Journal of Gerontology: MEDICAL SCIENCES
2005, Vol. 60A, No. 10, 1351–1355

Health Changes Among Swedish Oldest Old: Prevalence Rates From 1992 and 2002 Show Increasing Health Problems

Marti G. Parker, Kozma Ahacic, and Mats Thorslund

Aging Research Center, Karolinska Institute and Stockholm University, Stockholm, Sweden.

Background. The health of the elderly population is of utmost importance for planning policy and resources for care services. Most surveys of the health of the elderly population show improvement, suggesting support for the compression of morbidity hypothesis. This study examines changes in the health of the Swedish population (aged 77+) from 1992 to 2002.

Methods. Two nationally representative surveys of the elderly population ($n = 537$ and 563, respectively), including both community-based and institutionalized persons were used. Outcomes include self-reported diseases, symptoms, and activities of daily living, as well as objective tests of physical capacity, lung function, vision, and cognition.

Results. None of the indicators showed improvement. A number of health indicators showed significant worsening, with or without adjustment for changes in the age and sex distribution from 1992 to 2002. Among self-reported indicators, there were significant increases in several diseases and symptoms. The objective function tests also showed significantly worse results in 2002 compared to 1992 for physical capacity, lung function, and cognition. No significant differences in activities of daily living limitations were found.

Conclusions. In light of several recent studies, we expected to observe improvements in the health of the elderly population. However, this study showed no signs of improvement. On the contrary, we found a pattern of worsening health. The study included objective tests of function, implying that results are not due solely to raised expectations or changes in reporting. Possible explanations are discussed.

HEALTH trends among the oldest sector of the population are of paramount interest for future policy and resource allocation. Until recently, trend analyses have been hampered by a dearth of high quality population studies stretching over adequate periods of time. Over the past years, numerous studies have ''come of age,'' thereby allowing researchers to observe health changes over time in the elderly populations of several industrialized countries (1–3).

Comparisons between studies are complicated by wide differences in design, sampling, and health indicators. Variation among countries is to be expected, because at different periods of time, populations are at different stages of demographic development and may be experiencing different epidemiological transitions (4). During the 1900s, for example, the epidemiological pattern for Sweden shifted from a domination of infectious diseases to more chronic conditions. During the past decade, our ability to keep even very frail elderly persons alive has improved considerably.

Even within countries, it is difficult to discern common trends; in the U.S. population, one study found fluctuating trends in disability over time (5). Another U.S. study demonstrated increases in healthy life expectancy, but only among people with higher education (6). However, a review of U.S. studies concluded that most evidence points to declines in both limitations and disability (7).

Swedish studies have also suggested improvement (8). The Gothenburg study has seen significant improvements among later cohorts of 70-year-olds (9,10). A Swedish study of mobility (running, walking, stair climbing) in the population aged 18–75 showed a significant improvement between 1968 and 1991 (11,12). The improvement was most prominent in the older age groups (65–75 years).

Developments in Sweden's population are of particular interest because Sweden is demographically ''ahead'' of most other industrialized countries in regards to the proportion of elderly people, with 18% aged 65+, compared to the United States with 12% (13). Concerning the population aged 85+, the corresponding figures in 2000 were 2.5% in Sweden (14), compared to 1.5% in the United States (15). Swedish life expectancy at birth in 2004 was 82 years for women and 78 years for men, compared to 80 years and 75 years in the United States (13). Another point of interest is that, since the 1960s, Sweden has had a national health care system that has endeavored to make medical care available to everyone regardless economic means (16).

This study describes changes in health in two representative samples of the Swedish population aged 77+ in 1992 and 2002. In addition to disease and symptom variables, the study includes several domains of functioning: seeing, hearing, and cognition, as well as mobility and activities of daily living (ADL). Has the prevalence of health problems changed during the studied time period? Are the changes seen in mild or severe problems, or both?

