

This is the post print version of the article, which has been published in *Scandinavian Journal of Public Health*. 2019, 47(3), 293-300.  
<https://doi.org/10.1177/1403494818804106>

## FINAL VERSION

# Precarious work and the risk of receiving a disability pension

### 1st author:

Dr Satu Ojala, postdoctoral researcher  
Faculty of Social Sciences  
Kalevantie 5  
FI-33014 University of Tampere  
Finland

e-mail: [satu.ojala@uta.fi](mailto:satu.ojala@uta.fi)  
tel.: +358 50 318 6176  
fax: +358 3 213 4473

### 2nd (corresponding) author:

Dr Pasi Pyöriä, senior lecturer  
Faculty of Social Sciences  
Kalevantie 5  
FI-33014 University of Tampere  
Finland

e-mail: [pasi.pyoria@uta.fi](mailto:pasi.pyoria@uta.fi)  
tel.: +358 40 5013 097  
fax: +358 3 213 4473

**Word count:** 3,254 words

# Precarious work and the risk of receiving a disability pension

## Abstract

*Aims:* Precarious employment is an emerging determinant of occupational health, but its association with work-related disability remains little understood. We operationalised precarious work as a multidimensional construct and examined how the accumulation of precarious job features predicts the incidence of receiving a disability pension (DP). *Methods:* The study comprised 13,228 employees aged 20–54 who had been interviewed for the Finnish Quality of Work Life Surveys in 1984, 1990, 1997, or 2003. We measured precarious work with five variables that reflect both subjective and objective job insecurity: the threat of dismissal/unemployment, poor employability, low earnings, previous unemployment, and temporary contract. An eight-year follow-up was merged with the pooled cross-sectional data, and Cox proportional hazard ratios (HR) for receiving a DP were compared between the insecurity measures, controlling for sociodemographic covariates, job characteristics, and health at the baseline with a step-wise procedure. *Results:* Precarious employees had an elevated risk of receiving a DP (all covariates adjusted for). The risk of receiving a DP was associated with subjective job insecurity, with the strongest indicator being poor employability. The association between the threat of unemployment and receiving a DP was weak before controlling for health. Among objective insecurity measures, low earnings and earlier unemployment were weakly connected to receiving a DP before controlling for sociodemographic covariates, job characteristics, and health. *Conclusions:* **We recommend the evaluation of several precarious job features in future studies. The risk of receiving a DP could potentially be offset by improving individuals' employability.**

**Keywords:** Precarious work, disability pension, job insecurity, labour market, Finland

## **Introduction**

Vulnerable, precarious work has provoked much debate in recent decades. Since Rodgers' seminal work in 1989, a key focus of theorisations on precarious employment has been the accumulation of labour market risks and insecurity, although the exact definition of the concept remains elusive.<sup>1</sup> Employment precariousness is a multidimensional phenomenon that encompasses temporary contracts, spells of unemployment, poor prospects, and low income.<sup>2</sup> A lack of legal and union protection often contributes to precariousness. In a sense, precarious jobs are the opposite of the 'standard' employment relationship characterised by continuous, full-time employment with a single employer over the employee's life course.<sup>3</sup>

While it remains a matter of dispute whether or not there ever existed a golden age of stable employment relationships – and to what extent working conditions have changed for the worse – recent research has established precarious employment as a social determinant of health with potentially many detrimental effects.<sup>4,5</sup> A growing body of evidence indicates that work under such conditions not only represents social and economic vulnerability, but also a potent occupational health risk.<sup>6-9</sup> It is important to understand precarious work as a multifaceted construct, because occupational health depends on broader employment conditions than imminent physical or psychosocial work environment factors.<sup>6</sup>

The contours of precarious employment vary by production and welfare state regimes, labour market structures, and economic conditions. Comparative research speaks in favour of the Nordic model of labour relations, characterised by extensive and protective labour laws and high union density, combined with universal social security mechanisms.<sup>10</sup> Consequently, work is less precarious in the Nordic nations compared to other European countries, though no country is immune to the precarisation of work.<sup>11,12</sup> The high degree of unionisation in particular sets the Nordic countries apart from the rest of Europe. This is important, since a

lack of collective protection reduces workers' bargaining power and makes them susceptible to poor employment and working conditions, thus increasing the precariousness of employment overall.

