Secular Trends in the Determinants of Disability Benefits

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A major justification for devoting resources to the study of public health is the potential to answer questions about the burden of poor health, both in terms of the total burden faced by individuals and the burden placed upon publicly funded social insurance programs. Indeed, the adequate provision of social insurance programs is one of the key policy issues of our day. A potentially fruitful approach in undertaking this effort is to investigate the effects of specific chronic diseases and injuries upon program participation and benefit levels. Ideally, we would like to know something about the total economic costs of individual diseases using theoretically sound willingness-to-pay measures. In practice, however, willingness-to-pay measures cannot be estimated with most available health data.

Though this paper cannot pin down anything as ambitious as the total economic burden of disease, it does address the narrower but still important question of what is the burden of chronic illness upon Social Security Disability Insurance (SSDI) payments, and it documents how that burden has shifted between different disease groups over the past century. Furthermore, it addresses, at least to a limited extent, the profound intellectual question of what determines disability and how biomedical, economic, social, and institutional factors determine whether an individual will be disabled.

In this paper we begin an exploration of newly collected data on the health conditions and disability benefits of Union Army Veterans[1] and make comparisons to recipients of disability benefits in more recent times. We find two main results. The first is that there has been a significant shift in the types of diseases that lead to disability, both in terms of prevalence rates and benefit levels. The second is more surprising: the disabled in modern times generally have a greater number of chronic illnesses than did disabled Union Army veterans, even those who were severely disabled. This result implies a way of thinking about disease and disability that deserves more research attention. In short, prior to the advent of modern medicine and the concurrent reductions in the physical demands of work, people became disabled not because they had *numerous* chronic illnesses (i.e., high rates of co-morbidity), but because individual conditions (even ones as simple as hernias or hemorrhoids) had much more severely debilitating effects on health and upon the capacity to work than those same conditions do today.

I. Data

Data for this study come from two major sources. The first data source includes extensive individual-level data relating to military service, health, occupation, residence, and a host of other socioeconomic variables across the lifespan of sample Union Army veterans of the U.S. Civil War. When the collection is complete it will contain a longitudinal, random sample consisting of several thousand variables on approximately 36,000 individuals that were mustered into the Union Army during the Civil War (referred to here as the UA sample). This sample has been shown to be representative of the white, male, Northern population in the late 19th century.[2]

The second major data source is the New Beneficiary Survey (NBS). In 1982, the Social Security Administration surveyed

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[1] Data come from "Early Indicators of Later Work Levels, Disease, and Death" (Robert W. Fogel and Larry T. Wimmer, 1992). All data used here are being prepared for deposit at the Inter-university Consortium for Political and Social Research (ICPSR), Ann Arbor, MI.

[2] For evidence, see Fogel (1993).

individuals who had recently begun receiving benefits. The NBS is valuable because it contains extensive information on both income sources and amounts (including SSDI) and data on specific chronic diseases and impairments.

Making comparisons between these two data sources is extremely challenging for a number of reasons. First the state of medical knowledge is much different between the two time periods. Second, medical data in the UA sample come from physical exams, while the NBS health data is self-reported. Third, the eligibility requirements for the Union Army pension and SSDI were much different, as was the determination of benefits. Disability benefits in the UA data were determined by severity, while under SSDI they are determined primarily by Social Security earnings history. Finally, because we are talking about people living a century apart, many other differences exist between the populations that can never be completely controlled for. This is the same challenge that has always existed in using historical data to make comparisons to modern populations.

In order to make the data as comparable as possible, several restrictions were made in including observations for analysis. Both samples are restricted to "new beneficiaries" of disability benefits. In the NBS, all individuals are new recipients of SSDI, while in the UA sample, we restrict analysis to those who were first pensioned in 1891–1892. This period was chosen because it follows the liberalization of the pension laws in 1890 which allowed, for the first time, disability benefits to be awarded for conditions not related to wartime experience. Both samples were also restricted to males aged 45–59. The final NBS subsample includes 1,569 individuals, while the UA subsample contains 1,410 individuals mustered into the Union Army in 15 different states and the District of Columbia.

The bulk of the health information in the UA sample comes from records of the Pension Bureau, referred to as "Surgeons' Certificates." After applying for disability benefits, the claimant was required to submit to a detailed physical examination by a government-appointed board of three physicians. These exams were very thorough and included an investigation of the particular disabilities claimed by the veteran. The examining physicians noted physical-exam findings and recommendations for pension benefits on the certificate. Previous studies using the UA data on health were from a small pilot sample in which the Surgeons' Certificates were collected in a very crude fashion. The data used here, in contrast, contain roughly two-thirds of the final sample size, and the collection process of the medical data has been dramatically improved.