Material

The Swedish Panel Study of the Living Conditions of the Oldest Old (SWEOLD I & II) consists of two surveys from 1992 and 2002 that are representative of the population aged 77+. Institutionalized persons were included, and proxy and telephone interviews were carried out when necessary. Table 1 describes the sample characteristics. Whereas nonresponse was

Table 1. SWEOLD Sample Characteristics 1992 and 2002

Characteristic	1992	*N*	2002	*N*
Response pattern				
Response	95.4%	537	88.5%	561
Nonresponse	4.6	26	11.5	73
Type of interview				
Direct visit	81.8	439	79.9	448
Direct telephone	6.3	34	7.3	41
Proxy direct/telephone	11.9	64	12.8	72
Living situation				
In institutions	12.8	69	14.6	82
In community	87.2	468	85.4	479
Age group				
77–79 y	25.5	137	20.0	112
80–84 y	43.4	233	42.1	236
85+ y	31.1	167	38.0	213
Sex				
Male	39.5	212	40.6	228
Female	60.5	325	59.4	333

Note: SWEOLD = Swedish Panel Study of the Living Conditions of the Oldest Old.

greater in 2002, distribution of interview mode (direct, proxy, telephone) changed only marginally between the two studies. The percentage of persons living in institutions (12.8% and 14.6%) reflects the national average. Age and sex distribution is also reflective of national figures for the two survey years (17).

SWEOLD is based on a panel interview survey of the Swedish population aged 18–75 years that was begun in 1968 (18). This was a sociological survey that evaluated living conditions in a nationally representative sample. Subsequent waves of the survey maintained the age ceiling, and people older than 75 years were dropped from the panel. In 1992, all persons older than 75 years who had been included in at least one of the survey waves were traced. The survivors composed the SWEOLD I study ($n = 563$) (19); nonresponse was 4.6%. In 2002, the process was repeated; nonresponse for SWEOLD II ($n = 634$) was 11.5%. Both waves of SWEOLD were carried out by the same researchers and in close collaboration with the researchers of the original sociological survey to ensure similarity in fieldwork and design.

Outcome Measures

The interview included questions about health and function, as well as tests of cognition, lung function, vision, and physical capacity. *Health variables* were taken from a list of diseases and symptoms. The question was ''Have you had any of the following diseases or disorders during the last 12 months?'' Alternative responses were, ''No,'' ''Yes, mild problems,'' or ''Yes, severe problems.'' Common Swedish expressions for medical conditions were used because the questionnaire was designed for the general population and administered by laymen interviewers. The items are listed in Table 2.

Functional limitations and disability.—Hearing was a dichotomous variable based on the respondent's reported ability to hear a conversation between several people without difficulty, with or without a hearing aid. *Mobility* was an index of four mobility items. Respondents were asked if they could walk 100 meters, walk up stairs, rise from a chair without difficulty, and stand without support. *ADL* was an index of five items: eating, toileting, dressing, transferring in and out of bed, and bathing. *Instrumental ADL* (IADL) was included only for those persons living in the community. Respondents were asked if they usually cleaned house, shopped, and prepared food without help. Those persons who reported that they had help with these activities were then asked if they could do them if necessary. For mobility, ADL, and IADL, one limitation was considered mild, more than one was considered severe.

Tests of function.—Performance was an index of nine simple tests covering range of motion, strength, and hand function (20). Items selected were easy to administer and had been used in other population studies (21,22). The participants were asked, e.g., to pick up a pen from the floor, touch opposite toes, lift one kilogram, and rise from a chair. The interviewer demonstrated each test before asking the participant to perform it. Persons who could not perform a test easily were classified as having failed the test. A participant who failed one or two tests was considered to have mild problems, and one who failed three or more tests was considered to have severe problems.

Peak expiratory flow was tested three times, and the best score was analyzed. Peak flow is a simple test of lung capacity and is associated with mortality (23) and physical and cognitive function (24). As lung capacity is highly dependent on height, the residual from a regression model where height was regressed against the peak flow value was used as the outcome measure. Less than one standard deviation below the mean (of the combined samples) was considered severe, rates between this point and the mean were considered mild, and rates at or above the mean were considered no problem.

Vision was tested by asking the participants to read the instructions on a medicine bottle (1 capsule 3 times daily). Because literacy in Sweden is high (even in the oldest age groups), this can be seen as a test of vision and not of reading ability. Reading incorrectly or with difficulty was considered mild impairment, and total inability to read was considered severe.