Although research on precarious work and health continues to expand, an important gap remains. Few longitudinal studies from the Nordic countries – or indeed other parts of the world – have explored precariousness and its association with work-related disability, despite the fact that disability retirement is a major route to early exit from the labour market. In their prospective population-based study, Gustafsson et al. looked into the association between peripheral labour market position and receipt of a disability pension (DP). They found that the risk of receiving a DP increased gradually in line with the increased peripherality of the position held (measured by the level of employment income, working time, and days of unemployment).<sup>13</sup>

Instead of the core-periphery model, we rely here on theorisations that take into account both objective and subjective precarious job features.<sup>2,8,9,14,15</sup> This approach acknowledges that job insecurity is a powerful stressor; such insecurity has been identified in prior research as one of the most important perceived work-related health risks.<sup>16</sup>

We set out to investigate the association between precarious labour market position and receipt of a DP in the context of the Finnish wage- and salary-earning population. We measured the accumulation of precarious job features, adjusting for sociodemographic covariates, job characteristics, and health at the baseline. We hypothesised that the accumulation of precarious job features predicts an increased risk of receiving a DP in the following eight years.

## **Methods**

### *Study population*

This study comprised 13,228 employees aged 20–54 who had been interviewed for Statistics Finland's Quality of Work Life Surveys (QWLS) in 1984, 1990, 1997, or 2003. These surveys were based on random samples representing the entire wage- and salary-earning population residing in Finland. The surveys are extensive cross-sectional studies with very high response rates (78–89%). They are conducted in the form of personal face-to-face interviews that on average last a little over an hour. The survey material was pooled and linked with an eight-year follow-up containing register-based information on DP recipients. DP data were obtained from a national register maintained by the Finnish Centre for Pensions.

### *Outcome variable*

The outcome variable comprised all cases receiving a DP, counting the number of people collecting a DP annually at the end of each follow-up year, irrespective of the diagnosis. In Finland, a DP may be granted – either for a fixed term or until further notice – to an employee under 63 years whose work ability has been reduced for at least one year due to an illness, injury, or handicap. Mental and musculoskeletal diagnoses are the leading causes for the granting of a DP in Finland. These diseases cover about two thirds of all new disability pensions in the country.

Over the time frame of the present study, the most important change in the Finnish DP system has concerned the favouring of vocational rehabilitation over disability pensions. In 2004, a reform was implemented that encourages early vocational rehabilitation by making it a subjective legal right of workers at risk of losing work ability. Due to the reform, the number of disability pensions granted has gradually declined.

### *Exposure variable*

Precarious work as an exposure variable was operationalised on five dimensions that reflect both subjective and objective job insecurity: fear of labour market risk, poor employability prospects, temporary contract, previous unemployment, and low earnings. In many parts of the world, a lack of legal and union protection resulting in few statutory entitlements is an important dimension of precariousness, but this is not the case in the Nordic countries.<sup>2</sup>

Consequently, this criterion was not included in the present study.

*The fear of labour market risk* is the sum of three risk factors, namely the perceived threat of being laid off, dismissed, and/or made redundant. These were formed into a dichotomous variable (no threats vs at least one threat). *Poor employability* is measured by the question, ‘What do you think would be the likelihood of you finding a new job: good, reasonable, or poor?’ The response is deemed to reflect precarity if the respondent feels he/she has poor chances of finding a new job in the open labour market. *Temporary contract* comprises fixed-term and agency work. Part-time work was omitted, because for most people in Finland this is a voluntary choice. *Previous unemployment* refers to at least one spell of unemployment in the past five years. *Low earnings* (‘What is your monthly gross pay in your main job before tax?’) refers to the lowest income quintile. These measures, which are valid and reliable indicators of job insecurity with moderate intercorrelations (0.08–0.334), comprise an index of different dimensions of precariousness.<sup>2</sup>

