DISABILITY TRANSFERS AND THE LABOR FORCE
ATTACHMENT OF OLDER MEN:
EVIDENCE FROM THE HISTORICAL RECORD

John Bound

Timothy Waidmann

DISABILITY TRANSFERS AND THE LABOR FORCE
ATTACHMENT OF OLDER MEN:
EVIDENCE FROM THE HISTORICAL RECORD

ABSTRACT

In this paper we use trends in self-reported disability from the late
forties through the late eighties to gauge the impact of the growth of income
maintenance for the disabled on the labor force attachment of older working-
aged men. Under the assumption that the actual health of these men has not
changed, we can use the trends in self-reported disability to make inferences
about the disincentive effects of disability transfers. Our tabulations
suggest that, for the post World War II period, earlier accommodation of
health problems accounts for between two and three-fifths of the 4.9
percentage point drop in the labor force participation of men aged 45-54 and
between one-quarter and one-third of the 19.9 percentage point drop among men
aged 55-64. Since not all of this earlier accommodation can necessarily be
causally attributed to the expansion of disability programs, these figures
should be interpreted as upper bounds on the impact of such programs on the
work force attachment of older men.

John Bound
Population Studies Center
University of Michigan
1225 South University Avenue
Ann Arbor, MI 48104-2590

Timothy Waidmann
Population Studies Center
University of Michigan
1225 South University Avenue
Ann Arbor, MI 48104-2590

I. Introduction

While programs specifically targeted at the disabled, such as Workers Compensation and a variety of Veterans' programs, predate World War II, more general programs were not enacted into law until after the war.[1] In 1950 Aid to the Permanently and Totally Disabled (APTD), a state run – but partly federally financed – program for the indigent disabled was introduced. In 1956, the Social Security Act was amended to include early retirement for those who could pass a medical screening.[2] The Social Security Disability Insurance program (DI) began as a narrowly targeted program, but in 1960 individuals under the age of 50 were made eligible, and in 1965, the definition of disability was liberalized to allow those without permanent disabilities to qualify for benefits. While there have been no major changes in the statutory definition of disability since 1965 it is clear that de facto standards continued to be liberalized through the next decade.[3] During this same time period, benefit levels were rising more rapidly than wages. In 1972 DI benefit levels were increased 20% across the board and were indexed for inflation while, in the same year, DI beneficiaries were made eligible for medicare benefits, and the federally run Supplementary Security Income (SSI) program was introduced to replace the state run APTD programs.[4]

---

[1] In fact, while the original proponents of the Social Security system imagined Disability Insurance to be an important part of the system, they initially balked at recommending such a program because they foresaw problems in both the definition and certification of disability. For a more detailed account of the history of public policy toward disability, see Berkowitz, Johnson and Murphy (1976) and Burkhauser and Haveman (1982).

[2] It is worth clarifying the difference between DI and APTD and its successor SSI. DI provides benefits to disabled workers in amounts related to the disabled worker's past wages in Social Security covered employment. In order to qualify for DI benefits an individual must have worked in Social Security covered employment for 20 of the 40 quarters preceding the onset of their disability. SSI (and APTD before it) provides cash assistance to the needy aged as well as to the needy blind and disabled, with no requirement that they have worked in covered employment. As a needs-based program SSI provides payments based on the amount of other income available to an individual.

[3] The best evidence in favor of this claim comes from a variety of program statistics. Between 1965 and 1975 applicants as a fraction of the insured population rose more than 50% from 1.00% to 1.54% per year, but at the same time the fraction of applicants qualifying for benefits stayed virtually constant over the period, dropping from 47.6% in 1965 to 46.1% in 1975. In addition, the fraction of awards involving not just medical but vocational factors as well rose from 16% in 1965 to 27% in 1975.

[4] Replacing the state run APTD programs with SSI increased benefits levels in the states that had previously had the least generous APTD programs, while, through a grandfather clause, left benefit levels constant in the more generous states. Thus, the introduction of SSI represented and increase in program generosity.

With the increasing availability and generosity of disability benefits, the number of individuals receiving them rose sharply during the 1960s and 1970s. Tables 1 and 2 show that of the major programs, only veterans' disability programs have shown no marked postwar growth. As Table 1 indicates, total expenditures on disability programs as a fraction of GNP almost doubled, rising from .87% in 1950 to 1.64% in 1980. In addition to public programs for the disabled, coverage by employer-provided insurance has also increased.[5] Growth in expenditures was accompanied by concurrent growth in the number of beneficiaries. For example, Table 2 shows that the number of DI beneficiaries grew from slightly more than .45% of the working aged population in 1960 to over 2.0% in 1980. Beneficiaries of Aid to the Permanently and Totally Disabled (which, in 1974, was replaced by Supplemental Security Income) grew from .2% to 1.0% of the working aged population between 1950 and 1980.

Spurred partly by the potential insolvency of the DI trust fund and partly by fears that many of those receiving DI were not disabled by the legal definition of the term, first the Social Security Administration and then Congress acted to tighten eligibility requirements. Between 1975 and 1980 new awards, as a fraction of the insured population, dropped from .71% to .43%. In 1980 Congress passed legislation designed to tighten administrative control over the determination of medical eligibility for DI. The Reagan administration accelerated the implementation of the law and between 1980 and 1982 the number of new awards dropped 25% while many of those already on the rolls had their cases reviewed and were terminated. While pressure from Congress eventually led to a moratorium on terminations, the regime that emerged was characterized by a net tightening of the medical criteria for eligibility.

---

[5] See Hill (1987).

2

During the 1960s and 1970s, while the fraction of individuals receiving disability insurance was rising, the proportion of older men out of the labor force more than doubled (see Table 3). The coincident drop in the work force attachment of older men and rise in the fraction of this same group receiving DI benefits seems to suggest a causal connection in which the availability of generous disability benefits induced older men to leave the labor force in order to qualify for benefits [See Gastwirth(1972), Swisher(1973), Parsons(1980a)]. While the time series evidence on labor force participation and program growth is suggestive, it seems possible that the two trends are, in fact, independent, that DI has drawn from a population that would otherwise have been out of work and that those leaving the labor force did not end up on DI. In this work we use available historical information on the portion of older working aged men (45-64 years old) identified as unable to work to help answer the question of whether those currently receiving disability benefits would work were benefits not available.

The basic idea behind the use of the historical record can be explained very simply. If those currently receiving disability benefits are truly incapable of gainful employment we should expect to find that during the 1950s and 1960s, before the major growth in disability insurance programs, a sizable number of men were both reporting themselves disabled and either out of work or not regularly employed. On the other hand, if many of those currently receiving disability benefits are perfectly capable of working we would expect to find many of their counterparts in earlier periods working, and thus, we should find many fewer men reporting themselves disabled and out of work in the period before the expansion of the various disability programs. More specifically, if we assume that the proportion of older, working-aged men who are truly disabled has not changed much over time, we can attribute any rise in the proportion of the population reporting themselves disabled to social and economic factors.

3

Using data from the National Health Interview Survey (NHIS), we find that the proportion of men identified as disabled remained approximately constant during the 1950s and 1960s, rose rapidly during the 1970s and then leveled off in the 1980s. Comparing these trends to trends in labor force participation, we find that since 1970 changes in the proportion of 45-54 year old men identified as disabled closely mirror changes in the proportion of this age group out of the labor force. For men 55 and above the drop in participation is substantially greater than the rise in proportion of men identified as disabled. This evidence suggests to us that for 45-54 year old men but not for those 55 and above, a major part of the drop in labor force participation that occurred during the 1970s can be explained as earlier accommodation to health limitations brought on, at least in part, by the growth in the availability and generosity of transfer income targeted at the disabled.

The next section briefly reviews the development of the literature on disability programs and their effects on labor force attachment. Section III describes and presents the data we use to study the historical record. Section IV presents an economic explanation for the observed trends in self-reported health statistics and uses the results to measure the effect of government intervention on labor force attachment. In section V we present the alternative explanations of these trends which have been suggested elsewhere in the health literature and determine the extent to which they detract from our story. Section VI explores the causal factors behind early accommodation. Finally, section VII provides interpretations of our results and conclusions that might be drawn from this research.

II. Previous Literature

A considerable amount of research has already been conducted on the impact of Disability Insurance on the labor force attachment of older men. The common strategy has been to use regression techniques to compare the labor force participation rates of those with high replacement rates (those whose potential DI benefits

4

would replace a relatively large fraction of their pre-disability earnings) to those with low replacement rates.[6] The difference in the participation rates between these two groups is taken to be an estimate of the impact of DI on participation rates. Research following this kind of strategy has typically concluded that eliminating DI benefits altogether would have a very large impact on participation rates.[7]

This approach presents a number of problems. Since replacement rates for DI are decreasing functions of past earnings, it is difficult to determine whether it is generous replacement rates or low earnings that induce individuals to leave the labor force. Yet there are a number of reasons to suspect that those with low earnings would be those most likely to leave the labor force. In particular, there is good reason to believe both that those with low earnings are more likely to suffer from a variety of debilitating conditions and that these conditions are more likely to interfere with their work. We should, therefore, suspect that the coefficient on the replacement ratio is, at least to some extent, picking up these other effects and thus exaggerating the causal impact of DI itself.[8] That this specification tends to overstate the true impact of DI has been demonstrated in earlier research by Bound (1989). Bound replicates Parsons' technique using data from the 1972 Survey of the Disabled and obtains results quite similar to Parsons' for the sample of all older men. However, when the sample is restricted to those who have never applied for DI benefits, the empirical relationship between the replacement ratio and participation is virtually unchanged even though there can be no causal connection between DI and participation for this group.[9] Haveman and Wolfe (1984b) recognize that the replacement ratio is endogenous, use an estimation technique which predicts

---

[6] See Parsons (1980a, 1980b, 1982), Slade (1984), Haveman and Wolfe (1984a, 1984b), Leonard (1979). Leonard (1985) provides a review.

[7] Parsons' and Slade's results imply that virtually all of those receiving DI benefits would be in the labor force were it not for the program. Haveman and Wolfe find smaller impacts for DI.

[8] We are certainly not the first to raise this issue. See Welch (1977), Ashenfelter (1983) and Ehrenberg (1988).

[9] Haveman and Wolfe (1984a) argue a similar point by showing that Parson's results are sensitive to the specification of his empirical model.

variation in individuals' *ex ante* acceptance probabilities is due to actual variation in health. If we wish to study the impact of program expansion on labor force attachment, the only way to use variation in program structure as identifying information is to use time-series data. The historical record on the number of men who identify themselves as disabled before, during and after the disability transfer system experienced significant growth provides simple but largely unexploited evidence on the impact of these changes on the work force attachment of older working aged men. The historical record gives us a way to gauge the impact not just of the growth of DI but of all kinds of disability transfers.

III. Trends in the Prevalence of Disability

The longest historical record identifying the disabled comes from the National Health Interview Survey (NHIS), which has been conducted continuously since 1957 (a different portion of the sample is interviewed every two weeks).[13] Each year a large number of households representing over 100,000 individuals are surveyed. Respondents are asked both whether any individuals in the household suffer from any of a variety of specific conditions and whether their health limits or prevents them from working.[14] Information is also collected on the labor market activities

---

[13] While other sources are available for studying the historical record, for our purposes these are the most appropriate. For example, in 1970 and 1980 the Census asked questions about disability and tabulations based on those data give results very similar to those obtained with NHIS, but the NHIS provides data on an annual rather than decennial basis. Second, the CPS can be used in several ways to measure the prevalence of disability. None, however, precisely captures the concept of *self-reported* disability that we hypothesize is related to changes in public income maintenance. Third, while the Social Security Administration has conducted three detailed surveys of the disabled, they are infrequent, not completely comparable to one another, and their sample sizes are smaller than NHIS. For a more detailed presentation of these data see Bound and Waidmann (1989).

