

Two decades of working beyond age 65 in the Netherlands

Health trends and changes in socio-economic and work factors to determine the feasibility of extending working lives beyond age 65

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Summary

The percentage of 65–74-year-olds with paid work is increasing, but remains low. It is known that this minority is more highly educated and healthier than their non-working age peers. It is an open question to what extent their health and socio-economic characteristics have changed. In particular, if working and non-working age peers have become more alike in these respects. In this case, also lower educated and less healthy people would work beyond age 65 more often.

Using data from the nationally representative Longitudinal Aging Study Amsterdam during 1993–2012, the educational difference between working and non-working 65–74-year-olds remained, however, constant. Also the health difference between workers and non-workers remained constant. The proportion of people with a mortgaged home did rise faster in workers than in non-workers. Workers remained more often supporters of a flexible pension age than did non-workers.

In workers beyond age 65, the number of hours worked was low (on average, 17 hours/week). Moreover, this number decreased over the years in men and in those with middle or higher education, but not in lower educated workers.

According to this study's findings, differences in education and health remain important factors in possibilities or desires to work beyond age 65. In addition, economic factors play a role, as is demonstrated by the finding that home owners with a mortgage continue working relatively often. Insight into these factors is important for designing policies to extend working lives.

Samenvatting

Het percentage 65–74-jarigen met betaald werk neemt toe, maar blijft laag. Bekend is dat deze minderheid hoger opgeleid en gezonder is dan niet-werkende leeftijdsgenoten. Het is de vraag of de gezondheid en sociaal-economische kenmerken van deze groep zijn veranderd, en met name of werkende en niet-meer-werkende leeftijdsgenoten meer op elkaar zijn gaan lijken. Dat zou er op kunnen duiden dat ook lager opgeleide en minder gezonde mensen relatief vaker doorwerken na hun 65e jaar.

In de landelijk representatieve Longitudinal Aging Study Amsterdam bleef gedurende 1993–2012 het verschil in opleidingsniveau tussen werkende en niet-werkende 65–74-jarigen echter constant. Ook het gezondheidsverschil tussen werkenden en niet-werkenden boven 65 jaar bleef constant. Het aandeel mensen met een hypotheek op hun woning steeg sneller bij werkenden dan bij niet-werkenden. Werkenden bleven vaker voorstander van een flexibele pensioenleeftijd dan niet-werkenden.

Bij werkenden boven de 65 jaar is het aantal werkuren laag (gemiddeld 17 uur per week). Dit aantal nam bovendien in de loop der jaren af bij mannen en bij middelbaar- of hoger opgeleiden, maar niet bij werkenden met een lagere opleiding.

Volgens deze onderzoeksresultaten blijven verschillen in opleidingsniveau en gezondheid belangrijke factoren bij de mogelijkheden of wensen om door te werken na het 65e jaar. Daarnaast spelen ook economische factoren een rol, zoals blijkt uit het feit dat mensen met een hypotheek op hun woning relatief vaker doorwerken. Inzicht in deze factoren is van belang als men een beleid wil voeren gericht op langer doorwerken.

Executive summary and recommendations

Study aims

The policy to raise the statutory retirement age is intended to counteract increases in pension and care costs that accompany the ageing of the population. In the Netherlands, the statutory retirement age was fixed at 65 years up to 2012. Workers beyond this age were generally more highly educated and in better health than their retired counterparts. In order that all people can work until new statutory retirement ages, the gap between workers and non-workers nearing these ages needs to be bridged. During the past decades, the number of people working beyond the statutory retirement age has increased. Their increase in number begs the question: to what extent did their health and socio-economic characteristics change, and in particular, to what extent did they come to resemble more closely their age-peers who no longer work, but who in the near future need to continue working due to raises in the statutory retirement age?

Beyond health and socio-economic individual characteristics, we examine changes in characteristics of the work carried out by workers beyond age 65. Based on the observed trends, we discuss what continuation of these trends would imply for the feasibility of raising the statutory retirement age, and whether additional measures are needed to extend working lives up to new retirement ages.

We use the nationally representative Longitudinal Aging Study Amsterdam. We compare physical and cognitive health and socio-economic characteristics of workers and non-workers, as well as work characteristics of workers, aged 65–74 years, at seven points in time across 20 years (1993–2012). The study covers a period during which a series of measures were taken to discourage early exit from the labour market, while the statutory retirement age remained the same at 65 years.

Summary of findings

The percentage of 65–74-year-olds who were involved in paid work increased from 5 to 15% during the study period. Those working past the statutory retirement age thus remain a small minority. This minority has a higher level of education than non-workers, a difference that remained constant across the study period. Workers also have higher spendable income and greater income satisfaction than non-workers, but the latter difference decreased during the study period. The proportion of people with a mortgaged home rose more rapidly for workers than for non-workers. Endorsement of a fixed retirement age decreased, with workers more often endorsing a flexible retirement age than did non-workers.

The differences in health between workers and non-workers remained stable; we observed for both groups an increase in the prevalence of chronic diseases and improvement in cognitive functioning. The health gap is particularly large for functional limitations and self-rated health, health factors which elsewhere have been shown to be the strongest predictors of work exit.

Among workers, working hours are low (17 hours on average) and showed a decreasing trend in male and in middle- and higher educated workers. Lower educated workers have on average more chronic diseases, functional limitations and slower walking speed, yet worked increasingly longer hours than higher educated workers.

Policy recommendations

- The stability of the physical health gap between older workers and non-workers suggests that measures are needed in order to allow older people with health impairments to continue working, and to prevent increases in disability pensions. Stimulation of extension of working lives should be accompanied by facilitating workplace measures, especially in jobs requiring physical skills. These include health-promoting interventions, human resource management, and the possibility to adjust the pace of work to the physical or mental condition.
- On the other hand, as many types of work become increasingly more demanding mentally, the increase in level of education and the improving trend in cognitive functioning may facilitate extending working lives in professions requiring cognitive skills. It must be noted that older workers are not likely to fit into any job. During their lifetime, they have built up specific skills that make them better-suited for jobs requiring responsibility, accuracy, and experience – as opposed to jobs involving technological change.
- Workforce participation up to raised statutory retirement ages may be difficult to achieve in older people who have sufficient financial resources, particularly in those who own a home free from mortgage. For this group, other incentives to continue working must be devised.
- The low and ever-decreasing number of working hours of the higher educated is a matter of concern. Accommodation of worker preferences to work shorter hours is likely to prevent early exit from the labour market.
- Finally, the high and increasing endorsement by workers of a flexible retirement age is to be taken seriously. Discussions about a flexible retirement age need to be restarted.

1. Introduction

Most developed countries are experiencing steadily increasing life expectancy of their population, a trend that has been driven, since the second half of the 20th century, by improved mortality in the older population (Christensen et al. 2009). For example, in the Netherlands, between 1992 and 2016, life expectancy at age 65 rose from 15.0 to 18.7 in men, and from 19.5 to 21.4 years in women (Statistics Netherlands 2017a). Because the vast majority of the population aged 65 and over is inactive on the labour market, the increase of the older population implies an increase in pension costs. Moreover, because fertility has been declining since the late 1960s (from an average of 2.7 to 1.7 children per woman; Statistics Netherlands 2016b), the increased pension costs will have to be paid by a diminishing number of workers. To reduce the pressure on the pension system, policymakers in the Netherlands have implemented a range of measures aimed at increasing workforce participation up to the statutory retirement age of 65, which will be followed by a gradual rise in the statutory retirement age itself. This study addresses the feasibility, for the Netherlands, of extending working lives beyond age 65 by focusing on characteristics of the current population aged 65 to 74 years.

Trends in workforce participation

Policy measures aimed at preventing workers retiring before the statutory retirement age appear to have been effective, with the average actual retirement age rising from 62 in 2000 to 64 in 2012 (Statistics Netherlands 2017c). This is a substantial rise, and is even more noteworthy because in the decade before 2000 the actual retirement age remained stable. The rise seems attributable to a series of government measures that were implemented over several years (Vriend et al. 2016). These included cutting the financially attractive early-retirement possibilities while making prolonging work more financially attractive, limiting the duration of unemployment benefits, and limiting early exit through work disability benefits. During this period the statutory retirement age remained fixed at age 65. This is important for our study, as we can consider the same age group over our study period of 1993–2012.

