Changes in working life expectancy with disability in the Netherlands, 1992-2016
by van der Noordt M, van der Pas S, van Tilburg TG, van den Hout A, Deeg DJH

The manuscript reveals that between the 1990s and 2010s, subsequent generations of older workers have extended their working lives with disability. In view of current policy regulations, working life expectancy with disability is likely to increase even more. The findings emphasize the importance of workplace interventions that facilitate older workers with disability to remain satisfied and productive in the workforce.

Affiliation: Department of Epidemiology and Biostatistics, Amsterdam Public Health Research Institute, Amsterdam UMC, Vrije Universiteit Amsterdam, the Netherlands. m.vandernoordt@vumc.nl

Refers to the following texts of the Journal: 2003;29(2):134-142 2014;40(5):473-482 2008;34(2):83-95

Key terms: ageing; disability; older worker; retirement; the Netherlands; work ability; working life; working life expectancy

This article in PubMed: www.ncbi.nlm.nih.gov/pubmed/30176168

Additional material
Please note that there is additional material available belonging to this article on the Scandinavian Journal of Work, Environment & Health-website.
Changes in working life expectancy with disability in the Netherlands, 1992–2016

by Maaike van der Noordt, MSc,1 Suzan van der Pas, PhD,1, 2 Theo G van Tilburg, PhD,2 Ardo van den Hout, PhD,4 Dorly JH Deeg, PhD1

van der Noordt M, van der Pas S, van Tilburg TG, van den Hout A, Deeg DJH. Changes in working life expectancy with disability in the Netherlands, 1992–2016. Scand J Work Environ Health. 2019;45(1):73–81. doi:10.5271/sjweh.3765

Objectives Like other western countries, the Netherlands has abolished early retirement schemes and is currently increasing the statutory retirement age. It is likely that also older workers with disabilities will be required to work longer. We examine the change in working life expectancy (WLE) with disability of older workers by comparing data from three periods: 1992–1996, 2002–2006 and 2012–2016.

Methods Data are from the Longitudinal Aging Study Amsterdam (LASA). Respondents aged 55–65 with a paid job at baseline were included (N=1074). Disability was measured using the Global Activity Limitations Indicator (GALI). First, a continuous-time three-state survival model was created. Second, WLE with and without disability were estimated using MSM and ELECT in R. The modifying effects of gender and educational level were examined.

Results Among those initially in paid employment, total WLE increased over 20 years. For example at age 58, total WLE increased from 3.7 to 5.5 years. WLE with disability at age 58 increased from 0.8 to 1.5 years. There was no difference in WLE with disability between male and female workers or low- and highly educated workers.

Conclusions Between the 1990s and the 2010s, subsequent generations of older workers with disabilities have extended their working lives. The findings emphasize the importance of workplace interventions that facilitate older workers with disabilities to maintain well-being and work ability. In addition, the question arises whether current exit routes out of the workforce are still adequate.

Key terms ageing; older worker; retirement; work ability.

Western societies are facing demographic changes such as ageing of the population and shrinkage of the workforce (1). Like other policy-makers, the Dutch Government has taken action to counteract the negative financial consequences of these changes. Policy measures include discouraging early work exit through early retirement, disability pensions and unemployment by making these routes less attractive. In addition, the statutory retirement age is currently being raised. Parallel to these policy measures, the average actual retirement age has increased from <61 years in the early 1990s to 64.5 years in 2016 (2, 3).

In the 1990s and early 2000s, employers and the Dutch Government financially supported early retirement, which was common (3). However, this regulation has been phased out since 2005/2006 and early retirement has become financially unattractive (4, 5). Furthermore, the statutory retirement age, with its accompanying basic state pension, is increasing gradually from 65 years in 2012 to 67 years and three months in 2022; a further increase is foreseen (6, 7). Since 1966, workers with occupational limitations due to poor health could rely on the social security system to receive a disability benefit. In 2002, regulations were adjusted to support disabled workers with trainings and trial placements in order to withdraw them from and prevent them from entering the disability scheme; in 2006, the qualification criteria for receiving a disability pension became stricter (8, 9). From 1987, people who became unemployed and met specific criteria were eligible for benefits for

1 Department of Epidemiology and Biostatistics, Amsterdam Public Health Research Institute, Amsterdam UMC, Vrije Universiteit Amsterdam, the Netherlands.
2 Faculty of Health, University of Applied Sciences Leiden, Netherlands.
3 Department of Sociology, Vrije Universiteit Amsterdam, the Netherlands.
4 Department of Statistical Science, University College London, United Kingdom.