[14] In the early years of the survey, respondents were asked, "Has anyone in the family had any of these conditions during the past 12 months?" Then for each reported condition, the interviewer showed the respondent a flash card and asked the respondent to choose the statement that best describes how he is affected by this condition ("1) Not able to work at all. 2) ... limited in the amount or kind of work. 3)...limited in kind or amount of other activities. and 4)Not limited in any of these ways."). Beginning in 1969 the Health Interview Survey began to ask *all* working-aged men whether their health limited them in the kind or amount of work they could do or prevented them from working altogether. Specifically respondents are asked "Does ...'s health now keep him from working? Is he limited in the kind of work he could do because of his health? Is he limited in the amount of work he could do because of his health?") Women who were keeping house most of the past twelve months were only asked whether their health limited their ability to keep house, and were not asked about other work. In addition, after 1982, these questions were only asked of those under age 70.

8

of household members.[15] The NHIS has several drawbacks, however. The survey instrument was redesigned in 1969 and then again in 1982, and thus limits our ability to do comparisons that straddle regimes [See Wilson and Drury (1984)]. Within-regime changes in survey administration also have some potential for influencing results. In particular, the National Center for Health Statistics (NCHS) has in recent years been making more of an effort to avoid proxy respondents. To the extent that proxy respondents are less likely to report an individual as disabled than is the person himself, this trend in the use of proxy respondents could account for some of the apparent rise in the number of individuals identified as disabled in periods between design changes, e.g. 1969–1981.

Table 4 presents the NHIS story beginning in 1957. The only information available prior to 1969 is in published form, so information from the earliest years is only available in two and three year aggregations. Furthermore, since NCHS publications are not entirely consistent across years, some cells in Table 4 are blank. Sample sizes for the 45-64 year old group and estimated standard errors for one year (1983) are included to give the reader a notion of the accuracy of the reported proportions.[16] What emerges from this survey is an eleven-year period of almost no growth in the prevalence of severe disability between 1957 and 1968, a period of considerable growth in the early-to-mid seventies and a period of leveling-off in the late seventies and eighties.[17] The jump that occurs between 1967 and 1969 is most

---

[15] Respondents are asked about household members' activity during the past 12 months (" What was ... doing most of the past 12 months: working or doing something else?") as well as the past two weeks ("Did ... work at any time last week or the week before ... Does he have a job or business? ... was he looking for work or on layoff from a job?") The health limitation questions immediately follow the 12 month activity question. Then, after questions pertaining to conditions, doctor visits, and hospitalization, the respondent is asked about labor force activity in the previous two weeks.

[16] The standard errors reported are those calculated by NHIS to take account of complicated survey design effects and are about 30% higher than we would expect under simple random sampling.

[17] As a comparison, we estimated average growth rates of the proportion disabled for non-whites and all men and found them to be nearly identical after 1982 (-2.1%) and slightly smaller, though the difference is statistically insignificant, for non-whites than for the entire population between 1970 and 1981 (3.5 and 4.1% respectively). While non-whites had higher levels of self-reported disability, (12.4% of nonwhites and 7.4% of the entire population 45–64 were severely disabled in 1970) these differences in growth rates imply that the gap was narrowing slightly. Similarly, across education groups, no post-1982 growth rate was significantly different from zero, and while college graduates experienced lower rates of growth before 1982 (2.3%), other educational categories had roughly equal growth rates – 5.4% for high school drop outs, 7.6% for high school graduates and 5.8% for those with some college.

9

likely a consequence of the change in the survey instrument that was phased in over this period of time. Beginning in 1968, the survey stopped using the "condition approach," where individuals were first asked if they suffered from any of a specific set of conditions, and began using the "person approach," where every respondent was first asked if his health limited his ability to work. In addition, interviewers began asking about the presence of each level of limitation (most serious first) rather than showing the respondent a flash card listing all levels of limitation. Work done at NCHS suggests that these changes increased both the total number of individuals identified as disabled and the fraction of the disabled classified as severely disabled.[18] Unfortunately, this work does not present results in enough detail to allow us to calculate the portion of the 1967-1969 change in reported disability that can be attributed to the survey change.

Additional data suggest that during the 1950s and 1960s, the fraction of older working-aged men identifying themselves as unable to work remained approximately constant. The Current Population Survey of September, 1949 asked respondents the following two questions. "First of all, I would like to check persons (in this household) who aren't able to do their regular work or other duties today because of illness or disability." and "Is there anyone else (in the household) under 65 years old with a physical or mental condition that allows him to work only occasionally or not at all?" While micro-data from this survey are not available, results were reported in a set of tables published in the *Social Security Bulletin* [Moore and Sanders (1950)]. According to these data, in 1949, 3.7 percent of men aged 45–54 and 8.0 percent of those aged 55-64 reported that they were unable to work because of their health and had been unable to do so for at least six months. Eliminating those whose work limitation has lasted less than six months from those counted as

---

18 Between July 1967 and June 1968 the person method was used on half of the surveyed households while the condition method was used on the other half. Those surveyed using the person method were more likely to be identified as disabled. See National Center for Health Statistics (1972).

severely disabled, the 1969 NHIS shows 4.0% of men aged 45-54 and 9.6% of those aged 55-64 unable to work. We thus observe a two-decade growth of 0.3 percentage points for the younger group and 1.6 percentage points for the older one.

For the later period, during which we have complete data, Figure 1 graphically summarizes the NHIS trends in self-reported disability, and in Table 5 we estimated simple OLS regressions where the dependent variable was either the percent of the relevant population limited in their ability to work or the percent unable to work. Explanatory variables include a constant and linear time trends defined in such a way that the constants can be interpreted as predicted values in either 1970 or 1982. Results show a very clear upward trend in the 1970s in the percent of men identified as severely disabled. The estimates imply that between 1970 and 1980, the fraction of 45-64 year old men identified as disabled rose 3.8 percentage points. In absolute but not relative terms the rise was larger for the older groups. Trends for the disabled are less dramatic than trends for the severely disabled, implying that the fraction of older men identified as partially disabled was actually going down over this period. Turning to the 1980s we see estimates implying that the proportion identified as disabled was actually dropping over the decade.

The NHIS also provides information on specific chronic and acute conditions which can be used to determine the extent to which trends in self-reported disability are related to trends in specific self-reported condition prevalence. Other authors, using results from NCHS publications, have shown clear trends both in terms of the specific conditions associated with work limitations and in terms of overall prevalence rates. Colvez and Blanchet (1981) looked at trends in conditions causing limitation and found that for 45–64 year old men, no cause decreased in prevalence between 1966 and 1974 and five (diabetes, musculoskeletal disorders, heart conditions, hypertension, and other diseases of the circulatory system) increased significantly. More recently, Verbrugge (1984) looked at overall prevalence

11

rates and found that, for 45–64 year old men, diabetes, diseases of the heart, hypertension, cerebrovascular diseases, emphysema, hernias and other musculoskeletal conditions all increased in prevalence, and Chirikos (1986) found that the rise in prevalence of specific chronic conditions could account for most of the rise in self-reported disability.

Using NHIS micro-data we can get prevalence estimates broken down by disability status and estimates on the causes of the disabled respondents' work limitations. After asking respondents whether health limits their ability to work, the survey asks "What condition causes this limitation? Is this limitation caused by any other condition? Which of these conditions is the MAIN cause of this limitation?" We find that most individuals (98% on average) do report some kind of specific cause for their work limitations. Among 45-64 year old men the leading causes have tended to be cardio-vascular and musculo-skeletal conditions. For example, our tabulations indicate that in 1970, 20.3% of severely disabled 45-64 year old men reported heart conditions as the main cause of their limitation, 10% reported either arthritis or other musculoskeletal conditions as the cause, and 10% reported impairments of the back or extremities as the major cause.[19] In terms of accounting for changes over time, the importance of these types of conditions is clear. Our tabulations suggest that the changes in prevalence of disabling circulatory conditions make up more than a third of the total increase in disability between 1969 and 1981 and more than half of the decrease between 1981 and 1987. Similarly, disabling musculoskeletal conditions make up 32% of the increase in the 1970s and 24% of the 1980s decrease.

Each year individuals are also prompted with one of six lists of broadly grouped specific conditions. They are asked "During the last 12 months did ... have any

---

[19] Other conditions causing more than 2% of severe disability are Other Circulatory System (9.3%), Emphysema, Asthma and Other Respiratory (8.8%), Nervous System and Mental Conditions (4.0%), Digestive System (3.6%), and Malignant Neoplasms (2.5%). For a more detailed list see Verbrugge (1984) and National Center for Health Statistics (1977).

of the following?"[20]   Responses to these questions can be used to estimate (self-reported) prevalence rates for a large number of specific conditions. Table 6 presents estimated prevalence for the conditions most often cited as disabling. The numbers in the table represent the number of men (ages 45-64) per 1000 who report having a given condition. For each of the conditions except "Other Musculoskeletal," growth during the 1970s was greater than growth during the early and mid eighties. When we calculated prevalence separately for the disabled and non-disabled populations, we saw a similar pattern for most of the important disabling conditions. We found that during the 1970s prevalence rates for the major disabling conditions rose rapidly in both the disabled *and* the non-disabled population, and that these increases continued in the 1980s, but at a slower rate. For example, between 1972 and 1978-81 the prevalence of heart conditions among the severely disabled increased from 319.2 to 331.7 per 1000 (men 45-64) and then to 384.5 in 1984-87. Among the non-disabled prevalence increased from 45.4 per 1000 to 54.6 between 1972 and 1978-81 and then increased to 60.8 by 1984-87.[21]   The prevalence of arthritis/rheumatism among the severely disabled increased from 279 to 381.5 per 1000 between 1969 and 1978-81 and then to 444.1 per 1000 between 1978-81 and 1984-87. Among the non-disabled, prevalence increased from 116.1 to 168.5 and then to 182.3 over the same periods. In all of these cases the average growth in prevalence is higher during the seventies than in the eighties.

We would also like to know the extent to which changes in the fraction disabled has mirrored changes in the fraction receiving some kind of disability income, but reliable information on transfer income is hard to come by. Program statistics on the number of individuals receiving different kinds of benefits do not contain

---

[20] Before 1978, all individuals were asked the same list in a given year; since that time, each list is asked of one-sixth of the sample.

[21] To get an idea of the standard errors of these estimates, under random sampling, the prevalence estimate for the non-disabled of 0.0454 in 1972 (n=10817) has a standard error of 0.002, and the estimate for the severely disabled of 0.3192 (n=992) the standard error is 0.015. As stated above taking account of complex sample design would increase these errors by approximately 30%.

13

information on benefit overlaps (individuals receiving benefit income from more than one program). As a result, simply summing across programs will give an overestimate of the number of individuals receiving some kind disability transfer. Moreover, with the exception of DI, program statistics are not broken down by age or sex. On the other hand, transfer income is known to be seriously underreported in household surveys. Further, the nature of the income questions asked changes over time, and disability related transfer income is often not identified separately from non-disability related transfers. Thus using household surveys to accurately quantify program growth is a virtually hopeless task.

However, if we are willing to make assumptions about program overlap and demographic characteristics of recipients, program statistics can be used to make crude inferences about the fraction of the population receiving disability income. As of 1986, almost exactly one-half of all DI recipients were men between the ages of 45 and 64 (one third were women and one sixth men under the age of 45). On the other hand, data from the Supplemental Security Record (McCoy and Weems, 1989) show that in 1986 roughly 13% of SSI recipients were men 45-64 years old. Netting out those who were also receiving DI, we end up with roughly 11% of all SSI recipients. The dramatic difference in the demographic composition of DI and SSI is due to the nature of the programs themselves. To qualify for DI an individual must have a history of working in covered employment, a restriction that eliminates many women and younger individuals. Assuming that roughly 50% of those receiving Railroad disability, public employee disability, and the black lung benefits are 45-64 year old men, we estimate that in 1986 among this age group, 1,348,000 were receiving DI, another 307,000 were receiving SSI, 42,000 were receiving Railroad disability, 345,000 were receiving some kind of public employee disability benefits and 70,000 were receiving black lung benefits. Assuming negligible overlaps, this

14

implies that a total of 2,112,000 45-64 year old men or 9.9% of the civilian non-institutionalized population were receiving some kind of disability benefits, with nearly two thirds of these receiving DI. NHIS shows that in 1986 10.6% of 45-64 year old men were identified as unable to work. Thus, it would seem that as of 1986 the vast majority of men who identify themselves as disabled do, in fact, receive transfer income.[22] Making the same assumptions as above we calculate that as of 1980, 11.2% of 45-64 year old men were receiving disability benefits while the NHIS data show 10.9% severely disabled. In 1970, we estimate that 6.5% of 45-64 year old men were receiving disability income, and the NHIS shows 7.4% severely disabled. If we believe these estimates, the time series patterns seem to indicate that while the expansion of transfer programs during the seventies is associated with a rise in the fraction reporting themselves disabled, the number of new recipients is larger than the number of newly disabled. Hence some new awards went to persons who were already identified as disabled and were thus, most likely, out of the labor force. Similarly, the patterns in the eighties indicate that the decline in the number of transfer recipients is larger than the decline in the number disabled.

