 percent drop in mean earnings between the baseline and follow-up interviews, compared to the 32 percent decline for the ND=>ND group among those in the top SES group. These findings are consistent with the interpretation that voluntary labor force exit regardless of disability is the dominant pattern among the higher SES groups, while the lower the SES, the larger the role of disablement as a reason for labor force exit.

Differences in the receipt of public cash benefits (Table 6) are largely as expected both at baseline and follow-up. The ND=>D group experiences consistently larger increases in the receipt in disability benefits, both in proportion and amount, across the SES spectrum than those who stay nondisabled, with high school graduates showing the largest difference. Nevertheless, disability benefits play a smaller role compared to OASI benefits (presumably primarily early retirement). An important caveat here is that our data are based on survey self-report that may underreport DI and SSI disability.[22]

[22] See previous discussion of Rupp and Davies (2004). This potential underreporting bias is one reason we consider analyzing the HRS files that include matched administrative records.

In contrast to public benefits, the top SES group experienced the largest percentage point increase in the receipt of private pensions as well as in the amount received (Table 7). Furthermore, for both the ND=>D and the ND=>ND groups there is a clear positive association between increased receipt of private pensions and educational attainment. As a result of the differential role of public benefits and private pension by SES, when receipt from both sources combined is considered, a picture of differences in a relatively narrow range across SES groups emerges -- with respect to both receipt and average amount. However, differences between the ND=>D and the ND=>ND groups persists across all educational attainment groups.

Table 8 presents some aggregate comparisons between changes in earnings and changes in public benefits and pensions. For those in the bottom and middle SES groups it appears that the increase in the receipt of public benefits more than compensates for the decrease in the percent with nonzero earnings. The opposite pattern is true for the top SES group. When the receipt of public benefits and pensions combined is considered, the percentage point increase in receipt is higher than the percentage point decrease of those with nonzero earnings across the SES spectrum. However, when we look at the aggregate increase in the amount of public benefits as a percent of the aggregate earnings loss, we find that for all subgroups only one third or less of the aggregate earnings loss is replaced by increased public benefits. As anticipated, there is a strong negative relationship between SES and the aggregate public benefit replacement rate for both the ND=>D and ND=>ND groups. However, when we add income from pensions to public benefits, replacement rates increase substantially for those in the middle and top SES

groups, with high school graduates displaying the highest replacement rate across the disability groups.[23]

We next turn to household wealth. Table 9 shows that the mean value of both total household wealth and non-housing wealth increased between the baseline and follow-up waves for all disability and SES groups. As expected, there is a strong positive relationship between SES and wealth growth for both the ND=>D and ND=>ND groups. Some of the results on total household wealth appear counterintuitive, however. Surprisingly, among high school dropouts, the ND=>D group experienced a higher increase in total wealth than the ND=>ND group. Furthermore, across all SES groups, the percent increase in non-housing wealth was much higher for the ND=>D group than for ND=>ND group.

Turning our attention to health insurance coverage (Table 10) we observe that, as anticipated, there are strong SES differences in access to public and private health insurance across the board. Public health insurance (primarily Medicaid) is a great homogenizing force, but this effect is conditional on disability status. Public health insurance boosts insurance coverage for the bottom SES group, and to a lesser extent for the middle SES group, among those who started out as disabled (D) and those who experienced a disability shock (ND=>D). But among those who continue as nondisabled, public health insurance does not reduce SES differences in overall health insurance coverage, although it compensates for slight declines in private health insurance coverage.

[23] Note that these calculations compare aggregate dollar amounts for these various groups rather than some average of individual replacement rates. In future work we intend to incorporate statistics on individual replacement of earnings as well that provides a somewhat different perspective.

Table 11 shows that changes in both the percentage with MOOP expenses and in most cases the unconditional mean dollar amounts are fairly small across the SES spectrum. Nevertheless, high school graduates, across the three disability subgroups, had the largest increase in MOOP expenses. The difference between the disability groups among high school dropouts is noticeable. Although health insurance coverage dramatically increased for the ND=>D subgroup of high school dropouts, estimated out of pocket expenditures also increased by 24 percent. In contrast, there is hardly any change in MOOP expenses among high school dropouts in the ND=>ND group.

Finally, Table 12 presents a synthesis of gross changes in outcome indicators relative to baseline household income by SES group. The most salient finding here is that losses in own earnings tend to be fairly large compared to the increase in public benefits and pension income. SES differences in aggregate earnings losses are relatively small. There are clear differences in the patterns of changes in public benefits by SES group as well as across disability groups, confirming the relative importance of public benefits at the lower tail of the SES distribution, especially for those who experience a disability shock. The patterns for private pensions are the exact opposite. As a result, when we look at public benefits and pensions combined, the SES differences in percentage change are more muted, whereas the differences between the ND=>D group and ND=>ND group are more pronounced and negatively related to SES. Finally, wealth growth is clearly a fairly insignificant factor for high school dropouts, but plays a large role for the other two SES groups, especially for the top group.

5.4. Results of multivariate analyses

In this subsection we present the results of multivariate analyses designed to assess the net effect of disability shocks on various outcomes as well as the interaction effects of disability shocks and educational attainment. Tables 13 and 14 report the estimated coefficients of the disability shock variable and its interaction with the SES dummies, under different specifications and samples. In all model specifications we control for a large set of baseline variables, including the lagged values of the dependent variables of interest. Table 13 presents the results of income and wealth regressions, while Table 14 focuses on discreet outcomes such as poverty status, receipt of public benefits or pension income, and health insurance coverage. Estimates in column (1) focuses on disability shocks between Wave 1 and 5 and the results are comparable to the descriptive data presented earlier. In contrast, estimates in columns (2) through (7) are either random or fixed effect models on pooled sample where the disability shocks vary wave-to-wave.[24] Columns (2) and (3) are comparable to column (1) in that they consider information up to wave 5, but not beyond; columns (4) to (7) use all waves currently available (waves 1 through 7). All but the last two columns consider transitions up to age 65, while columns (6) and (7) consider transitions only up to age 62.[25] The structuring of Table 14 is similar, except for the presentation of both probit and OLS results for the wave 1 to wave 5 disability shock analysis (columns 1 and 2).

[24] In these models in addition to controlling for baseline characteristics we allow for wave-varying differences in the coefficients of right-hand side variables.

[25] We condition on being less than 62 years old, in order to access the sensitivity of our results to the claiming of early social security retirement benefits and related labor force withdrawal patterns. The estimation results, indeed, show that the magnitude of disability shock coefficients tend to be somewhat larger in absolute value when we condition the sample on being less than 62 years of age.

First, we look at total household wealth and household income (Table 13). With respect to household wealth the results are generally consistent with the expectation of a negative disability shock effect and a positive education interaction. Not surprising, when housing assets are excluded the results tend to be stronger. Furthermore, the estimated disability shock coefficients of household income are negative as expected, but only in a few cases are significant or marginally significant. The results are weaker for the disability shock*education interactions, but at least most of the coefficients have the expected positive sign.

We find that disability shocks increase the probability of being in poverty by roughly five to eight percentage points (Table 14). Most of the interaction coefficients have the expected negative sign, and some of these are statistically significant. There is a strong and statistically highly significant positive association between disability shocks and the receipt of cash benefits from public sources. The interaction coefficients have the expected negative sign (i.e. the effect of disability shocks decreases as educational attainment increases) and several of these coefficients are statistically highly significant. Importantly, when we restrict the analysis to transitions prior to the Social Security Early Retirement Age (ERA) -- prior to reaching age 62 -- the coefficients are relatively large in absolute value and highly significant, implying that access to early Social Security retired worker benefits mitigates some of the effects of disability shocks. Conversely, these findings indicate that the almost total conditioning of access to public benefits in the years preceding the ERA on both disablement and low income/assets results in a substantial gap in the social safety net for working-aged people aged 61 or less. The results on the receipt of pension income are mainly insignificant, but all of the significant

interaction coefficients have the expected positive sign. Importantly, disability shocks prior to age 62 (column 6 and 7) significantly decrease the probability of receiving pension income among high school dropouts, in contrast to the other education groups. Moreover, the statistically significant interaction effects on the receipt of public benefits and pensions have the opposite signs. Finally, we note that the estimated main and interaction effects prior to the ERA tend to be larger in absolute value for public cash benefit receipt as opposed to the receipt of private pensions. We note that this result may not hold for benefit and pension amounts.[26]

Finally, disability shocks significantly increase the probability of having health insurance coverage from any source, mainly because of increased access to public programs. Furthermore, interaction coefficients are large and statistically significant. These results are very robust to model specification and are clearly driven by the estimated net effects of public health insurance.