Fears of redundancy, actually experienced unemployment, poor chances of finding a new job, and low pay are all detrimental to physical and mental health.<sup>17,18</sup> Research on temporary work has produced less uniform results. Analyses comparing temporary and permanent workers do not always coincide with the division between precarious and non-precarious

employment, but the consensus among researchers has it that it is necessary to take fixed-term contracts into account when examining precarious work.<sup>6,11,14,19,20</sup>

### *Sociodemographic covariates*

Key covariates were controlled for with a stepwise procedure. These included age and gender, since work ability significantly decreases with age<sup>21</sup> and women have a higher risk of receiving a DP than men do.<sup>22,23</sup> We controlled for occupation (ISCO classification) but excluded education because it has a high correlation with occupation and pay (low earnings is taken into account here as one of the dimensions of precariousness). We also included measures for dependent children and a spouse. Our data has no information on the partner's health, which has a bearing on work disability,<sup>24</sup> but it was possible to control for whether the respondent has a spouse and if the spouse is employed.

### *Covariates characterising the job*

In their recent meta-analysis, Knardahl et al. found that low work control, both independently and in association with high job demands, predicts receipt of a DP.<sup>25</sup> In earlier studies, low work variation and discretion have been associated with an increased risk of receiving a DP,<sup>26,27</sup> while good work control implies the opposite.<sup>28</sup>

Following Karasek's demand/control model,<sup>29</sup> we measured the autonomy and intensity of work. Autonomy was measured by the sum of the questions, 'Are you able to influence: (a) The contents of your tasks? (b) The order in which you do your tasks? (c) The pace of your work? (d) Your working methods? (e) The divisions of tasks between employees? (f) Your choice of working partners?' (1=Not at all to 4=A lot, Cronbach's  $\alpha$  0.802). Intensity is the sum of the following items: 'Works to tight deadlines', 'Cannot take breaks sufficiently

often', 'Tasks are demanding', 'Work environment is restless', and 'Intensification of work over the past few years' (Cronbach's  $\alpha$  0.640).

Several other antecedents of DP receipt have been identified, and their cumulative exposure has been deemed harmful.<sup>26–29</sup> Among the physical hazards, exposure to whole-body vibrations and heavy lifting are known to increase the risk of receiving a DP. We included a measure for repetitive, monotonous movements in the respondent's current work.

We also considered adjusting for weekly working hours, shift work, employment sector and branch, personnel downsizing in the organisation, employer-provided training in the previous 12 months, work climate, and exposure to violence or harassment at work. None of these factors were associated with an increased risk of receiving a DP. To avoid over-adjusting the model, we excluded these factors.

#### *Covariates on health*

Finally, we controlled for health/disease, as chronic illnesses co-exist with work disability and incidences of injury. Mental health problems in particular have been linked with receipt of a DP.<sup>24</sup> Importantly, poor mental health and occupational injuries have been identified as risk factors of employment precariousness.<sup>6–9</sup>

As an indicator of mental health, we adjusted for depression (daily–weekly, once–twice/month, less often–never). Injuries and diseases were taken into account by including a joint measure for reported chronic illnesses or permanent injuries and a separate measure for work-related accidents during the previous 12 months. Health covariates were included in the final step of the analysis (model 5). An additional model was run to estimate health selection (Table 3); we excluded employees who had reported a chronic illness.



### *Statistical analysis*

The covariates described above were tested for multicollinearity: correlations with DP receipt were checked, and the models were run to include other indicators potentially linked to the explanandum, such as exposure to violence or harassment at work.<sup>29</sup> When no correlation with DP was detected, we excluded the variables from the analysis. Those who died or moved out of the country during the follow-up were excluded from the analysis. In the descriptive analysis of DP receipt (Table 1), we ran the Chi-squared test for the categorical variables and F-tests for the continuous variables.

For the follow-up model, Cox proportional hazard ratios (HR) were computed, adjusting for the covariates. The HRs for employees who had been granted a DP were estimated by precarious job features measured in the baseline survey (with 95% confidence intervals). In the first step, precarious job features and the cross-sectional time point (because the survey data was pooled) were included in the model, followed by models including age, sociodemographic covariates, job characteristics, and health in the subsequent steps.

