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**Labor market position after a rejection of a disability pension application:
a register-based cohort study**

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Abstract

Purpose: To study labor market positions of rejected disability pension applicants and to examine which characteristics predict ending up in these positions after the rejection.

Methods: Nationwide Finnish register data was used to describe employment, unemployment and disability pension trajectories of rejected applicants (n=5740) from four years before to four years after the rejection. Demographic, occupational and health-related determinants of labor market position after the rejection were examined among those employed and not employed at the time of the rejection.

Results: The proportion of the employed steeply decreased and that of unemployed increased before the rejection of a disability pension application. Four years after the rejection, 30% of the rejected applicants were employed, 24% were unemployed and 30% received disability pension. Employment at the time of the rejection, younger age, shorter unemployment history, public sector employment and milder work disability increased future employment. Manual work, public sector employment and previous long-term unemployment predicted future unemployment. Apart from higher age, associations with receiving disability pension were relatively weak.

Conclusions: For many rejected disability pension applicants return to work is challenging. Special efforts should be targeted to support the remaining work ability and to promote employment opportunities of the rejected applicants.

Keywords: disability pension; application; rejection; unemployment; employment status; labor market position

Introduction

Disability pension is an important component of the social security benefit system. Disability pension is intended to secure a living for those who are unable to work due to an illness or impairment that limits one's work ability. In the OECD countries, six percent of the working-age population receive disability benefits [1]. In the Scandinavian countries the figures are typically somewhat higher. In Finland, 7.4% of the population aged 25–64 years received disability pension at the end of 2015 [2].

Nevertheless, a substantial part of disability pension applications is rejected, and in many countries rejection rates have been increasing [1]. A rejection of a disability pension application implies that conflicting views about the applicant's work ability exist. In Finland, a disability pension can be normally granted if one's work disability continues after sickness allowance has been paid for one year [3]. A requirement is that the applicant has a medically diagnosed illness but the decision is based on an overall assessment where also other factors affecting the applicant's ability to work are taken into account. The decision is made by the pension provider on the basis of medical statements by the treating physician and other specialists, as well as other documents that describe the applicant's work ability, current job, work history and possibilities to work with the remaining work ability.

In Finland, 28% of the first-time applications in the earnings-related pension system were rejected in 2015 [4]. Due to differences in the benefit systems and application procedures, comparison to the rejection rates of other countries is difficult. The rejection rates have been shown to be higher, for example, among younger applicants and those with a weak labor market attachment. The rejection rates are also higher among applicants with musculoskeletal or mental problems, especially with complex or multiple diagnoses [5, 6, 7, 8].

In the recent years there has been a growing focus internationally to limit the number of people on permanent disability benefits following political changes that favour more active employment policies [9]. Also in Finland increasing emphasis has been put to work life participation of people with disabilities [10]. In this light it is inter-

esting to follow labor market positions of rejected disability pension applicants. Previous studies have shown that many of the rejected applicants are outside employment and a large proportion of them end up on a disability pension in a few years. A small-scale Finnish study showed that 43% of those with a rejection during 2010 had been working during the next calendar year [11]. Another study on public sector employees showed that one fourth of rejected applicants in 2009 had been granted a disability pension during the three following years. 30% had been working and 20% had been unemployed at least six months during the third year [12]. A Norwegian study showed that more than 40% of the rejected applicants were on disability pension after five years. A fourth of women and less than 20% of men were employed in gainful employment [13]. A US study showed that 40% of rejected disability insurance applicants were allowed benefits within three years [14].

The aim of this study was to examine labor market position among those who had a rejected disability pension application in 2010 using nationwide register-based data. We first examine trajectories of employment, unemployment and disability pension status from four years before the rejection to four years after the rejection. Then we examine whether several demographic, occupational and health-related characteristics are associated with employment, unemployment and disability pension status four years after the rejection. As these characteristics are associated with the probability of rejection, they may also explain the process following the rejection. Since being employed at the time of rejection presumably has a strong impact on subsequent labor market position, we also stratify the analyses by employment status at the time of the rejection.

Methods

Register of the Finnish Centre for Pensions was used to retrieve persons whose disability pension was rejected in 2010. This register includes all those who have any work history and have thus accrued earnings-related pension. However, the register does not include those who have never worked and are therefore entitled to national pension only. If one's work ability can be assumed to be restored through treatment or rehabilitation, the disability pension is granted for a fixed-term. Currently, about one half of all new disability pensions are fixed-term, and one fourth of the recipients return to work during the next four years [15].

