Labour market trajectories and early retirement due to permanent disability: a study based on 14 972 new cases in Spain

Fernando G. Benavides[1,2,3], **Xavier Duran**[1,2,3], **David Gimeno**[1,2,4], **Christophe Vanroelen**[5,6,7], **José Miguel Martínez**[1,2,3]

[1]Center for Research in Occupational Health (CiSAL), Department of Experimental and Health Sciences, University Pompeu Fabra, Barcelona, Spain

[2]CIBER de Epidemiología y Salud Pública (CIBERESP), Spain

[3]IMIM Parc Salut Mar, Social epidemiology and occupational health group, Barcelona, Spain

[4]The University of Texas School of Public Health, Department of Epidemiology, Human Genetics & Environmental Sciences, San Antonio Campus, Texas, USA

[5]Interface Demography, Department of Sociology, Division of Epidemiology, Human Genetics & Environmental Sciences, Vrije Universiteit Brussels, Belgium

[6]Research Foundation Flanders, Brussels, Belgium

[7]Health Inequalities Research Group (GREDS), Department of Political and Social Sciences, Employment Conditions Knowledge Network (EMCONET), Universitat Pompeu Fabra, Barcelona, Spain

Abstract

Background: To analyse the impact of labour market trajectory indicators on early retirement, measured by age at onset of permanent disability (PD).

Methods: Four labour market trajectory indicators were reconstructed in 14 972 new cases of PD recognized between 2004 and 2010: (1) number of employment contracts, (2) number of unemployment periods, (3) number of periods without social security affiliation and (4) percentage of time spent in inactivity. The outcome was measured as the age at onset of PD. Median differences and 95% confidence intervals (95%CI) were compared using a median regression. Analyses were stratified by sex and adjusted for occupational category and total time elapsed between the beginning of working life and the age at onset of PD: separately for each labour market indicator, and adjusted for each other.

Results: In men, the age at the onset of PD for workers with 15 or more employment contracts decreased by 4.8 years; and for workers with five or more periods without affiliation it decreased by 4.6 years. In women, the corresponding decreases were 5.8 years for 15 or more contracts and

Correspondence: Fernando G. Benavides, CiSAL-Universitat Pompeu Fabra, Parc de Recerca Biomèdica de Barcelona, Dr. Aiguader 88, 08003 Barcelona, Spain, Tel: (+34) 93 316 08 75, fernando.benavides@upf.edu.

Conflicts of interest: None declared.

7.2 years for five or more unaffiliated periods. The results for four indicators slightly changed when they were mutually adjusted.

Conclusions: Poor employment conditions, such as having a high number of periods without affiliation, a high number of contracts (in men) and a higher percentage of inactive time (in women) are associated with early retirement due to PD.

Introduction

Permanent disability (PD) refers to the legal recognition of a permanent reduction in a person's ability to perform usual work activities because of an injury or disease, supposedly for their remaining lifetime. The criteria for recognition may vary by country, but typically workers are required to have been affiliated with the country's social security system during some time prior to the granting of PD. In high-income countries, PD of individuals of working age represents a social and economic problem,[1] contributing to early retirement and significantly reducing workforce capacity while placing a burden on the social security system. In Spain, around 90 000 new PD cases have been granted every year over the last 10 years,[2] which represents a prevalence of about 5% (around 950 000 PD cases) of the working age population and a cost of €11 billion annually in terms of social benefits.[3]

To prevent early exit from the workforce and to increase employment rates of older age individuals,[4] we need an improved understanding of the factors that predict PD in the actively working population. Both health and working conditions appear to be related to PD. For instance, in the SHARE study,[5] the first longitudinal European project including data on working conditions, retirement and health among people aged 50 years and older, poor quality of the psychosocial work environment has been associated with disability[6] and with the intention to retire early[7]. There is also evidence showing that hazardous physical job demands[8] and psychosocial work-related factors[9] are linked to early retirement due to disability. Additionally, ill health,[10] deterioration of self-perceived health,[11,12] and previous sick leave episodes[13] have been related to early retirement or later disability pension.