IV. Early Accommodation: Definition and Measurement

The data present a clear picture of increasing prevalence of self-reported disability and a concurrent rise in the proportion of men reporting specific chronic conditions during the 1970s. For several reasons, however, it seems implausible that actual health has deteriorated such that it has limited men's ability to work. First, increases in self-reported prevalence do not necessarily imply increases in actual prevalence. In fact, in the one case for which the reports are currently available, clinical data from the NHANES-I and NHANES-II (National Health and

---

[22] Our tabulations using the 1984 wave of the Survey of Program Participation appear to support this statement. While we expect some degree of underreporting, SIPP shows 87% of those identified as unable to work receiving transfer income.

Nutrition Examinations Surveys) data show a drop in the fraction of men suffering from hypertension between the early and late 1970s, while self reported prevalence estimates show an increase of more than 100% between 1972 and 1979. Second, for other conditions as well, medical advances and changes in personal health habits [See Verbrugge (1984)] should have improved the health of the population while changes in the nature of the workplace presumably have made it less taxing.[23] If anything, these developments would indicate the opposite trend than is observed. While it is plausible that worsening environmental conditions might work in the direction of worsening health, they have seemingly little connection to circulatory and musculoskeletal conditions which, as we have seen, are associated with most of the growth in disability. While we do find it implausible that actual health has deteriorated, we will return to this point in section V and examine more carefully how changes in actual health might affect our findings.

Therefore, in the absence of any important changes in "actual" health, the seemingly systematic way in which self-reported disability varies with the extent of disability programs (see Figure 1) suggests that the growth of disability insurance programs encouraged earlier accommodation to health limitations. A simple approach to making the connection between disability and program participation is to compare trends in the prevalence of self-reported disability to trends in program statistics. Such a comparison suggests that during the 1950s and 1960s DI and other forms of disability transfers were drawing from a population already out of work since, during these decades, program growth was not associated with any substantial changes in the proportion of the population identified as disabled. On other hand, it would seem that during the 1970s both DI and other disability insurance programs were drawing increasingly from a population that would previously have been working; i.e., program growth *was* accompanied by increases in the proportion

---

[23] The workplace has changed both because of more stringent OSHA regulation during this period and the altered industrial and occupational mix. Baily (1987) provides a discussion of this issue.

16

of men identified as disabled. As shown above, the administrative data suggest that the growth in the population identified as disabled is nearly as large as the growth in the population receiving disability benefits.

Ideally we would like to have time series data that identify whether or not an individual worked, whether or not he received disability benefits and whether or not he identified himself as unable to work. Such data would allow us to see quite directly whether the men out of the labor force were also the men identifying themselves as unable to work and receiving disability benefits. Reliable data of this sort do not exist. The Health Interview Surveys identify labor force status, but have no information on receipt of disability benefits; the 1970 and 1980 Census had questions on work limitations, but the income information on these surveys is too sparse to allow one to determine which individuals were receiving disability benefits. The surveys of the disabled done by the census bureau for the Social Security Administration in 1966, 1972 and 1978 do have all the required information, but sample sizes are to small to allow reliable estimation of trends [see Bound and Waidmann (1989)]. Thus, our inferences have to be less direct.

Until 1969 the only information we have is on the fraction of men identified as unable to work. To use information on the trends in this fraction we first assume that all individuals receiving disability transfers classify themselves as severely disabled and that none of those identified as severely disabled are in the labor force.[24] In this simplified world, the expansion of disability transfers would attract both individuals who were working previously and those who were not working. Of these individuals, if we assume that those who were working classified themselves as able-bodied and those who were not working already classified themselves as disabled, then the

---

[24] These assumptions are not unrealistic. Tabulations on the 1978 Survey of Disability and Work indicate that of those receiving DI, SSI, Railroad Retirement, or Civil Service Disability 96.8% report themselves severely disabled while 2.3% are partially disabled and .9% report themselves not disabled. The labor force participation rate of the severely disabled aged 45-64 in 1969 was 15.9%.

17

decline in labor force participation that is attributable to program expansion is simply the increase in the fraction reporting themselves as severely disabled. This calculation provides our first measure of the historical impact of program expansion during the past four decades.

Recall that using the 1949 Current Population Survey and the 1969 NHIS,[25] we found that during the fifties and sixties, the proportion of men 45–54 identified as having been unable to work because of their health rose from 3.7 percent to 4.0 percent while the proportion of men 55–64 similarly identified increased from 8.0 percent to 9.6 percent. As discussed above, under the assumption that actual health has not changed and that the newly disabled leave the labor force, the impact of early accommodation on labor force participation rates of a particular population is simply the change in the percent reported as severely disabled. Thus, as is summarized in Table 7, for 45–54 year old men, earlier accommodation of health problems reduced the labor force participation rate by three-tenths of one percent. For those 55–64, these forces reduced the participation rate by 1.6 percent. Between 1949 and 1969, the labor force participation rate for men aged 45–54 declined from 95.6 percent to 94.6 percent, a drop of one percentage point, while the rate for 55–64 year old men declined from 87.5% to 83.4%, a drop of 4.1 points [Bureau of Labor Statistics (1989)]. Therefore, the proportions of these drops that would seem to be explainable by the phenomenon of early accommodation are 0.30 for the younger group and 0.39 for the older group.

For several reasons we analyze the 1970s separately from the rest of the post-war era. The 1970s were marked by relatively large changes in the proportion of men reporting themselves as disabled, while the 50s, 60s, and 80s were periods of little increase in self-reported disability. In addition, the survey changes of 1968/69 and

---

[25] To be consistent with the CPS definition of disability we recalculated the 1969 proportions so that they include only those disabled for six months or more.

18

1982 and the increased detail available in the data after 1969 make this separation a natural one.

The NHIS figures in Table 4 indicate that during the period from 1969 to 1981, the proportion of men 45–54 reporting themselves unable to work increased from 4.6% to 6.8% while labor force participation, as reported by BLS, declined from 94.6 to 91.4 percent. For the youngest group, then, early accommodation might explain 2.2 of the 3.2 point decline in labor force participation (69%). For the group aged 55–59, we can explain 4.9 of the 8.3 point drop (59%), and for the oldest group, we can explain 6.6 of the 17.1 point drop (39%).

During the most recent period, 1982-1987, there was little program growth and little or even negative growth in self-reported disability. Table 4 shows that during these years, the proportion of men reporting themselves unable to work fluctuated at around 6.6 percent for the youngest age group, decreased from 13.8 to 11.0 percent for the middle group, and decreased from 20.6 to 17.7 percent for the oldest group. During the same period of time, labor force participation rates continued to drop but, at least for the youngest age group, at a much slower rate than they had during the 1970s. The Bureau of Labor Statistics reports that for the 45–54 age group participation declined slightly from 91.2% to 90.7%. For the 55–59 group, the rate dropped from 81.9 to 79.7 percent, and for the 60–64 group the rate dropped from 57.2 to 54.9 percent of the population. This information is summarized graphically in Figure 1.

For the seventies and eighties, then, the congruence of trends in self-reported disability, labor force participation and PIM generosity presents suggestive evidence that early accommodation is at least partially responsible. Self-reported disability increases dramatically during the seventies, levels off in the late seventies and early eighties and then declines slightly. These trends mimic the trends in participation in public disability programs. At the same time labor force participation rates decline

19

steadily during the seventies and flatten in the eighties. This is especially true for the youngest age group. The fact that the rates for men over the age of 55 continue to decrease in the latter part of the 1980s only indicates that forces besides early accommodation are at work in the participation decision—not a widely disputed claim.

Using information on only the portion of the population identified as severely disabled, we are forced to assume that the men who are reclassifying themselves as disabled are also leaving the labor force. While it is true that most of those men identified as severely disabled are also out of the labor force, and most of those identified as able-bodied are in the labor force, the two partitions are not equivalent. Rather than assuming that all of those newly classified as disabled would have worked before programs like DI existed, another natural assumption would be that those who reclassify themselves from able-bodied to severely disabled were in the labor force with the same probability as the average able-bodied individual. Similarly, we might assume that the partially disabled who reclassify themselves as severely disabled worked with the same probability as the average partially disabled individual. Another problem with the calculations made above is that they assume constant labor force participation rates among those who do not reclassify themselves. We know, however that for men aged 45–64 participation among the disabled dropped during the 1970s from 15.9% in 1969 to 5.8% in 1981 for the severely disabled and from 93.0% to 84.4% for the partially disabled. To more realistically deal with this fact, a plausible assumption is that the severely disabled who worked previously but then left the labor force did so as a result of program expansion.

To make the measurements implied by these assumptions we use the microdata available from the NHIS to do cross-tabulations of labor force status and disability status. Using these data we can decompose the 1969–81 changes in labor

20

force participation, ΔLFP, into changes in disability status, w_j, holding constant disability specific participation rates, changes in these participation rates, LFP_j, holding constant disability status and an interaction between rates and composition. Thus, we can write

$$\Delta LFP = \sum_j (w_j^{t_1} - w_j^{t_0}) LFP_j^{t_0} + \sum_j (LFP_j^{t_1} - LFP_j^{t_0}) w_j^{t_0} + \sum_j (LFP_j^{t_1} - LFP_j^{t_0})(w_j^{t_1} - w_j^{t_0}).$$

We can now measure the contributions of each component to the decline in labor force participation and, based on the assumptions described above, produce estimates of the extent of earlier accommodation of health problems. Below are the components of the change in labor force participation between 1969 and 1981 as derived from the Health Interview Survey.

Components of Change in Male Labor Force Participation, 1969-81

Age	45–54	55–59	60–64
$LFP^{81} - LFP^{69}$	-3.08	-9.15	-18.20
$\sum_j (w_j^{81} - w_j^{69}) LFP_j^{69}$	-1.75	-4.17	-4.67
$(\Delta w_{sd}) LFP_{sd}^{69}$	0.45	0.32	0.19
$(\Delta w_{pd}) LFP_{pd}^{69}$	-1.62	-0.43	-1.41
$(\Delta w_{nd}) LFP_{nd}^{69}$	-0.58	-4.07	-3.45
$\sum_j (LFP_j^{81} - LFP_j^{69}) w_j^{69}$	-1.09	-4.98	-13.53
$(\Delta LFP_{sd}) w_{sd}^{69}$	-0.54	-0.88	-1.02
$(\Delta LFP_{pd}) w_{pd}^{69}$	-0.12	-1.02	-2.34
$(\Delta LFP_{nd}) w_{nd}^{69}$	-0.43	-3.08	-10.17
$\sum_j \Delta LFP_j \Delta w_j$	-0.23	-0.32	0.52
$\Delta LFP_{sd} \Delta w_{sd}$	-0.26	-0.53	-0.49
$\Delta LFP_{pd} \Delta w_{pd}$	0.02	0.05	0.38
$\Delta LFP_{nd} \Delta w_{nd}$	0.00	0.17	0.63

Note: sd, pd, and nd indicate severely, partially and not disabled respectively

In terms of our decomposition, the measure we describe above is equivalent to $\sum_j (w_j^{81} - w_j^{69}) LFP_j^{69} + (\Delta LFP_{sd}) w_{sd}^{69}$ where the first term contains the components due to changes in self-reported health status and the second term represents the changes in labor force participation among the severely disabled. This measure suggests that between 1969 and 1981, the amount of the drop in labor force participation among 45–54 year old men that we can attribute to early accommodation is 2.29 percentage points out of 3.08. For the 55–59 group, the numbers are 5.05 out of 9.15; and for the oldest group, 5.69 out of 18.20. A clear age pattern emerges from these numbers. Respectively, 74, 41, and 31 percent of the drops in participation rates during the 1970s are explained by some form of early accommodation.

