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Compression or expansion of morbidity? Trends in healthy-life expectancy in the elderly Austrian population between 1978 and 1998

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Abstract

The aim of our study is to test the theories of compression or expansion of morbidity on the basis of data on the elderly population of Austria. Our data come from four microcensus surveys for the years 1978, 1983, 1991, and 1998. We use self-perceived health ratings to calculate healthy-life expectancy for the elderly population aged 60–89. Because our data are based on four cross-sectional surveys, we devote the first part of the paper to the consequences of possible sampling and non-sampling errors in our analysis of time trends. We come to the conclusion that, although the absolute number of years lived in good health may be overestimated, the time trend in healthy-life expectancy over the 20 years most probably is unbiased. The second part of the paper describes trends in healthy-life expectancy for the Austrian population. Our results suggest that both healthy-life expectancy and the ratio of healthy years to life expectancy increased between 1978 and 1998. Thus, in Austria ill health seems to be more and more compressed into the later years of life. Contrary to Fries's hypothesis, however, life expectancy does not seem to be approaching a maximum average life span in Austria, as mortality rates at older ages have been continuously decreasing over the last 20 years.

Keywords: Health expectancy; Mortality; Morbidity; Health status; Austria

Introduction

As in most economically advanced countries, life expectancy in Austria has increased steadily over the last several decades. Compared with the early 1970s, life expectancy at birth has been extended by 8.1 years for men and 7.5 years for women. It reached 74.6 years for men and 80.9 years for women in 1998. Because of the already low levels of mortality for children and younger adults these gains in life expectancy are primarily the result of reductions in the mortality of the elderly. Between 1980 and 1998 the standardized mortality rate was reduced by 30% for men and 33% for women aged 60 years or older. There is no evidence that this trend will stop or be reversed in the future. Together with the ageing of populations in absolute and relative terms this is considered to be one of the major challenges facing social welfare systems.

The ultimate magnitude of the social and economic burdens of extended survival and population aging will to a great extent be determined by the future development of morbidity. Two different models describing the past and possible future developments of mortality and morbidity have been proposed. An "expansion of morbidity" theory (Gruenberg, 1977; Olshansky, Rudberg, Carnes, Cassel & Brady, 1991) assumes that the increase in life expectancy is caused by a reduction in the fatality rate of chronic diseases rather than by a decline in the incidence of these diseases. The increase in longevity should therefore go hand in hand with an increasing number of years spent in poor health. In

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contrast, Fries (1989) proposed a theory predicting a "compression of morbidity". According to Fries the onset of chronic diseases will be postponed, but the average maximum life span will not exceed 85 years. Morbidity will then be compressed into a shorter period of time at the end of life. But one can also imagine a situation in which the ratio of unhealthy years to life expectancy decreases and life expectancy in poor health increases. This scenario is called "the relative compression of morbidity". The opposite scenario, "the relative expansion of morbidity", implies a decrease in the health ratio (ratio of healthy years to life expectancy) combined with an increase in the number of healthy years (Robine & Mathers, 1993).

An appropriate method for analyzing trends in morbidity and mortality at the population level simultaneously is the calculation of health expectancies. These calculations have been performed for several countries covering different time periods and using various health measures (Crimmins, Saito & Ingegneri, 1989, 1997; Bebbington, 1991; van Ginneken, Dissevelt, van de Water & van Sonsbeek, 1991; van de Water, Boshuizen & Perenboom, 1996; Valkonen, Sihvonen & Lahelma, 1997; for an overview see Robine, Mathers & Brouard, 1996).

In general, the question of whether researchers find an expansion or compression of morbidity over the years depends partly on the definition of health they apply. When using self-reported disability, the increase in life expectancy is more likely to lead to an expansion of morbidity (for a review see Robine et al., 1996; Crimmins et al., 1997). However, a recent study by Manton, Corder and Stallard (1997) found a decrease in the age-standardized prevalence rate of disability for the US population aged 65 and above. Studies that analyze self-rated health usually tend to find a compression of morbidity, particularly among middle-aged men (van de Water et al., 1996; Waidmann, Bound & Schoenbaum, 1995).

The aim of our study is to provide further evidence to help us to determine which of the competing theories of the development of morbidity is more consistent with time trends in health expectancy, using the Austrian elderly population as an example. As a measure of health we use self-perceived health ratings. Combining these health ratings with information on life expectancy we calculate healthy-life expectancy for the Austrian population aged 60 years and older for the years 1978, 1983, 1991, and 1998.

Over the years the concept of self-rated health has become widely accepted as a sensible measure of health status. Greiner, Snowdon & Greiner (1996) provide an excellent overview of a large number of studies that deal with the relationship between health-related factors and the concept of self-rated health. These studies came to the conclusion that self-perceived health ratings are associated with physical function, current illness, and disability. They are also influenced by a large number of other factors relevant to health. Among them are health behaviors such as smoking, current use of medical resources (e.g. number of days spent in hospital), external resources (e.g. social supports), internal resources (e.g. religiosity), and psychological factors. Longitudinal studies indicate that self-perceived health is a sensible predictor of mortality (for a review see Idler & Benyamini, 1997).

Methods and data

Methods

We base our calculation of healthy-life expectancy on the method introduced by Sullivan (1971). When using this method, expected years in good or ill health are calculated by applying the age- and sex-specific cross-sectional prevalence rates of self-perceived health to the person-years lived in different age categories derived from period life tables. Our calculations cover the age interval 60–89. We restricted our analysis to the elderly because this is the age group where the "compression" and "expansion" mechanisms are manifested. However, we had to exclude ages 90+ because at these ages prevalence rates of good health tend to fluctuate randomly even in large sample surveys, especially for men. We therefore use partial life expectancy up to age 89 instead of total life expectancy.

Applying the Sullivan method for monitoring trends in healthy-life expectancy is attractive because it only requires cross-sectional data. From a methodological point of view the combination of the stock variable 'prevalence of ill health' with the flow variable 'mortality' may lead to odd results (Berendregt, Bonneux & van der Maas, 1994). This is especially true when sudden changes in the transition from one health status to another occur. However, Mathers and Robine (1997) have shown that the Sullivan method provides a good estimate of trends in health expectancy in the long term if changes in the prevalence of good or ill health are smooth and relatively regular.

Data

Data on mortality were drawn from period life tables for 1978, 1983, 1991, and 1998 published by the Austrian Central Statistical Office. Abridged life tables for 5-year age-groups were calculated based on Chiang (1984). Data on self-perceived health were collected by in-person microcensus surveys conducted in the four years with supplementary questions on health topics for the entire population (1978, 1983, and 1991) or for the elderly population only (1998). For microcensus surveys,