Disparities in Trends in Old-Age Disability:
1982 to 2001

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A consensus has emerged that disability prevalence rates have declined among older Americans (Freedman, et al, 2002; Schoeni et al. 2001). If such declines continue, their effect on the nation's health and economic well-being could be incredibly far-reaching, with potentially more older Americans able to work longer and relatively fewer needing medical and long-term care (Cutler 2001a, 2001b; Lubitz et al. 2001; Singer & Manton 1998). Our proposed study provides new evidence on trends in disability among older persons from 1982 to 2001 with a focus on identifying socioeconomic and demographic groups that have and have not experienced improvements. We will use the 1982-2001 National Health Interview Surveys (NHIS) to estimate the prevalence of disability and test for disparities in trends. The expanded content of the NHIS from 1997 to 2001 will also be used to examine a broader set of disability measures and socioeconomic factors than have been previously analyzed.

INTRODUCTION

Over the past decade, a consensus has emerged that disability prevalence rates have declined among older Americans (Freedman et al, 2002;Schoeni et al. 2001). Several studies suggest that the prevalence of severe cognitive functioning also may be falling among the elderly (Freedman et al. 2001; Liao et al. 2000; Manton et al. 1998). If such declines continue into the future, their effect on the nation's health and economic well-being could be incredibly far-reaching, with potentially more older Americans able to work longer and relatively fewer needing medical and long-term care (Cutler 2001a, 2001b; Lubitz et al. 2001; Singer & Manton 1998).

The consequences of recent trends in late-life health remain open to debate in part because the direction of future trends remains illusive. On the one hand, Americans entering late life over the next several decades will have more education (Freedman & Martin 1999), an indicator of socioeconomic status that has been repeatedly linked to better functioning. Yet, analyses suggest future increases in educational attainment will be much smaller than in the recent past. At the same time, newer cohorts of elderly are projected to be more racially and ethnically diverse (U.S. Bureau of the Census 1996) and have higher prevalences of obesity, diabetes, and other risk factors linked to late-life disability (Reynolds et al. 1998). Certainly, continued tracking of late-life health trends, broadly defined, is crucial for understanding the ramifications of America's aging population for social and health policies and programs.

Whether these improvements have been experienced widely is also still unclear. Although demographic and socioeconomic disparities in late-life health have been widely documented (for a review see Preston & Taubman 1994), few studies have included information on disparities in trends by major demographic and socioeconomic groups (Freedman & Martin 2000; Freedman & Aykan 2001b; Freedman et al. 2001; Manton & Gu 2001; Schoeni et al. 2001). Most analysis of disparities has been cursory and rarely have formal statistical tests been included. Hence, the critical questions of which groups are benefiting most and which are being left behind remain unanswered. Moreover, because future changes in the demographic and socioeconomic composition of the population are expected to be quite dramatic over the next few decades, an understanding of disparities in trends is critical to predicting the future course of the health of America's older population.

The goal of this paper is to update and expand our understanding of trends in late-life disability. Drawing upon new data from the National Health Interview Survey (NHIS), we will:

- Update trends in late-life health into the 21st century using measures that have been previously examined.

- Analyze trends in additional dimensions of disability that were added to the NHIS instrument in 1997.

- Investigate the extent of disparities in disability trends by race/ethnicity, sex, marital status, age, and socioeconomic status. By answering whether the gaps in prevalence are narrowing or widening, we will provide better insight into future directions in overall trends.

DATA AND METHODS
Data
   The NHIS is a repeated cross-sectional survey of the non-institutionalized population in the United States. Conducted annually by the National Center for Health Statistics, the NHIS includes a sample of roughly 8,000 adults 70 and older in each year. These large samples allow relatively precise

estimates of disability among elderly persons for each year, including estimates for some major subgroups. The sampling plan follows a multistage area probability design that permits the representative sampling of households. Although not everyone within a sampled household is interviewed, information is collected on all household members by using proxy respondents. The survey design changed in 1997, with additional information collected on one "sample adult."

Beginning in 1982, disability among people 70 and older (71 and older in 1982) is measured by two questions. The first question asks about ADL-type limitations: "Because of any impairment or health problem, does ___ need help of other persons with personal care needs, such as eating, bathing, dressing, or getting around this home?" Those who answered no to this question were then asked about IADL-type limitations: "Because of any impairment or health problem, does ___ need help of other persons in handling routine needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?" The questions in 1997 are slightly different. Initial analyses find that estimates of prevalence in 1996 and 1997 are very similar, suggesting that the modification did not have a substantive effect on disability assessment. However, the changes in 1997 included an expanded set of questions on disability including: a) need for personal care assistance with of the following: bathing, dressing, eating, transferring, toileting, and inside mobility, and b) functional limitations (i.e., how much difficulty do you have: sitting, stooping, reaching, grasping, lifting, pushing; how much difficulty do you have: walking ¼ mi, climbing stairs, standing; difficulty with mobility without aids).