Correspondence to: M. van der Noordt, Department of Epidemiology and Biostatistics, Amsterdam Public Health Research Institute, Amsterdam UMC, Vrije Universiteit Amsterdam, the Netherlands De Boelelaan 1089A, 1081 HV Amsterdam, The Netherlands. [E-mail: m.vandernoordt@vumc.nl]
The extent to which changes in employment policy regulations have affected the number of years older adults work with disability is yet unknown. This can be evaluated using the Working Life Expectancy (WLE) measure. This summary measure is similar to life expectancy, which is often divided in years into good and poor health (18), but with exit from the workforce as the final state instead of death. In a recent systematic review, self-perceived health, mental health, chronic diseases and respiratory diseases increase the likelihood of early exit. This exit has several routes, eg, via disability benefits, unemployment or early retirement (13). Older adults who continue working despite poor health may experience reduced productivity. Musculoskeletal Complaints, multimorbidity and psychological disorders are associated with low performance and increased sickness absence (15). Other studies stress that it is not the disease itself that limits work participation, but the consequences of the disease and, in particular, associated disabilities (16, 17). Changes in working life expectancy with disability have the potential to reduce health care costs and the burden of unemployment (23). Due to policy changes that have limited disability routes in the Netherlands, we expect that the number of years older adults work with disability has increased. In addition, we expect that men and low-educated people work increasingly more years with disability compared to women and highly educated people, respectively.

Methods

Data are from the Longitudinal Aging Study Amsterdam (LASA). LASA is a continuing Dutch population-based cohort study on predictors and consequences of changes in physical, cognitive, social and emotional functioning with age (26, 27). The first LASA cohort (1992/1993) consisted of 3017 older adults aged 55–85, of which 966 were aged 55–65. In 2002/2003 and 2012/2013, new cohorts were started with 1002 and 1023 adults aged 55–65 years, respectively. Follow-up interviews took place every three years. For this study, data of the first two observations were analyzed (T0 and T1). Observations in 1992/1993, 2002/2003 and 2012/2013 were considered as baseline for the three cohorts. Respondents with a paid job at baseline were selected (N=1315). We defined disability as the inability to work due to low-back pain, comparing workers with high versus low physical load. Lieve et al (21) compared healthy life expectancy with healthy WLE at age 50 in 12 European countries. In their study, the unhealthy state was a combination of a chronic physical or mental health problem, illness or disability and limitations in daily activities. Although various health measures were used in these studies, all emphasize the importance of considering disability when addressing WLE. It can be expected that WLE with disability is different for men and women, as well as low- and highly educated workers. Women often work part-time and men full-time. The age threshold to exit the workforce may be lower for women. This is in particular the case for women with a partner because the household is often less dependent on the income of the woman (23, 24). Lieve et al (21) showed that in the Netherlands, at age 50, unhealthy WLE was 2.1 years for men and 1.5 years for women. Based on these gender differences and the policy reforms regarding early exit that have taken place, we expect that in particular men work increasingly more years with disability. With regard to educational level, there is evidence that highly educated workers have the economic resources to exit work early. As early retirement schemes have been diminished and disability schemes have become stricter, we expect that, particularly in recent years, low-educated workers have been working with disability for more years compared to highly educated workers (25).

This study examines the change in WLE of older workers with disability by comparing cohort data of three different time periods: 1992–1996, 2002–2006 and 2012–2016. Due to policy changes that have limited disability routes in the Netherlands, we expect that the number of years older adults work with disability has increased. In addition, we expect that men and low-educated people work increasingly more years with disability compared to women and highly educated people, respectively.