Cognition was tested with items from the Folstein Mini-Mental State Examination (25). Cutoff points for mild and severe cognitive impairment were found using the corresponding items in larger Swedish studies (26,27) that included the entire Mini-Mental State Examination as well as clinical diagnoses of dementia.

Analysis

Prevalence rates were derived from both surveys separately. The data from both surveys were then combined to adjust for age and sex differences between 1992 and 2002. Odds ratios were obtained with ordered logistic regression (28). This is an extension of the binary response model in logistic regression, which allows for an ordered multicategorical outcome (29).

RESULTS

Table 2 presents the prevalence rates for the self-reported items. The first columns show the 2002 prevalence rates for no, mild, and severe problems. This is followed by the changes in prevalence rates from 1992 to 2002. The general pattern was an increased prevalence of both mild and severe problems. Noteworthy increases were seen in genital problems, depression, fatigue, and joint pain. Among functional limitations, increases were seen in hearing and mobility, but not in ADL or IADL, with the exception of an increase in mild IADL impairments.

The odds ratios show the odds of having problems in 2002 compared to 1992. They reflect the average change in mild and severe problems. We show the crude odds ratios as well as odds

Table 2. Self-Reported Health Problems

Health Problem	Percentage in 2002			Change From 1992 to 2002[1]			2002/1992			Missing
	No	Mild	Severe	No	Mild	Severe	OR	Adj. OR[2]	95% CI	*N*
Internal medicine										
Genital disorder (women: itching, prolapse; men: prostrate)	77.8	15.2	7.0	−8.5***	+4.4*	+4.1**	1.83***	1.83***	1.33–2.54	22
Stomach ache	77.2	17.6	5.2	−3.4	+3.8	−0.4	1.20	1.20	0.90−1.61	23
Leg ulcers	92.8	5.2	2.0	−4.3**	+3.7***	+0.6	2.62**	2.55**	1.39−4.68	15
Diabetes	90.0	6.8	3.2	0.0	−0.4	+0.4	1.00	1.00	0.68−1.50	11
Nervous system/psychosomatic										
Dizziness	60.8	31.1	8.0	−5.0	+1.9	+3.1*	1.28*	1.24	0.97–1.59	9
Mental illness	97.8	0.9	1.2	−0.4	+0.1	+0.3	1.26	1.24	0.52–2.99	15
Depression	82.6	12.2	5.2	−7.8***	+6.4***	+1.4	1.94***	1.92***	1.33–2.76	12
Anxiety	71.7	19.0	9.3	−3.1	+0.4	+2.7	1.20	1.20	0.92–1.57	10
Sleeplessness	60.0	25.1	14.9	−1.5	−3.0	+4.5*	1.13	1.12	0.88–1.42	12
General fatigue	50.6	37.0	12.4	−17.9***	+13.8***	+4.1*	2.04***	1.98***	1.55–2.52	10
Cardiac/Pulmonary										
Chest pain	75.8	15.6	8.6	+1.8	−3.4	+1.6	0.94	0.93	0.70–1.22	7
Myocardial infarction	93.5	4.1	2.3	−2.3	+0.9	+1.4	1.60	1.56	0.90–2.70	13
Other heart problems	79.1	14.6	6.3	−1.8	−0.7	+2.5	1.15	1.12	0.83–1.50	16
Hypertension	72.6	20.8	6.5	−4.7	+1.2	+3.5**	1.32*	1.38*	1.04–1.82	21
Stroke	93.9	3.8	2.3	−2.5	+3.0***	−0.5	1.71	1.58	0.89–2.82	12
Breathlessness	65.6	27.0	7.3	−3.4	+2.6	+0.7	1.16	1.16	0.90–1.49	10
Musculoskeletal pain										
Shoulder pain	56.7	31.0	12.3	−8.4**	+6.4*	+2.0	1.39**	1.42**	1.12–1.81	9
Back pain	47.2	28.7	24.1	−9.8**	+1.4	+8.4***	1.54***	1.59***	1.26–2.00	11
Joint pain (in arms or legs)	42.6	34.5	22.9	−15.7***	+8.9**	+6.9**	1.79***	1.84***	1.46–2.31	9
Functional limitations										
Hearing	55.1	—	44.9	−14.4***	—	+14.4***	1.86***	1.76***	1.37–2.27	6
Mobility	39.4	18.4	42.2	−10.8***	+2.8	+8.0**	1.48***	1.40**	1.11–1.77	25
IADL[3]	58.6	19.5	21.8	−2.3	+5.2*	−2.8	1.03	0.93	0.72–1.21	156
ADL[4]	66.8	15.9	17.3	−3.7	+0.8	+3.0	1.20	1.07	0.82–1.39	0