We included only first-time applicants, thus excluding persons who had a previous rejection during the preceding four years or who had received disability pension during the same time. If a person had several rejected applications during the year 2010 the first one was selected as a starting point for the follow-up. The study includes 5,740 disability pension rejections, which corresponds to 22% out of 26,250 applications. Of the rejections, 5,132 concerned full disability pensions and 608 partial disability pensions.

Being employed, unemployed or receiving disability pension were examined as three separate labor market positions after the rejection. Employment and unemployment were derived from the common employment register of the pension providers. Information on employment was based on employment contracts. Employment includes also subsidized employment, such as special work training programs and work during vocational rehabilitation, as long as one has a valid employment contract. There was no information of hours worked but we excluded contracts shorter than one month. Also those who are on sick leave but had a valid employment contract at the time of the measurement become classified as employed. Unemployment was based on receiving some unemployment benefit (earnings-related unemployment allowance, basic unemployment allowance or labor market subsidy). Those who had an employment contract but also received some unemployment benefit were defined as unemployed. Disability pensions were derived from the pension register. The register also includes disability pensions granted retroactively if the original negative

decision was revised due to an appeal or a disability pension was granted on the basis of a new application. In such cases, we started the follow-up for disability pension from the moment of the rejection earliest.

The predictors included demographic, occupational and health-related characteristics. Demographic characteristics included gender and age, which was classified as up to 35 years, 35–44, 45–54, and 55–62 years at the time of the application. Disability pensions are not granted to those who have reached the age of 63 years, which is the lower limit of old-age pension in Finland.

Occupational characteristics included occupational class, employment sector and history of past unemployment. Occupational class at the end of 2009 was derived from Statistics Finland and classified as manual workers, lower non-manual employees, upper non-manual employees and entrepreneurs (including self-employed and owners of companies with salaried employees) [16]. The classification is based on economic activity, occupational title and the number of subordinates. For the unemployed, students and those with a missing occupational class at the end of 2009, the most recent occupational class after the year 2000 was searched. After searching the retrospective information, the proportion of those with unknown occupational class decreased from 40 to 17%, consisting mainly of students (50%) and long-term unemployed (35%).

Employment sector was divided into private and public sectors (government and municipal employees). An important distinction concerning the current study is that while in the private sector the work ability of a disability pension applicant is evaluated with respect to any reasonable job considering one's education and occupational history, among the public sector employees only the applicant's own job is considered [17]. Unemployment history was based on the cumulative number of unemployment days during the four years preceding the rejection. Unemployment history was classified as no unemployment, up to one year of unemployment and more than one year of unemployment during the preceding four years.

Health-related characteristics included primary diagnosis of the application, whether the application included also a secondary diagnosis and whether the application concerned full or partial disability pension. Each disability pension application must include at least one medical diagnosis, which are classified according to the ICD-10 classification. The primary diagnosis was classified as musculoskeletal diseases (ICD-10 chapter M), depression (F32-F33), other mental and behavioral disorders (chapter F excluding F32-F33), other diseases, and injury (S00-T98). Having a secondary diagnosis was considered to reflect more complex and ambiguous illnesses. Granting of full disability pension requires that one's work ability is reduced at least 60%. For partial disability pension a reduction of 40% is required. Application of partial disability pension was thus considered to reflect less severe weakening of work ability.

Statistical methods

We first drew trajectories presenting the proportion of the employed, unemployed and those receiving disability pension from four years before the rejection to four years after the rejection based on cross-sectional measurements in one year intervals.

Binary logistic regression analysis was then used to examine the associations of the predictors with the labor market position four years after the rejection in a prospective design. In these analyses we excluded those who had turned 63 by the fourth anniversary ($n=389$) (i.e. 59 years at the time of the rejection) as 63 years is the common lowest old-age pension age in Finland. Disability pensions are automatically transformed into old-age pensions at that age. As most non-retired take their old-age pension when they turn 63, particularly if they have health problems [18], also employment and unemployment are unfeasible outcomes after that age. The analyses were also made separately among those employed and not employed at the time of the rejection. The predictors were adjusted for each other because many of the variables are interconnected: e.g. gender and age are related to diagnosis of the disability pension and partial disability pensions are more common in the female-dominated public sector, and they are often granted on the basis of musculoskeletal diseases.