While we consider these plausible estimates of the impact of early accommodation on labor force participation, other measures would be generated by different assumptions about the labor force participation of the severely and partially disabled. However, whatever one believes about the other components of change in labor force participation, it is fairly clear that the decline in participation rates among the able-bodied that are not associated with changes in health status cannot be attributed to any of the phenomena we have termed early accommodation. Thus, an upper bound on the effect of early accommodation, in terms of our decomposition, is $(LFP^{81} - LFP^{69}) - (\Delta LFP_{nd}) w_{nd}^{69}$. By age group, then, the largest fractions of the decline in labor force participation that might be explained as early accommodation are 86, 66, and 44 percent, respectively. While these calculations, summarized in Table 7, show that the exact magnitude of the decline in labor force attachment accounted for by early accommodation varies with the assumptions made, qualitative conclusions are reasonably robust. We can account for most, but not all of the drop in participation of 45 – 54 year old men, a bit over half of the

22

drop for 55 – 59 year old men and relatively little of the drop for 60 – 64 year old men.

Combining the results from the three time periods can give us some range for the impact of earlier accommodation on the labor force participation of older men since World War II. Using the simplest method above and calculating the increase in the portion of the population reporting themselves severely disabled, we find that between 1949 and 1987, an earlier accommodation explanation can account for a 2.3 percentage point drop in labor force participation for 45-54 year old men and a 5.3 point drop for 55-64 year old men.[26] Using our more detailed calculations we established a range of estimates for the period 1969-1981. Using this range in place of the simple calculation for this period, we can establish a range of estimates for the period 1949-1987 which suggests that earlier accommodation can account for between a 2.3 and a 2.8 percentage point decline in the participation of the younger group and between a 5.0 and a 6.6 point drop for those aged 55-64. Thus, for the entire post World War II period, our calculations suggest that earlier accommodation can account for between 39 and 57 percent of the 4.9 percentage point drop in labor force participation of those aged 45-54 and between 25 and 33 percent of the 19.9 point drop among those aged 55-64.

V. Alternative Explanations for the Rise in Self-reported Disability

So far we have maintained that it is earlier accommodation to health limitations, rather than actual deterioration in health, that explains the rise in self-reported disability. Yet several alternative explanations of the trends in health statistics have been offered in the literature. To the extent that these inter explain trends in health statistics, they detract from the early accommodation story presented above. The first group of explanations centers around survey design and

---

[26] For these calculations we added predicted changes for the periods 1949-69, 1969-81, and 1981-87.

23

holds that at least some of the change in self-reported health status may be arti-factual. The second group of these stories explains changes in health measures as a result of compositional changes in the population. Mortality rates for older men began to drop during the 1970s, and it is possible that this decline increased the frailty of the average 45–64 year old [Fries (1980), Shepard and Zeckhauser (1980), Feldman (1983)]. In this way, improvements in health status and survivorship might lead to more *actual* disablement. In addition, the 1960s and 1970s saw the deinsti-tutionalization of the mentally ill. To the extent that those who would previously have been institutionalized are still unable to participate in the labor market they will add to the non-institutionalized disabled [Verbrugge (1984)]. Since the surveys we use and BLS participation rates are based on the non-institutionalized civilian population, this compositional change might have contributed to the observed rise in self-reported disability and decline in labor force participation.

Survey Design Effects

In the specific case of the NHIS Wilson and Drury (1981, 1984) and Kovar and Poe [National Center for Health Statistics, 1985] present explanations of trends in reported health status in which those trends result from changes in questionnaires and changes in survey procedures. There are two major sources of potential effects. First, since NHIS was changed in 1969 and 1982, we might expect different patterns of response for the periods 57-68, 69-81, and 82-present. The changes do not, however, explain trends within a regime; i.e., they cannot explain the dramatic changes in reported disability between 1969 and 1981.

Another source of influence for survey design is the decrease over time in the rate of proxy response. Available data suggest that proxy respondents are less likely to report an individual as disabled (limited in his activity) than is the individual himself. For example, in a study done by Kovar and Wright (1973) a sample of interviewees was randomly assigned to two groups. The first (control group) was

24

interviewed using standard interview procedures while in the second (treatment group) every adult capable of responding for himself did so. In the control group, roughly 33 percent of individuals were reported on by proxies, while in the treatment group this proportion was only 3 percent. Kovar and Wright found that 12.4% of individuals in the control group and 13.6% of the individuals in the treatment group were identified as disabled. This evidence can be used to give us a rough idea of the magnitude of the difference using self-respondents might make. Roughly two thirds of the control group, as opposed to 95% of the experimental group, answered for themselves. A little algebra shows that this is consistent with 13.7% of self-respondents as against 9.6% of proxies identifying individuals as disabled – a sizable gap of roughly 40%.

Still, it seems unlikely that these differences in the propensity to report disability can explain much of the observed upward trend in reported disability. In 1970 43% of 45–64 year old men represented by the NHIS responded for themselves while 57% were represented by proxies. By 1980 49% of men were responding for themselves. As calculated above, if self-respondents are 40% more likely to be identified as disabled than those for whom a proxy responds, then a rise in the number who respond for themselves from 43% to 49% could account for a 2% rise in the proportion of individuals identified as disabled. Even if self-respondents were twice as likely to identify themselves as disabled the proportion identified as disabled would go up by only 4%. The observed increase in severe disability is something on the order of 40% (7.4 to around 11). Thus while the move away from the use of proxies may have raised the proportion of men identified as disabled, it can account for only a trivial portion (perhaps 5%) of the observed rise in disability rates.

25

Mortality Effects

We can get an upper bound on the impact of declining mortality on changes in

the prevalence of disability by calculating the fraction of the population that would

not have been alive had they faced the mortality schedules of earlier cohorts. Were it

the case that all the "marginal" survivors, those that would not have been alive had

they been born into earlier cohorts, were disabled, but that disability rates did not

change at all among the infra-marginal survivors, then the fraction of the population

that are marginal survivors represents the net addition to the disabled population.

Stated this way, it should be clear why this kind of calculation represents an extreme

upper bound for the impact of mortality declines on the fraction of the population

disabled. Not all of the marginal survivors will be disabled, nor will disability rates

stay constant among the population that would have survived regardless.

To determine the fraction of the population alive in a given year that would

not have been so had they faced the mortality schedule of men born 10 years earlier,

we first define the survival ratio to age x for a member of the cohort born in year

w as[27]

$$S^w(x) \equiv \frac{l_x^w}{l_{45}^w} = \prod_{t=45}^{x-1} (1 - q_t^w)$$

which is the actual probability of survival to *exact* age x conditional on survival to

exact age 45.[28] The life table death rate, q_t,[29] is defined as the probability that

an individual dies between birthdays t and $t+1$ and l_x is the number surviving

(out of l_{45}) to their xth birthday.[30] Next we define a hypothetical survival ratio,

---

[27] The life table symbols and terminology here will be familiar to demographers.

[28] By concentrating on only ages 45 and above we eliminate the effect of mortality improvements at earlier ages, which are concentrated in infancy.

[29] The mortality data used to calculate these death rates are found in the 1950 through 1985 volumes of *Vital Statistics of The United States*, and the population estimates are found in various volumes of the P-25 series of *Current Population Reports*. The method of calculation using these data is described in detail by Shryock and Siegel [U.S. Bureau of the Census, 1971]. Basically the technique calculates rates for five year intervals using Vital Statistics and Population data and uses graduation methods to fit a smooth curve over single-year age intervals. Using these mortality rates we then constructed cohort life tables for every cohort that reached age 45 between 1950 and 1985.

[30] If we assume that people die off uniformly between ages x and $x+1$ then we approximate the size of the mid-year population, or the average size of the population during the year, between the two ages (out of l_{45} that started) as $L_x = (l_x + l_{x+1})/2$.

26

$HS^{w,w-s}(x)$. Suppose those aged x years in year r had experienced their own mortality schedule until $r - s$, but between $r - s$ and r experienced the schedule of a cohort born s years before them. Symbolically,

$$HS^{w,w-s}(x) \equiv \begin{cases} \prod_{t=45}^{x-s-1}(1 - q_t^w)\prod_{t=x-s}^{x-1}(1 - q_t^{w-s}) & \text{if } 45 < x - s; \\ S^{w-s} & \text{otherwise.} \end{cases}$$

Finally, we define marginal survival as

$$MS^{w,w-s}(x) \equiv \frac{S - HS}{S}.$$

These ratios are defined in terms of single-year exact ages, but to make meaningful comparisons with the results calculated in the preceding section, we must calculate the marginal survival into a 5 or a 10 year age group. For example, we need to determine what proportion of those aged 45–54 in 1980 would have been dead if, during the 1970s, they had experienced the mortality of the cohorts born ten years before them. To do this, we first define single year of age survival ratios as

$$\frac{L_x^w}{l_{45}} = \frac{S^w(x) + S^w(x+1)}{2} \quad \text{and} \quad \frac{L_x^{w,w-s}}{l_{45}} = \frac{HS^{w,w-s}(x) + HS^{w,w-s}(x+1)}{2}.$$

We can then estimate the survival ratio for the population falling within a given 5 or 10 year age group in any year by weighting the single year survival ratios by single year population estimates (P's) from s years before.[31] Marginal survival ratios are then calculated substituting our multiple year ratios for the single year S and HS terms above.

The next task is to use this marginal survival measure to give a pessimistic estimate of the error in our assumption of the previous section. What we find is that if *all* marginal survivors are classified as severely disabled and *none* of the

---

[31] For example, $_5L_{55}^*/l_{45} = (P_{55}/_5P_{55})(L_{55}^*) + \ldots + (P_{59}/_5P_{55})(L_{59}^*)$

27

able-bodied population in 1980 would have been disabled in 1970, we can explain between a third and a half of the increase in self-reported disability between 1970 and 1980.

Table 8 shows that if those aged 45–54 in 1980 had experienced their own mortality schedules until 1970 and then the schedules of the cohorts born ten years before them between 1970 and 1980, 0.66 percent of them would have been dead. Thus, .66 of the 2.4 percentage point increase in prevalence of severe disability (28%) that occurred over this decade can conceivably be explainable in terms of declining mortality. Conversely, at least 72% of the increase in self-reported disability is *not* explained by mortality improvements. The fraction not explainable by mortality effects declines as we look at older age groups, however. For the 55–59 group, 1.82 of the 4.3 percentage point rise in disability (42%) is potentially explainable by mortality effects, and for the oldest group, 2.54 of the 3.9 percent increase (65%) might be explained.[32] Table 8 also shows very little mortality improvement during the sixties and a continuation of the seventies' trend into the first part of the 1980s.

Table 8 also presents these calculations broken down by specific causes. These numbers give an idea of the relative importance of these conditions to overall mortality improvement. These numbers represent the proportion of the cohort alive in a given year (1970, 1980 or 1985) who would have been dead had they experienced the cause specific mortality rates[33] of the cohort born m years earlier for the previous m years, and their own mortality schedule otherwise. For example, if, between 1970 and 1980, the birth cohorts aged 45–54 in 1980 had faced the age-specific infective

---

[32] Both Poterba and Summers (1987) and Baily (1987) do similar calculations. As a comparison, Poterba and Summers estimate that 3.9 percent of 60 year old men are excess survivors in 1980 while Baily estimates that proportion of 45-64 year old men to be 1.25 percent. Our estimates are slightly larger than Baily's and considerably smaller than those calculated by Poterba and Summers.

[33] Cause specific mortality rates are assumed to be in the same relative proportions as deaths, by cause. That is, for any given year and five year age group, $\frac{q_t^i}{q_t} = \frac{D_t^i}{D_t}$ where D_t^i is the number of deaths due to cause i in period t. Implicit in this calculation is the assumption of independence of risks among all causes of death. While this assumption is certainly incorrect, for probabilities as small as those involved here, this assumption is not terribly distorting.

28

disease mortality schedules of the cohorts born ten years before them (but otherwise faced their actual mortality schedules), 0.021% of them would have been dead. As can be seen in the table, improvements in mortality due to circulatory conditions can account for around fifty percent of the excess survivorship of the seventies and even more during the early eighties. The improvements in mortality due to disorders of the nervous system and sense organs[34] contribute about 25 percent of the excess during the seventies and none during the eighties.