All in all, we find that the main and interaction effects of public cash benefit programs and private pensions are as expected. However, when we look at overall effects on household income at the mean and lower tail the results are much weaker. This suggests that there are other factors at play here. Differential patterns of labor force withdrawal may play an important role here, and changes involving household composition and/or the behavior of other household members may also be subject for further explorations. With respect to wealth the results are consistent with our expectation of a negative disability shock main effect and positive disability shock*education interaction effects. As expected, these results are stronger when

[26] Tables 3 and 7 show that the relatively large pension amounts tend to dominate both the aggregate and the disaggregated picture for the top SES group.

housing assets are excluded. Finally, the net effect of disability shocks on health insurance coverage is strong and positive, while the disability shock*education interaction effects are negative and also strong. This reflects the U.S. health insurance system for the working aged where public coverage is heavily conditioned on both severe disability and means tests, whereas private health insurance coverage is more prevalent at higher SES levels and typically remains available subsequent to a disability shock.

6. Concluding comments

In this paper we demonstrate the overall role of access to public and private safety nets as potential buffers against threats to financial well-being associated with disability shocks and low SES among the near elderly. The results show that safety nets dampen the effects of disability shocks in a manner that interacts with socioeconomic status (SES). There is a positive association between disability shocks and the receipt of public cash benefits and a negative interaction with a key SES indicator, educational attainment, especially when we restrict the analysis to the period prior to the Social Security early retirement age. We find similar, but much stronger, effects on health insurance coverage. These findings are consistent with the heavy conditioning of public benefits on meeting strict means testing criteria and on the presence of severe disability prior to retirement age. We find contrasting results for overall effects on household income, wealth, and especially financial wealth. The estimated disability shock effects on all three of these outcomes are negative and in most models highly significant, while we find positive interactions with educational attainment. These findings suggest that public safety nets are insufficient to dampen the negative effects of earnings losses associated with

disability shocks among the less educated. Other factors, such as private pensions are important in reducing the adverse financial effects of disability shocks among the more educated. When we turn our attention to gross (as opposed to net) changes in household income we find large income reductions regardless of disability status that is associated with earnings reductions only partially compensated by increased cash benefits and pensions. In contrast, household wealth shows gross increases regardless of disability status and SES.

In future work we plan to use restricted SSA data matched to the HRS data, to analyze the dynamics of DI insured status as it relates to disability benefit coverage, earnings, OASDI and SSI benefits, and mortality. This may be a particularly worthwhile extension in light of the possible downward bias in the HRS survey data in estimates of DI and SSI disability benefit receipt. If such a bias exists and if substantial it may have resulted in some understatement of the importance of these public cash benefit safety nets in the analyses in this paper.

Another area of potential extension involves the analysis of the effect of pre-FRA disability shocks on post-FRA indicators of financial security. The potential payoff here arises from the fact that both unreduced Social Security retirement benefits and SSI cash benefits become available post-FRA/post age 65 regardless of disability status. Similar changes arise with respect to access to Medicaid and Medicare benefits.

While the paper provided a disaggregated view of the effect of disability shocks and SES interactions there are important sources of heterogeneity that are yet unexplored. For example, differences between the working and nonworking poor may be important, partly due to differences in patterns of income replacement related to disability shocks.

While most of the paper looked at educational attainment as the SES variable, some of the results may be sensitive to the SES indicator used. Likewise, alternative ways of measuring disability shocks may be helpful to consider. A more detailed look at pensions and financial and housing wealth is also warranted. While in this paper we looked at means, medians, and poverty status, more attention to the distribution of outcomes, particularly MOOP expenses may worth exploring. In addition, while the present analysis focused on the role of own earnings and own benefits and pensions, the findings suggest the need for a better understanding of the family-household context. Previous work looked at effects on spousal labor supply, but changes in marital status and other household variables also warrant attention. Finally, a nontrivial portion of this birth cohort died between 1992 and 2000, and looking at financial security during the last years of life of these people – invariably left out from studies of this kind – would be a natural extension.

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Table 1. Prevalence of disability at 1992 baseline and the onset of a doctor diagnosed major health condition, by various measures of socioeconomic status (SES)

SES measure	Doctor diagnosed major health condition					
	Disabled (D)[1]		ND => D[2]		ND => ND[3]	
	Percent distribution					
Education						
High school drop out	23.4	(1.8)	19.3	(1.4)	57.2	(1.9)
High school graduate	21.6	(1.2)	16.0	(0.9)	62.4	(1.2)
Some College	19.5	(1.3)	16.2	(1.0)	64.3	(1.7)
College Graduate or more	14.2	(1.6)	15.7	(1.4)	70.2	(1.9)
Total household income						
lowest 1/3rd	24.6	(1.2)	16.8	(1.2)	58.6	(1.4)
middle 1/3rd	20.4	(1.1)	18.2	(0.9)	61.4	(1.3)
highest 1/3rd	16.5	(1.3)	15.3	(0.9)	68.2	(1.5)
Total houshold wealth						
lowest 1/3rd	26.6	(1.4)	18.2	(1.1)	55.2	(1.4)
middle 1/3rd	18.8	(1.2)	18.4	(1.0)	62.8	(1.6)
highest 1/3rd	16.2	(1.2)	14.0	(1.1)	69.8	(1.6)
Income/wealth level indicator[4]						
Potentially eligible for SSI disability	24.4	(1.7)	18.4	(1.6)	57.2	(2.2)
Others with low income/annuitized wealth	22.4	(1.1)	18.1	(1.0)	59.5	(1.1)
Others with high income/annuitized wealth	16.3	(1.1)	14.9	(0.9)	68.8	(1.4)
N of Obs	812		681		2554	

Notes: Data are from Health and Retirement Study. Sample consists of individuals ages 51-56 at the baseline in 1992 (wave 1) and ages 59-64 in 2000 (wave 5). Monetary values are in 1992 dollars. Reported figures are weighted using survey sampling weights. Estimated standard errors are reported in parentheses.

[1] Disabled (D) group is defined based on respondent report of doctor diagnosed major condition (heart disease, cancer, stroke, and lung disease) at wave 1 baseline (1992).

[2] ND=>D group is defined based on respondent report of no doctor diagnosed major health condition at the baseline combined with the presence of doctor diagnosed major health condition at any of the follow-up waves up to wave 5 (in 2000). This group is construed to have experienced a "disability shock" during the 1992-2000 survey period.

[3] ND=>ND group is defined based on no doctor diagnosed major health condition at the 1992 baseline or at any of the follow-up waves up to wave 5 (in 2000).

[4] Of the total sample, we first define the subgroup that is potentially eligible for SSI disability. This subgroup is defined based on assets and income limits used under the SSI means test, except that in establishing countable income, the earned income of the respondent is capped at the Substantial Gainful Activity (SGA) level. The SGA screen is used in the determination of categorical eligibility as disabled. This indicator is derived separately for couples and single people and is wave specific, i.e. the program limits are in nominal terms for each wave year. The remaining part of the sample that is not potentially eligible for SSI disability is divided into two subgroups based on their annual household income and annuitized nonhousing wealth. Annuitized non-housing wealth is calculated using a 4 percent withdrawal rule and implicitly assumes liquidity. The annuitized wealth is then added to annual household income. Using this combined measure we derive the second and third subgroups as those whose income/annuitized wealth is below the median and those whose income/annuitized wealth is above the median.