Beyond specific working conditions or health status, employment conditions (e.g. number and type of contract, social benefits, wages, collective bargaining coverage, etc.) may also contribute to the age at onset of PD. This may be the case particularly, in a context of great financial costs associated with the ageing of the European workforce[14] and in times where employment conditions are becoming more flexible and insecure[15] under the influence of structural labour market changes brought on by deregulation. In fact, job insecurity has been identified as a major risk factor for workers' health[16] for both temporary and permanent employees. There is also evidence of increases in long-term work disability following major organizational change, such as the transfer of public sector activities to private companies.[17] Also, insecurity, measured by the number of unemployment periods, has been associated with a reduced sense of psychological wellbeing.[18] In a previous study, we found that the number of job contracts during a short time period before the onset of PD was significantly related to a higher number of potential years of working life lost prior to the official age of retirement.[19] The aim of this study was to examine the effect of several labour market

trajectory indicators, under the hypothesis that poor employment conditions are associated with early retirement due to PD.

Methods

Study design

The study is based on the Continuous Working Life Sample (CWLS),[20] a retrospective cohort formed in 2004 by a random sample of 4% (1.1 million) of the individuals affiliated with the Spanish Social Security System, including those who were employed, self-employed, unemployed receiving an unemployment benefit and pensioners. The CWLS is updated annually, maintaining individuals from the previous years who continue their affiliation during the current year and incorporating new individuals to maintain the overall representativeness of the reference population by sex, age, province and nationality. Approximately 88% of the initial 2004 sample was still in the cohort in 2010. While maintaining the anonymity of each individual, the CWLS collects data on all employment periods of an individual involving social security coverage. The CWLS also includes individual-level data on each PD recognized by the social security system. Such recognition requires undergoing an extensive examination by a Medical Impairment Evaluation Unit. A degree of PD can be granted based on the worker's ability to work despite the health condition. For this study, we considered only individuals with full PD, which are those who lost at least 55% of their ability to perform their current job. Between 2004 and 2010, 14 972 new cases of full PD were identified in the CWLS sample.

Measures

The dependent variable was the age at the onset of PD. For each PD case started between 2004 and 2010, we reconstructed the complete labour market trajectory from 1981 (the date at which Spanish social security data are considered exhaustive and of high quality), to the onset of PD. If the worker first became affiliated with the Spanish Social Security after January 1, 1981, the date of affiliation was used as the starting point. A total of 7167 (47.9%) PD cases contained information since 1981. On the basis of the data available in the CWLS, we created the following four indicators of labour market trajectories: (1) the number of new job contracts a worker had signed as an indicator of job instability; (2) the number of unemployment periods while receiving benefits as an indicator of job insecurity; (3) the number of periods longer than 30 days without affiliation (without work nor receiving an unemployment benefit) as an indicator of exclusion from the labour market and (4) the ratio (expressed as a percentage) of inactive time (i.e. unemployed or not affiliated) to the total potential working time (i.e. working or unemployed or not affiliated) as a summary indicator of labour market engagement. These four indicators were analysed separately to investigate their individual effects.

To explore dose–response relationships, the four indicators were categorized into tertiles, given that there were no theoretical criteria for categorization available. This resulted in the following categorizations: (1) for number of contracts: up to 5, from 6 to 14 and 15 or more; (2) for number of unemployment periods: up to 1, from 2 to 4 and 5 or more; (3) the same categories applied to the number of periods without affiliation and (4) for the

percentage of inactive time with respect to total potential working time: <7%, from 7 to 32% and more than 32%. Furthermore, occupational categories were derived from the registry data: skilled non-manual, skilled manual, unskilled non-manual, and unskilled non-manual. This information was taken at the moment the PD was recognized.