It should be stressed, however that the numbers we obtain are only upper bounds on the contribution of mortality effects. Several factors suggest the actual effect of declining mortality on disability rates is much lower than the upper bound we have calculated. First, as can be seen in Table 8, mortality rates continue to decline into the 1980s even after disability rates level off. This is an indication that the extent of the link between mortality and disability in the seventies calculated above is overstated. The fact that much of the increased survivorship is due to the lessening cardio-vascular risks gives force to the notion that many of the marginal survivors are able-bodied. In a review article Goldman and Cook (1984) estimate that more than half of the decline in ischemic heart disease mortality (the largest single component of circulatory system mortality) between 1968 and 1976 can be attributed to lifestyle changes—reduced cigarette smoking, weight reduction, and lower serum cholesterol levels, while 40% could be attributed to medical interventions, including both the better treatment of chronic heart trouble, e.g., improvements in the control of hypertension, and the increased success of emergency medical intervention. Thus, it seems quite natural to imagine that many of these *marginal* survivors would be able-bodied. Further, it would seem likely that both the lifestyle changes and the better treatment of chronic heart trouble could be expected to improve the health of many who would have been alive regardless. All in

---

[34] These include such things as Multiple Sclerosis, Meningitis, Epilepsy and Parkinson's Disease.

all, it seems doubtful that decreases in cardio-vascular mortality increased disability rates much at all. While the largest mortality improvement involved circulatory conditions, to the extent that medical advances decreased other types of mortality in a similar manner, the calculations above represent an even larger overstatement of the increased frailty of the population. Thus, while changes in mortality conditions might possibly explain some increase in the prevalence of disability, it seems unlikely that mortality is a major factor in these trends.

Deinstitutionalization Effect

Between 1960 and 1980 the proportion of the 45–64 year old male population in mental hospitals dropped dramatically to about a fourth of its original size. The (percentage point) changes are summarized below. These numbers suggest that by 1980 deinstitutionalization may have contributed as much as .49 percentage points to the growth in the proportion of 45-54 year old men that are disabled. For the older age groups the percentages are somewhat higher.

Percent of Men 45-64 in Mental Hospitals, 1960-1980

Age	1960 Level (%)	1960–1970 Change	1970–1980 Change	1980 Level (%)
45–54	.67	-.27	-.22	.18
55–59	.80	-.32	-.28	.20
60–64	.94	-.41	-.33	.20

Source: Tabulations based on the Census: 1960, 1970, 1980.

Unlike the mortality declines discussed above, deinstitutionalization occurred during the same period that the proportion of men classified as severely disabled was rising. However, the size of the institutionalized population was hardly large enough to contribute in any major way to trends in disability rates. Comparing the trends

30

in the institutionalization of the mentally ill to trends in the proportion of men identified as severely disabled we see that the change in the institutionalized population between 1970 and 1980 could explain at most a .22 percentage point rise in the proportion of 45-54 year old men identified as disabled. .22 represents just less than 10% of the 2.4 percentage point change in the portion of men identified as disabled during the same period of time. For the older groups deinstitutionalization can explain even less of the rise in self-reported disability rates.

Summary

Of these three alternative explanations for the rise in the prevalence of self-reported disability among older men the mortality effects are the only ones that may possibly explain a sizable portion of the observed change. Survey design effects cannot plausibly explain much more than 5% of the 1970–1980 change, while deinstitutionalization can explain at most ten percent of the same change. While mortality effects could conceivably explain as much as 28% of the observed 1970–80 change for the youngest group and 65% for the oldest, we doubt that the effects are substantial. Thus while we can attribute some changes in reported health statistics to other causes, we are still left with much that can be described as earlier accommodation to health problems, a phenomenon which seems to be especially pronounced among the younger groups of the men in question.

VI. Causal Factors

So far we have argued that the rise in the proportion of older men identified as unable to work represents earlier accommodation of pre-existing health conditions rather than artifacts of survey design or true decline in the health of this population. Men who would have worked, had they lived in earlier cohorts, are now out of the labor force, identifying themselves as disabled and receiving disability benefits. To

31

this point, however, we have not put forth a causal interpretation of the shift to this new regime.

The systematic way in which self-reported disability varies with the extent of disability programs suggests a simple—if extreme—causal connection. According to this interpretation, the initial increases in the availability of benefits encouraged the accommodation of health limitations, and the subsequent decreases in availability then discouraged this accommodation. Alternatives are possible, however, in explaining the earlier accommodation of health limitations that occurred in the 1970s. In particular, a combination of changes in attitudes towards health and changes in medical practice may well have led to the earlier diagnosis of pre-existing conditions and in turn might have encouraged men to leave the labor force and apply for disability benefits. Alternatively, earlier accommodation might reflect more general changes in the work force attachment of older working-aged men, occurring perhaps because of changes in attitudes towards work or in the demand for workers. In this case changes in self-reported disability status would reflect a rationalization of exogenous changes in labor force status.

There is, in fact, some indication that increases in the availability of disability benefits were not the only forces driving trends in early accommodation during the 1970s. First, the fraction of men identifying themselves as unable to work increased during the 1970s even among men over the age of 65, men for whom DI would be irrelevant. While the percentage increase was larger for the younger group – 60% from 7.2% to 11.5% for 45 to 64 year old men compared to 18% from 26.1% to 30.7% for men 65 and older[35]– suggesting factors at work for the younger group that were not operative for the older one, the parallel nature of the changes suggests that there must also have been forces at work that were common across the two age

---

[35] These are the raw percentages. While we worried that part of what might be driving the figures for the older group was the aging of the over-65 population, standardizing on age made no difference.

groups.[36] Second, at least for the older of the groups we have considered – those 54-64 – the drop in participation rates even among those identified as able bodied accelerated during the 1970s at the same time that the fraction identifying themselves as disabled began to rise. BLS figures show that the labor force participation rates among 55-64 year old men dropped 4.9 percentage points between 1955 and 1970, while dropping 10.9 percentage points from 1970 to 1980 (see Table 3). Our tabulations using the National Health Interview Surveys show that for 55-64 year old men identified as able bodied, participation dropped 7.5 percentage points from 93.3% to 85.8% between 1970 and 1980. Thus the average annual percentage point drop in participation among the able bodied during the 1970s was more than twice as high as the average annual percentage point drop for *all* groups during the 1950s and 1960s.

Awareness of Health Problems

We first examine the trends in self-reported disability in relation to trends in the prevalence of self-reported conditions. As seen above, the prevalence of self-reported disabling chronic conditions rose during the 1970s and then leveled off during the 1980s, mirroring the trends in self-reported disability. It may be that the upward trend in disability is responsible for some of the increase in specific conditions, as those attempting to establish disability find a medical means to do so. However, not all increases in prevalence can be accounted for in this way since the prevalence of disabling conditions among the non-disabled increased along with prevalence among the disabled. Using information on the types of conditions that increased in prevalence, Verbrugge (1984) argues that the rise in self-reported prevalence rates is a result of earlier diagnosis of pre-existing conditions. Earlier diagnosis, in turn, may be a result of several factors: the increased awareness of the importance of

---

[36] The fact that the upward trend occurred not only among those in their late 60s but also among men in their 70s and 80s, and the fact that the increase for those over the age of 65 occurred at the same time as the increases for men under the age of 65 suggest that this trend can't simply reflect cohort changes that occurred during the working lives of these men.

33

early diagnosis, the increased availability of medical care for some segments of the population and advances in detection technology.

What is more difficult to discern is whether the changes in the self-reported prevalence of specific conditions can account, in a causal sense, for some part of the rise in the fraction of men claiming to be limited in their ability to work. It seems quite plausible that, at least in some cases, doctors would recommend to men suffering from heart conditions that they stop working. Even for a condition like arthritis, where the source of the work limitation is the symptomatic pain involved, it is not hard to imagine that for some men, knowing that they had a recognized condition might affect behavior if for no other reason than that it might change their expectations about eligibility for disability programs. In addition, knowing that a condition is chronic lowers the individual's assessment of the probability of recovery, making it more likely that the individual will give up a career job. Finally, we might imagine that doctors, after diagnosing a disabling condition, might advise men to apply for disability benefits. Each of these scenarios implies that increased awareness of health leads to increased prevalence of self-reported disability and increased program participation. While each has some plausibility, we know of no way to evaluate their importance in terms of explaining changes in the fraction of the population reporting limitations.

Health as Rationalization

While much of the evidence suggests to us that changes in self-reported health status and labor force participation reflect early accommodation of existing health problems, it is not clear that all of this accommodation is a result of disability transfer programs. An alternative set of explanations suggests that changes in self-reported health status may be a rationalization for changes in labor force status that would have occurred anyway. Some such hypotheses state that the demand for older workers declined due to poor macroeconomic conditions or other exogenous shocks

34

like the entrance of large "baby-boom" cohorts into the labor force. Others focus on the supply side, and hypothesize that changing attitudes toward retirement made men leave the labor force earlier. The common thread in this group of explanations is that workers leave the labor force for reasons not directly related to health but then report that their health prevents them from returning to the labor force.

Even if the original impetus for labor force withdrawal came from something other than changes in the availability of disability benefits, it would not be too surprising if it was those in relatively poor health and/or those who were the most likely to qualify for disability benefits that showed the most responsiveness. For example, perhaps the shocks to the economy that occurred during the 1970s displaced many older workers, and those in poor health might have been the least capable of replacing their old jobs. Faced with relatively poor job prospects but the possibility of generous early retirement benefits, such men might have been willing to try to qualify for DI. From this perspective, DI would have acted more as an early retirement program than as disability insurance. According to this story, responses to the 1970s and 1980s recessions might have been different for a number of reasons. Perhaps, during the 1980s, the economy was more capable of generating jobs for older workers in poor health than it was during the 1970s. Alternatively, an option available during the 1970s to older workers in poor health, DI, had been partially closed off during the 1980s.

To the extent that there was geographic variation in the factors other than changes in the availability of disability transfers that might have affected the labor force attachment of older men, we can use this variation to help distinguish the effect of these factors from the effect of disability transfers on earlier accommodation. The NHIS has neither large enough sample sizes nor sufficient geographic detail to do this type of comparison, but both the 1970 and the 1980 censuses contained questions identifying the disabled. The 1970 census asked of 5% of the population "Does ...

35

have a health or physical condition which limits the kind or amount of work he can do at a job? Does his health or physical condition keep him from holding any job at all? How long has he been limited in his ability to work?" The 1980 census asked "Does ... have a physical, mental or other condition which has lasted six months or more which a)limits the kind or amount of work this person can do at a job? b)prevents this person from working at a job?" The fraction of 45-64 year old men identified as disabled in the censuses and the National Health Interview Surveys are quite similar. The 1970 census shows 19.0% with some work disability (compared to 17.0% in the 1970 NHIS) and 7.2% with severe work disabilities (compared to 7.4% in the NHIS).[37] The 1980 census shows 17.8% with some kind of work disability while 9.8% are shown as unable to work at all.[38] These numbers are lower than those shown by the 1980 NHIS, but this is largely a function of the fact that those identified as disabled in the 1980 census had to have suffered from a condition that had lasted at least 6 months and that those who were identified as severely disabled but in the labor force were reclassified as partially disabled. When adjustments are made to the NHIS to make results as comparable as possible to the 1980 census definitions the NHIS shows results very similar to those shown by the census.[39]

The first of the alternative stories we examine—and the easiest to test—is that which attributes trends in self-reported disability to macroeconomic conditions. According to this story, periods of economic stagnation push older workers from their jobs, and once out of the labor force, these individuals classify themselves as unable to work because of health problems. Substantial inter-state variation in macroeconomic conditions during the 1970s aids us in identifying the relationship between business cycles and self-reported disability. If macro-economic factors were

---

[37] 1970 Census figures obtained from U.S. Bureau of the Census (1973).

[38] 1980 figures are based on authors' tabulations of 5% Public Use Microdata Sample of the 1980 Census.

[39] Using the 1980 census definitions, the NHIS shows 19.3% classified as disabled and 9.3% as unable to work.

important we should expect to find that states that fared poorly in terms of un-employment during the 1970s would show greater increases in the odds that an individual reports himself severely disabled. To make the information from the two years as consistent as possible we code someone as severely disabled in 1970 only if he reported having been disabled for at least 6 months and did not report being in the labor force. While this procedure does make the two years consistent, it has the drawback of building in a definitional relationship between disability and labor force participation which will tend to bias our results towards finding a relationship between macroeconomic conditions and self-reported health status.

