

Persistent and Growing Socioeconomic Disparities in Disability Among the Elderly: 1982–2002

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Much attention and public debate have recently focused on disparities in health and medical care among racial and socioeconomic groups.^{1–3} At older ages, minority and socioeconomically disadvantaged populations are up to 3 times as likely as other groups to experience disability and the physical, cognitive, and sensory limitations that underlie it.^{4–6} In comparison with those without activity limitations, older people who report limitations—no matter their race or socioeconomic status—have 3 times the medical expenditures.⁷ Additionally, half of all medical expenditures for people with disabilities are paid for by public health programs.⁸

Recently, declines in disability have been documented among older Americans.^{6,9} A systematic review of the literature identified average annual declines during the 1980s and 1990s of 0.4% to 2.7% in limitations with instrumental activities of daily living (IADLs), such as shopping, cleaning, and going places, but inconsistent trends in limitations in activities of daily living (ADLs), such as bathing, dressing, and walking.¹⁰ More recently, an expert panel found that during the middle and late 1990s, the population aged 70 years and older experienced declines of 1.0% to 2.5% per year in ADL limitations.¹¹

Whether these recent improvements have been experienced broadly is still unclear. Although racial and socioeconomic disparities in late-life health have been widely documented,¹² few studies have examined disparities in disability trends. In their systematic review of the literature, Freedman et al.¹⁰ found that most analyses of trends in disparities in late-life disability have been cursory and have rarely included formal statistical tests. With respect to racial disparities, findings have been mixed: 2 studies reported a widening of Black–White differences during the 1980s,^{6,13} 1 found a narrowing during the 1990s,⁶ and a third suggested no change from 1982 through 1996.¹⁴ Two studies that have exam-

Objective. We sought to determine whether socioeconomic and racial/ethnic disparities in prevalence of disability over age 70 have widened or narrowed during the past 2 decades.

Methods. We used data from the 1982–2002 National Health Interview Surveys, which are nationally representative cross-sectional surveys of the noninstitutionalized population of the United States. Participants included 172 227 people aged 70 years and older. The primary outcome measure was the average annual percentage change in the prevalence of 2 self-reported disability measures: the need for help with activities of daily living (“ADL disability”) and need for help with either ADL or instrumental activities of daily living (“any disability”).

Results. All groups experienced declines in the age- and gender-adjusted prevalence of any disability during the 1982 to 2002 period. However, the average annual percent declines were smaller for the least advantaged socioeconomic groups. Differences in trends across racial/ethnic groups were not statistically significant. ADL disability prevalence decreased for the more advantaged groups but increased among the lowest income and education groups. Non-Hispanic Whites and minorities experienced similar average annual percent declines in ADL disability.

Conclusions. Racial/ethnic disparities in old-age disability have persisted over the last 20 years, whereas socioeconomic disparities have increased. (*Am J Public Health.* 2005;95:2065–2070. doi:10.2105/AJPH.2004.048744)

ined educational disparities suggest that improvements may have been larger for those with more than a high school education.^{14,15} To date, no evidence exists regarding trends in disparities with respect to other measures of socioeconomic status, notably income.

Hence, it remains unclear which groups have gained the most in recent years and which have been left behind. A more thorough understanding of trends in racial/ethnic and socioeconomic disparities is critical not only for measuring progress in eliminating the gaps, but also for targeting interventions and planning for the likely future course of population-level disability.