Analysis

Initially, we computed the median age at the onset of PD, as well as its 25th and 75th percentiles, for each of the labour market trajectory indicators. The difference in medians of the age at the onset of PD and respective 95% confidence intervals (95% CI) were estimated based on median regression models,[21] separately for each labour market indicator. We then ran a model with the four indicators adjusted for each indicator to examine to what extent the individual effect of each indicator was explained by the other factors. The lowest category of the labour market indicator served as the reference category (with a value of zero). The interpretation of coefficients in median regression models is analogous to ordinary linear regression, but uses the median instead of the mean. For instance, with a binary predictor such as sex (e.g. men = 0, women = 1) the constant is the median for the group coded zero (men). Also, assuming that other variables in the model are fixed, the regression coefficient for the sex variable indicates the effect on the outcome of a unit change in that variable (i.e. from 0 to 1) or, in other words, the difference in the outcome in medians between the category for which the variable is 1 (i.e. women) and the reference category 0 (i.e. men). As is the case in ordinary linear regression, if the 95% CI does not include 0, it indicates that the differences between the medians of both groups are not zero in the population, which is considered to be statistically significant assuming a significance level of 0.05. All analyses were stratified by sex, and differences in median estimation were adjusted for the total individual time to the onset of PD from either January 1, 1981 or the beginning of working life (if this occurred after January 1, 1981), and occupational category. All analyses were conducted using Stata 10.1.

Results

A total of 14 972 new PD cases (5058 women; 9914 men) were granted between 2004 and 2010. Half of the cases began their PD before age 53.5 for men and 51.1 for women (Table 1). In both men and women, the lowest medians for age at onset of PD were found among workers with 15 or more job contracts (50.2 years in men; 48.9 years in women), individuals with five or more periods without affiliation (49.1 years in men; 48.1 years in women), and individuals who were inactive for more than 32% of their working life (48.1 years in men; 48.4 years in women). Regarding the indicator for spells of unemployment, the highest median age at onset of PD was 50.6 for men unemployed between two and four times and 48.7 for women unemployed five or more times.

In both men and women (Table 2), the median age at onset of PD decreased from the first to the third tertile of each labour market trajectory indicator. In men, the age at onset of PD for workers with 15 or more employment contracts decreased by 4.8 years (95%CI: 5.1–4.4); for workers with five or more periods of unemployment it decreased by 3.2 years (3.6–2.8); for workers with five or more periods without affiliation it decreased by 4.6 years (5.0–4.2)

and for workers with more than 32% of inactive time it decreased by 4.1 years (4.5–3.7). In women, the corresponding decreases were 5.8 years (6.7–5.0) for 15 or more contracts; 5.1 years (5.9–4.2) for five or more unemployment periods; 7.2 years (8.0–6.3) for five or more unaffiliated periods; and 7.7 years (8.5–6.9) for more than 32% of inactive time.

The results for the four indicators changed slightly when they were mutually adjusted. Overall, while the effect of each of the four labour market trajectories diminished, the pattern of results was very similar for workers with 15 or more employment contracts (reduction of 3.4 years in men and 1.2 years in women), workers with five or more periods without affiliation (2.9 years in men and 3.3 years in women) and for male workers with more than 32% inactive time (3.9 years in women). In these fully adjusted models, periods of unemployment and the percentage of inactive time, although only in women, did not predict early retirement due to PD.

Discussion

Our findings show that having a high number of periods without affiliation is the key indicator of a person's labour market trajectory for the prediction, with a dose–response relationship, of early retirement due to PD, both in men and women. Other indicators in our study, mainly the number of contracts in men and the percentage of inactive time in women, were also associated with early retirement due to PD. While previous research[6,8] has focused on the predictive role of working conditions, our study improves the understanding of the factors predicting PD in the actively working population by identifying labour market trajectory indicators as predictors of PD.