We considered indirect age, gender, and occupation effects by including interactions between these groups and precarious job features. We found one substantial interaction: Previous unemployment X Gender. Hence, the final models include this interaction in addition to the direct effects. Furthermore, we estimated health selection by excluding employees who had a long-term illness, using the covariates of the final model (5). Finally, we tested our hypothesis according to which accumulated precarious job features are associated with an increased risk of receiving a DP.

Our survey material has only a marginal missing data problem, because it was collected through personal face-to-face interviews, with some information extracted from official registers. The results presented here included missing values recoded to the most likely value (mean or mode). Only occupation had some missing values (n=5) that had to be omitted.

## **Results**

Table 1 shows the characteristics of the study population, including the distribution of precarious job features and covariates, and the proportion of employees who entered the DP scheme during the follow-up period. Descriptive statistics show that most wage- and salary-earners in Finland have been affected by precariousness in one form or another. The proportion of cases receiving a DP was significantly higher among employees with precarious job features compared to those who reported no job insecurity at all.

Precarious job features were found to increase the risk of receiving a DP. Subjective job insecurity proved to be a stronger predictor for receipt of a DP than objective job insecurity. Before controlling for the occupation, job, and health covariates, the fear of labour market risk (i.e. unemployment/dismissal) and poor employability (i.e. poor chances of finding a new job) appeared to be risk factors for receipt of a DP (Table 2). From model 3 onwards, we adjusted for the significant interaction; i.e. we found that unemployed men who had experienced unemployment had a somewhat increased risk of entering the DP scheme compared to women who had reported previous unemployment.

After the occupation and job characteristics were adjusted for in model 4 (Table 2), the fear of losing one's job became an insignificant predictor for receipt of a DP. In addition, the interaction term lost statistical significance. In model 4, we tested for the interaction between precarious job features and occupation, but derived no statistically significant or substantively

meaningful findings. However, occupational categories are directly important predictors for receipt of a DP. Both service and production workers are more likely to enter the DP scheme than skilled workers. Nevertheless, poor employability remained the strongest predictor for receipt of a DP found in this study, even after adjusting for health in the final model (HR 1.4, 95% CI 1.2–1.7).

Among objective job insecurity factors, low earnings were weakly connected to receiving a DP before controlling for occupation, job characteristics, and health (Table 2). After adjustment for these covariates, the HRs were no longer statistically significant.

In an additional model (Table 3), we tested the health selection. By excluding those who had a long-term illness, which was reported in the baseline surveys, more confirmation was achieved for our finding that poor employability increases the risk of receiving a DP (HR 1.4, 95% CI 1.0–1.8).

Finally, our hypothesis of an increased risk of receiving a DP being attached to accumulated precarious job features was confirmed. In our model for the accumulation (Table 4), with the health covariates being adjusted for, the HRs for receiving a DP were at the level of 1.3–1.7 (95% CIs 1.0–2.2) for those respondents who suffered from more than one simultaneous job insecurity factor. There was a tendency for the risk of receiving a DP to increase as precarious job features accumulated (Table 4). Overall, the highest HRs were among those employees who met two or more of the five precarious job features measured in the baseline survey.

## **Discussion**

The goal of our study was to examine how the accumulation of precarious job features predicts receipt of a DP in an eight-year follow-up period. Precarious employment status was operationalised with five variables that reflect both subjective and objective job insecurity.

Sociodemographic and job characteristics and health were adjusted for, and the accumulation of precarious job features was then studied in relation to receipt of a DP using Cox proportional hazard ratios.