For the goal of examining trends in disability, the NHIS has several advantages over other data sets. Perhaps most importantly, it is an annual survey administered over a large number of years. The other national data sets that have been used to examine trends have many fewer data points. In addition, the NHIS has large, nationally representative samples, a consistently measured indicator of disability, and it is widely used and well documented. Because the NHIS is not a longitudinal survey, there is no loss to follow up or learning effects (i.e., respondents in subsequent waves of a longitudinal survey begin to answer "no" because they realize the interview will be shorter if they report not needing help) which may bias estimates of disability prevalence.

The most important limitation of the NHIS is its restriction to the non-institutionalized population. Following Schoeni, Freedman, and Wallace (2001), we will investigate the effects of this limitation by estimating the number of people disabled and not disabled in the institutional population using the National Nursing Home Surveys (NNHS). For the years the NNHS was administrated, we can combine the NHIS and the NNHS information to obtain estimates of disability prevalence that include the nursing home population. We can further use estimates of the number of people in assisted living facilities (not nursing homes) to bound the prevalence estimate for all elderly persons regardless of their living situation.

Methods

Using tabular and graphic techniques, we will first describe trends in the prevalence of late-life disability. To simplify presentation we will focus on dichotomous indicators, although some outcomes will have more than 2 categories (e.g., 0, 1-2, 3+ IADLs/ADLs; 0, 1-2, 3+ functional limitations). To test for trends in prevalence we will model each dichotomous outcome as a function of year dummies, using logistic regression for the dichotomous outcomes. For the 3-category outcomes we will explore multinomial logistic regression, and also the possibility of using ordinary least squares or censored regression (Tobit) models on the underlying continuous variable. Here we describe the basic approach for the dichotomous outcomes, but the method is generalizable to these other multi-category and continuous variables as well. In the case of the dichotomous outcome, a logistic model is estimated where the only explanatory factors are variables representing the year that the health outcome was measured.

$$Y_{it} = \alpha + \beta_{year} Year_t + \varepsilon_{it} \qquad [1]$$

The most distant year would serve as the reference category. Therefore, β_{year} is a vector representing the difference in health outcomes in the given year relative to the omitted reference year. In addition to testing whether each coefficient is statistically significantly different from 0, we will test whether each individual year is different from every other year. We will examine alternative, more restrictive functional forms, such as linear or quadratic representations, to determine whether the patterns can be represented with fewer parameters. We will test all trend terms jointly using nested log likelihood tests. We will also consider whether prevalence trends are an artifact of shifts in the age composition of the older population. As in Freedman and Martin (1998), in the tables and graphs we will stratify analyses by broad age groups. And in models, we will add age as a series of categorical variables; if the year coefficient(s) are no longer significant, then the trend is simply an artifact of age shifts in the population.

We will investigate disparities in prevalence trends across a variety of socioeconomic and demographic factors: race/ethnicity, income, poverty, marital status, age, and sex. We will first stratify our prevalence estimates by these variables. We will then enter individually each of the variables, X, into the logistic regression model, along with age and year. We will test whether the year coefficients differ for each group of interest interacting the year parameter(s) (using a parsimonious specification identified in Aim I) and X as shown in [2]:

$$Y_{it} = \alpha + \beta_{year}Year_t + \beta_{age}Age_{it} + \beta_x X_{it} + \beta_{year,x}Year_t * X_{it} + \varepsilon_{it} \qquad [2]$$

and conducting standard log likelihood ratio tests.

SUMMARY OF RESEACH AND POTENTIAL IMPLICATIONS
People who are disabled have higher medical expenditures, are less able to maintain employment, and have lower quality of life. Therefore, it is important to continue to monitor trends in disability at the population level, which is one of the central objectives of the proposed study. Moreover, given the growing concerns over disparities in health, we will determine whether the gains that have been achieved are being experienced among all socioeconomic and demographic groups, or whether it is only selected groups that have benefited. With these basic facts in hand, we can then begin to investigate potential causes for the changes, which is the next step in the research agenda.

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