Table 2. Overall indicators of financial security by disability group under three alternative disability definitions

Outcome measures	Value at 1992 baseline, absolute and relative 1992-2000 change	Doctor diagnosed major health condition			Self-reported poor or fair health			Self-reported work-limiting health condition		
		Disabled (D)	ND => D	ND => ND	Disabled (D)	ND => D	ND => ND	Disabled (D)	ND => D	ND => ND
Median household income	At baseline ($)	35,300	40,000	45,130	22,000	34,000	51,000	25,100	37,000	50,000
	Change ($)	-6,343	-8,928	-6,817	-6,535	-8,317	-6,280	-5,825	-10,270	-5,693
	Change (%)	-18%	-22%	-15%	-30%	-24%	-12%	-23%	-28%	-11%
Mean household total income	At baseline ($)	46,724	49,607	58,351	27,475	41,942	65,545	33,959	45,783	63,815
		(2,726)	(2,156)	(2,513)	(0,869)	(1,709)	(2,548)	(1,854)	(1,554)	(2,595)
	Change ($)	-1,730	-2,095	1,222	-3,634	-2,940	2,000	-3,925	-5,946	3,574
		(2,464)	(4,450)	(3,201)	(0,946)	(2,823)	(3,469)	(1,364)	(2,144)	(3,467)
	Change (%)	-4%	-4%	2%	-13%	-7%	3%	-12%	-13%	6%
Percent poor[1]	At baseline (%)	15.0%	8.3%	8.6%	26.7%	13.8%	4.3%	23.5%	12.0%	5.1%
		(1.4)	(0.9)	(0.7)	(1.6)	(1.3)	(0.5)	(1.6)	(1.2)	(0.6)
	At follow-up (%)	16.8%	14.7%	10.1%	32.9%	19.2%	4.6%	26.3%	19.1%	5.5%
		(1.5)	(1.5)	(0.8)	(2.1)	(1.6)	(0.5)	(2.1)	(1.4)	(0.6)
	Percentage point change	1.8%	6.4%	1.5%	6.2%	5.5%	0.4%	2.7%	7.1%	0.4%
		(1.3)	(1.5)	(0.8)	(2.0)	(1.4)	(0.6)	(1.7)	(1.1)	(0.6)
	Percent change (%)	12%	77%	17%	23%	40%	9%	12%	59%	8%
Household total wealth (unconditional mean)	At baseline ($)	187,050	180,448	271,279	98,155	157,806	301,568	132,062	186,964	289,991
		(19,905)	(14,113)	(17,044)	(9,875)	(8,490)	(15,579)	(13,720)	(11,032)	(17,242)
	Change ($)	64,120	90,218	144,039	4,723	57,871	167,984	35,979	121,164	141,798
		(22,383)	(26,939)	(49,515)	(9,887)	(28,877)	(49,792)	(10,226)	(56,478)	(37,007)
	Change (%)	34%	50%	53%	5%	37%	56%	27%	65%	49%
Household non-housing wealth (unconditional mean)	At baseline ($)	134,436	112,036	197,725	59,587	114,294	217,347	87,003	135,362	208,260
		(17,785)	(10,931)	(14,901)	(8,967)	(12,699)	(13,727)	(11,334)	(11,319)	(15,230)
	Change ($)	49,759	85,181	109,047	4,566	43,027	132,005	28,275	94,856	110,967
		(18,106)	(24,867)	(36,813)	(9,563)	(19,440)	(37,350)	(10,552)	(41,598)	(27,861)
	Change (%)	37%	76%	55%	8%	38%	61%	32%	70%	53%
Percent with health insurance from any source[2]	At baseline (%)	76.6%	77.4%	76.8%	67.3%	70.4%	81.4%	71.3%	70.6%	80.9%
		(1.5)	(1.4)	(1.0)	(1.8)	(1.7)	(0.9)	(1.9)	(1.8)	(0.9)
	At follow-up (%)	82.9%	86.7%	76.6%	79.6%	78.2%	80.0%	81.1%	77.9%	79.8%
		(1.4)	(1.5)	(1.0)	(1.9)	(1.5)	(1.0)	(1.9)	(1.6)	(1.1)
	Percentage point change	6.3%	9.3%	-0.1%	12.3%	7.7%	-1.3%	9.7%	7.3%	-1.1%
		(2.1)	(1.7)	(1.0)	(2.1)	(1.9)	(1.1)	(2.0)	(2.0)	(1.2)
	Percent change (%)	8%	12%	0%	18%	11%	-2%	14%	10%	-1%

Notes: See notes in Table 1. Self-reported poor or fair health and work-limiting health condition are two alternative disability definitions. The disability groups under these definitions are determined in a manner similar to the way we described the groups using the doctor diagnosed major health condition in notes to Table 1. Household income is expressed in per annum terms. Monetary values are in 1992 dollars. Estimated standard errors are in parentheses.

[1] In determining poverty status we follow the procedure described in the RAND-HRS documentation (Version G) to the extent feasible. Status as poor is determined using poverty threshold levels from the U.S. Census Bureau and family composition from the RAND-HRS data file. Family composition is determined based on the number of people living in the household. We were unable to identify the number of family memebrs under age of 18 and to precisely identify the number of household memebrs who were not related to the respondent or spouse, and therefore our poverty measure is somewhat imprecise.

[2] Health insurance coverage either through employer (self or spouse) or through public programs (Medicaid/Medicare).

Table 3. Absolute change in the mean value of various outcome measures between the baseline (1992) and follow-up (2000) waves, and as percent of baseline household income by disability group under three disability definitions