To test for a relationship between macroeconomic conditions and self-reported health, using data from the Bureau of Labor Statistics, we first regressed 51 state unemployment rates[40] on a constant and a dummy that was equal to one for years after 1972. The coefficient on the dummy represents the excess unemployment that the state experienced during the 1973 through 1979 period. Then using the 1% public use sample from the 1970 Census and the 5% sample from 1980, we calculated, for each of the 51 states, the log-odds of being out of the labor force and the log-odds of being severely disabled in each year. We then regressed the 1970-1980 change in log-odds of being out of the labor force and the change in the log-odds of being severely disabled on the states' excess unemployment and a constant. Results suggest that a one percentage point rise in the unemployment rate produces a 7.2% ($\hat{\sigma}_{\hat{\beta}}$=1.8%) increase in the odds of being out of the labor force and a 7.5% ($\hat{\sigma}_{\hat{\beta}}$=2.0%) increase in the odds of being severely disabled. Between 1973 and 1979 unemployment was, on average, 1.75 percentage points higher than in the 60-73 period, and since census data indicates that both of the above odds ratios increased by about 0.5 over this time period, these results suggest that about

---

[40] 50 states plus Washington, DC.

one quarter of the change in the odds ratio might be explained by macroeconomic changes.[41]

The worsening macro-economy is only one of a variety of factors that might have been affecting work force attachment. It seems plausible that to the extent that factors that weren't specifically health-related (e.g., changes in attitudes towards work) had an impact on work force attachment, they would raise both the fraction of men out of the labor force and identifying themselves as unable to work and the fraction out of the labor force and identifying themselves as able-bodied. We can get some idea of how important such factors are by comparing changes in the fraction out of the labor force and disabled to changes in the fraction out of the labor force and able-bodied. If there are important factors unrelated to health and health is simply a rationalization then we might expect a reasonably high correlation across states in these changes.

Again using the micro data from the census we calculated, for each state, the fraction of civilian, non-institutionalized 45-64 year old men falling into three mutually exclusive and exhaustive categories: 1) those in the labor force (LF), 2) those out of the labor force and severely disabled (OLF_d), and 3) those out of the labor force but not severely disabled (OLF_n). The change between 1970 and 1980 in the log-odds of being severely disabled as against being in the labor force, $d \ln \left(\frac{OLF_d}{LF} \right)$, was then compared to the change in the log-odds of being out of the labor force but not severely disabled, $d \ln \left(\frac{OLF_n}{LF} \right)$. Weighting by the 1970 population the correlation across states in these two changes was .44. Both changes are measured subject to sampling error, and correcting for the resulting bias raises the estimated cross state correlation to .56.[42]

---

[41] Deriving these estimates separately for each age group we find that macroeconomic changes might explain 25.9% of the change in the odds ratio for those 45-54, 26.4% for those 55-59, and 20.1% for those 60-64.

[42] The changes are measured with error, biasing the estimated correlation downwards, but the errors across the two changes are positively correlated, biasing the estimated correlation upwards. While the two biases, to some extent cancel, it is the errors in variables bias that is more important.

This reasonably large correlation is certainly suggestive that some of the forces that were inducing the able-bodied to leave the labor force were also inducing those with health limitations to do so. To get a notion as to how important these common factors might be for explaining the rise in self-reported disability we regressed the change in the log-odds of being disabled on the change in the log-odds of being out of the labor force, but not disabled. The coefficient on $d\ln\left(\frac{OLF_n}{LF}\right)$ was .39 (.11). Adjusting for sampling error in these variables, we get an estimated coefficient of .42. This coefficient implies that had the average $d\ln\left(\frac{OLF_n}{LF}\right)$ been zero, the change in the log-odds of being severely disabled would have been 40% lower than it was. In other words, these estimates suggest that had the availability of disability benefits increased in the way they did, but had the other forces at work lowering the participation rates of older men not been operative, we would have still seen an earlier accommodation of health limitations, but one that was 40% smaller than the one we actually observed.[43]

Summary

The evidence we have considered so far suggests that not all of the earlier accommodation to health limitations can be attributed to the rise in the availability of disability benefits. In particular, we have seen evidence suggesting that both the worsening macro economy and other factors unrelated to disability transfer programs may have contributed in substantial ways to the earlier accommodation we have observed. Our estimates using cross-state variation in participation rates suggests that such factors might have contributed as much as 40% to earlier accommodation, with another fraction attributable to growing health awareness.

At the same time, there is another piece of evidence suggesting that the increases in the availability of benefits *do* play an important causal role. Alternative

---

[43] If we do these calculations separately for each age group, common factors explain 41% of the rise in self-reported disability for those 45–54, 4% for those 55–59, and 41% for those 60–64. We suspect, however, small sample sizes make these estimates imprecise.

explanations that hold that more men left the labor force either because demand for older workers was falling or because attitudes toward retirement were changing imply that those leaving the labor force and applying for disability benefits in the 1970s were more marginally disabled than their counterparts in early decades. Without adjustment in the availability of benefits to accommodate the changing standards of applicants, we should have seen increased application rates and decreased acceptance rates. If application rates rose without a drop in acceptance rates then we can infer that, at the very least, increasing "demand" for benefits was accommodated by increasing availability. In fact, between 1965 and 1975, applications as a fraction of the insured population rose more than 50% from 1.00% to 1.54% per year. Over the same period of time, the fraction of applicants qualifying for benefits remained virtually constant, dropping from 47.6% in 1965 to 46.1% in 1975. Since 1975 the fraction of applicants awarded benefits dropped by 26% to 35.4 in 1985. At the same time, applications as a percentage of the insured dropped 33% to 1.03% per year. Thus, during the expansion, changes in the de facto standards used by disability examiners seemed to mirror changes in the standards used by potential applicants. It is fairly clear, therefore, that not all of the increase in application rates is due to changes in demand for benefits. Since then the tightening of standards has not been completely matched by changes in the number of individuals applying, but the fact that applications declined when acceptance probabilities declined is another good indication that the availability of benefits has played an important role in the changing rates of self-reported disability.

VII. Discussion

The data we have presented suggest that a sizable portion of the drop in the labor force participation of older working aged men that occurred during the 1970s can be attributed to the earlier accommodation of health problems. The basis

40

for our belief is that much of the observed change in labor force participation can be accounted for by changes in the fraction of men indicating that their health limits their ability to work. While these changes in self-reported disability can be accounted for by changes in the fraction suffering from documentable chronic health conditions, we do not believe that the actual health of the older working-aged population was deteriorating in any important way during this time period. We thus conclude that earlier accommodation does represent an accurate description of what was occurring.

The congruence between trends in self-reported disability and labor force attachment is strongest for the youngest age group we study, those aged 45-54. For this group the early accommodation explanation might explain up to 80% of the decline in labor force participation during the 1970s. For the oldest group, those aged 60-64, we can explain slightly more than one third of the decline of the 1970s. By way of comparison, during the 1950s and 1960s the early accommodation hypothesis is capable of explaining only a third of the small declines in labor force attachment for each group. An explanation consistent with these observations is that during the early years of program expansion, new beneficiaries came from a population that was already out of the labor force, and already classifying themselves as disabled. After 1970 public policy towards the disabled seems to have had a larger effect on the labor force response to health problems.

In terms of the ultimate causal forces involved in early accommodation, we suspect that the growth in the availability of disability benefits has played, at minimum, an important facilitating role. What plausibly are largely exogenous changes in the availability of benefits, liberalizations through the mid 1970s and retrenchment since then, have been associated with changes in the fraction of working aged men receiving benefits. Furthermore, during the 1970s and 1980s, though not before, the changes in the fraction receiving benefits seem to have closely mirrored

41

changes in the number of men identified as disabled. Program statistics on the fraction of men applying for and being awarded benefits suggest that up through the mid 1970s changes in the supply of benefits was keeping pace with demand, while during the late 1970s and 1980s the supply was dropping more rapidly than demand.

However, a variety of considerations suggest to us that factors other than increases in the availability of disability benefits also played an important contributing role. Not only did the fraction of men identifying themselves as unable to work increase over this period, but the fraction identifying themselves as suffering from potentially disabling chronic conditions also rose. This suggests at least the possibility that the earlier diagnosis of preexisting conditions could have led some men to apply for disability benefits. Second, both across time and across states, changes in the fraction of able-bodied men out of the labor force mirrored, to some extent, changes in the fraction identifying themselves as unable to work, suggesting that common factors were at work and might explain some of these trends. Third, the fact that there were changes in the fraction of men aged 65 and older identifying themselves as disabled suggests that factors other than disability insurance must have been responsible for some of the rise in the prevalence of self-reported disability. For all these reasons, our estimates of the extent to which changes in the labor force attachment of older men represented earlier accommodation of health limitations should be considered an upper bound on the causal impact of disability programs on their work force attachment.

Close in spirit to our own research is work by Martin Baily (1987), "Aging and the Ability to Work: Policy Issues and Recent Trends". In his paper, Baily uses published tabulations from the NHIS on self-reported health limitations to make inferences about the impact of the growth of disability insurance on work force attachment. Our work differs from Baily's in a number of important respects. While

42

the tabulations Baily uses end in 1980, the disability transfer system experienced dramatic changes in the early-to-mid eighties. The data from this later period provide important variation in program structure with which we can better identify incentive effects. Second, while Baily measures the increase in disability for 45–64 year old men as a group and considers the period 1960–1980 as a whole, our analysis indicates that this level of aggregation misses important differences across decades and age groups. Combining the sixties and seventies masks the very different trends in program growth and health status between the two decades. More importantly, we find large differences in the strength of economic incentives for younger and older members of the 45–64 year old group. Finally, while we make use of the same type of information as Baily, the detail of our analysis allows us to make quantitative rather than qualitative estimates of the disincentives associated with the historical growth of the disability transfer system.

It is of some interest to compare our results to earlier work by Bound (1989). Using data on men who had applied for DI benefits but had failed to pass the medical screening necessary to qualify for them, Bound argued that, as of 1980, DI could account for at most 2.1 percentage points of the decline in the labor force participation of 45-54 year old men. The estimates we have presented here suggest that earlier accommodation can account for somewhere between 2.5 and 3.0 percentage points of the decline in participation of 45-54 year old men between 1949 and 1981. Since not all of earlier accommodation represents the causal impact of DI on participation, the discrepancy between these different estimates should not be too surprising. In section VI we presented calculations that suggested that perhaps 40% of earlier accommodation might represent something other than the causal effects of disability transfers on participation. Reducing the 2.5 to 3.0 percentage point changes by 40% gives estimates of the causal impact of disability transfers on

43

participation of between 1.5 and 1.8 percentage points, numbers which are consistent with Bound's earlier estimates.

Using the same methodology Bound argued that DI could account for no more that 3.8 percentage points of the decline in the participation of 55-64 year old men. Our calculations suggest that earlier accommodation can account for from between 7.1 and 8.7 percentage points of the decline in participation of this group. Reducing these numbers by 40% we still get estimates of the causal impact of disability transfers that are somewhat larger than those implied by the information on rejected applicants: 4.3 to 5.2 percentage points as opposed to 3.8 percentage points. There are several plausible explanations for the discrepancy we observe for the older group. On the one hand, it seems entirely possible that less than 60% of earlier accommodation actually represents the causal impact of disability transfers on participation. On the other hand, it also seems possible that information on the labor force status of rejected applicants very close to retirement age might be a less reliable indicator of what these men would have been doing had they never applied for DI than would be the same information for somewhat younger men [Bound (1989), Parsons (forthcoming), Bound (forthcoming)].