METHODS

Data and Measures

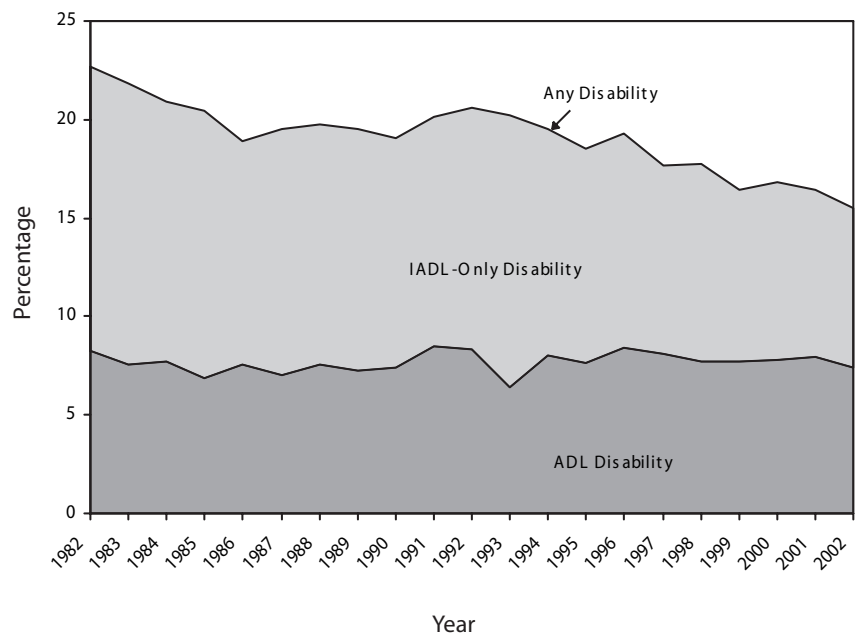
Our analysis was based on data from the National Health Interview Survey (NHIS), which is a repeated cross-sectional survey of the noninstitutionalized population in the United States. Conducted annually by the

National Center for Health Statistics, the NHIS includes a sample of approximately 8000 adults aged 70 years and older. The analysis uses data for each year from 1982 to 2002, resulting in a sample of 172 227 men and women aged 70 years and older during this period. These large samples allow for relatively precise estimates of disability prevalence for each year, including estimates for some major subgroups. The sampling plan followed a multistage area probability design that permitted the representative sampling of households. The “final basic weights,” which were poststratified to represent the civilian noninstitutional population, were used in all of the estimations. SUDAAN software (version 9.0, RTI International, Research Triangle, NC) was used to adjust statistical tests for the complex nature of the survey design.

Disability among people aged 70 years and older was measured by 2 questions. The first question asked about ADL-type limitations: “Because of any impairment or health

problem, do you/does ___ need the 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, do you/does ___ need the help of other persons in handling routine needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?" Before 1982, the questions were substantially different. The questions were slightly modified in 1997, with the introductory phrase using the following alternative language: "Because of a physical, mental, or emotional problem, does . . ." The estimates of disability prevalence were reported for ADL disability and "any disability," with the latter defined as either ADL or IADL disability.

Disparities were examined by race/ethnicity, education, and income groups. Non-Hispanic Whites were compared with all other racial/ethnic groups combined. Although there remain substantial differences in culture, socioeconomic status, and other factors within these racial/ethnic groups, additional disaggregation of the minority group led to imprecise estimates. Moreover, the contrasts of Blacks versus non-Blacks, and Whites versus non-Whites led to similar substantive conclusions. Education was classified into 5 groups: 0–8, 9–11, 12, 13–15, and 16 or more years. Disability prevalence was also reported for quartiles in the year-specific income distribution. In survey years 1982–1996 (1997–2002), family income was reported by the respondent as being in 1 of 27 (1 of 11) categories. To stratify the prevalence estimates by income quartiles, we calculated for each respondent a continuous income amount within the category reported by the respondent using a 3-step procedure. First, for each year from 1982 to 2002, we used the population aged 70 years and older from the March Current Population Survey, which is the US Census Bureau source for official estimates of income and poverty, to estimate family income as a function of sociodemographic variables and the family income categories appearing in the NHIS. Second, we used estimates from this model to calculate an



Note. IADL = instrumental activity of daily living; ADL = activity of daily living.

FIGURE 1—Percentage of the population 70 years of age and older with ADL, IADL-only, and any disability, 1982–2002.

exact family income within the category reported for each NHIS respondent. Finally, we grouped individuals in the NHIS into income quartiles. We evaluated the procedure by comparing the March Current Population Survey and calculated NHIS income distributions and trends and found that they were substantially similar.