Sample

Outcome

The outcome variable consists of three possible states, being in the workforce without disability (state 1), in the workforce with disability (state 2) and out of the workforce (state 3). At baseline, all respondents are in either the first or second state. At follow-up, they are in all three states. Disability is measured using the Global Disability Indicator (28) in LASA. The following questions are asked: “Do health problems limit your normal daily activities?” (yes; severely; yes moderately; no) and, if so, “Do these limitations last for more than three months?” (yes; no). If both questions were positively, the respondent was classified as having disability. This binary variable is commonly used for estimating healthy life expectancies (29). Two other measures of disability were used to check the robustness of findings: six self-reported questions and a Chair Stand Test. The six questions concerned difficulty in climbing or descending stairs of 15 steps without stopping, getting dressed and undressed, sitting down and standing up from a chair, cutting one’s toenails, walking outside for five minutes, and using public transport. These questions were selected from the validated Organization for Economic Cooperation and Development Questionnaire (30). If the respondent had (some) difficulties on at least one question, he or she was classified as having disability. The Chair Stand Test involved standing up and sitting down with folded arms, five times at usual pace. The total time needed was recorded by the interviewers. To categorize this variable, quartiles were used based on the time required in the total LASA sample in this age group (31). Respondents in the upper quartile (requiring ≥13 seconds to perform the test), those who used their arms to help, those who could not perform the test at all, were categorized as having disability.

In state 3, the respondents have stopped working. The age at which people stopped paid work was assessed with the question “In which month and which year did you stop doing paid work?” If the month and year of exit from the workforce was unknown (N=36), the date halfway between the two interviews was used to calculate the age of exit from the workforce. For deceased respondents (N=20), the age of exit from the workforce is calculated based on the date of death minus six months – provided this date was not earlier than the baseline interview – because it can be assumed that in most cases there has been a period of illness before death in which respondents did not work.

Covariates

Age at the time of the interview was based on the date of interview and the birthdate. The birthdate and gender were obtained from the municipal registry. Highest level of education completed comprises three levels: low (elementary school, lower vocational education or less), moderate (general intermediate, intermediate vocational, and general secondary education), and high (higher vocational education, college). Highest level of education was considered as continuous variable; cohort, gender and educational level as dummy variables.

Statistical analyses

Baseline characteristics were examined for the three cohorts, including a breakdown for workers with and without disability stratified by cohort and gender, and by cohort and educational level. Age was used as continuous variable; cohort, gender and educational level as dummy variables.
Results

Baseline descriptive characteristics

The proportion of workers with disability increased over the cohorts, as well as the proportion of female workers (table 1). Educational level increased over the cohorts both for workers with and without disability. Moreover, in the third cohort, workers without disability were more often highly educated, while workers with disability were more often moderately educated. Mean age increased only among workers without disability.

Number of years worked with disability

In figure 1, the estimated WLE are presented for each age year for all initial workers independent of their health state. For example, at the age of 58, total WLE was 3.7 years (95% CI 3.2–4.2) in the first cohort, 4.6 years (95% CI 4.0–5.1) in the second cohort, and 5.5 years (95% CI 4.9–6.0) in the third cohort. Across these cohorts, the estimated number of years worked with disability also increased. It was 0.8 (95% CI 0.6–1.1), 1.1 (95% CI 0.8–1.4), and 1.5 (95% CI 1.2–2.0) years, respectively in the three cohorts. In the increase in number of years worked with disability over the three cohorts is related to the increase in the prevalence of disability (see table 1). Furthermore, workers who already had a disability stayed in the workforce longer while having a disability. figure 2 shows that at the age of 58, this number of years increased from 2.2 years (95% CI 1.5–3.1) in the first cohort, to 2.6 (95% CI 2.0–3.3) in the second, and to 3.4 years (95% CI 2.7–4.3) in the third cohort.

Gender differences in WLE

There were no gender differences in total WLE, WLE with disability and WLE without disability between workers in the three cohorts. Neither was there an interaction of cohort with gender in state transitions (results available in supplementary file B, www.sjweh.fi/show_abstract.php?abstract_id=3765).

Education-based differences in WLE

Estimates of WLE stratified by educational level showed no difference in WLE with disability between low- and highly educated workers in any of the cohorts (see table 2). There were education-based differences in total WLE in the second and third cohort. Highly educated workers had a higher total WLE compared to low-educated workers. Tests of interaction effects of cohort with educational level indicated that differences between low, moderate and highly educated workers did not change over time (results available online in supplementary file C, www.sjweh.fi/show_abstract.php?abstract_id=3765).