Data from the Surgeons' Certificates are organized into major disease categories that reflect the categorization typically given by the examining physicians. Each of these categories is given a "rating," which corresponds to the dollar amount for the categories. For example, if the claimant was found to have heart disease and "rheumatism," the dollar amount awarded was divided between these two conditions according to their respective severity. Some of the disease categories correspond obviously to major body systems (cardiovascular, respiratory, genitourinary, etc.). Other categories are narrower, but they were important in terms of the disability rating system. For instance, there are categories for chronic diarrhea, varicose veins, and hernias because the examining physicians would frequently give dollar ratings attributed to these individual conditions. The disability rating is used as the fundamental criterion of whether disease exists within a given category. There are, of course, extensive additional data collected from the certificates that can be used to determine the presence of disease. It should be noted that this is a difficult and subjective process using currently nonstandardized values. Further explorations into making differentiated diagnoses may alter somewhat the results given here.[3]

[3] Because of space restrictions, a detailed discussion of how determinations of disease are made is not possible. An appendix outlining the methodology used in making these determinations, as well as more detail on disease categories in both the Union Army sample and the New Beneficiary Survey, is available from the authors upon request.

TABLE 1—NEW BENEFICIARIES OF SSDI (1982) AND NEW BENEFICIARIES OF THE UNION ARMY PENSION (1891–1892)

Disease category	SSDI recipients (percentage)	Union Army veterans by disability status (percentage)		
		Mild	Moderate	Severe
Cardiovascular	70.5	25.2	40.3	48.3
Arthritis	60.7	64.9	65.9	68.0
Injury	50.9	24.4	28.8	32.0
Mental/ emotional	38.1	2.0	3.3	4.4
Gastrointestinal	37.4	44.1	56.1	61.6
Eye	37.2	13.0	15.3	20.7
Respiratory	30.4	19.1	18.4	31.3
Ear	20.9	4.5	7.2	25.2
Central nervous system	19.6	8.0	10.3	16.3
Cancer	6.8	0.5	1.1	2.0
Other	NA	11.3	18.4	22.1
N:	1,569	644	472	294

Notes: Both samples include males aged 45–59. The SSDI sample has been reweighted to match the age distribution of the Union Army Veterans' sample. Information on disease classification is provided in a methodological appendix available from the authors upon request. See text for discussion of disability status.

II. Comparing the Health of the Disabled Across Time

While we do not make a direct comparison between the overall rates of disability-program participation between the two time periods, it is clear that the program participation rate was much higher for the Union Army pension than for SSDI. While the exact rate of participation among veterans is not known, the UA sample indicates that by 1890, between 26 percent and 47 percent (depending on mortality assumptions) of veterans had already enrolled in the program. In contrast, roughly 3 percent of the working-age population receives SSDI.

What we are able to calculate here is the proportion of individuals in each sample who have specific chronic conditions. Table 1 makes this comparison using a slight reclassification of the disease categories in each sample.[4] The first column shows the percentage of sample respondents in the NBS who report specific chronic conditions.[5] The remaining columns give the prevalence rates for the Union Army veterans according to the overall disability status of the veterans. The designations of mild, moderate, and severe are somewhat arbitrary, but natural breaking points occur given the nature of the Union Army pension system during this time period. "Severe" disability occurs if the examining physicians recommend a pension of at least $18 per month (which is a "total 3rd grade" pension and is considered equivalent to the loss of a hand or foot). "Moderate" disability is given to those who are recommended to receive $12–17 per month ($12 is the maximum allowable under the 1890 law). "Mild" disability is any recommended amount less than $12 per month.

Given that the Union Army program had much higher rates of participation, it is not surprising that, overall, the disease prevalence rates are higher for the NBS sample. However, even when we restrict the UA sample to those who are severely disabled (21 percent of the sample), we find that the prevalence rates in the NBS are either roughly the same (within 5 percentage points) or higher than the UA rates. The only exception to this is the dramatically higher rate of gastrointestinal disease (hernias, chronic diarrhea, hemorrhoids, diseases of the liver, to name a few) among the UA individuals. The UA sample has somewhat higher rates for arthritis, for respiratory disease, and for diseases of the ear, but the SSDI sample is substantially higher for the disease categories of cardiovascular, injury, mental/emotional, and eye disease. Diseases of the central nervous system and cancer are also modestly higher in the NBS sample.

Issues of sample comparability should lead us to approach these results cautiously, because there are many potential sample biases. One reason the NBS rates may be higher is that these individuals are recent recipients of SSDI, and they may feel an

[4] This reclassification is also discussed in the methodological appendix (see footnote 3).