Notes: Data are percentage with no, mild, or severe problems in 2002 and the change from 1992 to 2002, with the nonadjusted and age- and sex-adjusted odds ratios (OR) and 95% confidence intervals (CI) for change between 2002 and 1992 ($n = 1098$).

*$p < .05$; **$p < .01$; ***$p < .001$.

[1]Significance between one cell and the other two combined.

[2]Adjusted for differences in age and sex distributions between 1992 and 2002.

[3]Persons living in institutions were excluded ($n = 69$ in 2002; $n = 82$ in 2002, missing = 5). IADL = instrumental activities of daily living.

[4]Persons living in institutions were considered to have limitations in bathing. ADL = activities of daily living.

ratios adjusted for changes in age and sex distribution between 1992 and 2002. The ratios confirm the pattern found in the prevalence rates. The general picture did not change noticeably when age and sex were taken into account.

Significantly higher odds ratios were seen for leg ulcers, depression, general fatigue, hypertension, and musculoskeletal pain. Among functional limitations, the odds ratios for hearing and mobility limitations were significantly higher in 2002. None of the indicators showed significant improvement.

Table 3 presents the results of the objective tests. The sample was smaller here because the tests could not be administered in proxy or by telephone interviews. The prevalence rates and the relative odds ratios indicate a significant worsening of health for physical function, peak flow, and cognition. Limitations in vision did not change over the 10-year period.

Discussion

Previous studies in the United States, Sweden, and elsewhere have demonstrated improved health in the older age groups of the population. With this background, we expected improvement in our analyses of a recent wave of SWEOLD, a nationally representative study of Swedes older than 76 years. However, results revealed no signs of improvement and significant worsening of health compared to the same age group 10 years previously. Both mild and severe problems increased. The different measures used in the study showed different trends. In general, neither ADL nor disease variables (e.g., diabetes, stroke, heart infarction) showed change, and symptoms (e.g., fatigue, pain), functional limitations (hearing, mobility), and objective tests of function (performance tests, peak flow, cognition) showed a significantly worsening health.

The SWEOLD sample is small compared to many surveys (7) in larger countries. This necessitates greater changes for significant results, compared to larger surveys. The samples have low nonresponse rates and are representative; each sample comprises roughly 0.1% of the elderly Swedish population.

Nonresponse in 2002 was greater than in 1992 (11.5% vs 4.6%), although both surveys had high participation rates compared to most studies. Nonresponse is composed primarily of elderly people who were healthy enough to actively refuse an interview. In most cases, proxy interviews could be arranged for those persons who could not directly participate in an interview.

Table 3. Tests of Function

	Percentage in 2002			Change From 1992 to 2002[1]			2002/1992			Missing	
Function Tests[2]	No	Mild	Severe	No	Mild	Severe	OR	Adj. OR[3]	95% CI	1992 *N*	2001 *N*
Performance	42.9	15.8	41.3	−8.2*	+0.4	+7.8*	1.39**	1.37*	1.06–1.77	98	113
Peak flow	41.2	37.4	21.4	−15.2***	+6.4	+8.8***	1.86***	1.82***	1.39–2.84	124	136
Cognition	54.8	25.1	20.0	−10.0**	+3.5	+6.5**	1.54***	1.48**	1.14–1.92	79	87
Vision	87.2	4.0	8.8	+1.8	−1.9	+0.1	0.87	0.81	0.54–1.20	99	116

Notes: Data are percentage with no, mild, and severe problems in 2002 and the change from 1992 to 2002, with the nonadjusted and the age- and sex-adjusted odds ratios (OR) and 95% confidence intervals (CI) between 2002 and 1992 ($n = 1098$).