An additional policy measure has involved gradually increasing the statutory retirement age. In the Netherlands, this measure was implemented in 2013. Like pre-statutory retirement workforce participation, post-statutory retirement workforce participation has risen. According to figures from Statistics Netherlands for the age group 65–74, this percentage rose from 5.5% in 2003 to 10.1% in 2016 (Statistics Netherlands 2017d). The increase in workforce participation for this age group begs the

question: did their characteristics change, and in particular, did they come to resemble more closely their age-peers who no longer worked, but who in the near future need to continue working due to projected rises in the statutory retirement age?

Workers versus non-workers past age 65

In view of the rising retirement age, the group of workers past the age of 65 has received increasing attention across Europe (Scherger 2015, Montizaan 2017). Recent studies have shown that characteristics of workers past the current statutory retirement age compare favourably to those of the non-workers. In a study of men working past age 65, Monden (2008) showed that in 2006, these older workers were relatively highly educated. The same is true for women (Dingemans et al. 2016). Continuing workers are also in better health (Dingemans et al. 2016). To date, there are no data indicating the extent to which these characteristics have changed over time. As continuing workers are becoming more numerous, it may be expected that differences in education and health between continuing workers and non-workers will fade away.

Below, we discuss evidence on health trends in the older population and on changes over time in level of education and other socio-economic factors over the past decades.

Health and age

Epidemiological studies of the ageing population show evidence of age-related declines in health. Poor health conditions that have been shown to particularly affect workforce participation are chronic diseases, functional limitations, depressed mood, and poor self-rated health (Leijten et al. 2015, Van Rijn et al. 2014). The proportion of the Dutch population with a chronic disease rises with age, with at age 65 already a prevalence of 75% for any chronic disease (Nivel 2016). The most prevalent diseases at this age are musculoskeletal diseases, heart diseases, diabetes, and various forms of cancer. Moreover, a clear age-related rise is observed in the proportion of the population with multimorbidity (i.e. the presence of two or more diseases in one person). This condition is present in about half of the population aged 65 years (Nivel 2016). Functional limitations (i.e. limitations in performing activities of daily living) also show an increase with age. Mild limitations encompass difficulty in performing activities, whereas severe limitations imply the need for help with activities. According to national data, already 20% of persons aged 65 have mild limitations, and 5% have severe limitations (Van Gool et al. 2014). Depressive symptoms show a decline across adult ages, but are nevertheless present in 20% of the population aged 65 years (De Graaf et al. 2012). A summary measure of health as experienced by the individual is

self-rated health. Although this measure shows less of a decline with age, still one in four men and one in three women in the population aged 65 report less than good health (Statistics Netherlands 2014). A health measure that has received less attention in terms of work participation is cognitive functioning. However, in view of the decrease in physical labour and the concomitant increase in mental labour (Den Butter & Mihaylov 2013, Romeu Gordo & Skirbekk 2013), cognitive functioning is likely to become more important for the ability to work. Like other health aspects, cognitive functioning declines with age, albeit that its decline becomes more prominent at ages above 75. Yet, around age 65 about 2.5% of the population shows some form of dementia (Claassen 2016).

Trends in health over time

Considering the improvement in life expectancy, it may be logical to expect that the health of the older population also improves over time. Unfortunately, the general picture in most European countries is that the increase in life expectancy is not accompanied by a similar increase in the level of health (Luijben et al. 2013). Instead, the age-specific prevalence of chronic diseases is generally increasing over time (Crimmins 2004, Crimmins & Beltrán-Sánchez 2011), while the trend in the prevalence of functional limitations and disability shows variability across countries and over time (Lafortune & Balestat 2007). In particular, for the Netherlands, the trend in functional limitations has been shown to be stable since the early 1990s (Van Gool et al. 2011). Also self-rated health shows a stable trend (Galenkamp et al. 2013), as does depressed mood (De Graaf et al. 2012). According to a very recent study, only cognitive functioning shows a positive trend over the past two decades (Jagger et al. 2016, Essink-Bot et al. 2016). In all, there is no evidence that the health of the population is improving at the same rate as life expectancy is increasing.

Abundant evidence shows that a higher level of education is positively linked to better levels of health, both physically and mentally (Huisman et al. 2003; Murray et al. 2011). Moreover, trends over time in health have been shown to be more positive for the higher than for the lower educated (Helasoja et al. 2006; Hoogendijk et al. 2008).

Socio-economic factors

Since the Second World War, subsequent birth cohorts have enjoyed rising levels of education. In recent decades, these increases have played out in a substantial rise in the level of education in the older population (Joung et al. 2000). As highly educated people are more likely to have intrinsically motivating jobs than are lower educated

people (Henkens & van Solinge 2006), more people may be expected to work beyond age 65.

Several other socio-economic characteristics – including spendable income, wealth and presence of a partner – are indicative of the motivation to continue working (Madero-Cabib & Kaeser 2016). Also, socio-economic characteristics of the geographic area (such as cities versus small towns and industrialised versus agricultural regions) may facilitate continuation of work (Virtanen et al. 2014, Dingemans et al. 2016). Having a low spendable income, being a renter as an indicator of non-wealth, living in a city and living in an industrialised part of the country are factors motivating and facilitating extension of working lives. In contrast, having a partner who does not work is a factor motivating discontinuation of work. These factors may also be understood as proxies for the extent to which continuation of working is voluntary. In addition, norms about the age up to which workforce participation is viewed as normal may change (Dingemans et al. 2016). The past few decades have seen increases in spendable income, wealth, and urbanization. In addition, with regard to married people, labour participation of both spouses has increased. Considering all of these changes, we will examine whether the difference between continuing workers and non-workers fades over time.

Beyond individual characteristics

In addition to individual characteristics, work characteristics are likely to determine if an individual continues working past the statutory retirement age (Pleau & Shauman 2012). Recent decades have seen changes in the type of work, with less emphasis on physical and more emphasis on mental labour (Den Butter & Mihaylov 2013, Romeu Gordo & Skirbekk 2013). This change is attributed to a rise in employment in the service sector and a shrinkage of the traditional sectors agriculture and industry. To the extent that this shift implies that available jobs have become less physically demanding, it might be expected that physical health has become less of an obstacle to participation in the workforce past the statutory retirement age, so that the physical health advantage of workers over non-working age peers may have decreased over time. On the other hand, as available jobs are likely to become more cognitively demanding, a cognitive health advantage of workers may be expected to increase over time.

Aim of this study

By comparing trends over time in the characteristics of workers and non-workers past age 65, and by examining trends in work characteristics, this study explores the

feasibility of extending working lives in the near future, when the statutory pension age is raised to ages well beyond 65. This is particularly relevant because the current situation differs importantly from past experience. In the past, workers beyond age 65 were relatively highly educated. The current need to extend working lives, however, applies equally to higher and lower educated people, which means that all trends are also studied by level of education. Assuming that trends over time will continue in the near future, the findings may suggest some trends that facilitate and other trends that impede the extension of working lives.

2. Methods

Data

This study uses data from the Longitudinal Aging Study Amsterdam (LASA). Details on the sampling and data collection procedures of LASA have been described elsewhere (Huisman et al. 2011). In short, random samples of older adults were recruited in 1992 from population registries of 11 municipalities in three geographical areas in the Netherlands that reflect different socio-cultural values: the secularised West, the Protestant North-East, and the Roman Catholic South. In each area, samples from a larger city and two to four smaller municipalities were recruited, such that the samples from these municipalities reflected the degree of urbanisation of all of the Netherlands. The resulting sample is representative of the Netherlands in terms of urban-rural distribution and socio-cultural values. Because participants were followed in the event that they moved house, by 2012 they lived in over 200 municipalities throughout the Netherlands.

In the first cohort, a total of 3,107 men and women aged 55–85 years were enrolled in 1992–93 (cooperation rate 62%¹). In 2002–03, a second cohort aged 55–64 years was enrolled including 1,002 older adults (cooperation rate 62%). Since the baseline examination, follow-up examinations are repeated approximately every three years by means of a face-to-face interview. The Medical Ethics Committee of the VU University Medical Centre approved the study; informed consent was obtained from all respondents.

For the present study, respondents aged 65 to 74 were selected from each of the seven available measurement waves conducted so far (T1: 1992–93; T2: 1995–96; T3: 1998–99; T4: 2001–03; T5: 2005–06; T6: 2008–09; T7: 2011–12). The number of respondents varied between the measurement waves due to mortality, other reasons for drop-out and the inclusion of the second cohort in 2002–03. The numbers per wave ranged between 637 and 927 (see Table 1).