Supplementary analyses were conducted for each of the predictors individually (supplementary tables S1-S3) and using a follow-up time of two years (supplementary tables S4-S6). The results are given as odds ratios and their 95% confidence intervals. Statistical analyses were performed using SAS 9.3.

Results

Figure 1 presents employment and unemployment trajectories from four years before to four years after the rejection of a disability pension application. Entry to disability pension was followed from the rejection onwards.

- Figure 1 -

Four to two years before the rejection, about two thirds of the study population was employed (figure 1). After that the proportion of the employed steeply decreased, being 32% at the time of the rejection. During the four subsequent years, the proportion of the employed remained fairly stable at around 30%. The proportion of the unemployed was around 20% from four years to one year before the rejection. Unemployment increased to 35% at the time of the rejection, and started to decrease after one year. Four years from the rejection, 25% of the study population was unemployed. The proportion of those receiving disability pension increased from 19 to 30% from the first to the fourth year after the rejection. For 10% of the rejected applicants a disability pension was granted retroactively, so that the pension was effective already at the time of the rejection.

The proportion of people in the three labor market positions is also affected by the increasing proportion of the deceased and old-age pensioners during the follow-up. These proportions steadily increased from the first to the fourth year after the rejection. By the fourth anniversary, 200 (3.5%) rejected applicants had died and 355 (6.1%) had retired on old-age pension.

Table 1 presents the distributions of the demographic, occupational and health-related characteristics and the proportion of those rejected applicants who had an employment contract at the time of the rejection by each of the characteristics. Having an employment contract at the time of the rejection was more common among women and the proportion of the employed increased by age. Employment at the time of the rejection was less common among manual workers than non-manual em-

ployees or entrepreneurs, and more common in the public sector and those with no unemployment during the preceding four years. Employment at the time of the rejection was also more common among those who had applied disability pension due to musculoskeletal diseases and less common among those who had applied because of other mental disorders than depression. Employment at the time of rejection was more common among those who did not have a secondary diagnosis. It was also clearly more common among applicants for partial disability pension.

- Table 1 -

Table 2 presents the associations of the demographic, occupational and health-related characteristics with employment four years after the rejection among all rejected applicants and separately among those who were employed and those who were non-employed at the time of the rejection. Having an employment contract at the time of the rejection was strongly associated with employment four years later. Employment four years after the rejection was more common among women than men although the association was not statistically significant among those who were employed at the time of rejection. Future employment was less common among older rejected applicants.

Occupational class was relatively weakly associated with future employment. However, those without any known occupational class had weak prospects of employment. Furthermore, among those employed at the time of the rejection, entrepreneurs had higher risk of employment four years later. Also lower non-manual employees had slightly higher risk of employment than manual workers, although the association was not statistically significant at four years' follow up after other variables had been controlled for. However, the associations for lower non-manual employees and entrepreneurs were statistically significant when uncontrolled for other variables or when the follow-up time of two years was used (see supplementary tables S1 and S4). Working in the public sector was strongly associated with better employment prospects among those who were employed at the time of rejection. Those with more than one year of unemployment during the preceding four years had poor prospects of employment.

Compared to those with musculoskeletal diseases as the primary diagnosis, rejected applicants who had applied for disability pension due to depression or other mental disorders were less likely to be employed four years later, especially if they were non-employed at the time of rejection. Those with injury as the primary diagnosis were more likely to be employed in particular if employed already at the time of rejection. Having a secondary diagnosis decreased the prospects of future employment. Applying for partial disability pension was strongly associated with better employment four years after the rejection.

- Table 2 -

Applicants who were employed at the time of the rejection had clearly lower risk of unemployment four years later (table 3). Gender and age were not associated with future unemployment. Lower non-manual employees and entrepreneurs were less likely to be unemployed than manual workers, if they were employed at the time of the rejection. Those working in the public sector were less likely to be unemployed four years after the rejection. Past unemployment history increased unemployment also in the future. Unemployment four years after the rejection was more common if the application was based on other mental disorders than depression, but otherwise primary diagnosis of the application or having a secondary diagnosis was not associated with future unemployment. Neither was the type of disability pension applied for associated with future unemployment.