Discussion

This study aimed to examine the change in WLE with disability of older workers comparing cohorts of workers in the 1990s, 2000s and 2010s. WLE with disability of older workers, independent of their health state, increased over the years. There were no differences in WLE with disability between male and female workers, and between low- and highly educated workers.

Contextualizing the results

For workers aged ≥55, WLE with disability increased over the years. This is due to an increase in both the disability prevalence among older workers and the number of years older workers with disability remain in the workforce. The incremental increase in the second and the third cohort suggests a direct effect from the abolishment of early exit routes and stricter requirements for disability benefits. These measures were introduced between 2002–2006 (9). However, other societal developments also have contributed. The increase in educational level and decrease of physical labor has enabled older workers to work until older ages (34). Moreover, the awareness that peers are also working until older ages has been suggested to enhance older workers’ willingness to continue working (35).

This study showed that there were no differences in WLE with disability between male and female workers, nor did this potential difference increase over the years. We hypothesized that women would have a lower WLE with disability compared to men, which is in line with previous research (21). Women often have part-time jobs with a corresponding lower income, and most of them have a broad-winning male partner who is usually older (23, 24, 36). Both may lower the threshold for women to exit early (22). However, working in a part-time job may also facilitate older women to continue working. These opposing factors appear to outweigh each other. Data from Statistics Netherlands show that only since 2012 have women exited the workforce earlier compared to men. The difference increased from 0.1 year in 2012
to 1.0 year in 2016 (2). However, these small differences in the 2010s did not appear to affect WLE with disability differently for men and women in our study and did not, therefore, increase the gender differences.

In addition, we hypothesized that WLE with disability would be negatively related to highly educated workers, in particular in the third cohort. Good economic circumstances offer opportunities for early exit (37), and highly educated workers generally have more economic resources at their disposal compared to low-educated workers (25). However, this hypothesis was not supported. There was no difference in WLE with disability between low- and highly educated workers. Neither did we observe an increase in the elderly in the cohorts. It seems that the reformed social security is still adequate enough in giving low-educated workers the opportunity to exit the workforce early, which keeps socioeconomic differences limited. Data from Statistics Netherlands show that low-educated workers indeed more often exit the workforce through disability and unemployment schemes (2). Another explanation could be that highly educated workers choose to continue working with disability, while low-educated workers are required to continue working, which masks socioeconomic differences.

It may be expected low-educated workers suffer more from continuing work with disability compared to highly educated workers. First, low-educated workers have more job and health-related problems, which makes it more difficult to perform the job in presence of disability (38, 39). Second, low-educated workers are less likely to cope with their disability in their job (40). Third, highly educated workers more often make use of part-time retirement arrangements, which enables them to continue working with disability while low-educated workers continue working in their normal intensity (41). Therefore, especially highly educated workers, working with disability could result in a discrepancy between job requirements and work capabilities (14), which in turn can affect their work ability and productivity (42), as well as their well-being (43).

Methodological considerations

The use of data from the Longitudinal Aging Study Amsterdam (LASA) has several advantages. First, LASA is based on a representative sample of the Dutch older population, which offers a representative sample of the older working population as well. Second, LASA started in 1992, which provides an unique opportunity to compare WLE with disability over a period of 20 years. Third, in LASA multiple measures are available for disability. This allowed us to conduct a robustness check of our findings. Similar results were found when different measures of disability were used. There are also limitations of this study. First, the sample of workers was relatively small. This gives statistical power issues when subgroups are compared. However, in the main analysis the three cohorts were pooled, improving the power. Still, we refrained from building an extended multivariate model and added the covariates gender and educational level separately in the model. Second, we included respondents in paid employment at baseline and exit from work was an absorbing state, meaning that non-workers who returned to work are not represented. Thus, WLE is estimated for workers only and not for all persons at a particular age. This may limit comparability with other studies, eg, Lièvre et al (21) and Nummen et al (44). However, it is likely that omitting those who only returned a once, as a dummy exit from the workforce. The increased WLE with disability asks for re-evaluation of the current exit routes out of the workforce.

In view of the ongoing increase in the statutory retirement age, WLE with disability and possible differences between men and women, and between low- and highly educated workers, should be monitored to prevent socioeconomic differences.