The mechanisms through which this type of irregular labour market trajectory increases early retirement due to PD are complex and could operate through several routes. In line with the 'push and pull factors' model,[22] we can hypothesize that early retirement due to PD is a function of (a) the match between work ability and job requirements, (b) the compensation offered by the pension plan compared with potential income from work and (c) the non-monetary utility derived from continuing work. Therefore, PD benefits are probably the best option when an individual's work capacity is reduced because of a disease or injury, when one is exposed to unhealthy physical or psychosocial working conditions, and/or when one experiences irregular labour market trajectories. This hypothesis is supported by our study since the higher the number of periods without affiliation—i.e. without any social protection—the higher the risk of early retirement due to PD. In turn, the effect of irregular labour market situations, as a push factor for early retirement due to permanent PD, could be influenced by other pull and push factors operating at both the individual (e.g. health conditions, personal expectations and motivation, educational competencies, ethnic background, etc.) and the societal (e.g. quality of work, income from benefits, unemployment rates, etc.) levels.

In our study, the median age at onset of PD for each of the labour market trajectory indicators was between one and two years earlier in women than in men. This suggests a gender issue possibly related to additional difficulties in combining family and job demands. Particularly for women who typically play a double role (i.e. in their family as housekeepers

and caregivers, and in the larger society as working professionals) this could be an additional push factor.[23] In fact, recent research suggests that parenthood and the number of children in the household contribute to an increased likelihood of PD among young women.[24]

Our study has several unique features. For instance, it is the first longitudinal study based on a large sample of incident cases of medically certified PD, selected from a large and representative sample, including workers from all types of economic activities (i.e. agricultural, manufacturing and services). We used age at onset for measuring early retirement, which allows for quantification of the impact of PD. It is a potentially comparable measure across time periods and countries that, with appropriate cost data, can be used to estimate the economic consequences of PD. This study also incorporated possible differences in occupational categories as determinants associated with the process that leads to PD. As previous studies have shown, PD differs between skilled workers and non-skilled workers, in the sense that the risk of PD increases with decreasing occupational status and educational level.[25] Finally, the labour market trajectory indicators we used were derived from exhaustive official Spanish Social Security records. Nevertheless, the results from our final models may be affected by some over-adjustment given that we observed some moderate correlations, particularly between number of contracts and number of periods unemployed (data not shown). More research is needed to clarify—both conceptually and empirically—the labour market trajectory indicators that best predict early retirement due to PD.

The external validity of our study may be limited in the sense that the procedures and criteria used by the Spanish Social Security System to recognize PD cases (e.g. affiliation time, worker's age or medical evaluation) could differ from criteria used in other countries. Our study may underestimate the true burden of early retirement due to PD, since we included only official cases of PD, excluding workers in the informal economy and other groups not captured by the official registry. We did not have information either about medical diagnosis or previous spells of temporary sick leave before the recognition of PD, which may influence the risk of disability pension later on. Future studies should take into account the progression of medical conditions associated with each PD case, because an irregular labour market trajectory could result from less-favourable health conditions and serve as a precursor of PD. Furthermore, we did not have detailed data on the quality of the psychosocial work environment nor the exposure to hazardous physical job demands. Therefore, we included occupational category, which is a good, although imperfect, proxy for these working conditions. In addition, we did not have any data on early-life exposure to adversities-emotional or financial—which have been shown to be predictors of disability pensions, possibly via health behaviour and chronic disease. For instance, childhood adversities were associated with disability retirement among a representative sample of the Finnish population between 1998 and 2003[26]; and youth unemployment was associated with taking a disability pension in a cohort of Swedish men followed from 1976 to 2008.[27] Future studies should confirm our findings while taking into account the effect of less-favourable social and health-related early-life conditions on irregular labour market trajectories, which could result from and be predictors of PD.