- Table 3 -

Employment status at the time of the rejection was not associated with receiving disability pension four years later (table 4). Also gender was not associated with future disability retirement but the risk of disability pension increased strongly by age. Those with unknown occupational class had lower risk of receiving disability pension four years later but otherwise differences between occupational classes were small. Public sector workers employed at the time of the rejection had an increased

risk of future disability retirement. Differences by primary diagnosis of the rejected application were small. However, rejected applicants with injury had a lower risk of future disability retirement. Furthermore, among those not employed at the time of the rejection, applicants with other somatic diseases than musculoskeletal diseases had an elevated risk of receiving disability pension. Having a secondary diagnosis increased the risk of receiving disability pension four years later in particular among those not employed at the time of rejection. The type of disability pension applied for was not associated with being on disability pension four years after the rejection.

- Table 4 -

Discussion

A rejection of a disability pension application concerns a large group of applicants. We examined labor market trajectories of rejected applicants and determinants of being employed, unemployed and receiving disability pension four years after the rejection. As being employed at the time of rejection presumably has a strong impact on subsequent labor market position, the analyses were stratified by employment status at the time of the rejection.

Employment, unemployment and disability pension before and after the rejection

Problems in labor market attachment were common both before and after the rejection of a disability pension application. The proportion of the employed strongly decreased and that of unemployed increased before the rejection. During the years preceding the rejection, around 20% of the rejected applicants had been unemployed. In the overall working-age population, unemployment rate in the same time period has been under 10%, with a slightly increasing trend over time [19]. During the last year before the rejection, unemployment rate steeply increased but started to decrease one year after the rejection. The temporary rise may be because at that point many applicants have reached the maximum number of sickness allowance days and are therefore transferred to unemployment benefits. Nevertheless, after the rejection the unemployment rate remained at a higher level than it had been before the rejection. This may be indicative of work ability problems that hinder employment but do not give a right to a disability pension.

Being employed after the rejection was slightly more common among women than among men but there were no gender differences in the risk of unemployment or receiving disability pension. However, higher age was strongly associated with low prospects of employment and high risk of disability retirement. This may indicate that the difficulties of engaging and maintaining employment are particularly large among older workers with work ability problems. The age pattern in disability retirement reflects the common age gradient in disability retirement, with strongly in-

creasing incidence after 50 years of age [1]. Younger applicants with a rejection may be more easily directed to medical and occupational rehabilitation and are targeted other measures that improve their employment prospects.

Four years after the rejection a third of the rejected applicants were receiving disability pension. Also previous studies have found that a large part of those with a rejection end up having a disability pension in the next few years [13, 14]. This may suggest that the disability pension evaluation system does not always work optimally. Work ability is difficult to assess and borderline cases may lead to appeals or reapplications that may change the decision [8]. However, rejected applicants may receive a disability pension within a few years also because their work ability further deteriorates. The age pattern is consistent with the idea that among older applicants work ability may deteriorate more rapidly.

Employment status at the time of the rejection was strongly associated with future employment and unemployment. Similar findings have been reported previously among disability benefit claimants [20]. In contrast, employment status at the time of the rejection was not associated with receiving disability pension four years later when controlled for the other variables, although without the adjustments or with a two year's follow-up time an elevated risk of disability retirement among those employed at the time of the rejection was seen (supplementary tables S3 and S6). Interestingly, the associations of the demographic, occupational and health-related characteristics with future labor market position were generally fairly similar among those employed and those not employed at the time of the rejection. The few notable differences between the employed and non-employed appeared mainly in the associations of the occupational characteristics to future labor market positions. This supports the consistency of these characteristics as determinants of future labor market position regardless of the situation at the time of the rejection.

Occupational characteristics

Occupational class differences in employment, unemployment and receiving disability pension after the rejection were relatively small. Compared to manual workers, entrepreneurs tended to have slightly higher risk of employment and lower risk of unemployment after the rejection. In the unadjusted results better employment and lower unemployment of lower-non manual employees was also clearly visible (supplementary table S1), but the associations attenuated when other variables were adjusted for. Many female-dominated health care occupations in the public sector are classified as lower non-manual employees, which may explain good employment in this occupational class.