*$p < .05$; **$p < .01$; ***$p < .001$.

[1]Significance between one cell and the other two combined.

[2]Performance, peak flow, and vision tests were only administered in direct, face-to-face interviews; the cognitive test was administered in some telephone interviews.

[3]Adjusted for differences in age and sex distributions between 1992 and 2002.

Therefore, relatively less healthy persons could be overrepresented in 2002. However, even if much of the difference (seven percent units) comprised fairly healthy individuals, it would not change the overall findings of the study.

Because nonmedical personnel conducted the interviews, the health indicators used were crude and not always clinically relevant. Therefore, it is important to see the tables in terms of general trends, rather than focus on changes in specific health problems.

Increases in self-reported symptoms and disease can be due to actual health changes or to an increase in reporting. Increased reporting, in turn, can be a result of either a greater awareness of a problem or a greater social acceptance of some symptoms or diseases. For example, physicians may have been more likely in 2002 to identify depression among their elderly patients. Elderly people themselves may have become more likely to report their feelings. Therefore, part of the increased depression in this study could be due to underreporting in 1992.

Different indicators capture different dimensions of health and function and are influenced to different degrees by factors other than physical health. ADL, a commonly used outcome in this kind of survey, did not show significant change in our study. This could be due to the subjective nature of ADL and its vulnerability to the effects of environmental change and changes in expectations. For example, improvements in assistive technology and housing technology may have influenced rates of ADL limitations over this period by helping people compensate for their poor health (30).

Tests of function are less vulnerable to reporting differences, rising expectations, or environmental modifications. These objective tests, although crude compared to clinical testing, are reliable on a population level. The significant worsening of health reflected in these tests confirms the overall trend seen in the self- and proxy-reported indicators.

This study differs from other studies on several points. We have focused on a very old population (aged 77+). An age analysis of our data (17) showed worsening at all age levels. This does not preclude that there is improvement in younger populations, such as the 70-year-olds of the Gothenburg study (9,10). Unlike many studies, our surveys included both community-based and institutionalized persons. The community/institution threshold changes over time in response to changes in policy and resource allocation. Therefore, both groups must be included in analyses of health trends in the elderly population. Another difference is that this study uses self-reported health indicators as well as tests of function. Test results confirmed the self-reports.

Theories of population aging emphasize the interplay of mortality and morbidity patterns with demographic changes in a population (31). Over time, morbidity prevalence changes in relation to demographic change. The time period covered by most studies reported in the literature began in the 1980s and ended in mid-1990. Given that this study covers a later time period, and that Sweden is ''ahead'' of other countries regarding the aging population, the lack of improvement found in this study could be because it taps into a later stage of population development. Results could reflect the emergence of a very frail old population, as proposed by Robine and Michel (4). Results could also reflect local conditions, as suggested by Deeg (32), i.e., either a cumulative consequence of the supportive environment and care provided by the Swedish welfare state since the 1960s or, less likely, a result of reforms and cutbacks in care during the 1990s.

We do not view these findings as contradictory to those of previous studies. Rather, they reflect a nuanced description of a specific population and time period. Due to the multidimensionality of health, the effects of risk factors accumulated over the life course of different cohorts, and the complex, dynamic interplay of social factors, mortality, and morbidity, we can expect different studies to observe evidence supporting the various theories (33).

Study results are dependent not only on the methods and health indicators used, but also on the demographic/epidemiological phase currently being experienced by the studied population. Two analyses of changes in cognition using the Asset and Health Dynamics Among the Oldest Old Study and the Health and Retirement Study (AHEAD/HRS) data constitute a clear example of different methodological approaches. One research team found improvement between 1993 and 1998 (34), whereas a later analysis by another team found no improvement (35). Differences between the analyses included adjustment for survey design features, treatment of proxy data, and the addition of the 2000 wave. An example of period differences is the mobility study (11,12) mentioned above that analyzed the same cohorts in an earlier time period (ending in 1992). Using the same indicator, the first study found significantly improved mobility in the population, whereas this study found significant worsening.

