We evaluate whether trends in the prevalence of disability among the aged can be investigated using the 1980 U.S. Census' public transportation question and the 1990 query on mobility limitation. Despite the obvious difference in the two questions, we found remarkable similarity in major cross-sectional patterns, such as those by age and sex, when comparing results from the two data sets. This result, coupled with the large number of observations available in the U.S. censuses, suggests that census data may be a suitable data source to study mobility limitation patterns in the small subgroups of the population that are frequently underrepresented in sample surveys.

Key Words: Disability, Functional status, Data quality, Public transportation, United States

Can Data From the Decennial Census Measure Trends in Mobility Limitation Among the Aged? 1

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As is well known, the aging of the American population has important implications for health and social services. Members of the rapidly growing elderly population are not only at increased risk of institutionalization (Feller, 1983), but they also consume a disproportionate share of costly health care and social services. There is no doubt that the numbers of elderly disabled persons have certainly been increasing, if only as a function of sheer population growth and population aging. The documented high correlation between advancing age and increased functional disability (Leon & Lair, 1990; Logue, 1987) suggest that these increases are likely to continue.

Reliable estimation of the prevalence of long-term disability is therefore essential, because society can expect both heightened demand for health and social services for the aged, and a greater impact on government and private budgets. The amount of time individuals live with a disability may have dramatic impact on their economic resources, particularly when institutionalization is required. Further, it may have severe financial implications for informal caretakers who maintain persons with disabilities in the community. The need for data measuring the growth of the disabled elderly population and charting its sociodemographic characteristics has been apparent to observers who wish to target prevention, intervention, or social service programs to particular subpopulations (Manton, 1989). In particular, a lack of subnational data has hindered planning efforts that focus on the needs of state and local areas (LaFata, Koch, & Weisssert, 1994).

Researchers desiring data on the functionally impaired elderly, even at the national level, have been constrained by considerable obstacles. A first issue has been defining the “disabled” population. Davis and Rowland (1986) observe that there is no single generally accepted measure of health status. Definitions of disability and the degree reported have varied extensively among studies conducted in recent decades.

Research on the prevalence of functional disabilities and characteristics of the disabled in the United States has generally been based on relatively small samples (usually limited to the noninstitutionalized aged) that do not permit highly detailed baseline estimates of a multitude of characteristics. For the first time this century, a question that addressed functional disability in the aged population was included in the 1980 decennial population census. The query asked about health conditions (of 6 months or more duration) that limit or prevent using public transportation. To health care researchers, this question represented only a very limited part of the illness experience of the disabled, but it did suggest “where

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supportive services might be directed to counter some of the effects of illness” (Giachello, Bell, Aday, & Anderson, 1983). Not surprisingly, only scant use of the data on public transportation disability status resulted, and the item was dropped from the census questionnaire. In its stead a new set of two queries which addressed the individual’s ability to perform activities of daily living was introduced in 1990:

Because of a health condition that has lasted for six or more months, does this person have any difficulty —
(a) Going outside the home alone, for example, to shop or visit a doctor’s office? Yes/No
(b) Taking care of his/her own personal needs, such as bathing, dressing, or getting around inside the home? Yes/No

The first question has been termed the mobility limitation query; in this study we explored its comparability to the 1980 Census public transportation disability item. The second question has been termed the self-care limitation query and, while of interest, will not be further examined here.

The apparent lack of comparability of decennial census items on the health of the aged meant that, despite the vast sums expended on the decennial enumerations, no light was shed on the trends in disability prevalence among the elderly. This is particularly unfortunate, because, as has been pointed out by Crimmins and Ingegneri (1989), researchers disagree on the direction of change in the health status of Americans in the recent past. Colvez and Blanchet (1981) concluded that their data showed a rise in the prevalence of disability. Verbrugge (1984) also reported an increase in the prevalence of acute and chronic conditions. Manton, Corder, and Stallard (1983), however, noted a significant decline in the prevalence of chronic disability among Medicare enrollees between 1984 and 1989. On the basis of the available literature, then, physical disabilities may be increasing or decreasing (Robine & Ritchie, 1993).