According to the results, the accumulation of precarious job features over time is harmful, and poor employability prospects in particular predict receiving a DP. This result is in line with the theoretical debate on precarity, which underscores the importance of the individual's experiences and awareness of risks.<sup>2-4</sup> According to this line of thought, precarity cannot straightforwardly be reduced to a certain risk that has materialised, since the individual's subjective experiences and fear of the future may be a more relevant factor: if an individual feels he/she has poor chances of finding a new job in the open labour market, this anxiety may be a potential stressor impairing health and work ability.<sup>30</sup>

Our survey material, merged with the high-quality register data, was comprehensive; it reliably represents the entire wage- and salary-earning population of the country and has good response rates. A further strength is that we were able to adjust for the respondents' health at the baseline as well as test for the health selection. However, we do not know exactly if receipt of a DP as an outcome relates to impaired personal health, external working conditions, or a workplace accident, since we could not identify the diagnosis behind the granting of each DP. Another limitation is that we were unaware of respondents' health behaviour risks, such as unhealthy diet, sedentary lifestyle, smoking, or substance abuse. Smoking, for example, is an independent predictor for receipt of a DP irrespective of age, work environment, or general health status.

A further restriction is that we were able to measure the independent variables only at the baseline using the survey material. We could not follow changes in precariousness over time.

However, our earlier longitudinal study, representing the same population and time frame as the present study, indicates that temporary employment (as one aspect of precariousness) is not necessarily a trap.<sup>19</sup> Highly educated nurses on fixed-term contracts or academic project workers, for example, hardly qualify as the precariat. Nevertheless, temporary employment is a clear risk factor for being edged out of the labour market through retirement – especially via the DP system – for those on peripheral temporal contracts, such as employment subsidy workers. According to our prior analysis, roughly half of temporary employees managed to find a more stable employment position during the eight-year follow-up.<sup>19</sup>

In prior longitudinal studies on employment precariousness, precarious work has often been considered synonymous with temporary employment. This is problematic, since not all temporary workers are in precarious positions, just as not all those with permanent jobs are completely unexposed to precariousness.<sup>11,20</sup> In Finland, for example, temporary contracts are most common among highly educated public-sector employees. Instead of focusing on employment relationships alone, we relied on an approach that took into account both objective and subjective precarious job features. Hence, the main contribution of our study relates to the register-based data with a long follow-up and the theoretically informed multidimensional operationalisation of precarious work.

## **Conclusions**

There is a growing amount of evidence showing that precarious employment may pose a risk to both physical and mental health. As the present study suggests, it may also lead to premature retirement due to the accumulation of precarious job features over time.

Therefore, the promotion of good quality jobs should be a key policy target in order to make work more sustainable and enable individuals to stay in the labour market longer. At the

policy level, attention should be paid to amending risks related to subjective job precariousness. Employability, for example, could potentially be built up by improving skills, autonomy, and opportunities for on-the-job learning.

We recommend the evaluation of several precarious job features in future studies, as well as the accumulation of these features among the same employees. To our knowledge, this was one of the first analyses applying such a protocol in research on precarious employment and its association with work-related disability. We also recommend more detailed analyses of precarious employee groups. Temporary workers, for example, are a heterogeneous group, and not all fixed-term jobs necessarily imply an inferior status or high insecurity. It is rather the case that a combination of job-related risks may become toxic over time, regardless of the type of employment contract.

The results of our study may tentatively be generalised to other developed countries known for individually protective and collectively collaborative labour market regulation, especially those in the Nordic region. However, circumstances could differ in other national contexts, raising the need for replication studies.<sup>14</sup>

### **Acknowledgements**

We would like to thank The Future of Work: Opportunities and Challenges for the Nordic Models project (funded by the Nordic Council of Ministers and co-ordinated by Fafo) for the inspiration and collegial support provided.

### **References**

1. Rodgers G. Precarious work in Western Europe: the state of the debate. In: Rodgers G, Rodgers J eds. *Precarious Jobs in Labour Market Regulation: The Growth of Atypical Employment in Western Europe*. Geneva: International Labour Organization, 1989, 1–16.