Measures

Socio-economic characteristics

Gender and *age* were retrieved from the municipality registries. *Partner status*, asked during the interview, indicates having a partner in the household. *Level of education*,

1 The cooperation rate is defined as the number of completed interviews divided by the total number of contacted eligible persons.

asked during the baseline interview, was coded as (1) elementary schooling or less, (2) lower vocational to secondary schooling, and (3) higher education. Income was measured at each wave as *spendable income*, by asking the participant to indicate on a card with 12 categories the category of their income, considering altogether income from work, pensions, other benefits or dividends in their own name. The same question was asked about the partner's income. We calculated an equivalent income for each individual participant by first assigning the middle amount to each category. Subsequently, we summed the incomes of the participant and their partner, and multiplied this by 0.7. This correction is based on the ratio in Dutch state pensions for citizens living alone and living with others. In order to attain comparability of income across the full study period, the incomes measured at waves after 1993 were divided by the inflation factor in each year since 1993. As a measure of wealth, *housing tenure* was determined during the interview by asking the question if the house was rented or owned, and in the latter case, if there was a mortgage or not. Degree of *urbanisation* was measured as number of addresses per square kilometre in the postal code area of the participant, and recoded in five categories from rural (<500 addresses) to very urban (>2,500 addresses). Finally, to assess *personal norms about statutory pension age*, respondents were asked if they agreed with the statement that "there should be a fixed age for statutory retirement". If they agreed, they had to indicate at which age they thought that retirement should be fixed. Since only a small minority agreed with a fixed age, the responses to this question were not useable.

Health measures

Self-rated health (SRH) was measured using the question: How is your health in general? Possible responses were 'very good', 'good', 'fair', 'sometimes good, sometimes poor', or 'poor'? (Van Sonsbeek 1991). Scores range from 1 to 5.

The most frequently occurring somatic *chronic diseases* in the Netherlands at the onset of the study (each 5% or higher in the population aged >55 years) were assessed by self-report: chronic non-specific lung disease, cardiac disease, peripheral arterial disease, stroke, diabetes mellitus, arthritis and cancer (Van den Hoogen et al. 1985). Additionally, respondents were asked whether they had any other (with a maximum of two) chronic conditions that had been present for at least three months. In comparisons with general practitioner records, the accuracy of these self-reports was found to be satisfactory throughout the study period (Galenkamp et al. 2014).

Physical functioning was measured by self-report as well as by an objective test. Self-reported *functional limitations* were assessed by means of six questions about difficulty in carrying out the following activities (derived from the OECD questionnaire;

McWinnie 1981): (Can you) walk outside for five minutes, (un)dress yourself, walk 15 stairs without stopping, sit and rise from a chair, cut your own toenails and use own or public transportation. Response options were (0) 'yes, without difficulty', (1) 'yes, with difficulty', (2) 'only with help' or (3) 'no, I cannot'. The six items were summed to a total score, ranging between 0 zero (no limitations) and 18 (limitations for all six activities). The objective measure is a walk test, measuring the time taken to walk 3 meters, turn 180°, and walk back as fast as possible. From this test, *walking speed* is calculated in m/sec. Walking speed is considered a good, objective indicator of functional limitations (Guralnik et al. 2000).

To measure *depressed mood*, we used the Center for Epidemiological Studies Depression Scale (CES-D). The CES-D scale is a widely used self-report measure of depressive symptoms, consisting of 20 items rated on a 4-point scale, ranging from 0 (rarely or never) to 3 (mostly or always). The total score ranges between 0 and 60 (Radloff 1977). The scale has good criterion validity for major depressive disorder (sensitivity 100%; specificity 88%) and high reliability (Cronbach's $\alpha = 0.87$) in the LASA study (Beekman et al. 1997).

Cognitive impairment is measured using the MiniMental States Examination (MMSE, Folstein et al. 1975). The MMSE is widely used as a tool for monitoring global cognitive functioning, with satisfactory reliability and construct validity (Tombaugh & McIntyre 1992, Hogan et al. 2000). The test consists of 23 items; scores range from 0 to 30, with higher scores indicating better cognitive functioning. Because this measure is highly skewed, particularly in the younger-old, we performed for this study a log transformation of $(31 - \text{mmse score})$, so that higher values indicate worse functioning.

Work characteristics

Work status was defined as having a paid job of one hour or more weekly, in line with the International Labour Organisation definition. If respondents indicated that they did paid work, they were asked how many *hours weekly* they worked and what *type of contract* they had: (1) tenured or family business, (2) temporary, or (3) self-employed or freelance.

Respondents were asked to describe their job precisely. The occupation described by the respondent was coded according to the Netherlands Standard Classification of Occupations 1992 (NSCO92; Statistics Netherlands 2001). These 18 classes were condensed to five *types of occupation*, based on their nature and the sample distribution: (1) agricultural, (2) technical, transport, (3) administrative, commerce, (4) (para)medical, and (5) higher occupations in teaching, security, cultural domains, and management.

Statistical analysis

Data from the age groups 65–74 were pooled across waves, with the addition of a new variable 'time', based on wave number and indicating time from baseline: T1=0, T2=3 ... T7=19. Descriptive statistics of trends over time in individual characteristics by work status, and in work characteristics among the workers, were age- and gender-adjusted, so that changes in these characteristics reflect time trends, and not age- and gender-related compositional changes in the population. This was done by calculating the marginal estimates in Generalized Estimating Equations (GEE) models in SPSS Statistics 20, adjusted for age and gender at each wave (Twisk 2003). This regression method corrects for within-subject correlations by including a pre-specified correlation structure in the analysis. This correlation structure should fit the intercorrelations of each dependent variable at 0, 3, 6, 9, 13, 16 and 19 years. For all outcome measures, an exchangeable correlation structure showed the best fit. This correlation structure assumes that intercorrelations do not depend on the distance in time between two measurements. For the continuous variables, the identity link function was applied; for the dichotomous variables, the logit link function was applied.

For the analysis of differences in time trends in health and socio-economic characteristics by work status, we again applied GEE analyses. First, in models with as dependent variables each of these measures, differences were tested between workers and non-workers. Each model included age at each wave, gender and time. Second, the predictive value of time in years was examined in the same models. The possibility of a non-linear trend over time was tested by adding a quadratic term for time. If time showed a significant association, this was considered to indicate a significant change in the dependent variable over time. Third, in each model for a dependent variable, we added the product term of time in years (and, if significant in the previous step, time-squared) with workforce participation, and then tested for statistically significant contribution to the prediction of the dependent variable. In case a product term was significant, this was considered to indicate that the trend in the dependent variable differed significantly by workforce participation.

In the subsample of workers, time trends in work characteristics were examined by testing linear and quadratic time in years.

The level of statistical significance was $p < 0.05$ for main effects, and $p < 0.10$ for interaction effects, since the power of statistical tests for higher-order terms is generally lower than for first-order terms (Aiken & West 1991, Greenland 2009).

3. Results

The dataset pooled across the seven waves included a total of 5,047 observations coming from 2,428 individual respondents aged 65–74 years (Table 1). From these observations, 525 were from respondents with a paid job of one hour weekly or more. The latter observations came from 334 individual respondents.

Trends in socio-economic, health and work characteristics are shown in Table 1 for workers and non-workers. Appendix 1 shows differences between workers and non-workers by educational level, pooled across time.

Trends in work participation

The percentage of respondents working rose over time (Table 1). In men, the increase was from 8% in 1993 to 20% in 2012, and in women, from 3 to 11%. These increases did not differ significantly (interaction term $\text{year} \times \text{gender}$: $p = 0.462$). The average level of participation was lowest for workers with elementary schooling, followed by workers with middle schooling; participation was highest for the higher educated (5, 9, and 13%, respectively; see Appendix 1). An increase in work participation was seen in all three groups and did not differ between low, middle and high levels of education (interaction term $\text{year} \times \text{education}$: $p = 0.801$). These changes in participation, together with the general rise in level of education (see next paragraph), led to a change in the composition of the continuing workers by educational level: the proportion of higher educated increased from 13 to 27%, whereas the proportion of lower educated decreased from 27 to 13%.

Trends in socio-economic characteristics by work status

Age. Across all measurements, workforce participation declined steadily with rising age: from 19% at age 65 to 7% at age 74 (data not shown). This decline had a similar rate for the three educational levels (interaction term $\text{age} \times \text{sex}$: $p = 0.211$). The workers were somewhat younger than the non-workers, on average 69.1 versus 69.9 years ($p < 0.001$); this difference did not change significantly over time (interaction term $\text{year} \times \text{age}$: $p = 0.910$).