Crimmins et al. (1989, 1994) point out that one major problem inducing skepticism about reported trends is the weaknesses inherent in the available data. Much of the research findings are based on data from the National Health Interview Survey on activity-limiting conditions; yet comparability over time is dubious. Chapman, LaPlante, and Wilensky (1986), acknowledging that we cannot determine past trends, point out the importance of a constant benchmark for measuring disability in the future and urge that the 1990 Census queries be maintained so that the pattern in the 1990s and beyond can be definitively established. This surely is the hope of many health analysts who, while appreciative of the improved query on disability in the 1990 Census, regret the loss of comparability with the 1980 item. Yet, despite the rewording of the 1980 question, from one querying public transportation disability to one querying mobility limitation, some basic comparisons of the tabulations of the two censuses reveal some striking similarities. For this reason, we find such comparisons worthy of more detailed examination. Although mobility limitations do not encompass all poor physical and mental functioning, mobility is of such critical importance to older people in preserving independence and high quality of life that it has often been selected by researchers as the single measure of overall functioning (Guralnik et al., 1993; Parker, Thorslund, & Lundberg, 1994).

Published 1980 Census data indicate that there were 3.6 million noninstitutionalized persons 65 years of age and over with a public transportation disability among 24.2 million such persons. The 1990 Census indicated that the number of elderly noninstitutionalized persons who had a mobility limitation was 4.6 million, among a total of 29.6 million persons (U.S. Bureau of the Census, 1983a, 1993). These aggregate tallies indicate that 14.9% of the noninstitutionalized elderly were classified with a public transportation disability, whereas a slightly higher share — 15.6% — were reported to have a mobility limitation according to the 1990 Census.

Should health researchers and public policymakers even try to compare the 1980 and 1990 census data on mobility limitation, given the obvious difference in the two questions? One reason for study of the two sets of data is, acknowledging that no measure to date can be considered as the “gold standard” (Manton et al., 1993), the enormous size of the population samples involved. This great size means that data can be examined for states, metropolitan areas, and many local areas. Further very detailed comparisons can be made by a variety of sociodemographic characteristics.

The published census statistics on disability give few cross-classifications. Therefore, to analyze the characteristics of the population with disabilities, we derive some of the data for this report from the Public Use Samples, which are based on 5% samples of the national population in 1980 and 1990 (U.S. Bureau of the Census, 1983b, 1992). Using the appropriate weights in conjunction with the 5% sample for 1990, we derive an estimate for the noninstitutionalized population 65 years and over with a mobility limitation of 4,698,000 persons. It may be of interest to indicate that this represents more than three-fourths of the total noninstitutionalized elderly population the census counted as having either type of disability — a mobility limitation or self-care limitation (6,060,000 persons). Because most studies of disability limitations have focused on the noninstitutionalized population, we also describe this universe. However, in considering the prevalence of disability, it needs to be remembered that census data also can include the institutionalized population. The extent to which persons with disabilities are likely to be institutionalized needs to be kept in mind.

Numerous studies have found that the prevalence of disability increases markedly with age (Leon & Lair, 1990; Logue, 1987; Parker et al., 1994). One reason is that the older the person, the less likely that he or she can recover from a physical setback. Although the disabling effects of morbid health conditions are related not only to age but also to various other social, psychological, and demographic factors, it is age that is most significantly associated with disability.

Table 1 shows the percentage of the total aged...
population within five-year age groups defined as having a mobility limitation according to 1990 Census criteria: in addition, the corresponding percentages are given for the population according to the 1980 Census definition. As expected, the prevalence of a mobility limitation among the elderly dramatically increases with advanced age. The proportion with a census-defined mobility limitation was only 8% at ages 65–69 years, but twice as high (17%) at ages 75–79 years and more than three times as high (27%) at ages 80–84. Above age 90, more than 50% of persons were reported as disabled (according to both the 1980 and 1990 definitions).

The data in Table 1 reveal remarkable similarity in the percentages reported with mobility limitation in 1990 or public transportation disability in 1980 when disaggregated into age-sex groups. Among males, for example, although there appears to be a relative increase in limitation between 1980 and 1990 of 6%, the change is largely due to the upward shifting in the age composition of the population. Thus, in only one single age group (the very small group 90 years and over) was the proportion reporting disabilities in excess of 10% above the comparable proportion in 1980. In age groups from 65 to 79 years the percentages with limitations in 1990 actually were lower than in 1980. Similarly, among women, most of the apparent rise of 8% in the proportion disabled in 1990 compared with the like proportion in 1980 also was due to the greater weight over time given to the oldest old population. No age group under 85 years showed more than a 3% difference between 1980 and 1990 in the percentage disabled. For females, as for males, the largest change by far (15%) occurred in the oldest age group, those 90 years of age and older.