2. Pyöriä P, Ojala S. Precarious work and intrinsic job quality: evidence from Finland, 1984–2013. *Econ Labour Relat Rev* 2016;27:349–367.
3. Strauss K. Precarious work. In Richardson D, Castree N, Goodchild MF *et al.*, eds. *The International Encyclopedia of Geography*. New York: John Wiley & Sons, 2017, 1–9.
4. Lewchuk W. Precarious jobs: where are they, and how do they affect well-being? *Econ Labour Relat Rev* 2017;28:402–19.
5. Quinlan M. The ‘pre-invention’ of precarious employment: the changing world of work in context. *Econ Labour Relat Rev* 2012;23:3–24.
6. Benach J, Vives A, Amable M, *et al.* Precarious employment: understanding an emerging social determinant of health. *Annu Rev Public Health* 2014;35:229–53.
7. Scott-Marshall H, Tompa E. The health consequences of precarious employment experiences. *Work* 2011;38:369–82.
8. Tompa E, Scott-Marshall H, Dolinski R, *et al.* Precarious employment experiences and their health consequences: towards a theoretical framework. *Work* 2007;28:209–224.
9. Vives A, Amable M, Ferrer M, *et al.* The Employment Precariousness Scale (EPRES): psychometric properties of a new tool for epidemiological studies among waged and salaried workers. *Occup Environ Med* 2010;67:548–55.
10. Mustosmäki A. *How Bright Are the Nordic Lights? Job Quality Trends in Nordic Countries in a Comparative Perspective*. Jyväskylä: University of Jyväskylä, 2017.
11. Kim I-H, Muntaner C, Vahid Shahidi F, *et al.* Welfare states, flexible employment, and health: a critical review. *Health Policy* 2012;104:99–127.
12. Puig-Barrachina V, Vanroelen C, Vives A, *et al.* Measuring employment precariousness in the European Working Conditions Survey: the social distribution in Europe. *Work* 2014;49:143–61.
13. Gustafsson K, Aronsson G, Marklund S, *et al.* Peripheral labour market position and risk of disability pension: a prospective population-based study. *BMJ Open* 2014;4:1–8.
14. Kalleberg AL. *Precarious Lives: Job Insecurity and Well-Being in Rich Democracies*. Cambridge: Polity Press, 2018.
15. Vives A, González F, Moncada S, *et al.* Measuring employment precariousness in times of crisis: the revised Employment Precariousness Scale (EPRES) in Spain. *Gac Sanit* 2015;29:379–82.
16. Cheng GHL, Chan DKS. Who suffers more from job insecurity? A meta-analytic review. *Appl Psychol* 2008;57:272–303.
17. Otterbach S, Sousa-Poza A. *Job Insecurity, Employability, and Health: An Analysis for Germany across Generations*. Bonn: IZA, 2014.

18. Pulkki-Råback L, Ahola K, Elovainio M, *et al.* Socio-economic position and mental disorders in a working-age Finnish population: the health 2000 study. *Eur J Public Health* 2011;22:327–32.
19. Ojala, S, Nätti J, Lipiäinen L. Types of temporary employment: an 8-year follow-up of labour market attachment. *Soc Ind Res* 2017;138:141–63.
20. Virtanen M, Kivimäki M, Joensuu M, *et al.* Temporary employment and health: a review. *Int J Epidemiol* 2005;34:610–22.
21. Berecki-Gisolf J, Clay FJ, Collie A, *et al.* The impact of aging on work disability and return to work: insights from workers' compensation claim records. *J Occup Environ Med* 2012;54:318–27.
22. Albertsen K, Lund T, Christensen KB, *et al.* Predictors of disability pension over a 10-year period for men and women. *Scand J Public Health* 2007;35:78–85.
23. Nilsen SM, Ernstsens L, Krokstad S, *et al.* Educational inequalities in disability pensioning – the impact of illness and occupational, psychosocial, and behavioural factors: The Nord-Trøndelag Health Study (HUNT). *Scand J Public Health* 2012;40:133–41.
24. Vie GÅ, Romundstad PR, Krokstad S, *et al.* Mortality and work disability in a cohort of Norwegian couples: the HUNT study. *Eur J Public Health* 2015;25:807–14.
25. Knardahl S, Johannessen HA, Sterud T, *et al.* The contribution from psychological, social, and organizational work factors to risk of disability retirement: a systematic review with meta-analyses. *BMC Public Health* 2017;17:176.
26. Canivet C, Choi B, Karasek R, *et al.* Can high psychological job demands, low decision latitude, and high job strain predict disability pensions? A 12-year follow-up of middle-aged Swedish workers. *Int Arch Occup Environ Health* 2013;86:307–19.
27. Christensen KB, Feveile H, Labriola M, *et al.* The impact of psychosocial work environment factors on the risk of disability pension in Denmark. *Eur J Public Health* 2008;18:235–7.
28. Hinkka K, Kuoppala J, Väänänen-Tomppo I, *et al.* Psychosocial work factors and sick leave, occupational accident, and disability pension: a cohort study of civil servants. *J Occup Environ Med* 2013;55:191–7.
29. Karasek R, Theorell T. *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life*. New York: Basic Books, 1990.
30. Gallie D, Felstead A, Green F, *et al.* The hidden face of job insecurity. *Work Employ Soc* 2017;31:36–53.