Statistical Analyses

Unadjusted estimates of the prevalence of each of the 2 measures of disability—any disability and ADL disability—are shown in Figure 1 for all persons aged 70 years and older in each year from 1982 to 2002. Subsequent analyses calculate the unadjusted estimates for the 2 disability measures within each socioeconomic and racial/ethnic group from 1982 to 2002. A third-order polynomial was fit to the data and displayed. Figure 2 displays the trends in any disability for the highest and lowest income quartiles. Figures for the remaining socioeconomic and racial/ethnic groups and for ADL disability are available from the authors upon request. Tests of differences in the unadjusted trends displayed in Figure 2 were conducted using an F test for differences in nested logistic regression

models, where the reduced model contained parameters representing time in a third-order polynomial and an indicator for 1 of the 2 groups displayed in the chart, and the full model included additional interactions between the group indicator and the time parameters.

Statistical tests for adjusted trends and disparities in trends were conducted on the basis of a set of logistic regression models estimated from all years of data combined for each of the disability measures—any disability and ADL disability. The key explanatory factor is a linear trend variable that takes the value of 0 in 1982 and increases by 1 in each subsequent year, with a maximum value of 20 in 2002. A more parsimonious linear specification was adopted, because the second- and third-order polynomial terms (shown in Figures 1 and 2) were not consistently significant. The control variables in all of the models included age (represented by categories for 70–74, 75–79, 80–84, and 85 years of age and older), gender, and indicators for whether the response was given by a proxy (typically another household member). Proxy is included because previous research suggests that proxy and self-reports

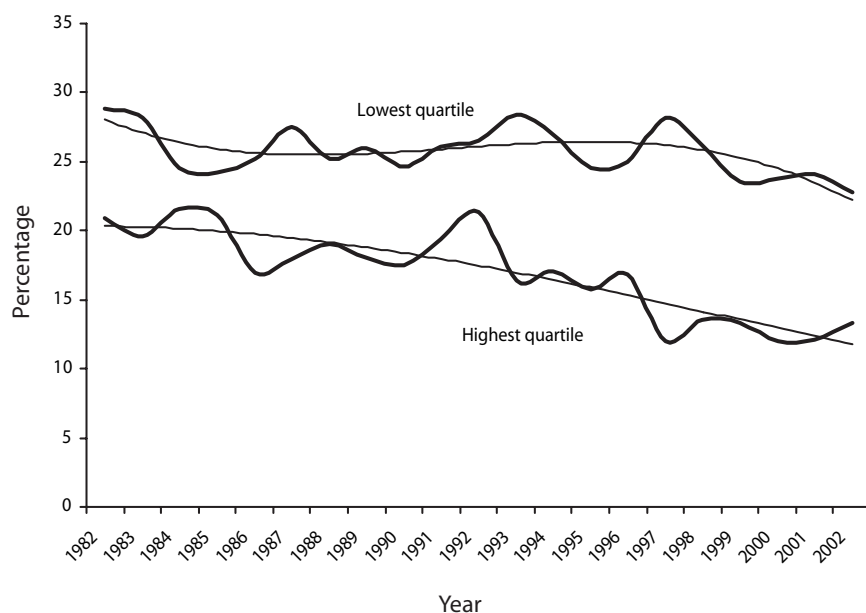


FIGURE 2—Percentage of the population 70 years of age and older with any disability among highest and lowest income quartiles, 1982–2002.

may differ systematically.¹⁶ We interacted the proxy indicator with an indicator for whether the interview was taken after 1996, because the ability to document proxy respondents changed after 1996.

Five models were estimated for each of the 2 dependent variables. The first model included the trend variable along with the control variables, thereby providing an estimate of the age- and gender-adjusted average annual change in disability across the entire population aged 70 years and older during the 1982 to 2002 period. Three additional models (models 2–4) included interaction terms that allowed the trend to vary by socioeconomic status or race/ethnicity for each of the 3 factors: education (0–8, 9–11, 12, 13–15, and 16 or more years; model 2), family income quartiles (model 3), and non-Hispanic Whites versus all other race/ethnicity groups combined (model 4). A fifth specification allowed the trend to vary by all 3 factors—education, income, and race/ethnicity—within the same model. Model 5 allowed us to examine the extent to which the disparities in trends for each factor were accounted for by differential trends in the other 2 factors. Whenever

a model included the interaction of the trend with race/ethnicity or socioeconomic status, the direct effect of that factor was also included in the model.

