17-Year Time Trend in Poor Self-rated Health in Older Adults: Changing Contributions of Chronic Diseases and Disability

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INTRODUCTION

Life expectancy in The Netherlands is increasing.[1] Still, it remains uncertain whether these added years are accompanied by ill health or by relatively good health and independency.[2] Self-rated health (SRH), a global measure of how individuals perceive their own health, is often used to study trends in the health of older people. However, previous studies on trends in SRH have shown mixed results [3,4]. Changing associations over time between SRH and indicators of other health dimensions may partly explain these inconsistent trends. This study reports on SRH trends in a representative Dutch sample of older people, between 1992 and 2009. Because there may be complex undercurrents of other health indicators such as chronic diseases and disability and their relations with SRH, trends in SRH are investigated in the context of time trends in chronic diseases and mild and severe disability.

METHODS

Sample

Details on the sampling and data collection procedures of the Longitudinal Aging Study Amsterdam have been described elsewhere.[5] In short, a random sample of older adults (ages 55-85) was drawn from the population registries of 11 municipalities in three geographical regions in The Netherlands in 1992. A total number of 3,107 men and women were enrolled at the baseline examination in 1992-1993. Face-to-face interviews in the respondent's home are repeated approximately every 3 years. In 2002-2003, 1,002 respondents aged 55-65 were added to the original sample. For the present study, data from all six measurement waves conducted so far were used (T1: 1992-1993; T2: 1995-1996; T3: 1998-1999; T4: 2001-2003; T5: 2005-2006; T6: 2008-2009). At each wave, people who were between 60 and 85 years were included.

Measures

Responses to the SRH question 'How is your health in general?' were dichotomized into either good SRH ('very good' or 'good') or poor SRH ('fair', 'sometimes good, sometimes poor; or 'poor'). The presence of the following self-reported *chronic diseases* or disease events was assessed: chronic non-specific lung disease, cardiac disease, peripheral atherosclerosis, stroke, diabetes mellitus, arthritis and cancer. In addition, a maximum of two other chronic diseases was recorded. *Disability* was assessed with six questions on performing daily activities. Respondents who reported difficulty with at least one activity, but

who were able to perform all activities independently, were categorized as mildly disabled; individuals who reported that at least one activity could not be performed independently were categorized as severely disabled.

Statistical Analysis

Trends in each health indicator were described with age- and gender-weighted means or percentages. Probability weights were computed by dividing 5-year age and gender strata proportions in T1-T3 and T5-T6 by proportions of the same strata in T4.

Generalized Estimating Equations (GEE) analysis was used for the analyses.[6] First, the predictive value of time in years was examined in different models for the outcome measures poor SRH, chronic diseases and mild and severe disability. To that end, an independent *time* variable was made to represent the increase in study years (0, 3, 6, 9, 13, and 16 years). Second, product terms of time in years with the independent variables were tested for significance to investigate whether associations between chronic diseases, disability and SRH changed over time. Analyses were conducted using SPSS 15.0.

RESULTS

There was no trend observed in the response categories for SRH. However, the mean number of chronic diseases (1.3 to 1.8) as well as the prevalence of having multimorbidity (36.7% to 51.7%) increased between T1 and T6. The prevalence of at least mild disability increased (20.5% to 32.1%), whereas the prevalence of severe disability decreased (23.5% to 19.7%).

GEE analysis confirmed that there was no independent effect of time in years on poor SRH in the total sample (OR=1.006; 95% CI 0.999-1.014), after adjusting for age, gender and education (Table 1). The average increase in number of diseases was 0.036 per year, reflecting an average increase of 0.6 diseases between 1992 and 2009. The percentage of older adults who were mildly disabled increased (OR=1.040; 95% CI 1.032-1.049), and the prevalence of severe disability remained stable (OR=0.997; 95% CI 0.989-1.006).

We found significant trends in the associations between chronic diseases, disability and poor SRH (Figure 1). In the total population, chronic diseases have a slightly *weaker* impact on poor SRH over time, indicated by a significant interaction effect between chronic diseases and time in the model with poor SRH as the outcome variable (OR=0.993; 95% CI 0.987-0.999). In contrast, severe disability was more *strongly* associated with poor SRH over time (OR=1.044; 95% CI 1.025-1.062).