Partner status. Overall, about three-quarters of respondents had a partner in their household; this proportion did not differ significantly by work status. It showed a slight but significant increase over time ($p = 0.023$), a trend that did not differ by work status. Only for measurement wave 2011–12, the interview included the question if the partner works. Work status of the partner was clearly associated with workforce participation of the respondent: the likelihood of continuing to work beyond age 65 was

Table 1. Socio-economic and work characteristics of Dutch 65–74-year-olds with paid work (W) and without paid work (NW) during the period 1993–2012 (Longitudinal Aging Study Amsterdam; data are adjusted for age and sex)

| | 1993 | | 1996 | | 1999 | | 2002 | | 2006 | | 2009 | | 2012 ^{1,2} | |
|---------------------------------------------|------|------|------|------|------|------|----------------|------|------|------|------|------|---------------------|------|
| Full sample (N) | 927 | | 786 | | 741 | | 658 | | 660 | | 638 | | 637 | |
| Paid work (N) | 54 | | 61 | | 43 | | 57 | | 81 | | 123 | | 106 | |
| % paid work ≥ 1 hr** | 5 | | 6 | | 6 | | 8 | | 11 | | 16 | | 15 | |
| | W | NW | W | NW | W | NW | W | NW | W | NW | W | NW | W | NW |
| Socio-economic characteristics | | | | | | | | | | | | | | |
| Age (M)**# | 69.4 | 70.3 | 68.9 | 70.2 | 69.4 | 69.9 | 69.9 | 69.7 | 68.8 | 68.8 | 68.4 | 69.7 | 69.0 | 69.6 |
| % female | 36 | 53 | 36 | 55 | 42 | 54 | 43 | 54 | 41 | 54 | 41 | 54 | 42 | 54 |
| Education: | | | | | | | | | | | | | | |
| % \leq elementary** | 27 | 42 | 26 | 38 | 27 | 35 | 24 | 31 | 19 | 25 | 16 | 21 | 13 | 18 |
| % middle | 60 | 59 | 59 | 52 | 57 | 53 | 59 | 55 | 59 | 59 | 59 | 60 | 60 | 60 |
| % higher** | 13 | 9 | 15 | 10 | 16 | 12 | 17 | 14 | 22 | 16 | 25 | 19 | 27 | 22 |
| Income ³ in 100 Dfl (M)**# | 20.9 | 18.8 | 22.1 | 19.8 | 21.5 | 20.8 | 22.4 | 21.1 | 23.6 | 22.4 | 31.0 | 26.2 | 30.9 | 26.0 |
| Wealth: home | | | | | | | | | | | | | | |
| – Renter**# | 59 | 62 | 59 | 59 | 50 | 55 | 56 | 49 | 45 | 45 | 40 | 42 | 34 | 39 |
| – Owner, mortgage# | 22 | 13 | 20 | 17 | 22 | 23 | 25 | 28 | 40 | 34 | 41 | 36 | 59 | 47 |
| – Owner, no mortgage | 19 | 25 | 21 | 24 | 28 | 22 | 19 | 23 | 15 | 21 | 19 | 22 | 27 | 24 |
| Income satisfaction (0–8) # | 7.0 | 6.7 | 7.4 | 6.5 | 7.1 | 6.9 | 7.1 | 7.0 | 6.8 | 6.7 | 7.3 | 6.8 | 6.8 | 6.8 |
| % living with partner* | 74 | 72 | 70 | 70 | 75 | 69 | 68 | 71 | 75 | 74 | 76 | 76 | 78 | 77 |
| Urbanisation (M)** | 3.0 | 3.0 | 2.8 | 3.0 | 2.8 | 3.0 | 2.9 | 3.0 | 3.0 | 3.0 | 2.9 | 3.0 | 3.1 | 3.1 |
| Geographic area: | | | | | | | | | | | | | | |
| % West | 50 | 45 | 49 | 44 | 48 | 43 | 48 | 42 | 43 | 42 | 43 | 43 | 43 | 42 |
| % North–East | 34 | 30 | 37 | 32 | 34 | 34 | 37 | 34 | 38 | 35 | 37 | 34 | 36 | 34 |
| % South# | 16 | 25 | 14 | 24 | 18 | 23 | 15 | 24 | 19 | 23 | 20 | 23 | 21 | 24 |
| Fixed retirement age: | 9 | 28 | 18 | 29 | 6 | 21 | – ⁴ | – | 5 | 18 | 1 | 12 | 5 | 18 |
| %agree** | | | | | | | | | | | | | | |
| Health characteristics | | | | | | | | | | | | | | |
| Self-rated health** | 2.2 | 2.4 | 2.3 | 2.4 | 2.1 | 2.4 | 2.2 | 2.4 | 2.2 | 2.4 | 2.2 | 2.4 | 2.1 | 2.3 |
| Number chronic diseases** | 1.2 | 1.4 | 1.5 | 1.6 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 2.1 | 1.9 | 2.2 |
| Function limitations (sr)**# | 1.1 | 1.4 | 1.5 | 1.6 | 1.4 | 1.7 | 1.5 | 1.7 | 1.1 | 1.8 | 1.2 | 1.7 | 0.9 | 1.6 |
| Walking speed (tested)** | 0.9 | 0.8 | 0.9 | 0.9 | 0.9 | 0.8 | 0.9 | 0.8 | 1.0 | 0.9 | 1.0 | 0.9 | 0.9 | 0.9 |
| Depressive symptoms | 6.4 | 7.4 | 6.9 | 7.5 | 6.2 | 7.8 | 8.9 | 8.3 | 6.8 | 7.9 | 6.7 | 7.5 | 5.7 | 7.5 |
| Cognitive functioning** | 1.0 | 1.1 | 1.0 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 0.9 | 0.8 | 0.9 |
| Work characteristics (Workers only) | | | | | | | | | | | | | | |
| Hours work/week (M) ** | 26 | | 19 | | 15 | | 17 | | 16 | | 15 | | 14 | |
| Type of contract: | | | | | | | | | | | | | | |
| % tenured or family | 27 | | 30 | | 16 | | 21 | | 16 | | 24 | | 23 | |
| % temporary* | 27 | | 42 | | 60 | | 53 | | 55 | | 51 | | 51 | |
| % self-employed | 46 | | 28 | | 24 | | 26 | | 29 | | 25 | | 26 | |
| Sector: | | | | | | | | | | | | | | |
| % agricultural* | 13 | | 9 | | 7 | | 6 | | 4 | | 3 | | 3 | |
| % technical,transport | 20 | | 23 | | 23 | | 30 | | 33 | | 34 | | 25 | |
| % adminis,commerce | 13 | | 20 | | 16 | | 16 | | 18 | | 13 | | 21 | |
| % (para)medical | 21 | | 21 | | 22 | | 20 | | 17 | | 22 | | 22 | |
| % teaching,security, cultural,management | 33 | | 27 | | 32 | | 28 | | 28 | | 28 | | 29 | |

Marginal means from Generalised Estimating Equations (GEE) adjusted for age and sex, estimated at age 69.8 years

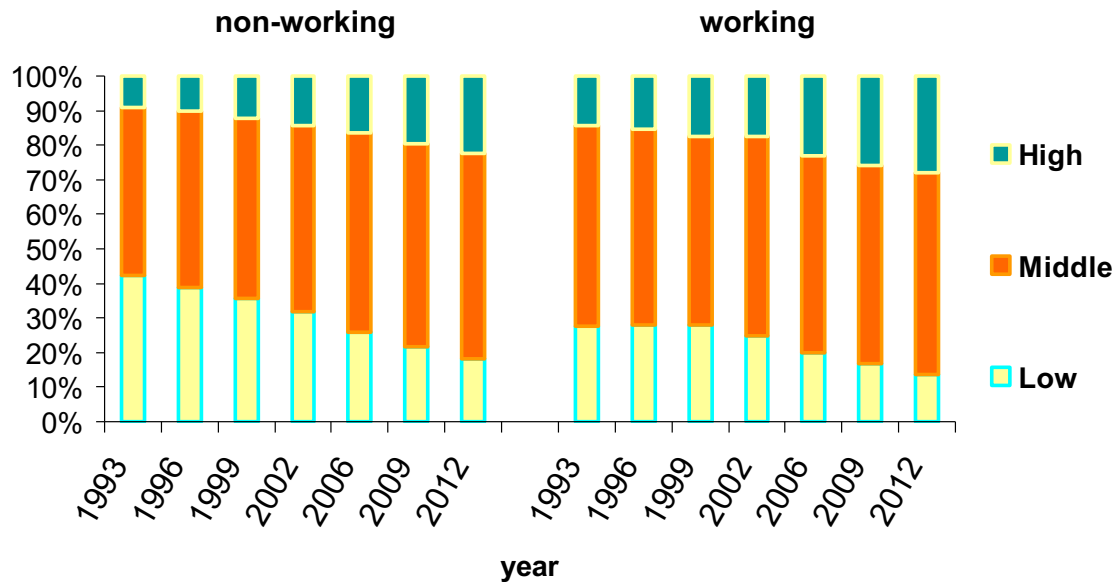
1 significant (linear) trend based on GEE adjusted for age and sex: * $p < 0.05$; ** $p < 0.01$

2 trend in workers deviates from that in non-workers testing interaction term year*work: # $p < 0.05$

3 Income is spendable income per month, corrected for partner status and for inflation since 1993

4 No data for 2002

Figure 1. Level of education 65–74-year-olds without and with paid work 1993–2012 (Longitudinal Aging Study Amsterdam).