An estimate of the average annual percentage change in disability, the parameter of central interest, was calculated as the estimated odds ratio on the trend variable minus 1, and then multiplied by 100, and is reported in Table 1 for models 1 to 4. The differences in the average annual percent change in disability across groups, relative to the reference group, are reported in Table 2, with significance tests evaluated by significance levels for interaction terms between the trend variable and the socioeconomic indicator variables. Estimates of all odds ratios from the logistic models are available from the corresponding author upon request.

Sensitivity analyses (results not shown) were conducted along several dimensions. Model estimates were robust to the number of education and income groups and to alternative categorizations of race/ethnicity (e.g., Black vs non-Black). Moreover, estimates from an ordinary least-squares specification, which provides estimates of absolute rather than relative change, yielded similar substan-

tive conclusions. Finally, we explored sensitivity to the omission of the institutional population using data from the National Nursing Home Survey and found that differential trends by race/ethnicity among the institutionalized population were not sufficient to alter the substantive conclusions for the groups shown here.

RESULTS

Unadjusted Trends

The proportion of the population aged 70 years and over reporting any disability declined substantially over the last 2 decades from 22.7 to 15.5% (Figure 1). The improvement was driven largely by a decline in IADL-only disability (i.e., the proportion who have an IADL disability but not an ADL disability), which decreased from 14.5 to 8.1%. The proportion of the population with ADL disability showed very little change.

However, there were considerable differences in trends in any disability across the groups. As shown in Figure 2, older people in the lowest quartile of income (or with the least education; figures available from the authors upon request) showed virtually no improvement, whereas those in the more advantaged categories did. As a result, the socioeconomic gap in any disability prevalence, already in favor of the advantaged group in 1982, became much larger between 1982 and 2002. At the same time, both non-Hispanic Whites and all other racial/ethnic groups experienced a decline in the prevalence of any disability, but there was no statistically significant change in the gap in favor of non-Hispanic Whites.

Disparities in ADL trends were also apparent (data available from authors upon request). Trends across education groups were notably disparate, with those who have the least education actually experiencing an increase in the proportion reporting ADL disability and those with the highest education experiencing declines. For income, during the 1980s, the rates of ADL disability were remarkably similar for the bottom and top quartiles, but they appeared to diverge in the 1990s. The racial/ethnic gap in ADL disability was substantial and persistent throughout the 20-year period.

TABLE 1—Average Annual Percentage Change in Disability, by Socioeconomic Status, From Logistic Models: 1982–2002

| | Dependent Variable | |
|---------------------------------|-----------------------|-----------------------|
| | Any Disability | ADL Disability |
| Model 1: all people | -2.15*** | -0.62*** |
| Model 2: years of education | | |
| 0–8 | -0.88*** | 0.79** |
| 9–11 | -0.84** | 0.15 |
| 12 | -1.61*** ^b | -0.40 ^c |
| 13–15 | -1.67*** ^a | -0.47 ^b |
| 16 or more | -2.53*** ^c | -1.38*** ^c |
| Model 3: family income quartile | | |
| Lowest | -1.38*** | 1.12*** |
| 2nd | -2.65*** ^c | -1.76*** ^c |
| 3rd | -3.06*** ^c | -2.04*** ^c |
| Highest | -3.11*** ^c | -1.62*** ^c |
| Model 4: race/ethnicity | | |
| All other groups | -2.57*** | -0.67 |
| Non-Hispanic White | -2.18*** | -0.73*** |

Note. Estimates were based on logistic models for the sample of people aged 70 years and older that adjust for age, gender, proxy, proxy interacted with post-1996 indicator, and the socioeconomic factor under consideration; the models do not adjust for the other 2 socioeconomic factors simultaneously. The reference groups were as follows: 0–8 for education, lowest quartile for income, and “all other groups” for race/ethnicity.

^aStatistically significant trend relative to the trend for the reference group at the .10 level.

^bStatistically significant trend relative to the trend for the reference group at the .05 level.