In conclusion, given the increasing orientation of global labour market policies towards more flexible employment conditions, the potential consequences of rising PD for the sustainability of welfare states should be put on the research and policy agenda. In the European context of increasing population ageing and prevalence of chronic health problems, it is precisely those policies that support stable and safe labour market trajectories (for example, income security, job training or other policies that reduce periods of inactivity) that can help to keep people employed until retirement age.[26] In fact, in countries with a welfare state that combines high employment protection policies and labour market flexibility, such as in the Scandinavian countries, there seems to be a less pronounced or even inexistent relationship between job insecurity and adverse health outcomes.[27]

Acknowledgements

References

1. The Organisation for Economic Co-operation and Development (OECD). Sickness, Disability and Work: Breaking the Barriers; A Synthesis of Findings across OECD Countries. Paris: OECD Publishing, 2010.

2. Duran X, Martínez JM, Benavides FG. Tendencia temporal de la incapacidad permanente en España (1992–2010). Rev Esp Salud Publica 2012;86:533–42. [PubMed: 23223765]

3. Ministerio de Trabajo y Seguridad Social. Estadísticas, Presupuestos y Estudios de la Seguridad Social. Available at: http://www.seg-social.es/descargapdf/131039?dDocName=174958. (23 May 2014, date last accessed).

4. Vaupel JW, Loichinger E. Resdistributing work in aging Europe. Science 2006;312:1911–3. [PubMed: 16809529]

5. SHARE. Survey of Health, Ageing and Retirement in Europe. Available at: http://www.share-project.org/. (23 May 2014, date last accessed).

6. Reinhardt JD, Wahrendorf M, Siegrist J. Socioeconomic position, psychosocial work environment and disability in an ageing workforce: a longitudinal analysis of SHARE data from 11 European countries. Occup Environ Med 2013;70:156–63. [PubMed: 23243100]

7. Siegrist J, Wahrendorf M, von dem Knesebeck O, Jürges H, et al. Quality of work, well-being, and intended early retirement of older employees: baseline results from the SHARE Study. Eur J Public Health 2007;17:62–8. [PubMed: 16777840]

8. Blekesaune M, Solem PE. Working conditions and early retirement: a prospective study of retirement behavior. Res Ageing 2005;27:3–20.

9. Roboek SJW, Schuring M, Croezen S, Stattin M, et al. Poor health, unhealthy behaviors, and unfavorable work characteristics influence pathways of exit from paid employment among older workers in Europe: a four year follow-up study. Scand J Work Environ Health 2013;39:125–33. [PubMed: 22949091]

10. Schuring M, Robroek SJW, Otten FWJ, Arts CH, et al. The effect of ill health and socioeconomic status on labour forcé exit and re-employment: a prospective study with ten years follow-up in the Netherlands. Scand J Work Environ Health 2013;39:134–43. [PubMed: 22961587]

11. Pietilainen O, Laaksonen M, Rahkonen O, Lahelma E. Self-rated health as a predictor of disability retirement–the contribution of ill-health and working conditions. PLoS One 2011;6:e25004. [PubMed: 21949830]

12. van den Berg T, Schuring M, Avendano M, Mackenbach J, et al. The impact of ill health on exit from paid employment in Europe among older workers. Occup Environ Med 2010;67:845–52. [PubMed: 20798020]

13. Kivimaki M, Ferrie JE, Hagberg J, Head J, Westerlund H, et al. Diagnosis-specific sick leave as a risk marker for disability pension in a Swedish population. J Epidemiol Community Health 2007;61:915–20. [PubMed: 17873230]

14. OECD. Ageing and pension system reform: implications for financial markets and economic policies. Available at: http://www.oecd.org/daf/financialmarketsinsuranceandpensions/privatepensions/35810991.pdf. (23 May 2014, date last accessed).

15. Tompa E, Scott-Marshall H, Dolinschi R, Trevithick S, et al. Precarious employment experiences and their health consequences: towards a theoretical framework. Work 2007;28:209–24. [PubMed: 17429147]

16. Virtanen P, Vathera J, Kivimakï M, Pentti J, et al. Employment security and health. J Epidemiol Community Health 2002;54:569–74.