**Table 1.** Descriptive statistics of the study population according to precarious job features and covariates, and the proportion of employees who entered the disability pension (DP) system in the eight-year follow-up.

Factors		Categories	% of all employees	Proportion receiving a DP in the 8-year follow-up		
				% of employees in the category	n	Chi-squared / F-test, Sig.
Precarious job features, Year	Subjective precarious job features	Fear of labour market risk	23	6	162 / 2,945	0.001
		Poor employability	26	9	297 / 3,359	0.000
	Objective precarious job features	Lowest pay quintile	19	5	111 / 2,442	0.751
		Previous unemployment	24	4	121 / 3,100	0.104
		Temporary contract	14	4	64 / 1,785	0.063
	Survey year	1984	30	5	187 / 3,880	0.000
		1990	24	6	170 / 3,054	
1997		20	4	108 / 2,619		
2003		26	3	106 / 3,347		
Age	Age	20–39 years	40	1	52 / 5,206	0.000
		40–49 years	34	3	146 / 4,340	
		50–54 years	26	11	373 / 3,353	
Socio-demographic characteristics	Gender	Woman	52	4	260 / 6,644	0.003
		Man	49	5	311 / 6,255	
	Spouse	No spouse	26	4	143 / 3,330	0.002
		Spouse not working	12	6	97 / 1,591	
		Spouse working	62	4	331 / 7,978	
Children under 18 years	No	50	6	383 / 6,442	0.000	
	Yes	50	3	188 / 6,457		
Job characteristics	Occupation	Service workers	13	6	107 / 5,313	0.000
		Production workers	27	6	223 / 5,237	
		Lower-level white-collar	39	4	176 / 5,077	
		Higher-level white-collar	20	3	65 / 2,604	
	Job control	1 = Low ... 4 = High Control	Mean 2.6	Mean 2.4		0.000
	Job demands	1 = Low ... 10 = High demands	Mean 3.7	Mean 3.9		0.013
	Repetitive, monotonous movements	No	73	4	380 / 9,378	0.001
To some extent		11	5	71 / 1,468		
A lot		16	6	120 / 2,053		
Health	Accident at work, previous 12 months	No	93	4	510 / 11,957	0.001
		Yes	7	7	61 / 942	
	Depression	No	85	4	426 / 10,995	0.000
		Monthly	11	6	75 / 1,367	
		Daily–Weekly	4	13	70 / 537	
	Chronic illness / permanent injury	No	77	3	256 / 9,987	0.000
Yes		23	11	315 / 2,912		
Model for the accumulation (Table 4)	Accumulation of precarious job features	0/5	39	3	144 / 5,048	0.000
		1/5	33	5	224 / 4,232	
		2/5	17	6	117 / 2,127	
		3–5/5	12	6	86 / 1492	
Overall risk of receiving a DP			4		571 / 12,899	

**Table 2.** Precarious job features and hazard ratios (HR) for receiving a disability pension during the eight-year follow-up.