[5] The reported numbers for the SSDI sample have been reweighted to match the age distribution of the Union Army Veteran Sample, though this reweighting has very small effects on the reported results.

incentive to overreport their health conditions given that they have recently been classified as disabled. However, the general scholarly consensus on self-reported health data is that most conditions are underreported, if for no other reason than that they have not been revealed by a physical exam, thereby mitigating the effect of the overreporting. An additional potential bias is that the UA sample may contain many individuals who would have previously been classified as disabled but were not eligible until the change in the law in 1890, whereas the NBS sample includes only those recently disabled. However, since there was little that could be done for these people in terms of medical treatment, the UA sample rates are probably higher than they would be if the sample were to consist solely of the newly disabled, as the NBS does. This bias tends to reinforce, not weaken, our results.

Probably the biggest reason to regard this result as tentative involves differences in diagnostic techniques between the two periods. One advantage of a disease-specific approach is that we can point to particular conditions where this effect should be most pronounced. Cancer is an obvious example, given that most cancers were undetectable and untreatable in the 19th century. Another case is mental/emotional illness. It is also plausible that applying advanced diagnostic techniques in the case of cardiovascular disease would lead us to increase the UA estimate in that category, particularly since hypertension was not understood in the 1890's but is a common diagnosis today.

It is important to note at this point that higher rates of chronic illness among recipients of disability benefits do not imply that the UA individuals were not as sick as modern populations. There are compelling reasons to believe that the physical disabilities of individuals in the 1890's were, on average, much greater than today, even when holding constant the level of chronic disease and injury. For instance, lack of medical treatment caused many conditions that are effectively treated today (such as hernias or varicose veins) to be highly debilitating. This is especially true in light of the fact that the physical demands of the workplace have fallen significantly.

TABLE 2—RELATIVE CONTRIBUTION OF INDIVIDUAL DISEASE CATEGORIES TO DISABILITY BENEFIT LEVELS (PERCENTAGES)

Disease category	Union Army veterans (1891–1892)	SSDI recipients (1982)
Gastrointestinal	25.4	9.3
Arthritis	23.3	15.9
Cardiovascular	12.4	23.3
Injury	10.0	13.9
Respiratory	8.3	8.2
Other	6.0	0.0
Eye	5.8	8.6
Ear	5.1	4.5
Central nervous system	2.8	4.9
Mental/psychological	0.6	9.3
Cancer	0.4	2.2
N:	1,410	1,569

Notes: Both samples include males aged 45–59. The SSDI sample is reweighted to match the age distribution of the Union Army sample. Disease reclassifications are discussed in a methodological appendix available from the authors upon request.

A final comparison between the two periods concerns not the prevalence of conditions among the disabled, but the relative contributions that chronic conditions make to the monetary value of disability benefits. In the Union Army sample, dollar amounts were specifically attributed to different conditions, but in the NBS, only crude estimates of relative burden can be made. This task is undertaken here by dividing the total monthly benefit equally across the conditions reported by the respondent. Thus if the total benefit is $600 and the respondent reports having a respiratory condition and arthritis, then the $300 is attributed to each condition.

The relative budgetary burdens of the different conditions are classified in Table 2 (the observations from the NBS sample have been reweighted to reflect the age distribution in the Union Army sample). Though similarities exist, there is a noticeable shift in the distribution of disease burden. Gastrointestinal disease (which includes mostly conditions that are easily correctable today) and arthritis together account for close to half the burden of disease of new beneficiaries in the 1891–1892 period, but just over 25 percent in the modern period. Much of the difference has been made up in

terms of cardiovascular disease and mental/emotional conditions. These shifts, though tentative given the nature of the data, are consistent with the medical, economic, social, and institutional factors that have occurred over the last century.

III. Future Directions

The economic burden of disease is represented, in part, by the payment of disability benefits. Thus, the relative burden of different chronic health conditions is an important variable that affects policy choices such as the allocation of medical research funds or the provision of disability insurance. The lesson of this research is that accurate forecasts of disease prevalence rates are not sufficient for making disability policy.[6] We must understand, as well, the variety of continually changing factors that cause a particular condition to be debilitating and whether or not that debilitation leads to participation in available disability programs.

[6] The link between specific chronic disease and disability is missing, for instance, in the recent finding by Kenneth G. Manton et al. (1997) that chronic disability rates among the U.S. elderly (age 65+) fell between the years of 1982 and 1994. Though there is mounting evidence, such as that in Timothy Waidmann et al. (1995), that rates of chronic illness are falling as well, little is known about how changes in the relationship between disease and disability may have affected the disability trends.

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