^cStatistically significant trend relative to the trend for the reference group at the .01 level.

* $P = .1$; ** $P = .05$; *** $P = .01$.

Adjusted Trends

After adjustment for age, gender, and proxy, there were statistically significant declines in the proportion of the older population with any disability or with just an ADL disability (row 1 of Table 1), although the average annual rate of decline was substantially greater for the former: 2.15% versus 0.62% per year.

The age-gender-adjusted prevalence of any disability declined for all education, income, and race/ethnicity groups (column 1 of Table 1; all P values $< .05$). Nevertheless, declines were the greatest for the most educated and for those with the highest income. The differences in trends across education and income groups were substantial and statistically significant, with declines for the least educated group 0.88% per year versus 2.53% per year for the most educated ($P < .01$ for difference). For income quartiles, the top 3 quartiles had significantly greater improvements than the lowest income quartile ($P < .01$). In contrast, differences in trends across

the 2 racial/ethnic groups were not statistically significant ($P = .27$).

For all groups combined, age-gender-adjusted trends in ADL disability declined by 0.62% per year ($P < .01$); however, differentials in adjusted ADL disability prevalence were apparent by education and income groups. For example, prevalence increased for those with 0 to 8 years of education by 0.79% per year ($P < .05$) and decreased for those with 16 or more years by 1.38% per year ($P < .05$) but did not change significantly for the other education categories. The differences between trends for the lowest and highest education groups were statistically significant ($P < .01$). ADL disability also increased among those in the lowest income quartile, and there was a statistically significant difference in the trend in comparison with the other quartiles ($P < .01$), with each of the 3 higher quartiles showing significant improvement. Gains were not significantly different between the 2 racial/ethnic groups considered here ($P = .91$).

The first two columns of Table 2 show the difference in average annual percent change relative to the lowest education and income groups and to all minority groups combined; these estimates are based on the models in Table 1 that do not control for all 3 factors simultaneously. The differences in decline in any disability between the lowest and highest education and income groups (column 1 in Table 1) were 1.65% and 1.73% ($P < .01$), respectively, whereas the differences in ADL disability were more than 2% per year (column 2 in Table 1; $P < .01$). In contrast, the difference in declines between racial/ethnic groups was not significant.

By allowing differential trends by race/ethnicity, education, and income groups simultaneously (columns 3 and 4 in Table 2), differences in declines across income and education groups persist although they are reduced. For example, the difference between the highest and lowest income groups is reduced from 1.73% to 1.35%. Racial/ethnic differences in the trends in any disability (ADL disability) of 0.98% (0.81%) in favor of minorities emerge once the differentials across income and education groups are taken into account.

DISCUSSION

The prevalence of any disability declined from 1982 to 2002 among all socioeconomic and racial/ethnic groups considered here: high and low income, more and less educated, and non-Hispanic Whites and minorities. At the same time, the magnitude of those improvements differed greatly between more and less advantaged groups, with disparities across educational and income categories generally widening. Disparities by race and ethnicity largely persisted. Racial/ethnic disparities would have been reduced if not for the fact that gaps in education and income widened, and minorities were concentrated in disadvantaged groups.

The increase in the need for help with ADL disability among the least educated group is a disturbing finding. This analysis does not indicate whether the relative trends reflect changes in the relationships between socioeconomic status and disability over time or changes in the composition of each group

TABLE 2—Difference in Average Annual Percentage Change in Disability Relative to Reference Group With and Without Controlling for Trends in the Other Two Socioeconomic Factors

