

Trends in population health

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In this issue, a paper by Zunzunegui et al., using a representative sample of older Spanish people, shows that there was a significant decline in severe disability during the 1990s. Disability is defined as needing help in at least one of seven activities of daily living (ADLs). However, the study also shows that, after age 90, the disability trend may be reversed as a very old population emerges.

First, this work confirms the favorable trend in severe disability now observed in many developed countries, including Finland, where there appears to be a decrease in the need for assistance at age 85 (1), and the United States, where several studies have shown a decline of 1-2% per year in the prevalence of older people requiring help in personal care activities during the 1990s (2). A Japanese study has also shown a decline in ADL and IADL disability during the 1990s, but it was not accompanied by a decline in functional limitations, suggesting that findings may be due to developments in assistive technology or changes in the built-up environment (3). Indeed, new reports suggest that increases in the use of assistive technology may explain half the decline in ADL disability in the US (4, 5). Only Australia and New Zealand appear to have witnessed an increase in severe disability at age 65 and over during the 1990s (6), although in both cases changes in survey design may explain the results.

In the late 1980s or early 1990s, most developed countries established health surveys for monitoring ongoing changes in population health due to concern at the potential expansion of morbidity subsequent upon reduced mortality among the elderly. The current OECD study on the costs of care for elderly populations is reviewing the trends in ADL disability at age 65 and over, resulting from such surveys (7). Out of 13 national surveys covering 11 OECD countries, the vast majority shows a decline in ADL disability: Denmark, Finland, Italy, Japan,

the Netherlands, United Kingdom (General Household Survey), United States (Medicare Current Beneficiary Survey), and Sweden (until 1996). Three more show almost no trends: Australia, Switzerland and United States (National Long Term Care Survey); whereas three surveys show an increase: Belgium, United Kingdom (Health Survey for England) and Sweden (since 1998). Preliminary results suggest that a decline in ADL disability may be less universal than expected and less certain. However, more importantly, the OECD study shows that ADL disability at age 65 and over ranges from a low of 12% in Finland (Health Survey) to a high of 30% in the United States (Medicare Current Beneficiary Survey).

In this issue, Zunzunegui et al. conclude that their results may be valid for other countries in Southern Europe with similar socio-economic conditions. For the past 20 years, Spain has been one of the fastest growing economies in the West and has witnessed a substantial improvement in the health of its population. Today, Spain is one of the leaders for the highest life expectancy at birth. Already, the Spanish National Disability, Impairment and Handicap Survey, conducted in 1986 and 1999, showed a significant decrease in the prevalence of disability, although some changes were made in survey design. Spain seems to have witnessed one of the steepest declines in disability, although, compared with other countries, it started from a much higher level of disability (8).

Other European studies confirm these results. Indeed, the HALE project suggests that improvement in self-care abilities for older men and women during the 1990s was more pronounced in the south than in the north of Europe (9); the CLESA project found that the prevalence of disability varied significantly across European countries, Italy and Spain having the highest prevalence and the Netherlands the lowest (10).

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Several factors in these studies may contribute to the observed trends in ADL disability and differences across countries, including developments in assistive technology, changes in the environment, changes in survey design (which still occur far too often), the pace of increase in life expectancy, initial level of disability, and local conditions. Moreover, it appears that a favorable trend in ADL disability does not necessarily mean a positive trend in all health indicators - for instance, functional limitations. Understanding old-age disability and health trends is the purpose of TRENDS, a newly created research network, supported by the US National Institute on Aging (<http://trends.psc.isr.umich.edu/>). For such a network, using only one indicator, such as ADL disability, is not sufficient when discussing health trends in the older population. Although trends in disability are definitely of interest, they provide little information if we cannot identify and separate the elements linked to functional capacity and to the environment.

A Swedish study, using two small but representative samples of the oldest population, including both community-based and institutionalized people, suggested a significant decline in physical capacity, lung function, and cognition during the 1990s, with an increase in both mild and severe health problems (11). Another analysis of the same dataset shows a significant increase in serious problems (diseases/symptoms, mobility, cognition/communication) and complex problems, defined as serious problems in two or three domains (12). In this context, the lack of increase in ADL disability may seem odd, and alternative indicators of disability, less vulnerable to environmental change, may be needed. For the authors of the Swedish study, these results reflect the emergence of a very frail old population, as proposed by Robine and Michel (13).

Considering the dimensions of population health proposed by Crimmins (i.e. risk factors, diseases/conditions/impairments, functioning loss, disability and death), only disability and death clearly decreased during the 1990s, whereas self-reported morbidity clearly increased (14). A recent study in the United States, using the National Health and Nutrition Examination Surveys (NHANES III, 1988-1994, and IV, 1999-2000), found mixed results for 10 biological markers, with improved values for cholesterol and homocysteine and worsening values for systolic blood pressure, obesity and C-reactive protein (15).

Four questions deserve to be examined when investigating disability trends: 1) the trend in life expectancy; 2) the initial level of disability; 3) whether decline in disability is strong enough to compensate for the lengthening of life; 4) whether disability is concentrated in the most severe levels.

Significant gaps in life expectancy at age 65 are found among the most developed countries, varying, for example, by 5 years for women in 2002, from 18.2 years in Denmark to 23.0 years in Japan (www.mortality.org). In Denmark, the Netherlands and the United States, life

expectancy at age 65 increased very slowly during the 1990s, whereas in Italy, Spain, France and Japan it increased rapidly. Are the ADL disability trends related to the levels and trends of life expectancy at age 65? Decline in ADL disability cannot have the same meaning in the US, where life expectancy is relatively low and increased slowly during the 1990s, and in Spain, where life expectancy is high and increased rapidly during the same period. Moreover, when disability is high, as in the United States or in Southern Europe, there is room for improvement, i.e., disability decline. However, when the disability level is low, as in Australia or the Netherlands, it may be more difficult to reduce it any further (16). To know whether decline in ADL disability above age 65 is large enough to compensate for the lengthening of life, it is necessary to go a step further and simultaneously to take into account survival and disability (17). This is done through the estimation of life expectancy without ADL disability, called active life expectancy (ALE). Thus, a recent study in the US, using data collected in 1900-1910 on Civil War Union Army veterans combined with data from the National Long Term Care Survey (1982-1999) and making projections to 2080, reports that the proportion of life expectancy at age 65 free from ADL/IADL disability increased from 73.9% in 1935 to 78.5% in 1999, and that it will reach 85.2% to 88.1% in 2080, according to two alternative scenarios, suggesting strong compression of disability over time (18). Eventually, the introduction of severity levels in ADL/IADL disability will help the assessment of whether disability is concentrated in the most severe levels, with moderate and light disability declining more rapidly than severe disability.

Altogether, these recent studies suggest that a decline in ADL disability above age 65 occurred during the 20th century. They now raise new questions, since the disability level may today be relatively low in some countries and life expectancy high in others, as the numbers of extremely old persons accumulate. Decline in disability not accompanied by a similar improvement in functioning and several indicators of morbidity suggest worsening of the physiological health status during the same period. Changes in living conditions and the built-up environment may explain some of the results. Decline in disability may have reduced long-term care costs, but it is unlikely that it has contributed to reducing total medical costs. We need more than ADL series to monitor changes in population health.

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