Outcome measure	Value at 1992 baseline, and absolute and relative change between 1992 and 2000	Doctor diagnosed major health condition			Self-reported poor or fair health			Self-reported work-limiting health condition		
		Disabled (D)	ND => D	ND => ND	Disabled (D)	ND => D	ND => ND	Disabled (D)	ND => D	ND => ND
Mean household total income	At baseline ($)	46,724 (2,726)	49,607 (2,156)	58,351 (2,513)	27,475 (869)	41,942 (1,709)	65,545 (2,548)	33,959 (1,854)	45,783 (1,554)	63,815 (2,595)
Unconditional mean of own earnings	Change ($)[1]	-7,287 (1,137)	-13,261 (1,325)	-9,130 (1,579)	-5,135 (622)	-9,520 (987)	-10,523 (1,636)	-5,486 (726)	-12,783 (1,128)	-9,248 (1,778)
	Change as % of baseline HH income[2]	-16%	-27%	-16%	-19%	-23%	-16%	-16%	-28%	-14%
Public benefits (SSI+DI+OASI)	Change ($)	1,926 (139)	2,028 (163)	1,212 (51)	1,683 (155)	1,913 (144)	1,305 (58)	1,711 (174)	2,306 (126)	1,105 (64)
	Change as % of baseline HH income	4%	4%	2%	6%	5%	2%	5%	5%	2%
Pension incomes	Change ($)	1,854 (332)	3,725 (641)	2,584 (321)	1,285 (280)	1,517 (254)	3,330 (353)	1,098 (322)	2,342 (361)	3,173 (387)
	Change as % of baseline HH income	4%	8%	4%	5%	4%	5%	3%	5%	5%
Public benefits + pension incomes	Change ($)	3,780 (369)	5,754 (706)	3,796 (327)	2,967 (323)	3,430 (313)	4,635 (361)	2,809 (329)	4,647 (402)	4,278 (408)
	Change as % of baseline HH income	8%	12%	7%	11%	8%	7%	8%	10%	7%
Household total wealth	Change ($)	64,120 (22,383)	90,218 (26,939)	144,039 (49,515)	4,723 (9,887)	57,871 (28,877)	167,984 (49,792)	35,979 (10,226)	121,164 (56,478)	141,798 (37,007)
	Change as % of baseline HH income	137%	182%	247%	17%	138%	256%	106%	265%	222%
Household annuitized wealth	Change ($)	1,990 (724)	3,407 (995)	4,362 (1,473)	183 (383)	1,721 (778)	5,280 (1,494)	1,131 (422)	3,794 (1,664)	4,439 (1,114)
	Change as % of baseline HH income	4%	7%	7%	1%	4%	8%	3%	8%	7%
Medical our-of-pocket (MOOP) expenditures (Wave 5 - Wave 2)	Change ($)	231 (81)	264 (132)	60 (46)	178 (86)	302 (101)	58 (47)	65 (119)	278 (80)	85 (48)
	Change as % of baseline HH income	0%	0.5%	0.1%	0.6%	0.7%	0.1%	0.2%	0.6%	0.1%
Respondent income (earnings, public benefits, pensions) adjusted for own MOOP expenditures	Change ($)	-3,085 (1,153)	-7,287 (973)	-4,997 (1,628)	-1,803 (752)	-6,029 (898)	-5,473 (1,649)	-2,334 (705)	-7,835 (1,002)	-4,625 (1,790)
	Change as % of baseline HH income	-8%	-15%	-9%	-9%	-15%	-9%	-9%	-19%	-7%
Household income adjusted for MOOP expenditures	Change ($)	-768 (2,396)	-1,501 (4,448)	1,999 (3,191)	-2,650 (932)	-2,459 (2,777)	2,831 (3,460)	-2,758 (1,377)	-5,216 (2,145)	4,273 (3,463)
	Change as % of baseline HH income	-2%	-3%	3%	-10%	-6%	4%	-8%	-11%	7%
Household income and annuitized wealth adjusted for MOOP expenditures	Change ($)	1,222 (2,928)	1,906 (5,211)	6,361 (3,771)	-2,467 (985)	-738 (3,410)	8,112 (4,014)	-1,627 (1,438)	-1,422 (2,878)	8,712 (4,037)
	Change as % of baseline HH income	3%	4%	11%	-9%	-2%	12%	-5%	-3%	14%

Notes: See notes in Tables 1 and 2. Own earnings, household income, pension income, public benefits, and out-of-pocket medical expenditures (MOOP) are expressed in per annum term. Annuitized wealth excludes housing wealth. Monetary values are in 1992 dollars. Estimated standard errors are in parentheses.

[1] Change indicates the absolute change in the mean values of the corresponding indicator between the follow-up and baseline waves.

[2] Absolute change in mean values expressed as percent of mean household (HH) income at the baseline.

Table 4. Household income and poverty status by SES and disability group

SES Group: Educational attainment	Value at 1992 baseline, and absolute and relative change between 1992 and 2000	Doctor diagnosed major health condition					
		Disabled (D)		ND => D		ND => ND	
		Mean household total income					
High school dropout	At baseline ($)	26,319	(1,859)	26,898	(2,522)	32,617	(1,742)
	Change ($)	-4,457	(1,760)	-5,524	(2,798)	-1,568	(2,256)
	Change (%)	-17%		-18%		-11%	
High school graduate	At baseline ($)	41,040	(2,404)	41,495	(1,955)	47,155	(1,604)
	Change ($)	-5,276	(2,671)	-6,618	(1,339)	-5,195	(1,655)
	Change (%)	-13%		-14%		-11%	
Some college or more	At baseline ($)	67,674	(4,922)	70,969	(5,200)	78,938	(4,204)
	Change ($)	4,374	(6,179)	4,203	(10,869)	7,923	(6,921)
	Change (%)	4%		2%		10%	
		Median household total income					
High school dropout	At baseline ($)	19,768		22,240		25,000	
	Change ($)	-6,607		-7,563		-5,871	
	Change (%)	-33%		-34%		-23%	
High school graduate	At baseline ($)	32,732		37,600		41,000	
	Change ($)	-4,226		-8,657		-8,636	
	Change (%)	-13%		-23%		-21%	
Some college or more	At baseline ($)	52,500		61,800		61,972	
	Change ($)	-4,872		-12,955		-6,720	
	Change (%)	-9%		-21%		-11%	
		Percent poor					
High school dropout	At baseline	28.6	(2.7)	21.8	(3.2)	19.9	(2.0)
	At follow-up	36.7	(2.9)	38.6	(4.5)	26.5	(1.9)
	Percentage point change	8.0	(3.0)	16.8	(3.8)	6.6	(1.9)
	Percent change	28%		77%		33%	
High school graduate	At baseline	13.0	(1.8)	6.3	(1.6)	8.7	(1.0)
	At follow-up	13.9	(1.7)	9.1	(1.9)	9.6	(1.2)
	Percentage point change	0.8	(1.9)	2.7	(2.1)	0.9	(1.3)
	Percent change	6%		43%		11%	
Some college or more	At baseline	7.7	(2.0)	1.9	(0.9)	3.7	(0.8)
	At follow-up	6.4	(1.9)	5.3	(1.3)	3.5	(0.7)
	Percentage point change	-1.3	(1.9)	3.4	(1.4)	-0.2	(0.8)
	Percent change	-17%		179%		-6%	

Notes: See notes in Tables 1 and 2. Standard errors are reported in parentheses.

Table 5. Percent with non zero earnings and unconditional mean earnings by SES and disability group

SES Group: Educational attainment	Value at the 1992 baseline and 2000 follow-up, and absolute and relative change	Doctor diagnosed major health condition					
		Disabled (D)		ND => D		ND => ND	
		Percent with nonzero earnings					
High school drop out	At baseline	55.5	(4.1)	64.9	(4.4)	70.8	(1.8)
	At follow-up	26.0	(2.8)	25.6	(3.4)	46.2	(2.2)
	Percentage point change	-29.5	(3.6)	-39.3	(4.2)	-24.6	(2.2)
	Change (%)	-53%		-60%		-35%	
High school graduate	At baseline	67.5	(2.6)	84.9	(2.6)	75.5	(1.6)
	At follow-up	44.1	(2.8)	50.7	(3.0)	52.9	(1.5)
	Percentage point change	-23.4	(3.1)	-34.3	(3.5)	-22.6	(1.5)
	Change (%)	-35%		-40%		-30%	
Some college or more	At baseline	81.2	(2.9)	89.6	(1.9)	84.5	(1.1)
	At follow-up	50.2	(3.4)	56.0	(3.5)	60.8	(1.6)
	Percentage point change	-31.0	(2.6)	-33.6	(3.8)	-23.7	(1.6)
	Change (%)	-38%		-38%		-28%	
		Mean earnings and earnings change (unconditional)					
High school drop out	At baseline ($)	9,140	(1,009)	11,853	(1,441)	13,735	(677)
	At follow-up ($)	5,163	(885)	3,443	(692)	8,250	(875)
	Change ($)	-3,978	(1,206)	-8,410	(1,529)	-5,484	(771)
	Change (%)	-44%		-71%		-40%	
High school graduate	At baseline ($)	15,249	(1,029)	20,745	(1,242)	18,927	(750)
	At follow-up ($)	9,835	(870)	10,615	(1,092)	11,591	(671)
	Change ($)	-5,414	(963)	-10,130	(1,154)	-7,335	(751)
	Change (%)	-36%		-49%		-39%	
Some college or more	At baseline ($)	30,067	(2,789)	38,057	(3,325)	38,218	(2,638)
	At follow-up ($)	18,253	(2,229)	18,931	(1,782)	25,993	(2,540)
	Change ($)	-11,814	(2,863)	-19,126	(3,541)	-12,225	(3,255)
	Change (%)	-39%		-50%		-32%	

Notes: See notes in Tables 1 and 2. Standard errors are reported in parentheses.