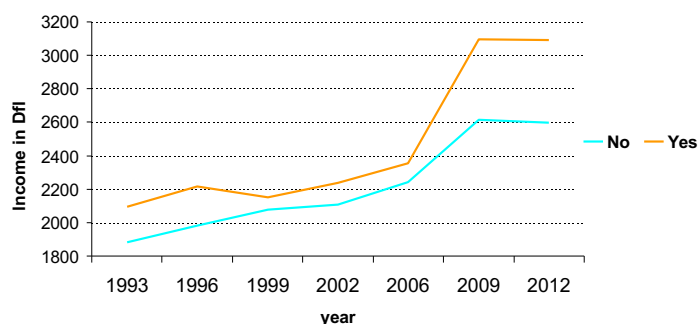
Note: Significant difference between non-workers and workers in higher and lower education (both: $p < 0.001$), but not in middle education ($p = 0.372$); significant decrease in proportion lower ($p < 0.001$), increase in proportion higher educated ($p < 0.001$), and no change in proportion middle educated; no significant difference in trend between workers and non-workers ($p > 0.25$).

higher when the partner also worked, the more so for men (46% vs 23%, $p < 0.001$) than for women (33% vs 11%, $p = 0.013$).

Education. The level of education was higher in the workers than in the non-workers by about 12 percentage points, and increased significantly over time in both groups with no significant difference in rate of increase (Figure 1).

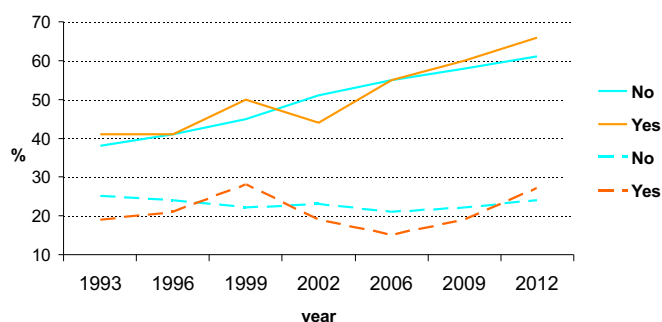
Income and wealth. Spendable income rose until 2009, from which year the rise stopped. Across the 20-year period, workers had higher spendable incomes than non-workers, and in the 2000s, their spendable income rose faster than that of non-workers (interaction term year*income: $p = 0.038$) (Figure 2a). Wealth, as indicated by homeownership, rose throughout the study period both for continuing workers and for non-workers, from about 40 to 63%. However, during the 2000s homeownership rose faster for workers (interaction term year*ownership: $p = 0.044$) (Figure 2b). Moreover, compared to non-workers, the proportion of workers with a mortgage on their home rose faster (interaction term year*mortgage: $p = 0.086$). Although income satisfaction was higher among workers than among non-workers, income satisfaction increased over time among non-workers, which was not the case for workers (interaction term year*satisfaction: $p < 0.001$) (Figure 2c). For all three

Figure 2a. Spendable income 1993–2012, by workforce participation (No/Yes), ages 65–74 years (Longitudinal Aging Study Amsterdam).



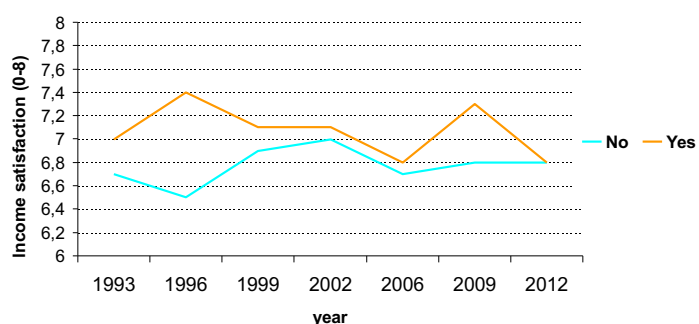
Note: Marginal estimates for age 69.8 from Generalised Estimating Equations (GEE) adjusted for age, sex. Significant difference workers–non-workers ($p < 0.001$); significant trend difference workers–non-workers (interaction year*work, $p = 0.038$).

Figure 2b. Homeownership 1993–2012, by workforce participation (No/Yes), ages 65–74 years (Longitudinal Aging Study Amsterdam). Continuous line: homeownership. Broken line: homeownership without mortgage.



Note: Marginal estimates for age 69.8 from Generalised Estimating Equations (GEE) adjusted for age, sex. No significant difference workers–non-workers ($p > 0.20$); significant trend difference workers–non-workers (interaction year*work, $p = 0.044$).

Figure 2c. Satisfaction with income 1993–2012, by workforce participation (No/Yes), ages 65–74 years (Longitudinal Aging Study Amsterdam).



Note: Marginal estimates for age 69.8 from Generalised Estimating Equations (GEE) adjusted for age, sex. Significant difference workers–non-workers ($p = 0.004$); significant trend difference workers–non-workers (interaction year*work, $p < 0.001$).

indicators of income and wealth, lower values were found in the lower than in the higher educated, while the differences between workers and non-workers were the same across educational levels.

Region. Both workers and non-workers lived in increasingly urbanised areas. As reflective of the Dutch population, almost one-half lived in the West of the Netherlands, and just over one-third in the North-East. There were no differences according to workforce participation. However, the higher educated lived in areas with a higher level of urbanisation and more often in the West of the Netherlands.

Personal norm about pension age. A minority of 65–74-year-olds felt that statutory retirement should be at a fixed age. This minority was smaller in workers than in non-workers. Moreover, this minority declined over the decades from 9 to 5% among continuing workers, and from 28 to 18% among non-workers. This decline was significant in both workers and non-workers, and did not differ between these groups (interaction term year*norm: $p = 0.175$). Lower educated people agreed significantly more often with a fixed retirement age than did higher educated people.

Table 2. Trends over 1993–2012 in physical and mental health in 65–74-year olds: (1) difference between workers and retired; (2) trend in full sample; (3) trend difference between working and retired participants (Wald chi-square test; significance)

| | (1) Difference in health by work status | | | (2) Health trend in full sample ¹ | | | (3) Difference in health trend by work status ² | |
|-----------------------------|-----------------------------------------|--------|--------|----------------------------------------------|---------|--------|------------------------------------------------------------|--------------|
| | B | Wald | p | B | Wald | p | Wald | P |
| Self-rated health | 0.172 | 18.696 | <0.001 | -0.002 | 1.021 | 0.312 | 0.131 | 0.718 |
| Number of chronic diseases | 0.137 | 6.422 | 0.011 | 0.038 | 139.922 | <0.001 | 0.844 | 0.358 |
| Functional limitations (sr) | 0.432 | 28.508 | <0.001 | | | | | |
| – linear | | | | 0.066 | 16.840 | <0.001 | 4.486 | 0.034 |
| – quadratic | | | | -0.003 | 15.603 | <0.001 | 4.964 | 0.026 |
| Walking speed (tested) | -0.078 | 26.666 | <0.001 | | | | | |
| – linear | | | | -0.003 | 1.950 | 0.163 | 1.155 | 0.282 |
| – quadratic | | | | 0.001 | 8.837 | 0.003 | 1.512 | 0.219 |
| Depressive symptoms | 0.970 | 9.114 | 0.003 | | | | | |
| – linear | | | | 0.144 | 8.194 | 0.004 | 0.713 | 0.328 |
| – quadratic | | | | -0.008 | 9.017 | 0.003 | 1.618 | 0.203 |
| Cognitive functioning | 0.031 | 0.991 | 0.320 | -0.012 | 61.698 | <0.001 | 0.363 | 0.547 |

1 Linear association with time in years; trends are tested for linearity by including a quadratic term for time; if the quadratic term is non-significant, test results are shown for the model with only the linear term

2 Tested by adding an interaction term of time*[health variable]

Abbreviation: sr, self-reported

Trends in health by work status

Trends in physical and mental health for continuing workers and non-workers are shown in a series of figures (3a – f). Relevant test parameters appear in Table 2. All health variables showed better health for the participants with paid work, with the exception of cognitive functioning, where no difference was observed. The size of the difference by work status can be assessed considering the Wald statistic: self-reported physical functioning showed the largest differences, followed by self-rated health.