The implications of health trends for future policy concerning resources for geriatric care and elder social services are even more complex to estimate than are the health trends themselves (30). Resource demands will vary according to the health dimension entailed. For example, trends in symptoms and disease reflect needs for medical services, whereas functional

and activity limitations call for compensatory measures such as assistive technology or social services. The value of health trend analyses would be strengthened if these dimensions, and their implications for care, were more carefully delineated.

The curious lack of increase in ADL limitations, despite the increase in other indicators, must be investigated more closely. Crimmins (33) has shown that disease was less closely linked to disability during the 1990s. Is this a trend that can be encouraged through environmental modifications and other interventions? Studies that examine the person–environment interface in the face of disease, chronic conditions, and the aging process are essential.

This study, using recent, representative samples including institutionalized persons and proxy data, as well as a variety of health indicators, suggests an expansion of morbidity in the elderly Swedish population between 1992 and 2002. Whether these findings are indicative of a new trend, and the emergence of a frail elderly population, or a minor fluctuation in an otherwise positive development of compression, remains to be seen in future studies. Nevertheless, the results suggest that an indefinitely continuing compression of morbidity cannot be assumed among very old persons.

Acknowledgments

We are grateful for the financial support from the Swedish Council for Working Life and Social Research (grants 2003-0539 and 2002-0919), the Vardal Foundation (grant V2002 057), and the Swedish Research Council (grant 2000-0893/28).

The Karolinska Institute Ethics Committee approved the project.

Address correspondence to Marti Parker, Aging Research Center, Karolinska Institute & Stockholm University, Neurotec, Box 6401, 113 82 Stockholm, Sweden. E-mail: marti.parker@ki.se