Perhaps the most interesting conclusion of this paper is not a point estimate for the impact of disability transfers on labor force attachment but concerns more basic issues raised in the rest of the literature. There has been a tendency to equate the behavioral responses to the availability and generosity of disability benefits, i.e. changes in work force attachment, to malingering (Parsons 1980; Leonard 1985; Baily 1987; Yelin 1986, 1989). According to this argument, being disabled implies being unable to work, and for those truly unable to work changes in the availability of disability benefits should have no impact on behavior. As a result, researchers who have been interested in defending disability insurance as sensible social policy have been forced into arguing that behavioral responses have been trivial, while

44

taking solace in the fact that those receiving disability transfer income do, indeed, suffer from documentable chronic conditions. Others have taken evidence in favor of behavioral responses as evidence that many of those receiving disability benefits are perfectly capable of work – that the social costs of disability transfers have been high and the target efficiency low.

This dichotomy is a false one. We do believe that the increased availability of disability transfers during the 1970s played a role in inducing or at least facilitating older men to leave the labor force. However, the evidence seems to suggest that most of those who did so and began receiving disability transfers did suffer from potentially disabling conditions, many of which (e.g, hypertension, heart problems, diabetes) seem unlikely to be reported unless a doctor had told the individuals of the condition's existence. Moreover, a high fraction of those identifying themselves as disabled receive either SSDI or SSI, and while there are legitimate questions about the validity of the medical screening required to qualify for such benefits, it seems very unlikely that an individual would qualify without suffering from a disabling chronic condition. Under these circumstances, evaluating the appropriateness of the changes in the availability and generosity of disability benefits that occurred during the 1970s and 1980s becomes a much more difficult and complex task than simply estimating the magnitude of the behavioral response to the liberalization and subsequent retrenchment in these programs.

References

Ashenfelter, Orley, (1983) "Determining Participation in Income-Tested Social Programs," *Journal of the American Statistical Association,* 78, 517–25.

Baily, Martin N., (1987) "Aging and the Ability to Work: Policy Issues and Recent Trends," in Gary Burtless, ed., *Work, Health and Income among the Elderly.* Washington DC: The Brookings Institution.

Berkowitz, Monroe, William G. Johnson, and E. H. Murphy, (1976) *Public Policy toward Disability.* New York: Praeger.

Bound, John, (1989) "The Health and Earnings of Rejected Disability Insurance Applicants," *American Economic Review,* 79, 482–503.

_____, (forthcoming) "Disability Insurance Effects on Denied Claimants: Reply," *American Economic Review.*

_____ and Timothy Waidmann, (1989) "Disability Transfers and the Labor Force Attachment of Older Men: Evidence from the Historical Record," Institute for Research on Poverty, Discussion Paper no. 899-89.

Burkhauser, Richard V., and Robert H. Haveman, (1982) *Disability and Work: The Economics of American Policy.* Baltimore, MD: Johns Hopkins University Press.

Chirikos, Thomas N. (1986) "Accounting For The Historical Rise in Work Disability Prevalence." *Milbank Memorial Fund Quarterly/Health and Society,* 64, 271-301.

Colvez, A., and M. Blanchet, (1981) "Disability Trends in the United States Population, 1966-76: Analysis of Reported Causes," *American Journal of Public Health,* May.

Ehrenberg, Ronald G., (1988) "Workers' Compensation, Wages, and the Risk of Injury," in *New Perspectives in Workers' Compensation,* John F. Burton, Jr. ed. (Ithaca: ILR Press), 71-96.

Feldman, Jacob J., (1983) "Work Ability of the Aged under Conditions of Improving Mortality," *Aging and Work,* 6(3), 197-213.

Fries, J. F., (1980) "Aging, Natural Death, and the Compression of Morbidity," *New England Journal of Medicine,* July 17, 30 3.

Gastwirth, Joseph L., (1972) "On the Decline of Male Labor Force Participation," *Monthly Labor Review,* October, 95, 44-46.

Goldman, Lee and E. Francis Cook, (1984) "The Decline in Ischemic Heart Disease Mortality Rates," *Annals of Internal Medicine,* 101, 825-836.

Haveman, Robert H., and Barbara L. Wolfe, (1984a) "The Decline in Male Labor Force Participation: Comment," *Journal of Political Economy,* June, 92(3), 532-541.

_____, (1984b) "Disability Transfers and Early Retirement: A Causal Relationship?," *Journal of Public Economics,* 22.

Hill, Diane B., (1987) "Employer-Sponsored Long-Term Disability Insurance," *Monthly Labor Review* 110(7), July, 16-22.

Kovar, M.G. and R.A. Wright, (1973) "An Experiment with Alternate Respondent Rules in the National Health Interview Survey," *1973 Social Statistics Section, Proceedings of the American Statistical Association*, 311-316.

Leonard, Jonathan S., (1979) "The Social Security Disability Insurance Program and Labor Force Participation." National Bureau of Economic Research, Working Paper No. 392, August.

—————————, (1985) "Disability System Incentives and Disincentives for the Disabled." Unpublished paper.

McCoy, John L. and Kerry Weems, (1989) "Disabled-Worker Beneficiaries and Disabled SSI Recipients: A Profile of Demographic and Program Characteristics," *Social Security Bulletin*, 52:5, May, 16-28.

Moore, M. E., and B. S. Sanders, (1950) "Extent of Total Disability in the United States," *Social Security Bulletin*, November.

National Center for Health Statistics, (1972) Geraldine A. Gleeson: "Interviewing Methods in the Health Interview Survey," *Vital and Health Statistics*, Series 2, No. 48.

—————————, (1977) Charles S. Wilder: "Limitation of Activity Due to Chronic Conditions, United States, 1974," *Vital and Health Statistics*, Series 10, No. 111.

—————————, (1985) M.G. Kovar and G.S. Poe: "The National Health Interview Survey Design, 1973-84, and Procedures, 1975-83," *Vital and Health Statistics*, Series 1, No. 18.

—————————, (*Various Years*) *Vital Statistics of the United States*, vol 2: *Mortality*, pt. A.

Parsons, Donald O., (1980a) "The Decline of Male Labor Force Participation," *Journal of Political Economy*, February, 88, 117-134.

—————————, (1980b) "Racial Trends in Male Labor Force Participation," *American Economic Review*, December, 70, 911-920 .

—————————, (1982) "The Male Labor Force Participation Decision: Health, Reported Health, and Economic Incentives," *Economica*, February, 49, 81-91.

Poterba, James M., and Lawrence H. Summers, (1987) "Public Policy Implications of Declining Old-age Mortality," in Gary Burtless, ed., *Work, Health and Income Among the Elderly*, Washington: The Brookings Institution.

Shepard, D. and R. Zeckhauser, (1980) "Long-term Effects of Interventions to Improve Survival in Mixed Populations," *Journal of Chronic Diseases*, 33, 413-33.

Slade, Frederic P., (1984) "Older Men: Disability Insurance and the Incentive to Work," *Industrial Relations*, Spring, 23, 260-269.

Swisher, Idella G., (1973) "The Disabled and the Decline in Men's Labor Force Participation," *Monthly Labor Review*, November, 96, 53.

47

U.S. Bureau of the Census, (1971) *The Methods and Materials of Demography,* by Henry S. Shryock, Jacob S. Siegel, and Associates. Washington, D.C.: USGPO.

—————————, (1973) *Census of Population: 1970, SUBJECT REPORTS,* Final Report PC(2)-6C, "Persons With Work Disability."Washington, D.C.: USGPO.

—————————, (*Various Years*) *Current Population Reports, Series P-25,* Nos. 519, 917, and 1022.

Verbrugge, Lois M., (1984) "Longer Life but Worsening Health? Trends in Health and the Mortality of Middle-aged and Older Persons." *Milbank Memorial Fund Quarterly/ Health and Society,* 62, 475-519.

Welch, Finis, (1977) "What Have We Learned from Empirical Studies of Unemployment Insurance?,"*Industrial and Labor Relations Review,* 30, 451-461.

Wilson, R. W., and T. F. Drury, (1981) "Factors Affecting the Use of Limitation of Activity as a Health Status Measure." Manuscript, U.S. Department of Health and Human Services.

—————————, (1984) "Interpreting Trends in Illness and Disability: Health Statistics and Health Status," *Annual Review of Public Health,* 5.

Yelin, Edward, (1986) "The Myth of Malingering: Why Individuals Withdraw from Work in the Presence of Illness," *Milbank Quarterly,* 64(4), 622-649.

—————————, (1989) "Displaced Concern: The Social Context of the Work-disability Problem," *Milbank Quarterly,* 67, Suppl. 2, Pt. 1, 114-165.

Figure 1

Trends in OLF, SD and DI, males 45-64, 1969 to 1989
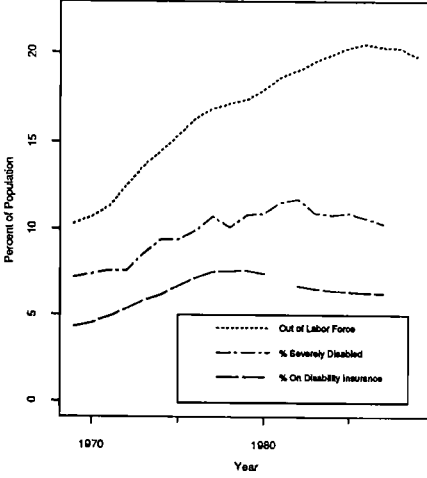
Trends in OLF, SD and DI, males 45-54, 1969 to 1989
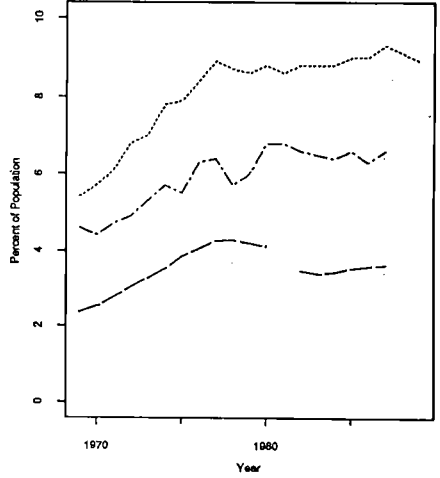
Trends in OLF, SD and DI, males 55-59, 1969 to 1989
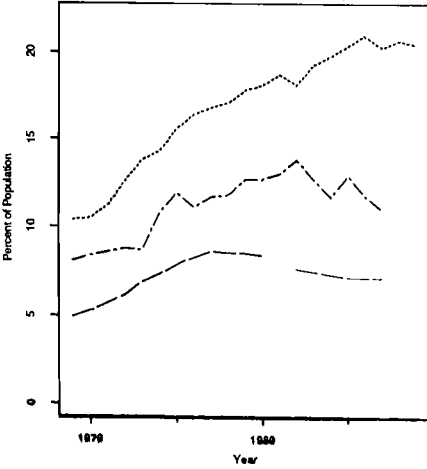
Trends in OLF, SD and DI, males 60-64, 1969 to 1989
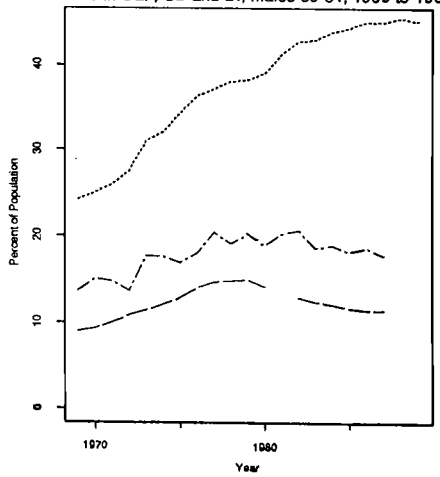
Legend:
- .... Out of Labor Force
- ─·─·─ % Severely Disabled
- ─ ─ ─ % On Disability Insurance

Table 1: Expenditures on Disability Benefits as a % of GNP

	1950	1955	1960	1965	1970	1975	1980	1985
Total Public Expenditures	.87	.83	1.01	1.07	1.19	1.57	1.64	1.50
Selected Programs								
Social Security Disability Insurance	-	-	.11	.22	.30	.53	.57	.46
Public Sector Disability Insurance	.07	.08	.10	.11	.13	.17	.20	.17
Veterans Disability Programs	.58	.49	.49	.43	.39	.35	.32	.27
Workers' Compensation	.13	.13	.15	.15	.16	.20	.27	.32
Aid to the Permanently and Totally Disabled/ Supplemental Security Income*	.02	.05	.06	.07	.11	.20	.19	.20

* Supplemental Security Income replaced Aid to the Permanently and Totally Disabled in 1974.
Source: Security Bulletin, Annual Statistical Supplement, various years

Table 2: Number of Disability Beneficiaries
[As Percent of Persons Aged 16-64]

	1950	1955	1960	1965	1970	1975	1980	1985
Selected Programs								
Social Security Disability Insurance	-	-	.45	.91	1.26	1.89	1.99	1.76
Public Sector Disability Insurance	.14	.20	.24	.30	.36	.40	.50	.50
Veterans Disability Programs	2.47	2.72	2.92	2.94	2.69	2.45	2.23	1.94
Workers' Compensation	-	-	-	-	.54	.60	.72	.76
Aid to the Permanently and Totally Disabled/ Supplemental Security Income*†	.17	.35	.46	.58	.81	1.02	1.04	1.10

* Supplemental Security Income replaced Aid to the Permanently and Totally Disabled in 1974.
† From 1975 on we have excluded beneficiaries who also receive DI benefits.
Source: Security Bulletin, Annual Statistical Supplement, various years, and tabulations based on CPS (see Krueger (1989) for details).