Table 6. Receipt and amount of public cash benefits by SES and disability group

SES Group: Educational attainment	Value at 1992 baseline and absolute change between 1992 and 2000	Doctor diagnosed major health condition			Doctor diagnosed major health condition		
		Disabled (D)	ND => D	ND => ND	Disabled (D)	ND => D	ND => ND
		Percent receiving SSI+DI			Unconditional mean SSI+DI income ($)		
High school dropout	At baseline	22.0	9.4	3.8	1,352	527	196
		(2.7)	(2.3)	(0.9)	(218)	(145)	(50)
	Change	8.8	12.8	3.9	-10	465	118
		(3.1)	(2.9)	(1.3)	(233)	(213)	(75)
High school graduate	At baseline	9.7	1.6	2.8	580	154	175
		(1.6)	(0.9)	(0.6)	(115)	(91)	(42)
	Change	1.5	7.7	1.5	221	369	56
		(2.0)	(1.7)	(0.7)	(162)	(100)	(57)
Some college or more	At baseline	5.1	0.4	2.0	323	35	162
		(1.4)	(0.4)	(0.6)	(90)	(35)	(54)
	Change	4.3	4.3	-0.1	236	261	-39
		(1.9)	(1.9)	(0.5)	(125)	(139)	(41)
		Percent receiving OASI			Unconditional mean OASI income ($)		
High school dropout	At baseline	2.4	3.4	0.9	66	187	64
		(1.05)	(1.47)	(0.30)	(34)	(121)	(10)
	Change	32.2	30.2	23.6	1,701	1,915	1,156
		(3.35)	(3.73)	(1.72)	(196)	(293)	(91)
High school graduate	At baseline	1.5	0.0	0.6	56	0	17
		(0.7)	(0.0)	(0.2)	(34)		(8)
	Change	32.4	31.0	23.7	2,024	1,800	1,300
		(3.3)	(2.5)	(1.5)	(249)	(188)	(106)
Some college or more	At baseline	0.8	0.2	0.2	1.5	1.4	4.9
		(0.8)	(0.2)	(0.1)	(1)	(1)	(3)
	Change	21.9	21.5	18.1	1,474	1,422	1,101
		(2.9)	(2.3)	(1.2)	(199)	(198)	(75)
		Percent receiving SSI+DI+OASI			Unconditional mean SSI+DI+OASI income ($)		
High school dropout	At baseline	23.1	12.1	4.7	1,417	715	260
		(2.9)	(2.5)	(1.0)	(226)	(177)	(53)
	Change	34.7	41.4	26.5	1,690	2,381	1,274
		(4.6)	(4.0)	(2.1)	(286)	(348)	(99)
High school graduate	At baseline	11.3	1.6	3.4	636	154	192
		(1.8)	(0.9)	(0.7)	(114)	(91)	(42)
	Change	33.1	37.8	24.9	2,245	2,169	1,356
		(3.5)	(3.2)	(1.4)	(228)	(220)	(112)
Some college or more	At baseline	5.9	0.6	2.2	324	36	167
		(1.3)	(0.4)	(0.6)	(90)	(35)	(54)
	Change	24.6	25.2	17.8	1,710	1,683	1,061
		(3.3)	(2.6)	(1.1)	(209)	(241)	(66)

Notes: See notes in Tables 1 and 2. Standard errors are in parentheses.

Table 7. Percent receiving and amount of pensions, and public benefits and pension combined, by SES and disability group

SES Group: Educational attainment	Value at 1992 baseline and absolute change between 1992 and 2000	Doctor diagnosed major health condition			Doctor diagnosed major health condition		
		Disabled (D)	ND => D	ND => ND	Disabled (D)	ND => D	ND => ND
		Percent receiving private pensions			Unconditional mean pension income ($)		
High school dropout	At baseline	1.0	0.2	1.4	13	1	90
		(0.7)	(0.2)	(0.6)	(9)	(1)	(47)
	Change	15.9	14.5	10.8	942	1,065	747
		(2.7)	(2.6)	(2.2)	(166)	(283)	(162)
High school graduate	At baseline	7.1	5.9	5.7	765	438	541
		(1.3)	(1.6)	(0.7)	(245)	(151)	(99)
	Change	18.9	23.6	19.0	1,889	2,933	1,896
		(2.3)	(3.1)	(1.6)	(334)	(550)	(255)
Some college or more	At baseline	9.2	6.7	4.7	1,862	1,255	598
		(1.6)	(1.8)	(0.6)	(395)	(422)	(96)
	Change	15.5	27.3	19.7	2,448	6,081	3,958
		(2.6)	(4.2)	(1.3)	(780)	(1,459)	(759)
		Percent receiving public benefits and/or pensions			Unconditional mean income from public benefits and pensions combined ($)		
High school dropout	At baseline	23.1	12.3	6.0	1,430	716	350
		(2.9)	(2.5)	(1.2)	(227)	(177)	(79)
	Change	42.4	44.6	30.5	2,632	3,445	2,021
		(4.1)	(4.0)	(2.6)	(306)	(476)	(195)
High school graduate	At baseline	15.7	7.5	8.7	1,401	593	733
		(1.6)	(1.9)	(0.7)	(258)	(187)	(76)
	Change	37.2	46.2	32.8	4,134	5,102	3,253
		(3.8)	(3.8)	(1.6)	(464)	(614)	(272)
Some college or more	At baseline	13.9	7.3	6.5	2,187	1,291	765
		(1.9)	(1.8)	(0.9)	(382)	(423)	(117)
	Change	28.2	39.3	29.1	4,159	7,764	5,019
		(3.3)	(4.3)	(1.5)	(855)	(1,521)	(775)

Notes: See notes in Tables 1 and 2. Pension income and public benefits are expressed in per annum terms. Monetary values are in 1992 dollars. Standard errors are in parentheses.

Table 8. Comparisons between changes in earnings and changes in public benefits (and private pensions) between 1992 and 2000, by SES and disability group

SES Group: Educational attainment	Doctor diagnosed major health condition			Doctor diagnosed major health condition		
	Disabled (D)	ND => D	ND => ND	Disabled (D)	ND => D	ND => ND
	Difference between percentage point change in receipt of public benefits and percentage point change in percent with zero earnings (%)			Change in mean value of public benefits as a percent of unconditional mean earnings change (%)		
High school dropout	5.2 (4.5)	2.1 (4.1)	1.9 (2.7)	-30%	-22%	-18%
High school graduate	9.7 (3.6)	3.5 (3.8)	2.3 (2.0)	-33%	-18%	-15%
Some college or more	-6.4 (3.3)	-8.4 (3.7)	-5.9 (1.6)	-12%	-8%	-7%
	Difference between percentage point change in receipt of public benefits+pensions and percentage point change in percent with zero earnings (%)			Change in mean value of public benefits + pensions as a percent of unconditional mean earnings change (%)		
High school dropout	12.9 (4.2)	5.4 (3.8)	5.9 (3.2)	-48%	-33%	-30%
High school graduate	13.8 (3.7)	11.9 (3.6)	10.2 (2.1)	-66%	-46%	-35%
Some college or more	-2.8 (3.3)	5.7 (4.6)	5.3 (1.6)	-34%	-39%	-39%

Notes: See notes in Tables 1 and 2. Pension income and public benefits are expressed in per annum terms. Monetary values are in 1992 dollars. Standard errors are in parentheses.