There is some reason to believe that the relatively large increase in the percent reporting a disability in the oldest age category may be at least in part artifactual. This occurs because a considerable proportion of those reported at the very oldest ages in 1980 were individuals who were enumerated with an unknown age and were therefore assigned an age by the Census Bureau through allocation procedures. Careful review of some of the enumeration records for these individuals has indicated that many actually were in much younger age categories (Spencer, Goldstein, & Tauber, 1987). Thus it is likely that the age group 90 and over in 1980 was to some extent weighted with persons who were actually substantially younger, and therefore not likely to report a mobility limitation. The percentage calculated for 1990 may be more nearly correct.

The data in Table 1 also show that at every age females among the noninstitutionalized population had higher disability rates than males. The differences were similar in 1980 and 1990: At both censuses in most five-year age groups the percentage of women who reported a disability was about 1.3 or 1.4 times the percentage of men who indicated having a disability. Among all institutionalized males 65 years and over, about 12% in 1980 and 1990 were enumerated as having a public transportation disability or a mobility limitation. Among females, the proportion was 17.2% in 1980 and 18.5% in 1990. As noted above, some of the reason for the slightly higher level observed in 1990 may have been the somewhat older age distribution of the elderly population in 1990 compared with 1980.

A number of researchers have commented on an apparent paradox: disability rates for elderly women are higher than those for elderly men, yet mortality rates for men are substantially greater at every age. The explanation seems to be that the diseases that commonly afflict older men (e.g., heart disease) predominate as causes of death, whereas those that commonly afflict older women (e.g., arthritis, osteoporosis) predominate as causes of illness (Siegel & Taueber, 1986; Verbrugge, 1983). Although prevalence estimates of functional limitations show greater disability for females than males, a longitudinal study of an elderly population found that the risks of becoming disabled are roughly the same for both groups. This suggests that prevalence differences between men and women are due to the greater survival of females at any given level of age and functional impairment (Manton, 1988).

Discussion

Despite the fact that the wording of the census question on mobility limitation was very much altered between censuses and that the elderly of 1980 to a large extent were not the elderly of 1990, a
remarkable correspondence in the age-sex specific proportions reporting a disability emerged when comparing results from the two data sets. We can only speculate on the meaning of this correspondence. One reasonable assumption might be that although the wording of the census query changed, its interpretation by respondents remained about the same. If this assumption were valid, then it would follow that relatively little change in the proportion with a disability occurred during the 1980s. Of course, this is a very big "if."

It is worth noting that the most thorough evaluation of the 1980 Census public transportation disability query concluded that the item was "indeed interpreted as a hypothetical question, whether or not public transportation was actually available" (Logue, 1987). The patterns and levels of reported disability were found to be plausible and consistent with expectations based on other sources of information. Our comparison of data from the 1980 query with that from the mobility limitation question in 1990 indicates a very high level of consistency, providing still further support to Logue’s conclusion. Even though the 1980 and 1990 comparisons suggest certain patterns (or lack of them) because of the difference in wording of the item, no definitive statements can be made regarding trends. Logue argued that to monitor future trends in disability, the public transportation disability item ought to be included in the 1990 census. As we have observed, this did not happen. However, an even stronger case can now be made for including the 1990 Census query in future enumerations. A benchmark is needed that will be adequate to chart the growth of the disabled population using a common, easily understood standard.

As has been noted again and again, the choice of a measurement scale for self-reports of disability can have a potentially major impact on estimates across studies (Jette, 1994). Perhaps the surprising finding of the present study is the very close correspondence between the 1980 and 1990 data on the proportions with disability despite the very different wording of the roughly comparable census question. Because of the bias evidently due to the potentially different interpretations to the changing question, firm conclusions regarding disability trends among the elderly are precluded. Nevertheless, it can be observed that the major cross-sectional patterns, such as those by age, appear to be very similar. It is greatly hoped that the measurement scales used in the 1990 Census are retained in 2000, so that for the first time in American history, differences in definition of disability will not obscure the use of census findings.

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