Concluding remarks

Between the 1990s and the 2010s, subsequent generations of older workers have extended their working lives with non-standard work. The findings emphasize the importance of workplace interventions that facilitate older workers with disability to maintain well-being and work ability. In addition, the question arises whether current exit routes out of the workforce are still adequate. The authors declare no conflict of interest.

References

1. European Commission. White paper: An agenda for adequate, safe and sustainable pensions. Brussels: European Commission, 2012. Report No: COM(2012) 55 final.
2. Statline.cbs.nl. Van arbeid naar pensioen; pensioen 55 jaar van ouder [From labor to retirement; persons aged 55 years and older]. Den Haag:Hersen: Statistics Netherlands. [Accessed 2018 July 5]. Available from: http://statline.cbs.nl/Statweb/p ublication/DM/SLNL#DA/200911en#SD/1;3-5&3D0;D3;94&D1;0&D2;0&D7;WED=2-1&DHDR=T, G6&STB=G1;G2;G3;G4;G5;G7;VW=T.
3. van Nieuwen W, Beets G. Social situation observatory. Demographic monitor 2005. Demographic trends, socioeconomic impacts and policy implications in the European Union. The Hague: Netherlands Interdisciplinary Demographic Institute, 2006. Report No. 72.
4. Organisation for Economic Co-operation and Development (OECD). Ageing and employment policies: Netherlands 2014: Working better with age. Paris: OECD Publishing; 2014.
5. Overheid.nl. Wat aanpassing fiscale behandeling VUT/ prenopenzijn en introductie levensloopregeling [Tax Treatment for Voluntary Early Retirement-Pre-pension and Introduction of Life-course Savings Scheme] [Adjustment Act]. Den Haag: Rijksoverheid, 2005 [Cited 2018 Feb 27]. Available from: http://wetten.overheid.nl/BWBR0108053-2014-12-20.
6. Rijksoverheid.nl. Tekomst pensioenstelsel [Future pension system]. Den Haag: Rijksoverheid; 2018 [Cited 2018 Aug 29]. Available from: https://www.rijksoverheid.nl/onderwerpen/pensionsteken/tekomstpensioenstelsel.
7. Overheid.nl. Wet verhoging AOW- en pensioenrichtleeftijd [Increase of the General Old Age Pension and the pension target age Act]. Den Haag: Rijksoverheid; 2012 [Cited 2018 Feb 27]. Available from: http://wetten.overheid.nl/BWBR0003799-2016-01-01.
8. Organisation for Economic Co-operation and Development (OECD). Sickness and disability schemes in the Netherlands. Country memos as a background paper for the OECD Disability Review. Paris: OECD Publishing; 2007.
9. van Oorschot W. Narrowing pathways to early retirement in the Netherlands. Benefits. 2007;15(3):247-55.
10. Government.nl. Q = U Aemplement insurance. Den Haag: Rijksoverheid; 2011 [Cited 2018 Feb 27]. Available from: https://www.rijksoverheid.nl/documenten/healths/2011/10/20/ q-a-unemployment-insurance.
11. Overheid.nl. Wet inkomensvoorziening ouderen volwassenen [Act on income provisions for older unemployeed persons]. Den Haag: Rijksoverheid, 2008 [Cited 2018 Feb 27] Available from: http://wetten.overheid.nl/BWBR0024394-2016-08-01.
12. Hoeymans N, Wong A, van Gool CH, Deij NJ. Nusselder WJ, de Kleer MM et al. The disabling effect of diseases: a study on trends in diseases, activity limitations, and their interrelationships. Am J Public Health 2012 Jan;102(1):163-70. http://dx.doi.org/10.2105/AJPH.2011.309266.
13. van Rijn RM, Robroek SJ, Brouwer S, Burdorf A. Influence of poor health on exit from paid employment: a systematic review. Occup Environ Med 2014 Apr;71(4):295–301. http://dx.doi.org/10.1136/ooemed-2013-101591.

14. Blokesch M, Solem PE. Working conditions and early retirement: A prospective study of retirement behaviour. Rex Aging 2005;27(1):3–30. http://dx.doi.org/10.1177/0167380205271438.