Table 9. Household wealth by SES and disability group

SES group: Educational attainment	Value at the 1992 baseline and 2000 follow-up, and absolute and relative change	Doctor diagnosed major health condition					
		Disabled (D)		ND => D		ND => ND	
		Total household wealth (unconditional mean)					
High school dropout	At baseline ($)	70,775	(9,710)	64,078	(9,893)	120,926	(16,910)
	Change ($)	10,440	(8,409)	16,603	(12,565)	4,447	(12,412)
	Change (%)	15%		26%		4%	
High school graduate	At baseline ($)	158,436	(18,215)	140,722	(14,452)	228,612	(18,339)
	Change ($)	28,865	(16,617)	55,866	(16,302)	106,759	(60,818)
	Change (%)	7%		40%		47%	
Some college or more	At baseline ($)	301,946	(43,110)	288,197	(28,545)	372,015	(24,012)
	Change ($)	143,315	(58,051)	166,972	(62,921)	235,562	(69,914)
	Change (%)	3%		58%		63%	
		Total household non-housing wealth (unconditional mean)					
High school dropout	At baseline ($)	41,933	(8,188)	33,857	(8,239)	74,940	(14,673)
	Change ($)	3,009	(6,498)	13,805	(10,698)	3,562	(11,710)
	Change (%)	25%		41%		5%	
High school graduate	At baseline ($)	102,410	(15,678)	85,029	(11,846)	161,938	(17,106)
	Change ($)	23,208	(16,270)	52,074	(14,376)	71,542	(41,827)
	Change (%)	10%		61%		44%	
Some college or more	At baseline ($)	236,829	(39,876)	184,722	(23,024)	280,803	(21,398)
	Change ($)	113,804	(45,710)	159,414	(58,961)	186,226	(57,739)
	Change (%)	4%		86%		66%	

Notes: See notes in Tables 1 and 2. Monetary values are in 1992 dollars. Standard errors are in parentheses.

Table 10. Health insurance coverage by SES and disability group

Outcome measure	Value at the 1992 baseline and 2000 follow-up, and absolute and relative change	Doctor diagnosed major health condition					
		Disabled (D)		ND => D		ND => ND	
		High school dropout					
Private health insurance coverage through self or spouse (%)	At baseline	41.1	(3.8)	54.2	(4.3)	55.7	(2.3)
	At follow-up	36.6	(3.2)	48.5	(3.3)	48.7	(2.7)
	Percentage point change	-4.4	(3.0)	-5.7	(3.4)	-6.9	(2.3)
Medicaid or Medicare coverage (%)	At baseline	26.2	(3.1)	10.8	(2.4)	7.1	(1.1)
	At follow-up	50.3	(3.8)	48.8	(4.6)	13.6	(1.5)
	Percentage point change	24.0	(3.6)	38.0	(4.6)	6.5	(1.6)
Any health insurance coverage (%)	At baseline	65.3	(3.9)	64.4	(4.5)	61.8	(2.4)
	At follow-up	80.3	(3.1)	87.7	(2.9)	60.6	(2.7)
	Percentage point change	15.0	(4.3)	23.3	(3.9)	-1.2	(2.2)
		High school graduate					
Private health insurance coverage through self or spouse (%)	At baseline	71.1	(2.5)	78.6	(2.8)	75.6	(1.7)
	At follow-up	66.5	(2.1)	72.3	(2.8)	72.3	(1.8)
	Percentage point change	-4.6	(2.1)	-6.3	(2.4)	-3.3	(1.8)
Medicaid or Medicare coverage (%)	At baseline	9.4	(1.5)	1.7	(0.7)	2.7	(0.4)
	At follow-up	21.3	(2.1)	19.8	(2.4)	7.7	(0.9)
	Percentage point change	11.8	(1.6)	18.1	(2.3)	5.0	(0.8)
Any health insurance coverage (%)	At baseline	77.7	(2.4)	79.6	(2.8)	77.6	(1.6)
	At follow-up	82.7	(1.7)	85.9	(2.5)	78.5	(1.8)
	Percentage point change	5.0	(2.0)	6.3	(2.4)	0.9	(2.0)
		Some college or more					
Private health insurance coverage through self or spouse (%)	At baseline	80.0	(2.7)	83.3	(2.1)	80.9	(1.4)
	At follow-up	74.5	(3.7)	81.4	(2.7)	79.1	(1.6)
	Percentage point change	-5.6	(3.4)	-2.0	(3.3)	-1.9	(1.8)
Medicaid or Medicare coverage (%)	At baseline	4.7	(1.4)	1.2	(0.3)	1.9	(0.6)
	At follow-up	13.8	(2.3)	8.0	(1.8)	3.7	(0.9)
	Percentage point change	9.0	(2.1)	6.8	(1.8)	1.7	(0.6)
Any health insurance coverage (%)	At baseline	83.2	(2.3)	83.3	(2.1)	82.4	(1.2)
	At follow-up	85.0	(2.2)	86.9	(2.7)	81.9	(1.4)
	Percentage point change	1.7	(2.9)	3.6	(3.4)	-0.5	(1.7)

Notes: See notes in Tables 1 and 2. Standard errors are in parantheses.

Table 11. Medical out-of-pocket (MOOP) expenditures by SES and disability group

Outcome	Values at baseline and follow-up waves, and absolute and relative changes	Doctor diagnosed major health condition					
		Disabled (D)		ND => D		ND => ND	
		High school dropout					
Percent with nonzero MOOP	**At baseline (wave 1)**	80.4	(3.2)	72.6	(3.0)	75.2	(2.0)
	At baseline (wave 2)	76.1	(3.1)	78.2	(3.1)	68.6	(2.1)
	At follow-up (wave 5)	73.9	(3.4)	77.6	(3.5)	78.2	(2.0)
	w2 to w5 percentage point change	-2.2	(3.8)	-0.6	(4.9)	9.6	(2.7)
	w2 to w5 percent change	-3%		-1%		14%	
Unconditional Mean MOOP expenses ($)	**At baseline (wave 1)**	1,842	(690)	1,280	(307)	995	(130)
	At baseline (wave 2)	727	(104)	820	(276)	577	(133)
	At follow-up (wave 5)	822	(91)	1,020	(110)	556	(41)
	w2 to w5 $ change	95	(108)	200	(298)	-21	(128)
	w2 to w5 percent change	13%		24%		-4%	
		High school graduate					
Percent with nonzero MOOP	**At baseline (wave 1)**	88.7	(1.8)	82.5	(2.3)	79.9	(1.6)
	At baseline (wave 2)	86.7	(2.2)	85.6	(2.5)	83.6	(1.0)
	At follow-up (wave 5)	88.5	(1.8)	92.0	(1.8)	88.0	(1.3)
	w2 to w5 percentage point change	1.9	(2.9)	6.4	(3.0)	4.4	(1.7)
	w2 to w5 percent change	2%		8%		5%	
Unconditional Mean MOOP expenses ($)	**At baseline (wave 1)**	2,145	(353)	1,446	(295)	941	(54)
	At baseline (wave 2)	648	(61)	646	(72)	542	(39)
	At follow-up (wave 5)	974	(81)	955	(84)	649	(44)
	w2 to w5 $ change	326	(98)	308	(122)	107	(49)
	w2 to w5 percent change	50%		48%		20%	
		Some college or more					
Percent with nonzero MOOP	**At baseline (wave 1)**	86.9	(2.0)	86.9	(1.7)	86.4	(1.2)
	At baseline (wave 2)	84.7	(2.6)	91.4	(1.8)	86.9	(1.0)
	At follow-up (wave 5)	95.3	(1.3)	97.6	(1.0)	93.8	(0.7)
	w2 to w5 percentage point change	10.6	(3.2)	6.2	(2.2)	7.0	(1.0)
	w2 to w5 percent change	13%		7%		8%	
Unconditional Mean MOOP expenses ($)	**At baseline (wave 1)**	1,787	(299)	1,517	(329)	1,151	(121)
	At baseline (wave 2)	866	(112)	900	(173)	617	(43)
	At follow-up (wave 5)	1,078	(132)	1,161	(120)	670	(48)
	w2 to w5 $ change	212	(183)	260	(246)	53	(64)
	w2 to w5 percent change	25%		29%		9%	

Notes: See notes in Tables 1 and 2. MOOP expenses are expressed in per annum terms. In the 1992 wave respondents were asked about MOOP expenses during the last 12 months, whereas in the following waves respondents were asked about MOOP expenses in the previous two years. Due to this change in the reference period, and for comparisons with wave 5, we report here MOOP expenses in wave 2 (1994), in addition to wave 1, and also report absolute and relative change between wave 2 and wave 5. Monetary values are in 1992 dollars. Standard errors are in parentheses.