		HR	95% CI	
Model 1: Accumulation of precarious job features, Survey year	Fear of labour market risk (Ref. No)	<b>1.398</b>	<b>1.147</b>	<b>1.703</b>
	Poor employability (Ref. No)	<b>3.253</b>	<b>2.747</b>	<b>3.852</b>
	Lowest pay quintile (Ref. No)	.983	.793	1.219
	Previous unemployment (Ref. No)	.869	.694	1.087
	Temporary contract (Ref. No)	.831	.622	1.111
2 LL 10555, ChiSq 259 (df 8) Sig. 0.000				
Model 2: 1 + Age  Interaction terms Precarious features X Age were tested, not significant	Fear of labour market risk (Ref. No)	<b>1.333</b>	<b>1.089</b>	<b>1.632</b>
	Poor employability (Ref. No)	<b>1.724</b>	<b>1.445</b>	<b>2.057</b>
	Lowest pay quintile (Ref. No)	1.137	.915	1.411
	Previous unemployment (Ref. No)	1.148	.908	1.450
	Temporary contract (Ref. No)	1.049	.777	1.417
2 LL 10183, ChiSq 661 (df 10) Sig. 0.000				
Model 3: 1 & 2 + Demographic characteristics  Interaction terms Precarious features X Gender were tested; Previous unemployment X Gender significant, added to the model	Fear of labour market risk (Ref. No)	<b>1.262</b>	<b>1.030</b>	<b>1.545</b>
	Poor employability (Ref. No)	<b>1.758</b>	<b>1.470</b>	<b>2.103</b>
	Lowest pay quintile (Ref. No)	<b>1.307</b>	<b>1.044</b>	<b>1.638</b>
	Previous unemployment (Ref. No)	1.289	.969	1.715
	Temporary contract (Ref. No)	1.081	.800	1.459
	Previous unemployment X Gender	<b>.654</b>	<b>.432</b>	<b>.992</b>
2 LL 10110, ChiSq 738 (df 15) Sig. 0.000				
Model 4: 1–3 + Occupation & Job characteristics  Interaction terms Precarious features X Occupation were tested; a weak interaction for Poor employability X Occupation was found, not substantive	Fear of labour market risk (Ref. No)	1.186	.966	1.456
	Poor employability (Ref. No)	<b>1.608</b>	<b>1.340</b>	<b>1.929</b>
	Lowest pay quintile (Ref. No)	1.136	.902	1.430
	Previous unemployment (Ref. No)	1.656	.884	3.102
	Temporary contract (Ref. No)	1.229	.907	1.665
	Previous unemployment X Gender	.695	.458	1.055
2 LL 10056, ChiSq 778 (df 20) Sig. 0.000				
Model 5: 1–4 + Health	Fear of labour market risk (Ref. No)	1.115	.907	1.372
	Poor employability (Ref. No)	<b>1.384</b>	<b>1.151</b>	<b>1.663</b>
	Lowest pay quintile (Ref. No)	1.121	.892	1.410
	Previous unemployment (Ref. No)	1.778	.949	3.330
	Temporary contract (Ref. No)	1.186	.877	1.606
	Previous unemployment X Gender	.680	.447	1.032
2 LL 9844, ChiSq 1096 (df 26) Sig. 0.000				

**Table 3.** Test for health selection. Precarious job features and hazard ratios (HR) for receiving a disability pension during the eight-year follow-up, employees without chronic illness.

		HR	95% CI	
Control variables such as in Model 5 Selecting only employees without chronic illness	Fear of labour market risk (Ref. No)	1.262	.928	1.715
	Poor employability (Ref. No)	<b>1.367</b>	<b>1.040</b>	<b>1.798</b>
	Lowest pay quintile (Ref. No)	1.002	.699	1.437
	Previous unemployment (Ref. No)	2.121	.861	5.228
	Temporary contract (Ref. No)	1.055	.675	1.651
	Previous unemployment X Gender	.649	.349	1.207
2 LL 4320, ChiSq 437 (df 25) Sig. 0.000				

**Table 4.** Accumulation of precarious job features and hazard ratios (HR) for receiving a disability pension during the eight-year follow-up.

		HR	95% CI	
Control variables such as in Model 5 Accumulation of precarious job features	0/5 (Ref.)			
	1/5	<b>1.335</b>	<b>1.075</b>	<b>1.659</b>
	2/5	<b>1.525</b>	<b>1.180</b>	<b>1.971</b>
	3-5/5	<b>1.689</b>	<b>1.270</b>	<b>2.245</b>
2 LL 9848, ChiSq 1084 (df 23) Sig. 0.000				