| | Not Controlling for Other 2 Factors ^a | | Controlling for Other 2 Factors | |
|------------------------------------|--|--------------------|---------------------------------|--------------------|
| | Any Disability | ADL Disability | Any Disability | ADL Disability |
| Years of education | | | | |
| 0–8 (reference group) | | | | |
| 9–11 | 0.04 | -0.64 | 0.16 | -0.41 |
| 12 | -0.73 ^c | -1.19 ^d | -0.44 | -0.70 |
| 13–15 | -0.79 ^b | -1.26 ^c | -0.43 | -0.72 |
| ≥16 | -1.65 ^d | -2.17 ^d | -1.21 ^c | -1.51 ^c |
| Family income quartile | | | | |
| Lowest (reference group) | | | | |
| 2nd | -1.27 ^d | -2.88 ^d | -1.10 ^d | -2.46 ^d |
| 3rd | -1.68 ^d | -3.16 ^d | -1.52 ^d | -2.64 ^d |
| Highest | -1.73 ^d | -2.74 ^d | -1.35 ^d | -2.08 ^d |
| Race/ethnicity | | | | |
| All other groups (reference group) | | | | |
| Non-Hispanic White | 0.39 | -0.06 | 0.98 ^d | 0.81 ^b |

Note. Estimates were based on logistic models for the sample of people aged 70 years and older that adjust for age, gender, proxy, proxy interacted with post-1996 indicator, and direct effect of socioeconomic factors under consideration.

^aThese estimates were the differences relative to the reference group reported in models 2, 3, and 4 in Table 1.

^bStatistically significant trend relative to the trend for the reference group at the .10 level.

^cStatistically significant trend relative to the trend for the reference group at the .05 level.

^dStatistically significant trend relative to the trend for the reference group at the .01 level.

in the population. Educational attainment of the population aged 70 years and older increased dramatically during the 1980s and 1990s, with the share that has 0 to 8 years of schooling declining from 46% in 1982 to 17% in 2002 (from tabulations using the NHIS). Those left behind in the least educated group may have become increasingly negatively selected or disadvantaged.

Trends by income quartiles were not subject to such selectivity, because the categories were based on a relative ranking (quartiles) of income each year. Nevertheless, they too indicate a widening disability gap between rich and poor and an increase in ADL disability among the most disadvantaged. During the 1980s and early 1990s, income differentials widened.¹⁷ Income—more so than education—may reflect a reciprocal relation between socioeconomic status and health, making it difficult to sort out whether widening income differentials are driving disability gaps or vice versa.^{18–20} This question deserves additional attention.

Although we can only speculate about the causes of the widening disparities, many factors have been identified as contributing to

socioeconomic and racial/ethnic disparities in disability at a point in time. Disability is a function of both underlying physical capacity and the environment in which a person lives and works. Although the Medicare program helps equalize access to health care at older ages, variations in access, receipt, and quality of care persist.^{1,2,21} There are also important differentials in public access to health care information, communication with health care providers, and adoption of healthy behaviors.^{2,22} Socioeconomic and racial/ethnic factors may play different roles in the onset, progression, and recovery associated with disease and disability.^{23,24} Furthermore, late-life disability may be influenced substantially by earlier life experiences, including health care throughout life, occupation, and exposures to infection and environmental toxins.²⁵ Moreover, racial and socioeconomic differentials in housing quality and unmet need for home modifications have been found.^{26,27} Thus, to close completely the gaps in late-life functioning may require a combination of medical, behavioral, and environmental interventions over the lifetime of a cohort. Additional

research is needed to identify which interventions might be most effective in reducing disability among disadvantaged as well as advantaged populations. ■

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Contributors

R.F. Schoeni, L.G. Martin, and V.A. Freedman originated the study, conceptualized ideas, synthesized analyses, and interpreted findings. R.F. Schoeni supervised all aspects of its implementation and led the writing. P.M. Andreski completed the analyses. All authors contributed to the writing of the article and reviewing drafts.

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Human Participant Protection

This research was approved by the University of Michigan institutional review board.

References

1. Smedley BD, Stith AY, Nelson AR, eds. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: National Academies Press; 2002.
2. *National Healthcare Disparities Report*. Rockville, MD: Agency for Healthcare Research and Quality; 2003.
3. Kaiser J. Democrats blast a sunny-side look at US health disparities. *Science*. 2004;203:451.
4. Freedman VA, Martin LG. Understanding trends in functional limitations among older Americans. *Am J Public Health*. 1998;88:1457–1462.
5. Freedman VA, Aykan H, Martin LG. Aggregate changes in severe cognitive impairment among older Americans: 1993 and 1998. *J Gerontol B Psychol Sci Soc Sci*. 2001;56B:S100–S111.
6. Manton KG, Gu XL. Changes in the prevalence of chronic disability in the United States black and non-black population above age 65 from 1982 to 1999. *Proc Natl Acad Sci USA*. 2001;98:6354–6359.
7. Trupin L, Rice DP, Max W. *Medical Expenditures for People with Disabilities in the United States, 1987*. Washington, DC: US Department of Education, National Institute on Disability and Rehabilitation Research; 1996.