Table 12. Percentage change of outcome indicators relative to mean household income at 1992 baseline, by SES and disability group

Educational attainment	Variable	Doctor diagnosed major health condition		
		Disabled (D)	ND => D	ND => ND
		Mean household income at baseline ($)		
High School dropout	Household income at baseline	26,319	26,898	32,617
		(1,859)	(2,522)	(1,742)
High school graduate		41,040	41,495	47,155
		(2,404)	(1,955)	(1,604)
Some college or more		67,674	70,969	78,938
		(4,922)	(5,200)	(4,204)
	Change variable	Change as a percent of baseline household income (%)		
High school dropout	Own earnings	-15.1%	-31.3%	-16.8%
High school graduate		-13.2%	-24.4%	-15.6%
Some college or more		-17.5%	-26.9%	-15.5%
High school dropout	SSI+DI	-0.04%	1.73%	0.36%
High school graduate		0.5%	0.9%	0.1%
Some college or more		0.3%	0.4%	0.0%
High school dropout	OASI	6.5%	7.1%	3.5%
High school graduate		4.9%	4.3%	2.8%
Some college or more		2.2%	2.0%	1.4%
High school dropout	SSI+DI+OASI	6.4%	8.9%	3.9%
High school graduate		5.5%	5.2%	2.9%
Some college or more		2.5%	2.4%	1.3%
High school dropout	Pensions	3.6%	4.0%	2.3%
High school graduate		4.6%	7.1%	4.0%
Some college or more		3.6%	8.6%	5.0%
High school dropout	SSI+DI+OASI+pensions	10.0%	12.8%	6.2%
High school graduate		10.1%	12.3%	6.9%
Some college or more		6.1%	10.9%	6.4%
High school dropout	Annuitized wealth	0.5%	2.1%	0.4%
High school graduate		2.3%	5.0%	6.1%
Some college or more		6.7%	9.0%	9.4%
High school dropout	MOOP	0.4%	0.7%	-0.1%
High school graduate		0.8%	0.7%	0.2%
Some college or more		0.3%	0.4%	0.1%

Notes: See notes in Tables 1 and 2. Standard errors are in parentheses.

Table 13. Estimates of the effect of a disability shock on household assets and income from Tobit Maximum Likelihood Random Effect and Linear Fixed Effect models

Dependent variable	Wave 5 controlling for wave 1[1]	Pooled waves 2-5 and age < 65[2]		Pooled waves 2-7 and age < 65		Pooled waves 2-7 and age < 62	
		Random Effect	Fixed Effect	Random Effect	Fixed Effect	Random Effect	Fixed Effect
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ln (total household wealth)							
Disability shock	-.500	-.336[b]	-.298	-.385[a]	-.352[c]	-.557[a]	-.577[a]
	(.321)	(.144)	(.242)	(.114)	(.181)	(.146)	(.293)
Disability * HSG	.440	.121	-.050	.190	.086	.423[b]	.409
	(.360)	(.183)	(.287)	(.145)	(.214)	(.183)	(.335)
Disability shock * Some College	.449	.444[b]	.323	.281[c]	.264	.553[a]	.590[c]
	(.412)	(.218)	(.305)	(.171)	(.236)	(.215)	(.358)
Disability shock * College graduate	.461	.325	.421	.451[a]	.501[b]	.468[b]	.626[c]
	(.376)	(.221)	(.301)	(.177)	(.223)	(.224)	(.361)
Ln (total household non-housing wealth)							
Disability shock	-.884[a]	-.518[a]	-.617[b]	-.625[a]	-.681[a]	-.540[a]	-.698[a]
	(.284)	(.179)	(.250)	(.141)	(.189)	(.180)	(.272)
Disability * HSG	.862[b]	.421[c]	.419	.594[a]	.578[b]	.532[b]	.690[b]
	(.362)	(.227)	(.308)	(.178)	(.233)	(.226)	(.334)
Disability shock * Some College	.903[b]	.440[c]	.290	.469[b]	.441[c]	.389	.440
	(.424)	(.268)	(.341)	(.210)	(.252)	(.264)	(.362)
Disability shock * College graduate	.479	.312	.600[c]	.629[a]	.808[a]	.379	.751[b]
	(.431)	(.272)	(.342)	(.217)	(.247)	(.275)	(.357)
Ln (total household income)							
Disability shock	-.333[b]	-.173[b]	-.156	-.117[c]	-.029	-.204[b]	-.080
	(.167)	(.079)	(.144)	(.061)	(.116)	(.081)	(.169)
Disability * HSG	.436[b]	.195[c]	.118	.119	-.014	.191[c]	.015
	(.180)	(.101)	(.157)	(.079)	(.126)	(.104)	(.188)
Disability shock * Some College	.244	.101	.026	.042	-.012	.097	.016
	(.202)	(.121)	(.197)	(.093)	(.156)	(.122)	(.220)
Disability shock * College graduate	.158	.088	.234	-.036	-.021	.018	-.005
	(.205)	(.123)	(.167)	(.096)	(.137)	(.127)	(.206)
N of obs	3,235	12,515		18,306		13,514	

Notes: Data are from Health and Retirement Study. The table reports coefficients (marginal effects for the probit model) and robust standard errors (in parentheses) from linear model estimates under different specifications. Control variables not reported include baseline wave characteristics such as eduaction, age, age squared, marital status, race, ethnicity, region of residence, dummies for self-reported health status, the presence of chronic conditions (high blood pressure, diabetes, arthritis), a set of behavioral risk factors (smoking, exercise, body mass index or BMI, drinking), a scaled index of ADL functional limitations, and wave dummies. For each outcome of interest we also include the corresponding baseline variable such as ln(total household wealth) or ln(total household non-housing wealth) or ln(total household income). Superscripts [a], [b] and [c] denote significance at the 1, 5 and 10 percent levels, respectively. Monetary values are in 1992 dollars.

[1] Sample consists of individuals age 51-56 at the baseline wave (in 1992) and age 59-64 in wave 5 (2000). We restrict the sample to non-disabled individuals at baseline using 'Doctor diagnosed major health condition' as the disability definition. Disability shock is conceptualized as a ND=>D transition between respective waves.

[2] Pooled samples consist of non-disabled individuals age 51-59 at baseline wave.