15. van den Heuvel SG, Geurkens GA, Hoofman WE, Koppes LL, van den Bosche SN. Productivity loss at work, health-related and work-related factors. J Occup Rehabil 2010 Sep;20(3):331–9. Epub 2009 Nov 19. http://dx.doi.org/10.1007/s10899-009-9219-7.

16. Alavinia SM, de Boer AG, van Duivenbode KC, Frings-Dresen MH, Burdorf A. Determinants of work ability and its predictive value for disability. Occup Med (Lond) 2009 Jan;59(1):32–7. Epub 2008 Dec 17. http://dx.doi.org/10.1093/occmed/kqp148.

17. de Klerk MM. Rapportage gehandicapt in 2000. Arbeidsmarktpositie en financiële situatie van mensen met beperkingen en/of chronische ziekten [Report on the disabled 2000]. Den Haag: Sociaal en Cultureel Planbureau, 2000.

18. Mathers CD, Sadana R, Salomon JA, Murray CJ, Lopez AD. Healthy life expectancy in 1991 countries. 1999. Lancet 2001 May;575(2999):1685–91. http://dx.doi.org/10.1016/S0140-6736(00)04824-8.

19. Nurminen MM, Heathcote CR, Davis RA. Estimating marginal cohort working life expectancies from sequential cross-sectional survey data. J Off Stat 2004;20(3):495.

20. Burdorf A, Jansen JP. Predicting the long term course of low-back pain and its consequences for sickness absence and associated work disability. Occup Environ Med 2006 Aug;63(8):522–9. http://dx.doi.org/10.1136/oem.2005.019745.

21. Lievre A, Jouf F, Banyas T, Serret C, Brouard N, Robine JM et al. Healthy working life expectancies at age 50 in Europe: a new indicator. J Nutr Health Aging 2007 Nov-Dec;11(6):508–14.

22. CBS.nl. Arbeidssamen [Labor participation]. Den Haag/ Heerlen: Statisties.Netherlands; [cited 2013 Feb 27]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=82090NED&CBS=1&D&D=1&ST&D=7-8&ядер0=4,5,14,19,24,28,34,38,44,49,54,59,64,68&HDR=G&ESTB=G1,G2,G3,T&V=7.

23. Haussmann R, Tyson L, Zabahi S. The Global Gender Gap Report 2017. Geneva: World Economic Forum, 2017.

24. CBS.nl. Welvaart van personen [Welfare of people]. Den Haag/Heerlen: Statisties.Netherlands. Available from: https:// openstatdata.cbs.nl/statline/CBS.nl/dataset/83740NED/table?ve=1527691062413.

25. Visser M. Inequality between older workers and older couples in the Netherlands. A dynamic life course perspective on educational and social class differences in the late career. Nijmegen: Radboud University; 2017.

26. Huisman M, Poppeelaars J, van der Horst M, Beekman AT, Brug J, van Tilburg TG et al. Cohort profile: the Longitudinal Aging Study Amsterdam. Int J Epidemiol 2011 Aug;40(4):868–76. http://dx.doi.org/10.1093/ije/dyr129.

27. Hoogendoek EJ, Deeg DJ, Poppeelaars J, van der Horst M, Brouwer van Gunzenou MC, Comijs HC et al. The Longitudinal Aging Study Amsterdam: cohort update and major findings. Eur J Epidemiol 2016 Sep;31(9):927–45. http://dx.doi.org/10.1007/s10654-016-0192-0.

28. Robine JM, Jagger C. Euro-REVES Group. Creating a coherent set of indicators to monitor health across Europe: the Euro-REVES 2 project. Eur J Public Health 2003 Sep;13(3 Suppl 6):6–14. http://dx.doi.org/10.1093/eurpub/ckp006.

29. Jagger C, Gilles W, Moscone F, Cambois E, Van Oyen H, Nusselder W et al.; ELFE team. Inequalities in healthy life years in the 25 countries of the European Union in 2005: a cross-national meta-regression analysis. Lancet 2008 Dec;372(9656):1214–31. http://dx.doi.org/10.1016/S0140-6736(08)61594-9.

30. McWhinney JR. Disability assessment in population surveys: results of the O.E.C.D. Common Development Effort. Rev Epidemiol Sante Publique 1981;29(4):413–9.