17. Virtanen M, Kivimäki M, Singh-Manoux A, et al. Work disability following major organizational change: the Whitehall II study. J Epidemiol Community Health 2010;64:461–64. [PubMed: 20445214]

18. Duran X, Martínez JM, Benavides FG. Occupational factors associated with the potential years of working life lost due to a non-work related permanent disability. Work 2012;45:305–9.

19. Booker CL, Sacker A. Psychological well-being and reactions to multiple unemployment events: adaptation or sensitisation? J Epidemiol Community Health 2012;66:832–8. [PubMed: 21690607]

20. López MA, Benavides FG, Alonso J, Espallargues M, et al. The value of using administrative data in public health research: the Continuous Working Life Sample. Gac Sanit 2014;28:334–7. [PubMed: 24698033]

21. Koenker R Quantile Regression. New York, NY: Cambridge University Press, 2005.

22. Stattin M Retirement on grounds of ill health. Occup Environ Med 2005;62:135–40. [PubMed: 15657199]

23. Artazcoz L, Benach J, Borrell C, Cortès I. Unemployment and mental health: understanding the interactions among gender, family roles, and social class. Am J Public Health 2004;94:82–8. [PubMed: 14713703]

24. Floderus B, Hagman M, Aronsson G, et al. Disability pension among Young women in Sweden, with special emphasis on family structure: a dynamic cohort study. BMJ Open 2012;2:e000840.

25. Krosktad S, Johnsen R, Westin S. Social determinants of disability pension: a 10-year follow-up of 62,000 people in a Norwegian county population. Int J Epidemiol 2002;31:1183–91. [PubMed: 12540720]

26. Harkonmäki K, Korkeila K, Vahtera J, Kivimäki M, et al. Childhood adversities as a predictor of disability retirement. J Epidemiol Community Health 2007;61:479–84. [PubMed: 17496255]

27. Lundin A, Hemmingsson T. Adolescent predictors of unemployment and disability pension across the life course – a longitudinal study of selection in 49 321 Swedish menWorking Paper 2013:25. Uppsala, Sweden: Institute for Evaluation of Labour Market and Education Policy (IFAU); 2013. Available at http://www.ifau.se/Upload/pdf/se/2013/wp-2013-25-Adolescent-predictors-of-unemployment-and-disability-pension-across-the-life-course.pdf. (25 August 2014, date last accessed).

28. Doyle Y, McKee M, Rechel B, Grundy B. Meeting the challenge of population ageing. BMJ 2009;339:b3926. [PubMed: 19805472]

29. Kim I-H, Muntaner C, Vahid F, et al. Welfare states, flexible employment, and health. A critial review. Health Policy 2012;104:99–127. [PubMed: 22137444]

Key points

- Job insecurity is a major risk factor for workers' health, both for temporary and permanent employees.

- Permanent disability contributes to early retirement and significant reduction in workforce capacity, placing a burden on the social security system.

- This study shows that unstable labour market trajectories are associated with early retirement due to PD.

- Employment policies stimulating a stable labour market integration of employees during their employment career could help to reduce early retirement due to PD.

Table 1

Age at the onset of PD (2004–2010) by labour market trajectory indicators since 1981 or for the first contact with the Spanish Social Security system