Table 14. Estimates from Probit, OLS, and Linear Random Effect and Fixed Effect Models of the effect of a disability shock on different outcomes of interest

Dependent variable	Wave 5 controlling for wave 1[1]		Pooled waves 2-5 and age < 65[2]		Pooled waves 2-7 and age < 65		Pooled waves 2-7 and age < 62	
	Probit	OLS	Random Effect	Fixed Effect	Random Effect	Fixed Effect	Random Effect	Fixed Effect
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Being in poverty[3]								
Disability shock	.054[b]	.102[a]	.076[a]	.055[c]	.030[c]	-.012	.067[a]	.028
	(.022)	(.037)	(.025)	(.030)	(.017)	(.022)	(.023)	(.036)
Disability * HSG	-.047[a]	-.119[a]	-.068[b]	-.046	-.013	.030	-.052[b]	.005
	(.014)	(.041)	(.028)	(.035)	(.019)	(.025)	(.026)	(.041)
Disability shock * Some College	-.031	-.083[c]	-.079[a]	-.066[c]	-.012	.027	-.054[c]	-.034
	(.022)	(.044)	(.030)	(.039)	(.021)	(.028)	(.028)	(.044)
Disability shock * College graduate	.038	-.064	-.056[b]	-.048	.000	.046[c]	-.033	.020
	(.052)	(.042)	(.028)	(.036)	(.019)	(.025)	(.028)	(.043)
Receiving any public income[4]								
Disability shock	.153[a]	.137[a]	.135[a]	.151[a]	.112[a]	.118[a]	.142[a]	.186[a]
	(.046)	(.040)	(.025)	(.032)	(.017)	(.023)	(.022)	(.032)
Disability * HSG	-.043	-.048	-.066[b]	-.093[b]	-.039[c]	-.049[c]	-.072[a]	-.133[a]
	(.046)	(.049)	(.030)	(.039)	(.021)	(.028)	(.026)	(.037)
Disability shock * Some College	-.067	-.085	-.103[a]	-.116[a]	-.086[a]	-.119[a]	-.116[a]	-.168[a]
	(.051)	(.056)	(.034)	(.043)	(.025)	(.032)	(.028)	(.038)
Disability shock * College graduate	-.098[b]	-.127[b]	-.138[a]	-.175[a]	-.098[a]	-.121[a]	-.138[a]	-.195[a]
	(.050)	(.056)	(.034)	(.042)	(.025)	(.033)	(.026)	(.036)
Receiving pension income								
Disability shock	.039	.028	-.018	-.028	.004	-.003	-.030[b]	-.044[a]
	(.042)	(.029)	(.016)	(.018)	(.012)	(.015)	(.012)	(.016)
Disability * HSG	-.003	.009	.070[a]	.088[a]	.051[a]	.070[a]	.069[a]	.088[a]
	(.048)	(.041)	(.025)	(.029)	(.018)	(.022)	(.020)	(.028)
Disability * Some College	.028	.040	.048[c]	.045	.023	.024	.055[b]	.061[b]
	(.059)	(.051)	(.029)	(.031)	(.022)	(.026)	(.024)	(.031)
Disability * College graduate	.010	.030	.068[b]	.072[b]	.054[b]	.059[b]	.073[a]	.077[b]
	(.058)	(.056)	(.033)	(.037)	(.025)	(.030)	(.029)	(.038)

(Table 14 cont.)

Dependent variable	Wave 5 controlling for wave 1[1]		Pooled waves 2-5 and age < 65[2]		Pooled waves 2-7 and age < 65		Pooled waves 2-7 and age < 62	
	Probit	OLS	Random Effect	Fixed Effect	Random Effect	Fixed Effect	Random Effect	Fixed Effect
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Has any HI coverage[5]								
Disability shock	.186[a]	.230[a]	.140[a]	.097[a]	.121[a]	.096[a]	.136[a]	.123[a]
	(.022)	(.032)	(.023)	(.032)	(.016)	(.022)	(.021)	(.036)
Disability * HSG	-.149[b]	-.136[a]	-.091[a]	-.071[c]	-.080[a]	-.084[a]	-.081[a]	-.097[b]
	(.065)	(.040)	(.029)	(.039)	(.020)	(.028)	(.026)	(.042)
Disability shock * Some College	-.191[b]	-.165[a]	-.102[a]	-.064	-.078[a]	-.069[b]	-.088[a]	-.102[b]
	(.079)	(.046)	(.033)	(.046)	(.024)	(.032)	(.029)	(.045)
Disability shock * College graduate	-.228[a]	-.183[a]	-.108[a]	-.073[c]	-.107[a]	-.096[a]	-.127[a]	-.130[a]
	(.087)	(.046)	(.033)	(.044)	(.024)	(.031)	(.031)	(.048)
Has private HI coverage								
Disability shock	.025	.016	-.029	-.046	-.036[b]	-.050[b]	-.034[c]	-.053[c]
	(.040)	(.035)	(.023)	(.030)	(.015)	(.020)	(.019)	(.030)
Disability * HSG	.012	.011	.037	.049	.025	.031	.034	.049
	(.053)	(.044)	(.029)	(.036)	(.020)	(.025)	(.024)	(.036)
Disability shock * Some College	-.029	-.020	.039	.048	.036	.046	.045[c]	.038
	(.067)	(.051)	(.034)	(.044)	(.023)	(.029)	(.028)	(.038)
Disability shock * College graduate	.031	.026	.065[c]	.075[c]	.065[a]	.072[b]	.049[c]	.055
	(.069)	(.051)	(.034)	(.042)	(.024)	(.029)	(.030)	(.044)
Has public HI coverage								
Disability shock	.196[a]	.260[a]	.189[a]	.173[a]	.177[a]	.170[a]	.184[a]	.194[a]
	(.035)	(.037)	(.024)	(.030)	(.016)	(.020)	(.021)	(.031)
Disability * HSG	-.039[a]	-.151[a]	-.127[a]	-.135[a]	-.095[a]	-.110[a]	-.108[a]	-.145[a]
	(.013)	(.044)	(.029)	(.035)	(.020)	(.024)	(.026)	(.036)
Disability shock * Some College	-.039[a]	-.184[a]	-.154[a]	-.134[a]	-.119[a]	-.122[a]	-.127[a]	-.139[a]
	(.015)	(.048)	(.030)	(.036)	(.021)	(.025)	(.027)	(.038)
Disability shock * College graduate	-.051[a]	-.244[a]	-.187[a]	-.192[a]	-.180[a]	-.194[a]	-.173[a]	-.203[a]
	(.013)	(.042)	(.027)	(.032)	(.019)	(.023)	(.025)	(.033)
N of obs.	3,235		12,515		22,616		15,691	

Notes: Data are from Health and Retirement Study. The table reports coefficients (marginal effects for the probit model) and robust standard errors (in parantheses) from linear probability model estimates under different specifications. Control variables not reported inlcude baseline wave characteristics such as education, age, age squared, marital status, race, ethnicity, region of residence, dummies for self-reported health status, the presence of chronic conditions (high blood presure, diabetes, arthritis), a set of behavioral risk factors (smoking, exercise, body mass index or BMI, drinking), a scaled index of ADL functional limitations, and wave dummies. For each outcome of interest we also include the corresponding baseline varibale such as poverty status, health insurance status, receipt of public cash benefits, or pension income. Superscripts [a], [b] and [c] denote significance at the 1, 5 and 10 percent levels, respectively.

[1] Sample consists of individuals age 51-56 at the baseline wave (in 1992) and age 59-64 in wave 5 (2000). We restrict the sample to non-disabled individuals at baseline using 'Doctor diagnosed major health condition' as disability definition. Disability shock is conceptualized as a ND=>D transition between respective waves.

[2] Pooled samples consist of non-disabled individuals age 51-59 at baseline wave.

[3] Being in poverty is defined based on wave specific household income, family size, and the wave year poverty threshhold and family size obtained from Census Bureau.

[4] Receiving public income is defined as receving income from SSI, DI, and/or OASI.

[5] Having health insurance coverage from any source is defined as being covered either through employment (self or spouse) or public insurance (Medicaid or Medicare).

Appendix Table 1: Aging of the original cohort of the Health and Retirement Study, by birth year and survey year

Cohort	Birth Year	Interview year						
		1992	1994	1996	1998	2000	2002	2004
		Age						
HRS	1931	61	**63**	65	67	69	71	73
	1932-1933	59-60	61-62	**63-64**	65-66	67-68	69-70	71-72
	1934-1935	57-58	59-60	61-62	**63-64**	65-66	67-68	69-70
	1936-1937	55-56	57-58	59-60	61-62	**63-64**	65-66	67-68
	1938-1939	53-54	55-56	57-58	59-60	61-62	**63-64**	65-66
	1940-1941	51-52	53-54	55-56	57-58	59-60	61-62	**63-64**