DISCUSSION

While both the health indicators chronic diseases and mild disability showed increased prevalences in Dutch older people between 1992 and 2009, there has been no shift in the prevalence of poor SRH in the total sample. Associations between health indicators showed significant changes over time: poor SRH is decreasingly determined by chronic diseases, and increasingly determined by severe disability.

The number of chronic conditions increased, confirming results by other studies.[2,7] This trend may indicate an increased prevalence of diseases, but also increased reporting or a greater likelihood of being diagnosed. There may be a complex interplay of on the one hand earlier diagnosis, probably resulting in less disability associated with chronic diseases, and on the other hand increased survival, resulting in more disability associated with chronic diseases. Another likely explanation is that improved disease control and increased use of assistive technology has led to increased mild disability but prevented increases in severe disability, despite the increased prevalence of chronic diseases.[8,9] Our results are in line with those reported by Perenboom et al. (2004), who showed an increase in number of years lived with mild disability, but not in years lived with moderate or severe disability.[10]

Chronic diseases also showed a decreasing impact on poor SRH over time. This might be explained by improved prognosis for people with chronic disease. In addition, there may be a declining trend in what is regarded as 'normal' health, which is often used as a reference for health-ratings.[11]

In conclusion, this study shows that trends in different health dimensions between 1992 and 2009 have been diverging: Stable health trends were observed when health was measured by poor SRH or severe disability, while clear worsening health trends were found when health was measured by chronic diseases or mild disability. Over time, poor SRH was less strongly associated with chronic diseases, but more strongly with severe disability. Trends in health were most unfavourable for the most vulnerable groups: the oldest old and the lower educated. Because the seeming stability in poor SRH may hide the undercurrents of other health indicators, trends in SRH should be studied in the context of other health indicators.

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Table 1 Time Trends in Poor Self-Rated Health, Chronic diseases, Mild and Severe Disability: Longitudinal Aging Study Amsterdam (LASA), 1992-2009

	Number of chronic diseases (0-9)		**Mild disability Vs. no mild disability**	**Severe disability Vs. no severe disability**	**Poor SRH**	
	b (95% CI)		OR (95% CI)	OR (95% CI)	OR (95% CI)	
Total	0.049 (0.045-0.053)***		1.040 (1.033-1.048)***	1.006 (0.998-1.013)	1.010 (1.003-1.017)**	
Total [a]	0.034 (0.030-0.038)***		1.030 (1.022-1.037)***	0.990 (0.982-0.999)*	1.000 (0.994-1.007)	
Total [b]	0.036 (0.032-0.040)***		1.040 (1.032-1.049)***	0.997 (0.989-1.006)	1.006 (0.999-1.014)	
Men [c]	0.040 (0.033-0.046)***	‡	1.041 (1.029-1.051)***	1.002 (0.988-1.016)	1.006 (0.995-1.017)	
Women [c]	0.033 (0.027-0.039)**		1.040 (1.029-1.052)***	0.994 (0.983-1.005)	1.006 (0.997-1.016)	
60-74 years [b]	0.028 (0.022-0.034)***	‡	1.039 (1.028-1.050)***	0.996 (0.984-1.010)	0.997 (0.987-1.006)	‡
75-85 years [b]	0.046 (0.038-0.054)***		1.048 (1.023-1.073)***	0.992 (0.979-1.006)	1.017 (1.004-1.029)**	
Low educated [b]	0.045 (0.037-0.052)***	‡	1.045 (1.030-1.060)***	1.001 (0.982-1.009)	1.019 (1.007-1.031)**	‡
Higher educated [b]	0.031 (0.026-0.036)***		1.037 (1.027-1.048)***	0.995 (0.989-1.013)	0.999 (0.990-1.008)	

Note. b=unstandardized regression coefficient; CI=confidence interval; OR=odds ratio; SRH= self-rated health

[a] adjusted for gender and age in years

[b] adjusted for gender, age in years and education in years

[c] adjusted for age in years and education in years

* P < .05; ** P < .01; *** P < .001

‡ Significant interaction effect of gender, age or education (p<.10)