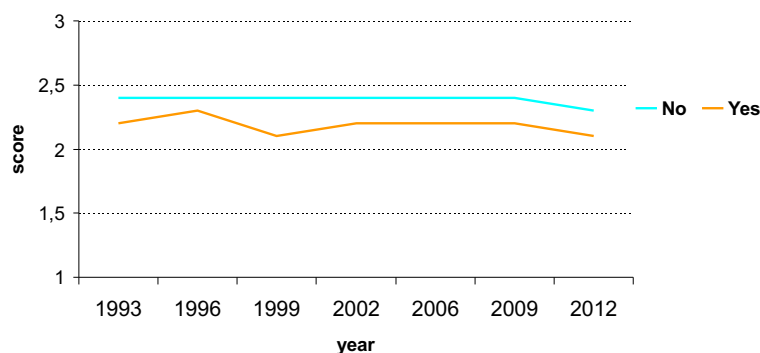
Furthermore, all health variables showed significant change over time, with the exception of self-rated health, which showed a stable trend (Table 2, column (2) and Figure 3a). For chronic diseases, a linearly increasing trend was observed, whereas for cognitive functioning a linearly decreasing trend was seen, meaning that cognitive functioning over time improved (Figures 3b and 3f). Three health variables showed non-linear trends (Figures 3c, d and e). The number of self-reported functional limitations rose up to about 2004 and improved afterwards, with steeper improvement in workers. This trend difference is accounted for by the changed composition of the group of workers in terms of a greater proportion of higher educated (data not shown). Objective physical functioning showed the lowest walking speed slightly earlier, around 2000, and improvement after that. Depressed mood showed a peak around 2000, improving afterward to the level of 1993. Except for the improvement in functional limitations, none of these health trends were statistically significantly different between workers and non-workers (Table 2, column (3)).

It must be noted that all indicators of health (except for depressed mood) showed poorer levels for the lower than for the higher educated (Appendix 1). The educational differences were greatest for functional limitations and walking speed. These health differences were similar in workers and non-workers (no interaction term education*work was significant).

Trends in work characteristics

Working hours. Regarding work characteristics (Table 1, lower part), the number of hours worked decreased over time ($p = 0.041$). In fact, this decrease only occurred in men (from 24 to 12 hours), whereas in women the number of hours worked remained stable at the lower level of nine hours on average. The higher educated worked on average fewer hours than the lower educated. Furthermore, whereas the lower educated showed an initial decrease in working hours in the early 1990s, their number of working hours rose gradually from 10 in 1996 to 17 in 2012. In contrast, the number of working hours of the middle- and higher educated remained stable across this period at 10 hours (interaction term year*education: $p = 0.054$) (Figure 4). Thus, in 2012,

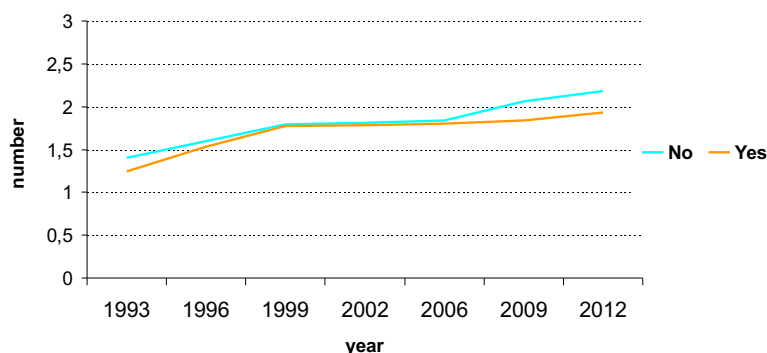
Figure 3a. Self-rated health 1993–2012, by workforce participation (Longitudinal Aging Study Amsterdam).



Note: Marginal estimates for age 69.8; GEE model adjusted for age, sex.

Difference workers–non-workers: $p < 0.001$; no significant trend difference workers–non-workers (interaction year*work, $p = 0.72$)

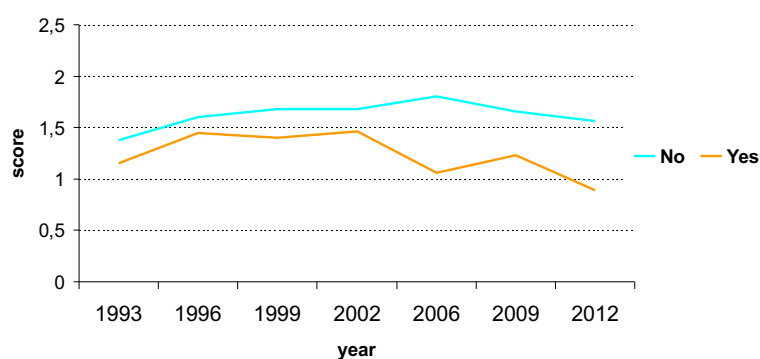
Figure 3b. Number of chronic diseases 1993–2012, by workforce participation (Longitudinal Aging Study Amsterdam).



Note: Marginal estimates for age 69.8; GEE model adjusted for age, sex.

Difference workers–non-workers: $p = 0.011$; no significant trend difference workers–non-workers (interaction year*work, $p = 0.36$)

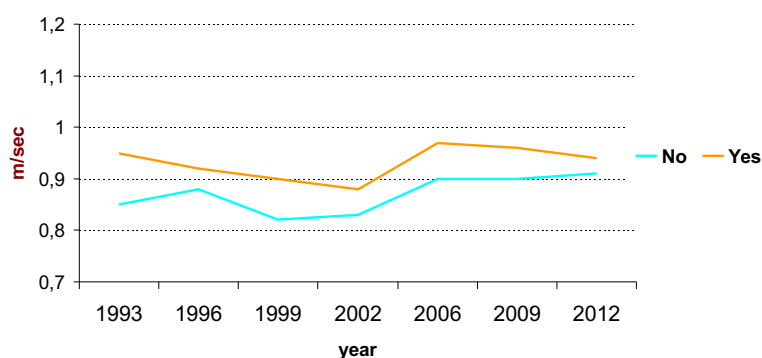
Figure 3c. Functional limitations 1993–2012, by workforce participation (Longitudinal Aging Study Amsterdam).



Note: Marginal estimates for age 69.8; GEE model adjusted for age, sex.

Difference workers–non-workers: $p < 0.001$; significant trend difference workers–non-workers (interaction year(sq)*work: $p = 0.026$)

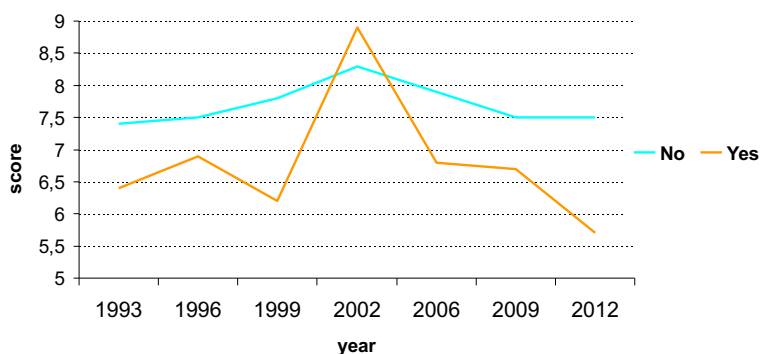
Figure 3d. Walking speed 1993–2012, by workforce participation (Longitudinal Aging Study Amsterdam).



Note: Marginal estimates for age 69.8; GEE model adjusted for age, sex.