Table 3: Percent of Men in the Labor Force and Percent of Men on Disability Insurance; Selected Ages.

Year	In Labor Force				On Disability Insurance			
	45-54	55-64	55-59	60-64	45-54	55-64	55-59	60-64
1950	95.8	86.9			0.0	0.0		
1955	96.4	87.9			0.0	0.0		
1960	95.7	86.8			0.8	3.5		
1965	95.6	84.6	90.2	78.0	1.8	5.3	4.2	6.7
1970	94.3	83.0	89.5	75.0	2.5	7.1	5.3	9.3
1975	92.1	75.6	84.4	65.7	3.9	10.4	8.0	13.3
1980	91.2	72.1	81.9	61.0	4.2	11.3	8.6	14.1
1985	91.0	68.8	79.6	55.6	4.0	10.5	8.1	13.0

Universe: Civilian non-institutionalized population.

Sources: Employment and Earnings, The Social Security Bulletin Annual Statistical Supplement, various years.

Table 4: NHIS Trends in Disability by Age, 1957-1987.
Percent of Males Unable or Limited in the Ability to
Perform Major Activity

Year	Severely Disabled				Disabled				N
	45-64	45-54	55-59	60-64	45-64	45-54	55-59	60-64	45-64
1957-58	4.2	–	–	–	16.6	–	–	–	–
1959-61	4.4	–	–	–	14.8	–	–	–	–
1961-63	4.4	–	–	–	15.9	–	–	–	–
1965-66	4.4	–	–	–	15.8	–	–	–	–
1967	–	–	–	–	16.5	–	–	–	–
1968	–	–	–	–	17.3	–	–	–	–
1969	7.2	4.6	8.1	13.6	17.6	13.9	18.9	26.3	12,772
1970	7.4	4.4	8.4	15.0	17.0	12.0	19.5	28.5	11,358
1971	7.6	4.7	8.6	14.7	17.5	13.3	19.0	27.6	13,096
1972	7.6	4.9	8.8	13.6	17.8	13.5	20.0	27.0	13,059
1973	8.6	5.3	8.7	17.7	19.0	14.1	20.4	31.3	11,791
1974	9.4	5.7	10.8	17.6	19.9	14.4	23.4	30.4	11,458
1975	9.4	5.5	11.9	16.9	19.1	13.5	23.5	28.6	11,416
1976	9.9	6.3	11.1	18.0	20.0	14.9	22.6	30.4	11,036
1977	10.7	6.4	11.7	20.4	20.1	13.6	23.0	33.2	10,872
1978	10.1	5.7	11.8	19.1	19.7	14.1	22.0	31.2	10,567
1979	10.8	6.0	12.7	20.2	19.9	14.1	22.4	31.0	10,506
1980	10.9	6.8	12.7	18.9	20.2	14.0	23.1	31.9	9,725
1981	11.5	6.8	13.0	20.2	20.5	14.5	23.3	30.9	10,273
1982	11.7	6.6	13.8	20.6	19.5	13.4	22.7	31.0	9,750
1983	10.9	6.5	12.7	18.6	19.2	13.4	21.4	29.2	9,812
1984	10.8	6.4	11.7	18.9	18.4	13.0	19.7	28.3	9,640
1985	10.9	6.6	12.9	18.1	18.3	12.4	21.3	28.0	8,260
1986	10.6	6.3	11.8	18.6	18.2	12.5	20.7	28.0	5,578
1987	10.3	6.6	11.0	17.7	17.0	12.3	18.0	26.6	10,929
$\hat{\sigma}_{1983}$	0.41	0.47	0.84	1.06	0.54	0.67	1.13	1.23	–

Note: "Severely Disabled" refers to those unable to perform major activity while "Disabled" refers to those limited in the ability to perform or unable to perform major activity. Estimated standard errors which take account of complex survey design are reported for 1983.

Source: Data for entire age group 45-64 obtained from tables in NCHS publications. Data for five and ten year age groups from authors' tabulations of NHIS micro-data tapes.

Table 5: NHIS Trends in Disability by Age, 1969 – 1987
Summary OLS Regressions

1969 – 1981	Dependent Variable: % Severely Disabled				Dependent Variable: % Disabled			
	45–64	45–54	55-59	60-64	45–64	45–54	55-59	60-64
Constant	7.4	4.6	8.4	14.5	17.7	13.3	19.7	27.8
(1970)	(.16)	(.14)	(.27)	(.52)	(.25)	(.29)	(.49)	(.64)
$10 \times$ Trend	3.8	2.0	4.5	5.7	2.8	1.0	3.8	4.1
	(.25	(.23)	(.43)	(.83)	(.40)	(.46)	(.79)	(1.02)
$\hat{\sigma}$	.34	.31	.58	1.12	.54	.62	1.07	1.38

1982 – 1987	Dependent Variable: % Severely Disabled				Dependent Variable: % Disabled			
	45–64	45–54	55-59	60-64	45–64	45–54	55-59	60-64
Constant	11.4	6.5	13.4	19.8	19.5	13.5	22.3	30.4
(1982)	(.17)	(.10)	(.46)	(.47)	(.22)	(.14)	(.80)	(.41)
$10 \times$ Trend	-2.2	-0.1	-4.4	-4.4	-4.5	-2.5	-6.9	-7.4
	(.73)	(.46)	(2.64)	(1.37)	(.73)	(.46)	(2.64)	(1.37)
$\hat{\sigma}$	.24	.14	.64	.65	.31	.19	1.11	.57

Note: Data used are based on author's tabulations of the National Health Interview Surveys, 1969 – 1987.

Table 6: **Trends in Prevalence of Selected Chronic Conditions:**
Rates Per 1000 Men, Ages 45-64

Condition	$P_{t_0}^i$	P_{78-81}^i	P_{84-87}^i	Annual Growth	
				t_0 to t_1	t_1 to t_2
Diabetes	38.6	49.5	56.9	1.67	1.23
Mental/Nervous Conditions	7.7	13.2	13.8	0.84	0.10
Heart Conditions	89.9	102.4	111.2	1.66	1.48
Cerebrovascular Disease	11.3	15.2	18.0	0.52	0.46
Hypertension	101.2	205.0	241.8	13.84	6.13
Other Circulatory	19.4	36.2	44.3	2.24	1.35
Emphysema	14.7	34.5	25.3	2.08	-1.52
Arthritis/Rheumatism	140.8	209.6	225.7	6.55	2.69
Other Musculoskeletal	72.8	64.0	70.0	-0.84	1.00

Notes: Before 1978, each survey asks about only one set of conditions: Diabetes and Mental/Nervous Condition questions (1973), Circulatory Conditions (1972), Emphysema (1970), and Musculoskeletal Conditions (1969) Prevalence rates for 1978-81 and 1984-87 are simple averages of single year rates. "Annual Growth" is defined as $\frac{P_b - P_a}{b - a}$.

Source: Authors' tabulations based on the National Health Interview Surveys, 1969-1987.

Table 7: Actual and Predicted Changes (decreases) in Labor Force Participation Rate A Comparison of Methods and Age Groups.

Time Period	Age Group	Actual Decrease	Predicted Decrease	Method	Percent Predicted
1949–1969	45–54	1.0	0.3	[1]	30
	55–64	4.1	1.6	[1]	39
1969–1981	45–54	3.2	2.2	[1]	69
		3.1	2.3	[2]	74
		3.1	2.7	[3]	86
	55–64	12.8	5.8	[1]	45
		13.6	5.5	[2]	41
		13.6	7.1	[3]	52
	55–59	8.3	4.9	[1]	59
		9.2	5.1	[2]	55
		9.2	6.1	[3]	66
	60–64	17.1	6.6	[1]	39
		18.2	5.7	[2]	31
		18.2	8.0	[3]	44
1982–1987	45–54	0.5	0.0	[1]	0
	55–64	2.6	-2.7	[1]	-104
	55–59	2.2	-2.8	[1]	-127
	60–64	2.3	-2.9	[1]	-126
1949–1987	45–54	4.9	2.3	[1]	39
	55–64	19.9	5.3	[1]	27

Note: Method [1] uses BLS estimates of labor force participation and "Predicted Change" equals the increase in percent severely disabled. Method [2] uses NHIS estimates and predicts the change as $\sum_j (w_j^{81} - w_j^{69}) LFP_j^{69} + (\Delta LFP_{sd}) w_{sd}^{69}$. Method [3] also uses NHIS estimates of labor force participation and "Predicted Change" equals $LFP^{81} - LFP^{69} - (\Delta LFP_{nd}) w_{nd}^{69}$.. For the period 1949-87 we use BLS estimates of labor force participation and "Predicted Change" is the sum of the predicted change (method [1]) estimates from 49-69 and 69-87.

Table 8: Percent of those alive in 1970, 1980, 1985 who would have been dead had they experienced the mortality rates of cohort born 10, 10, 5 years earlier. (total, and by selected causes)

| | 1960–1970 | | | 1970–1980 | | | 1980–1985 | | |
	45–54	55–59	60–64	45–54	55–59	60–64	45–54	55–59	60–64
All Causes	0.069	0.357	0.457	0.658	1.824	2.539	0.358	0.593	0.955
Infective Diseases	0.072	0.299	0.360	0.021	0.076	0.117	-0.004	-0.006	-0.012
Neoplasms	-0.045	-0.193	-0.320	-0.028	-0.069	-0.212	-0.036	-0.026	-0.026
Endocrine Diseases	-0.003	0.003	0.016	0.017	0.050	0.084	-0.003	0.002	0.006
Blood-related Diseases	0.001	0.001	0.002	0.001	0.004	0.007	0.000	-0.001	-0.001
Mental Disorders	-0.008	-0.013	-0.020	-0.009	-0.031	-0.039	0.004	0.005	0.006
Nervous System	0.129	0.396	0.723	0.104	0.448	0.767	0.001	-0.002	-0.006
Circulatory System	-0.003	0.004	-0.050	0.371	0.957	1.312	0.192	0.446	0.742
Respiratory System	-0.022	-0.102	-0.237	0.055	0.122	0.146	0.016	0.028	0.048
Digestive System	-0.027	-0.055	-0.067	0.020	0.038	0.071	0.049	0.059	0.073
Genitourinary System	0.024	0.079	0.120	0.026	0.078	0.106	0.004	0.005	0.007
Skin	0.001	-0.001	-0.002	0.001	0.005	0.006	0.000	0.000	-0.000
Musculoskeletal System	-0.001	-0.005	-0.004	0.001	0.004	0.001	0.001	0.002	0.004
Congenital Anomalies	-0.000	-0.000	-0.003	0.005	0.010	0.008	0.001	0.001	0.000
Infant Death	-0.000	-0.000	-0.000	0.000	-0.000	-0.000	-0.000	-0.000	0.000
Symptoms/Ill-Defined	-0.015	-0.035	-0.057	0.007	0.010	0.012	0.012	0.023	0.030
Accidents	-0.033	-0.020	-0.007	0.067	0.132	0.172	0.051	0.060	0.085

Note: Rows correspond to major headings in Vol. II, pt. A of Vital Statistics of the US. While the classifications were revised in 1965 and 1975, the major classifications were unchanged.
Source: Authors' tabulations based on Vital Statistics of the United States.