Indicators	Men				Women			
	Cases	Age at the onset of PD			Cases	Age at the onset of PD		
		P_{25}	P_{50}	P_{75}		P_{25}	P_{50}	P_{75}
Number of job contracts								
Up to 5	3412	50.7	56.3	59.8	1911	47.6	54.0	58.5
6 to 14	3044	42.1	51.9	58.2	1784	40.9	49.4	55.9
15 or more	3458	42.2	50.2	57.0	1363	41.6	48.9	56.1
Number of periods unemployed								
Up to 1	3980	47.4	55.3	59.3	2401	45.7	53.2	58.3
2 to 4	2381	40.9	50.6	57.9	1292	40.2	48.7	55.4
5 or more	3553	44.8	52.5	58.3	1365	43.2	49.4	56.3
Number of periods without affiliation (at least 30 days)								
Up to 1	3973	50.5	56.1	59.8	1936	47.9	54.3	58.6
2 to 4	2566	42.7	52.3	58.4	1507	41.5	50.2	56.8
5 or more	3375	41.2	49.1	56.5	1615	41.0	48.1	54.8
Percentage of inactive time respect to the total								
<7%	3355	51.4	56.3	59.8	1622	49.0	55.0	58.9
From 7% to 32%	3623	44.0	52.7	58.6	1370	41.9	50.1	56.7
>32%	2936	39.0	48.1	56.2	2066	40.7	48.4	54.9
Total	9914	44.6	53.5	58.7	5058	43.3	51.1	57.1

Table 2

Differences in median age at the onset of PD (2004–2010) by labour market trajectory indicators since 1981 or for the first contact with the Spanish Social Security system

	Men			Women		
	Crude	Adjusted (1)	Adjusted (2)	Crude	Adjusted (1)	Adjusted (2)
Number of contracts						
Up to 5	0	0	0	0	0	0
6–14	−4.4 (−4.9, −3.9)	−2.8 (−3.2, −2.4)	−1.9 (−2.5, −1.4)	−4.7 (−5.5, −3.9)	−5.4 (−6.2, −4.6)	−1.7 (−2.7, −0.8)
15 or more	−6.1 (−6.7, −5.6)	−4.8 (−5.1, −4.4)	−3.4 (−4.0, −2.7)	−5.2 (−6.1, −4.3)	−5.8 (−6.7, −5.0)	−1.2 (−2.5, 0.1)
Number of periods unemployed						
Up to 1	0	0	0	0	0	0
2–4	−4.7 (−5.3, −4.2)	−2.7 (−3.1, −2.2)	−0.4 (−0.9, 0.2)	−4.5 (−5.5, −3.6)	−5.2 (−6.1, −4.4)	−0.6 (−1.6, 0.5)
5 or more	−2.8 (−3.3, −2.3)	−3.2 (−3.6, −2.8)	0.9 (0.3, 1.6)	−3.8 (−4.7, −2.9)	−5.1 (−5.9, −4.2)	1.5 (0.3, 2.8)
Number of periods without affiliation (at least 30 days)						
Up to 1	0	0	0	0	0	0
2–4	−3.8 (−4.4, −3.2)	−2.7 (−3.1, −2.3)	−1.5 (−2.1, −1.0)	−4.1 (−5.1, −3.2)	−4.4 (−5.3, −3.5)	−1.3 (−2.5, −0.1)
5 or more	−7.0 (−7.5, −6.5)	−4.6 (−5.0, −4.2)	−2.9 (−3.6, −2.2)	−6.2 (−7.1, −5.2)	−7.2 (−8.0, −6.3)	−3.3 (−4.8, −1.8)
Percentage of inactive time respect to the total						
<7%	0	0	0	0	0	0
7–32%	−3.6 (−4.1, −3.1)	−2.7 (−3.1, −2.3)	−0.2 (−0.8, 0.4)	−4.9 (−5.8, −4.1)	−4.2 (−5.0, −3.3)	−1.7 (−2.9, −0.5)
>32%	−8.2 (−8.8, −7.7)	−4.1 (−4.5, −3.7)	−0.2 (−0.9, 0.6)	−6.6 (−7.4, −5.9)	−7.7 (−8.5, −6.9)	−3.9 (−5.3, −2.6)

(1) Adjusted by the total time elapsed from the beginning of working life to the onset of PD and occupational group category. (2) Adjusted by (1) plus rest of labour market indicators