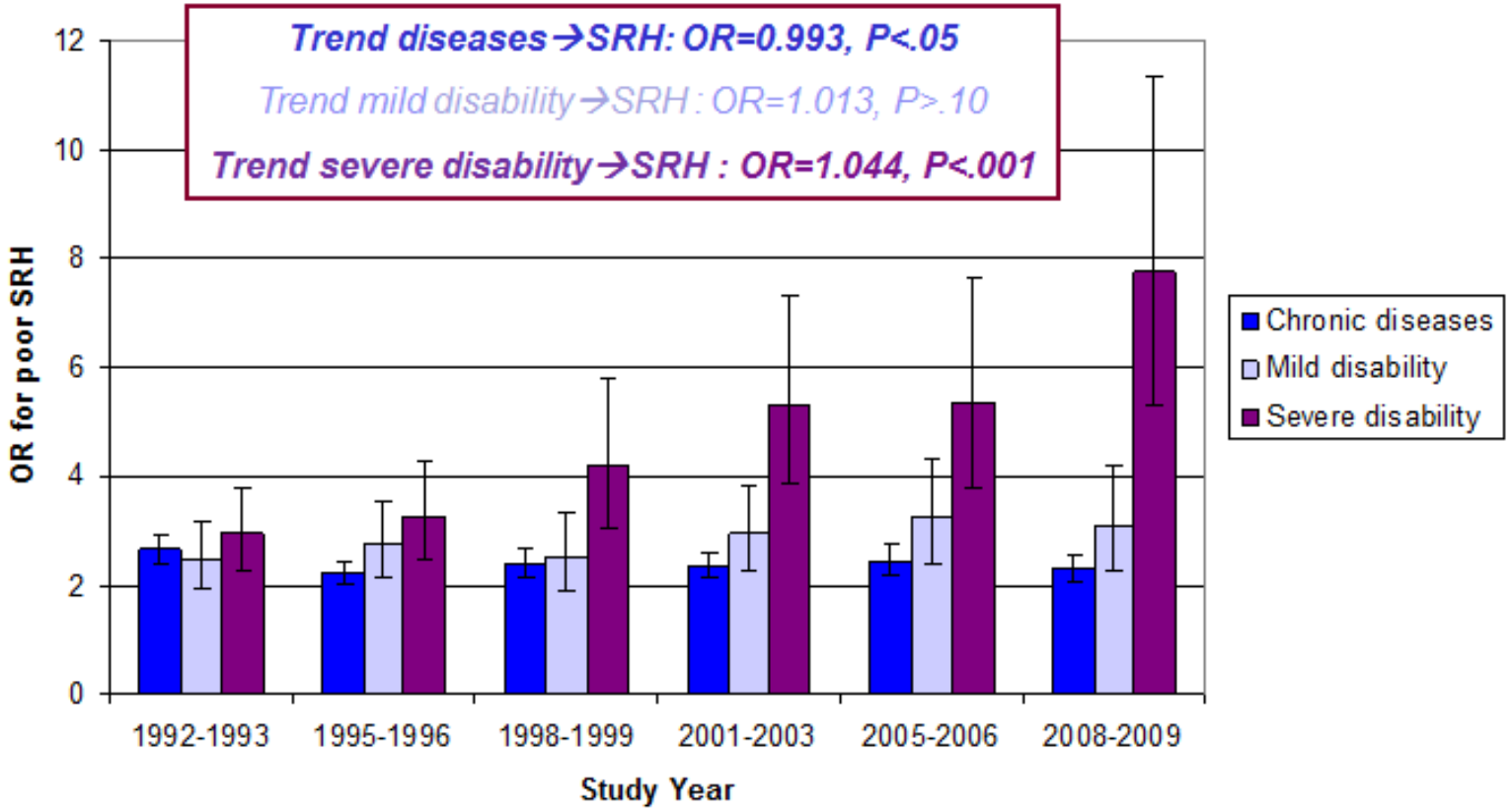

Figure 1 The association between number of chronic diseases, mild and severe disability and poor SRH at each measurement wave. In the box, odds ratios for trend obtained from the GEE analysis are shown.