31. Penninx BW, Deeg DJ, van Eijk JT, Beekman AT, Gurinuk JM. Changes in depression and physical decline in older adults: a longitudinal perspective. J Affect Disord 2000 Dec;61(1–2):1–12. http://dx.doi.org/10.1016/S0165-0327(00)00152-X.

32. Jackson CH. Multi-state models for panel data: the MSM package for R. J Statsoft. 2011;38(1):29. http://dx.doi. org/10.18637/jss.v038.i08.

33. van den Hout A. ELIECT: Estimation of life expectancies using continuous-time multi-state survival models. ELIECT version 0.2. Vignette. 2016.

34. Setzertsen RA Jr, Hagestad GO. What’s the latest? II. Cultural age deadlines for educational and work transitions. Gerontologist 1996;36:5.602–13. http://dx.doi.org/10.1093/geront/36.5.602.

35. van Solinge H, Henkens K. Involuntary retirement: the role of restrictive circumstances, timing, and social embeddedness. J Gerontol(B) Psychol Sci Soc Sci 2007 Sep;62(5):S285–9. http://dx.doi.org/10.1093/geronb/62.5.S295.

36. Eisemann M. Retiring together? Challenges for dual earners. Demos 2018;34(5):1–3.

37. Stattin M. Retirement on grounds of ill health. Occup Environ Med 2005 Feb;62(2):135–40. http://dx.doi. org/10.1136/oem.2004.015669.

38. Kösten L. Verzorgende beroepen psychisch en fysiek zwaar belastend [Nurturing professions psychologically and physically stressful]. Socialeconomische Trends. 2008(1).

39. Henkens K, Van Solinge H, Damman M, Dimgmanns E. Taken by surprise: how older workers struggle with a higher retirement age. Demos 2016;32(3):1–2.

40. Bengtsson S, Datta Gupta N. Identifying the effects of retirement on the ability to cope with a disability among individuals with disabilities. PLoS One 2017 Mar;12(3):e0173659. http://dx.doi.org/10.1371/journal.pone.0173659.

41. Henkens CJ, van Dijk HP, van Solinge H. De vervagende grens tussen werk en pensioen: over doorwerkers, doorstarters en herintreders [The fading border between employment and retirement. About continuing to work and re-entering employment]. Amsterdam: KNAW Press; 2009.

42. Leijten FR, van den Heuvel SG, Ybema JF, van der Beek AJ, Robroek SJ, Burdorf A. The influence of chronic health problems on work ability and productivity at work: a longitudinal study among employees. Scand J Work Environ Health. 2014 Sep;40(5):473–82. http://dx.doi.org/10.5271/sjwhh.3444.

43. Daly MC, Gardiner CS. Disability and Subjective Well-Being: Stanford, CA: Stanford University Press; 2013.

44. Nurminen MW. Worklife expectancies of fixed-term Finnish employees in 1997–2006. Scand J Work Environ Health. 2008 Apr;34(2):81–95. http://dx.doi.org/10.5271/sjwhh.1222.

45. Eiwals R, Boeters S, Bosch N, Deelen A, ter Weel B. Arbeidsmarkt ouderen en duurzame inzetbaarheid [Older workers and sustainable employability]. Den Haag: CPB, 2013.

46. Choi BC. Definition, sources, magnitude, effect modifiers, and strategies of reduction of the healthy worker effect. J Occup Med 1992 Oct;34(10):979–88.

47. Ilmarinen J. Ageing workers in the European Union: status and promotion of work ability, employability, and employment: Finnish Institute of Occupational Health, Ministry of Social Affairs and Health, Ministry of Labour; 1999.

48. Delattie SL, Haaften KA, van Dijk FJ. What employees with rheumatoid arthritis, diabetes mellitus and hearing loss need to cope at work. Scand J Work Environ Health 2003 Apr;29(2):134–42. http://dx.doi.org/10.5271/sjwhh.715.

49. Cloosterman L, Bekkers MB, Ueters E, Proper KI. The effectiveness of interventions for ageing workers on (early) retirement, work ability and productivity: a systematic review. Int Arch Occup Environ Health 2015 Jul;88(5):521–32. http://dx.doi.org/10.1007/s00420-014-1069-y.

Received for publication: 28 February 2018.