Difference workers–non-workers: $p < 0.001$; no significant trend difference workers–non-workers (interaction year-square*work, $p = 0.22$)

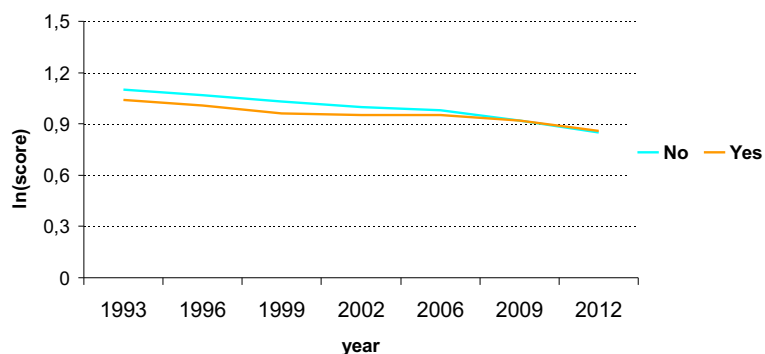
Figure 3e. Depressed mood 1993–2012, by workforce participation (Longitudinal Aging Study Amsterdam).



Note: Marginal estimates for age 69.8; GEE model adjusted for age, sex.

Difference workers–non-workers: $p = 0.003$; no significant trend difference workers–non-workers (interaction year-square*work, $p = 0.20$)

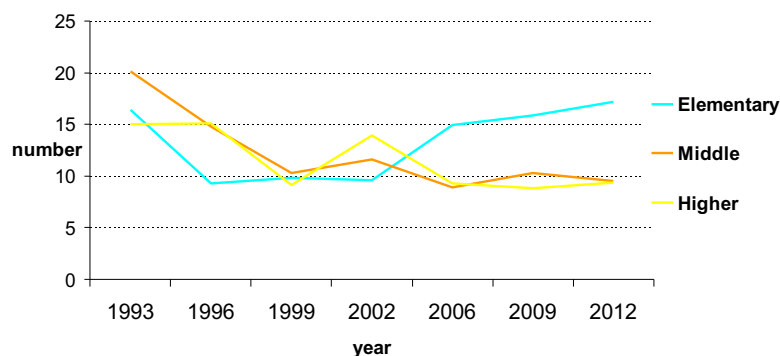
Figure 3f. Cognitive functioning 1993–2012, by workforce participation (Longitudinal Aging Study Amsterdam).



Note: Marginal estimates for age 69.8; GEE model adjusted for age, sex.

No Difference workers–non-workers: $p = 0.32$; no significant trend difference workers–non-workers (interaction year*work, $p = 0.55$)

Figure 4. Hours of work 65–74-year-olds by level of education, 1993–2012 (Longitudinal Aging Study Amsterdam).



Note: Marginal estimates for age 68.8 years; GEE model adjusted for age, sex. No difference between levels of education: $p=0.70$; marginally significantly decreasing trend overall ($p=0.080$); educational difference in trend: decline in middle and higher, increase in elementary educated workers ($p(\text{interaction education} \times \text{year})=0.054$).

the lower educated worked substantially more hours than the middle- and higher educated (17 versus nine hours). More detailed analysis of the general decrease in working hours showed that the rise in chronic disease prevalence and the increase in temporary contracts accounted for 43% of the decrease (data not shown).

Type of contract. The majority of the contracts were temporary (47.5%). Contracts were tenured or in a family business in 20.7% of the cases, and the remaining 31.9% were self-employed. Over time, the proportion of work in temporary contracts increased substantially from 27 to 51% ($p = 0.002$) and tenured work or work in self-employment showed non-significant decreases ($p = 0.438$ and 0.107 , respectively). Furthermore, the lower- and middle educated had more often a tenured job than the higher educated ($p < 0.001$), whereas there were no educational differences in the other contract types.

Sector. Regarding the sector in which 65–74-year-olds worked, on average 9.5% was agricultural, 32.0% technical or transportation, 15.9% administrative or commercial, 18.9% (para)medical, and 23.7% in higher occupations in teaching, security, cultural domain, or management. Over time, agricultural work decreased substantially ($p = 0.046$), while work in the administrative and commerce sectors increased (marginally significant, $p = 0.077$), and work in other sectors showed no significant change. There were also educational differences in sectors: the lower educated had greater representation in the agricultural and technical/transport sectors ($p = 0.013$ and < 0.001 , respectively), whereas more than half of the higher educated had jobs in the higher sectors ($p < 0.001$).

4. Discussion

This study aimed to assess the feasibility of extending working lives beyond age 65 by deriving projections for the near future from the changes in the workforce participation of the 65–74-year-olds during the past decades. Considering that a very small minority of this age group worked in the 1990s – a minority that grew substantially up to 2012 – we attempted to identify factors that induced greater workforce participation over time. Thus, we examined trends in health and socio-economic characteristics in 65–74-year-olds, comparing those who did not work with those who continued working, as well as trends in work characteristics among the continuing workers.

During our study period of 1993–2012, we saw an increase in work participation, with similar rates of increase in men and women and in lower-, middle- and higher educated people. Yet, at the end of the period the workers still constituted a minority, with percentages between 10 and 20%, depending on the gender and educational level. During this period, the Dutch government gradually implemented policy measures to increase workforce participation up to the statutory retirement age (65 years). This was at first done by restricting disability pension eligibility (from the mid-1990s), then also by restricting the unemployment benefit period (early 2000s), and finally, by abolishing early retirement regulations (from 2006). Despite all of these policy measures, the statutory retirement age was left at 65 years, so that any direct influence on workforce participation from age 65 onwards is unlikely. Indeed, from our data it can be seen that workforce participation increased gradually, rather than at an accelerated pace such as in the age group 55–64 years after the abolishment of early retirement (Statistics Netherlands 2016d). However, in view of the worldwide financial crisis in 2008, a decrease in work participation might have been expected. The observation of a continued increase in workforce participation may suggest that a policy measure ‘carry-over’ effect up to age 65 to ages beyond 65 may have compensated the potential effects of the financial crisis.

The continuing workers spent relatively few hours on paid work: on average, no more than around 17 hours weekly. Moreover, the number of working hours decreased in the course of the study period. This was especially true for men and for the middle- and higher educated workers. The increase in chronic diseases accounted for part of the decrease in working hours. This suggests that the workers who could afford to work fewer hours chose to reduce their hours when they faced a chronic disease. In contrast, after an initial decline, the weekly hours of the lower educated increased since the early 2000s. Although the lower educated are more likely to have chronic diseases, they appear to be less able to decrease their working hours.

We expected an initial health advantage of workers past the statutory retirement age over their non-working age peers. This was substantiated for all health variables except cognitive functioning. In both workers and non-workers, chronic diseases showed increases, whereas cognitive functioning showed improvements, and self-rated health showed a stable trend. Non-linear trends indicating initial worsening and subsequent improvement were observed for functional limitations (both self-reported and tested) and depressed mood. Meanwhile, no differences in health trends between workers and non-workers were observed. Returning to our expectations stated in the Introduction, the workers had a health advantage over the non-workers, but this health advantage neither increased nor decreased over time. The health gap between workers and non-workers thus remained the same. This gap was largest for functional limitations and self-rated health. The literature shows that exactly these health measures are strong predictors of exit from work (Van den Berg et al. 2010; Van Rijn et al. 2014).

Within the subsample of workers, the increase in cognitive functioning was partly explained by the higher level of education of subsequent cohorts of workers, and by the shift away from the agricultural sector and the shift towards more work in the administrative and commerce sectors. These shifts correspond to the findings by Romeu Gordo and Skirbekk (2013), implying a rise in jobs requiring cognitive skills.

The observed educational difference between workers and non-workers calls for further interpretation. It may be that older people, due to age-related health declines, either select themselves into less physically demanding jobs (which are generally jobs for the more highly educated) or do not work past the statutory retirement age. Taking together the improvement over time in cognitive functioning at the population level, the increase in jobs that require cognitive skills, and the increase in the proportion of workers past the statutory retirement age, older people seem to have used the greater opportunity to select themselves into these jobs. Nevertheless, some lower educated older people do work past the statutory retirement age. Within the subsample of workers, the lower educated had substantially poorer health compared to their more highly educated age peers. It has been suggested that the higher educated work past the statutory retirement age because they enjoy working, and the lower educated do so out of financial necessity (Henkens & Van Solinge 2006). This implies that the education-based health differences that are well-known in the general population are reproduced in the subsample of workers past the statutory retirement age. So far, the proportion of lower educated among the continuing workers is very small. When greater numbers of lower educated people need to work past age 65, the education-based health differences may become exacerbated because of

the poorer health in combination with more physically demanding work conditions of the lower educated.