References

1. Doblhammer G, Kytir J. Compression or expansion of morbidity? Trends in healthy-life expectancy in the elderly Austrian population between 1978 and 1998. *Soc Sci Med.* 2001;52:385–391.
2. Malmberg JJ, Miilunpalo SI, Vuori IM, Pasanen ME, Oja P, Haapanen-Niemi NA. Improved functional status in 16 years of follow up of middle aged and elderly men and women in north eastern Finland. *J Epidemiol Community Health.* 2002;56:905–912.
3. Robine JM, Jagger C, Mathers CD, Crimmins EM, Suzman RM, eds. *Determining Health Expectancies.* Chicester, England: John Wiley & Sons, Ltd.; 2003.
4. Robine JM, Michel JP. Looking forward to a general theory on population aging. *J Gerontol A Biol Sci Med Sci.* 2004;59:M590–M597.
5. Crimmins EM, Saito Y, Reynolds SL. Further evidence on recent trends in the prevalence and incidence of disability among older Americans from two sources: the LSOA and the NHIS. *J Gerontol B Psychol Sci Soc Sci.* 1997;52:S59–S71.
6. Crimmins EM, Saito Y. Trends in healthy life expectancy in the United States, 1970–1990: gender, racial, and educational differences. *Soc Sci Med.* 2001;52:1629–1641.
7. 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.
8. Lagergren M, Batljan I. Will there be a helping hand? Macroeconomic scenarios of future needs and costs of health and social care for the elderly in Sweden, 2000-30. Stockholm: Ministry of Health and Social Affairs; 2000.
9. Steen B. The elderly yesterday, today and tomorrow: aspects on cohort differences from the gerontological and geriatric population studies in Goteborg, Sweden (H70). *Arch Gerontol Geriatr.* 2002;35Suppl:359–370.
10. Wilhelmson K, Allebeck P, Steen B. Improved health among 70-year olds: comparison of health indicators in three different birth cohorts. *Aging Clin Exp Res.* 2002;14:361–370.
11. Ahacic K, Parker MG, Thorslund M. Mobility limitations in the Swedish population from 1968 to 1992: age, gender and social class differences. *Aging (Milano).* 2000;12:190–198.
12. Ahacic K, Parker MG. Mobility limitations 1974–1991: period changes explaining improvement in the population. *Soc Sci Med.* 2003; 57:2411–2422.
13. Population Reference Bureau. 2004 World Population Data Sheet. Population Reference Bureau. Available at: http://www.prb.org. Last accessed July 15, 2004.
14. Statistics Sweden. Population statistics. Available at: http://www.ssd.scb.se/databaser. Last accessed July 15, 2004.
15. U.S. Census Bureau. International Data Base. Available at: http://www.census.gov/cgi-bin/ipc/idbsum?cty=US. Last accessed July 15, 2004.
16. Parker MG. Sweden and the United States: is the challenge of an aging society leading to a convergence of policy? *J Aging Soc Policy.* 2000;12:73–90.
17. Thorslund M, Lennartsson C, Parker MG, Lundberg O. De allra äldstas hälsa har blivit sämre (Elderly people's health has become worse). *Läkartidningen (The Journal of the Swedish Medical Association).* 2004;101:1494–1499.
18. Erikson R, Åberg R, eds. *Welfare in Transition, A survey of living conditions in Sweden 1968–1981.* Oxford: Clarendon Press; 1987.
19. Lundberg O, Thorslund M. Fieldwork and measurement considerations in surveys of the oldest old. *Soc Indic Res.* 1996;37:165–187.
20. Parker MG, Thorslund M, Lundberg O. Physical function and social class among Swedish oldest old. *J Gerontol.* 1994;49:S196–S201.
21. Aniansson A, Rundgren A, Sperling L. Evaluation of functional capacity in activities of daily living in 70-year-old men and women. *Scand J Rehabil Med.* 1980;12:145–154.
22. Pedersen NL, McClearn GE, Plomin R, Nesselroade JR, Berg S, DeFaire U. The Swedish adoption twin study of aging: an update. *Acta Genet Med Gemellol (Roma).* 1991;40:7–20.
23. Cook NR, Evans DA, Scherr PA, Speizer FE, Taylor JO, Hennekens CH. Peak expiratory flow rate and 5-year mortality in an elderly population. *Am J Epidemiol.* 1991;133:784–794.
24. Cook NR, Albert MS, Berkman LF, Blazer D, Taylor JO, Hennekens CH. Interrelationships of peak expiratory flow rate with physical and cognitive function in the elderly: MacArthur Foundation studies of aging. *J Gerontol A Biol Sci Med Sci.* 1995;50:M317–M323.
25. Folstein MF, Folstein SE, McHugh PR. ''Mini-mental state''. A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res.* 1975;12:189–198.
26. Palmer K, Wang HX, Bäckman L, Winblad B, Fratiglionie L. Differential evolution of cognitive impairment in nondemented older persons: results from the Kungsholmen Project. *Am J Psychiatry.* 2002;159: 436–442.
27. Gatz M, Fratiglioni L, Johansson B, et al. Complete ascertainment of dementia in the Swedish Twin Registry: the HARMONY study. *Neurobiol Aging.* 2005;26:439–447.
28. SAS/STAT. *User's Guide.* Vol 2. 4th Ed. Cary, NC: SAS Institute Inc.; 1994.
29. Demaris A. *Logit Modeling. Practical Applications.* Vol 86. Newbury Park, CA: Sage Publications; 1992.
30. Spillman BC. Changes in elderly disability rates and the implications for health care utilization and cost. *Milbank Q.* 2004;82:157–194.
31. Myers GC, Lamb VL, Agree EM. Patterns of disability change associated with the epidemiologic transition. In: Robine JM, Jagger CD, Mathers CD, Crimmins EM, Suzman RM, eds. *Determining Health Expectancies.* Chichester, England: John Wiley & Sons, Ltd; 2003:59–74.
32. Deeg DJH. Population aging: the benefit of global versus local theory. *J Gerontol A Biol Sci Med Sci.* 2004;59A:600.
33. Crimmins EM. Trends in the health of the elderly. *Annu Rev Public Health.* 2004;25:79–98.
34. 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;56:S100–S111.
35. Rodgers WL, Ofstedal MB, Herzog AR. Trends in scores on tests of cognitive ability in the elderly U.S. population, 1993–2000. *J Gerontol B Psychol Sci Soc Sci.* 2003;58:S338–S346.

Received July 29, 2004
Accepted October 20, 2004
Decision Editor: John E. Morley, MB, BCh