

**Introduction** The current demographic ageing in developed countries is expected to pressure the pension system, particularly in countries where reproduction rates are low. This has led to policy reforms aimed at increasing labour force participation of older workers (Cooke 2006). Early retirement arrangements are made less attractive financially, in order to increase the age at retirement. In the future, certain retirees will consequently work until higher ages than they intended. In light of these policy reforms, the question rises whether the age at which persons retire has an effect on health. This is important for workers themselves but also for policy makers who need to know the consequences for health care costs. If the reduced costs of early retirement simply move to health care costs, these plans should be reconsidered. On the other hand, when health care costs decrease because working longer has a positive effect on health, it would justify the reforms even more.

Because self-perceived health is such an encompassing health measure, our main goal will be to study the effect of age at retirement on self-perceived health during the retirement transition. Studies aimed specifically at the effect of age at retirement on self-perceived health are scarce. Mojon-Azzi, Sousa-Poza, and Widmer (2007) examined the effect of retirement and age at retirement on self-perceived health. Retirees were compared with persons who continued working between the age of 55 and 75 years. They found no effect of age at retirement. Retirement however, did show an effect on self-perceived health. When respondents were asked if they felt their health had changed, they reported a positive change. However, when change was measured by comparing self-perceived health before and after retirement, they found no effect of retirement.

Various studies have addressed the general effect of retirement on self-perceived health, not specifically focusing on age at retirement, showing either no effect (Ekerdt, Bossé & LoCastro 1983; Ekerdt & Bossé 1982) or a positive effect (Gall, Evans & Howard 1997; Van Solinge 2007). As for instance Van Solinge (2007) demonstrates, various individual and contextual characteristics possibly influence the effect of retirement on self-perceived health, explaining these varying results. However, to our knowledge, no studies aimed at age at retirement and health, examined these characteristics. In order to unravel the true effect of age at retirement on self-perceived health, it seems imperative to include such characteristics. Therefore, our second goal is to explore the influence of individual and contextual characteristics on age at retirement and self-perceived health.

**Method** Subjects were 200 persons from the *Longitudinal Aging Study Amsterdam* (LASA), who retired between ages 55 and 64 years. To test for a significant effect ( $p < 0.05$ ) of age at retirement on change in self-perceived health, multinomial logistic regression analysis was applied with three outcome categories: increase in self-perceived health, decrease in self-perceived health and no change in self-perceived health as reference category.

For better interpretation of the effect of age at retirement on change in self-perceived health, pre-retirement self-perceived health and period of retirement were first controlled for (model 1). Pre-retirement health was controlled for because it might influence the direction and magnitude of change in self-perceived health. Respondents who retired between '92 and '06 were pooled. Since the average age at retirement has changed during these years, period of retirement was controlled for.

To test for a spurious effect of age at retirement on change in self-perceived health, the influence of various additional covariates were explored. Because little was known about the influence of these covariates, they were tested for effect modifying as well as confounding influence.

**Results** Within the multinomial logistic regression analyses, two comparisons were made: 1) increase compared to no change and 2) decrease compared to no change in self-perceived health. In our first model we adjusted for pre-retirement self-perceived health and period of retirement. A 1.28 significantly higher odds of experiencing a decreased compared to an unchanged self-perceived health was found for persons who retired one year later between 55 and 64 years. The effect of age at retirement on an increased compared to an unchanged self-perceived health was not significant.

Partner status after retirement, level of education, physical performance and time that has passed since retirement appeared to be confounders. After adding the confounders to model one, a 1.37 significantly higher odds of experiencing a decreased compared to an unchanged self-perceived health was found, when retiring one year later (model 2). Time since retirement and self-esteem after retirement showed to be significant effect modifiers. Respondents who were retired for up to one year had a 2.40 significantly higher odds and those who were retired for one to two years had a 2.03 significantly higher odds of experiencing a decrease compared to an unchanged self-perceived health. No effect was found for respondents who were retired for longer than two years.

Self-esteem after retirement was stratified according to the used answer categories. A low number of respondents answered 'no agreement/no disagreement' ( $n=12$ ), 'disagree' ( $n=2$ ) or 'strongly

disagree' (n=3), so these respondents were all considered to have low self-esteem. Those with low or medium self-esteem had no significantly raised odds. However, respondents who had a high self-esteem after retirement had a 2.27 significantly higher odds of experiencing a decreased compared to an unchanged self-perceived health after retirement when retiring at a higher age.

**Discussion** Our main goal was to study the effect of age at retirement on change in self-perceived health during the retirement transition. The results show that age at retirement has an effect on self-perceived health after retirement when considering retirees at 55-64 years. Retiring at a higher age gives a higher likelihood of experiencing a decreased compared to an unchanged self-perceived health after retirement. We did find retirees who increased in self-perceived health, but the likelihood of increased self-perceived health does not depend on age at retirement.

One possible explanation is that, if work has harmful physical and emotional aspects, later retirees have possibly endured them for a longer period of time which could explain why a decrease is seen. However, it seems equally rational to expect a beneficial effect, considering later retirees are released from possible harmful physical and emotional aspects. Also, it is questionable if the work environment in the Netherlands normally has such a strong negative effect on health.

A consequent aspect of the Dutch retirement system is that retirement is mandatory from the day a persons turns 65 years. As Van Solinge and Henkens (2007) show, involuntary retirement can lead to problems with adjustment to retirement. In concordance, involuntary retirement has been shown to have a negative influence on health (Henkens, Van Solinge, and Gallo 2008). One could argue that retirement near the age of 65 is more likely involuntary, whilst retirement at younger ages (i.e. before the age of 65 years) is more likely voluntary. Age at retirement thereby acts as a proxy for involuntary retirement.

Our second goal was to explore the influence of individual and contextual characteristics. Indeed, our results show that various characteristics need to be considered when studying age at retirement and change in self-perceived health. Self-esteem might serve as a resource at younger ages. In addition, a higher level of education might act as a resource at any retirement age. We find that higher educated are less likely to experience a decrease in self-perceived health after retirement. Higher educated are known to more likely be of good health (Mackenbach *et al.* 1997). No effect of age at retirement is seen for persons who are retired for longer than 2 years and up to 4.5 years. This

could indicate retirees adjust to retirement after some time, which is according to Atchley's Retirement Adjustment Theory (1976). More follow-up periods over a longer period of time is needed to confirm this theory.

Because of the pressure on the pension system, increasing the labour force participation of older workers seems inevitable. Determining possible risk factors and understanding the reason for the negative effect are essential in defining the next step in policy.

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