8. Trupin L, Rice DP, Max W. *Who Pays for the Medical Care of People with Disabilities?* Disability Statistics Abstract, Number 13. Washington: DC: US Department of Education, National Institute on Disability and Rehabilitation Research; 1996.
9. Cutler D. Declining disability among the elderly. *Emphasis Health Affairs*. 2001;20:11–27.
10. Freedman VA, Martin LG, Schoeni RF. Recent trends in disability and functioning among older adults in the United States: a systematic review. *JAMA*. 2002; 288:3137–3146.
11. Freedman VA, Crimmins E, Schoeni RF, et al. Resolving inconsistencies in old-age disability trends: report from a technical working group. *Demography*. 2004; 41: 417–441.
12. Preston SH, Taubman P. Socioeconomic differences in adult mortality and health status. In: Martin LG, Preston SH, eds. *Demography of Aging*. Washington, DC: National Academy Press; 1994:279–314.
13. Clark D. US trends in disability and institutionalization among older Blacks and Whites. *Am J Public Health*. 1997;87:438–440.
14. Schoeni RF, Freedman VA, Wallace R. Persistent, consistent, widespread, and robust? Another look at recent trends in old-age disability. *J Gerontol B Psychol Sci Soc Sci*. 2001;56:S206–S218.
15. Crimmins EM, Saito Y. Trends in health life expectancy in the United States, 1970–1990: Gender, racial, and educational differences. *Soc Sci Med*. 2001; 52:1629–1641.
16. Magaziner J, Zimmerman SI, Gruber-Baldini AL, Hebel JR, Fox KM. Proxy reporting in five areas of functional status. Comparison with self-reports and observations of performance. *Am J Epidemiol*. 1997;146: 418–428.
17. Mishel L, Bernstein J, Schmitt J. *The State of Working America: 1998–99*. Ithaca, NY: Cornell University Press; 1999.
18. Smith JP. Healthy bodies and thick wallets: the dual relation between health and economic status. *J Econ Perspect*. 1999;13:145–166.
19. Adda J, Chandola T, Marmot M. Socio-economic status and health: causality and pathways. *J Econometrics*. 2003;112:57–63.
20. Mulatu MS, Schooler C. Causal connections between socio-economic status and health: reciprocal effects and mediating mechanisms. *J Health Soc Behav*. 2002;43:22–41.
21. De Lew N, Weinick R. An overview: eliminating racial, ethnic, and SES disparities in health care. *Health Care Financing Rev*. 2000;21:1–7.
22. Berkman LF, Mullen JF. How health behaviors and the social environment contribute to health differences between black and white older Americans. In: Martin LG, Soldo BJ, eds. *Racial and Ethnic Differences in the Health of Older Americans*. Washington, DC: National Academy Press; 1997:163–182.
23. Melzer D, Izmirlan G, Leveille SG, Guralnik JM. Educational differences in the prevalence of mobility disability in old age: the dynamics of incidence, mortality, and recovery. *J Gerontol B Psychol Sci Soc Sci*. 2001;56:S294–S301.
24. Zimmer Z, House JS. Education, income, and functional limitation transitions among American

adults: contrasting onset and progression. *Int J Epidemiol*. 2003;32:1089–1097.

25. Kuh D, Ben-Shlomo Y, eds. *A Life Course Approach to Chronic Disease Epidemiology*. Oxford: Oxford University Press;1997.

26. Newman S. The living conditions of elderly Americans. *Gerontologist*. 2003;43:99–109.

27. Tabbarah M, Silverstein M, Seeman T. A health and demographic profile of noninstitutionalized older Americans residing in environments with home modifications. *J Aging Health*. 2000;12:204–228.

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