In interpreting the current findings in terms of the feasibility of working up to an ever-higher retirement age, it should be kept in mind that older people who worked past the statutory retirement age up to 2012, generally did so voluntarily. As the statutory retirement age increases, workforce participation will no longer be voluntary up to ages well above 65. This may mean that the group of workers included in our study is not comparable to future workers beyond age 65. To assess the extent to which the current continuing workers are or are not comparable to the future workers beyond age 65, we attempted to obtain more clarity about the voluntariness of continued workforce participation. A Swiss study on the voluntariness of the decision to postpone retirement showed that those who were more likely to opt for later retirement were more highly educated and had benefited from periods of economic expansion. In contrast, those who were compelled to extend their working lives were more often self-employed (e.g., farmers) and widowed persons, which may mean that they had experienced a significant reduction in financial resources (Madero-Cabib & Kaeser 2016). In line with these findings, in our study we attempted to address the extent of voluntariness by examining financial resources, such as spendable income, homeownership, and satisfaction with income. We found that continuing to work is associated with owning a home that still has a mortgage, which is the case for a growing group of older people. This factor may motivate people to continue working, albeit not voluntarily. At the same time, the rise in the statutory retirement age may be especially hard to realise in older people who have sufficient financial resources, particularly in those who own a home free from mortgage. Current spendable income actually proved to be higher for those who continued working than for the non-workers, which suggests that continuation of work by people with higher incomes was predominantly done on a voluntary basis. Continuing workers also had greater income satisfaction, but in this respect the difference with the non-workers decreased over time. Furthermore, not surprisingly, the continuing workers more often favoured a flexible retirement age than did the non-workers. This difference did not change over time. Also, the higher educated favoured this flexibility more than their lower educated counterparts did. Possibly, the lower educated have greater need of the social protection that a fixed retirement age provides.

Strengths and limitations of the study

This study's strengths include its long historic trend perspective of 19 years, its broad variety of health measures, including self-reported and objectively tested, and its

combination of individual characteristics with characteristics of the work performed. Of course, this study also has some limitations. First of all, its numbers of continuing workers are relatively small, so that subdivision by e.g. sector becomes perilous. Because of the small numbers, some work types may have been combined that show different trends and different associations with health over time. For example, the technical and transportation domains were combined into one category. Second, since this is a trend study, which is based on cross-sectional data at subsequent waves, it does not allow causal inferences.

Implications and further research

Implications of this study stem first of all from the stability of the difference in health between workers and non-workers. As workers currently continuing to work voluntarily beyond age 65 are relatively healthy, the policy measures aimed at extending working lives for less healthy people should be accompanied by facilitating workplace measures, or else there may be an increase in disability pensions. This is especially urgent for jobs performed by the lower educated. Workplace measures that have been studied include health-promoting interventions, human resource management, and the possibility to adjust the pace of work to the worker's physical or mental condition (AKC library, www.bibliotheek-arbeidenchronischeziekte.nl). These studies have been performed in younger age groups, and may not be optimally applicable to age groups beyond 65 years. For example, this age group will experience increasing pressure to provide informal care, not only to ageing partners, but particularly to parents who are increasingly likely to reach very old ages. Future research on possibilities to extend working lives will need to incorporate these personal pressures.

Furthermore, older workers are not likely to fit into any job, as there are notable differences in skills between younger and older workers. During their lifetime, older workers have built up specific skills that allow them to fit better into jobs requiring responsibility, social skills, accuracy, and experience, and render them less well-suited for jobs involving technological innovation (Fouarge 2011). Further research on extending working lives should include such job characteristics. In this respect, it is also important to involve employers, as they may have stereotypical views regarding the skills of older workers (Oude Mulders et al. 2014).

Our finding regarding the low number of working hours and the decrease in working hours of the higher educated suggests that it will be difficult to achieve employment up to retirement age in full-time jobs. Measures that accommodate workers' preferences to work shorter hours are likely to prevent early exit from work. Furthermore, our finding of a high and increasing endorsement among workers of a

flexible retirement age suggests that it may be well worth examining to what extent flexibilisation of the statutory retirement age (and accompanying financial measures) would improve labour participation compared to a fixed statutory retirement age for all.

Finally, as the numbers of health-impaired people working beyond age 65 are likely to increase, the question arises what this means for their healthcare utilisation and costs. Further research should include not only pension costs but also costs incurred in the healthcare sector.

In conclusion, the policy to raise the statutory retirement age should be accompanied by several specific measures that will increase the likelihood that older workers actually reach the statutory retirement age while in the labour force. With such measures in place, pension and healthcare costs that accompany the ageing of the population have a better chance of being counteracted by the benefits of extension of working lives.

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Appendix

Characteristics of Dutch 65–74-year-olds with and without paid work by level of education during the period 1993–2012 (Longitudinal Aging Study Amsterdam; data are adjusted for age, sex, and wave)

| | Elementary or less | | Vocational or secondary | | Higher | |
|--------------------------------------------|---------------------|----------------|-------------------------|-----------------|--------------------|----------------------|
| Full sample (N) | 1582 | | 2665 | | 800 | |
| % paid work ≥1 hr | 5 | | 9 | | 13** | |
| | No work (n=1504) | Work (n=78) | No work (n=2370) | Work (n=295) | No work (n=648) | Work (n=152) |
| Individual characteristics | | | | | | |
| Age (M) | 70.0 | 69.0 | 69.9 | 69.1 | 69.8 | 69.0 ⁺⁺ |
| % female | 67 | 66 | 50 | 49 | 32 | 32 ^{****} |
| Income ¹ (M) | 1746 | 2131 | 2197 | 2341 | 3091 | 3395 ^{****} |
| Home (%): | | | | | | |
| – Renter | 64 | 63 | 49 | 49 | 32 | 32* |
| – Owner, mortgage | 17 | 22 | 25 | 26 | 43 | 50+ |
| – Owner, no mortgage | 19 | 15 | 26 | 25 | 25 | 18 |
| Income satisfaction (0–8) | 6.3 | 6.4 | 6.8 | 7.2 | 7.3 | 7.3 ^{**} |
| % living with partner | 68 | 69 | 77 | 80 | 69 | 66 ^{**} |
| Urbanisation (M) | 2.8 | 2.8 | 3.0 | 3.0 | 3.3 | 3.3 ^{**} |
| Geographic area (%): | | | | | | |
| – West | 38 | 38 | 44 | 44 | 50 | 50 ^{**} |
| – North–East | 37 | 37 | 33 | 33 | 25 | 25 |
| – South | 24 | 23 | 22 | 22 | 25 | 24 |
| Fixed retirement age: %agree | 28 | 16 | 20 | 6 | 11 | 4 ^{****} |
| Health | | | | | | |
| Self-rated health | 2.5 | 2.2 | 2.3 | 2.2 | 2.2 | 2.1 ^{***} |
| No. of chronic diseases | 1.9 | 1.6 | 1.8 | 1.6 | 1.5 | 1.5 ^{**} |
| Functional limitations (sr) | 2.1 | 1.6 | 1.4 | 1.0 | 1.0 | 0.9 ^{****} |
| Walking speed (tested) | 0.81 | 0.88 | 0.88 | 0.95 | 0.93 | 0.97 ^{****} |
| Depressive symptoms | 8.7 | 6.8 | 7.2 | 6.5 | 6.8 | 6.3 ⁺⁺ |
| Cognitive functioning | 1.24 | 1.25 | 0.93 | 0.97 | 0.72 | 0.67 ^{**} |
| Work characteristics | | | | | | |
| Hours work/week (M) | – | 20 | – | 17 | – | 15 |
| Type of contract: | | | | | | |
| % tenured or family | – | 22 | – | 29 | – | 9 ^{**} |
| % temporary | – | 54 | – | 44 | – | 54 |
| % self-employed | – | 21 | ..– | 25 | – | 32 |
| Sector ² : | | | | | | |
| % agricultural | – | 8 | – | 4 | – | 0* |
| % technical, transport | – | 40 | – | 29 | – | 12 ^{**} |
| % adminis, commerce | – | 6 | – | 19 | – | 21 |
| % (para)medical | – | 27 | – | 21 | – | 14 |
| % teaching, security, cultural, management | – | 19 | – | 27 | – | 53 ^{**} |

Marginal means from Generalised Estimating Equations (GEE) adjusted for age and sex, estimated at age 69.8 years

* $p < 0.05$; ** $p < 0.01$ indicates significant differences between levels of education, based on GEE adjusted for age, sex, and wave

+ $p < 0.05$; ++ $p < 0.01$ indicates significant differences between workers and non-workers, based on GEE adjusted for age, sex, and wave

indicates significant interaction between level of education and work status

1 Income is spendable income, corrected for partner status and for inflation since 1993

2 60 (of 526) respondents with missing values

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