Those with an unknown occupational class had low risk of employment which is understandable as the engagement into labor market in this group was weak already at the time of the rejection. Besides poor employment prospects, among those with unknown occupational class also the risk of disability retirement was low, implying that in this group it is difficult to fulfil the demands of the working life while also the criteria for a disability pension are hard to meet. The risk of disability retirement after the rejection did not differ between manual workers and non-manual employees, even if such difference is very strong in the risk of disability retirement in general [21]. This is likely to be because the rejected applicants are a twice selected group, first as applicants and then as rejected applicants, which evens out the differences.

The history of unemployment was associated with low prospects of employment and high risk of unemployment after the rejection. A third of the rejected applicants had some unemployment background and another third had been unemployed for at least one year during the preceding four years, confirming previous findings that experiences of unemployment are common among those with a rejection [6]. Previous studies have also shown that history of unemployment is associated with increased risk of rejection [7, 8]. Long-term unemployment combined with some work ability problems may lead to a situation where one sooner or later ends up in applying for disability pension. One motivation for applying a disability pension is to search for a secure subsistence and therefore it may be applied more easily than when employed. Unemployment may also complicate the assessment of work ability thus leading to higher proportion of rejections among the unemployed.

Occupational sector was one of the strongest determinants of the labor market position after the rejection. There are some regulations and policies that may explain the differences between private and public sectors. Half of the public sector employees were employed at the time of the rejection while in the private sector the proportion was only 26%, reflecting the practice that in the public sector employment contracts are more commonly continued despite long-term sickness absence. Working in the public sector was strongly associated with future employment but only if the applicant was employed at the time of the rejection. Also receiving disability pension was more common among public sector employees but again only if the applicant was employed at the time of the rejection. This may be related to the regulation that in the public sector work ability is assessed with respect to one's own current job and not to any available job one can be expected to manage. This regulation applies to those who have an employment contract at the time when the work disability begins [17].

Health-related characteristics

In comparison to applicants with musculoskeletal diseases, those who had applied disability pension due to mental disorders had poorer prospects to future employment, especially if they were not employed at the time of the rejection. This was also often the case particularly among rejected applicants with other mental disorders than depression, of whom only 17% were employed at the time of the rejection. The applicants with other mental disorders also had a lower risk of being unemployed four years after the rejection. However, despite the lower risk of both future employment and unemployment, the risk of future disability retirement was not elevated, suggesting that many rejected applicants with mental disorders other than depression have been excluded outside the labor market as well as the disability benefits.

Rejected applicants with injury more often were employed and less often receiving disability pension four years after the rejection than those who had applied disability pension due to some somatic or mental illness. The effect of injury on work ability may be temporary but one may need longer time to recover than the maximum sick-

ness allowance period of 300 allowance days. It may be visible already at the time of the application that the applicant's work ability can be restored with appropriate rehabilitation efforts. A previous study showed that return to work after temporary disability pension was most common among those with injury [15].

Slightly over one half of the rejected applicants had also one or more secondary diagnoses relating to the work disability. In previous studies associations of multi-morbidities and complex illnesses with rejections of disability pension applications have been shown. Rejected applicants had more often multiple diagnoses than those who were granted a disability pension [5], and complex mental disorders and musculoskeletal diseases more often led to rejection than well-defined conditions [7]. In our study those with a secondary diagnosis less often were employed and more often receiving disability pension four years after the rejection. Having several illnesses may decrease work ability more than a single illness [22, 23]. Work ability problems based on multi-morbidity may be more difficult to assess and more challenging to combine with the demands of working life.

About 10% of the rejected applicants had applied for partial disability pension. Rejection of an application for a partial disability pension was associated with increased employment but not with unemployment or receiving disability pension four years after the rejection. These findings are understandable as applying partial disability pension implies milder decrease in work ability and it is customary to continue working alongside the pension. A large majority of those who had applied for partial disability pension were employed at the time of the rejection.

Methodological considerations

The data was representative including all new rejections from the earnings-related pension scheme during one year. The outcome measures were based on employment contracts and receiving unemployment benefits or disability pension. Over the study years approximately 85% of the persons belonged to one of these labor market positions. At time of the rejection and one year earlier the coverage was lower, which is

explained by the receipt of sickness allowance, the use of which was not comprehensively available in our data, and was therefore not analysed. Also maternal and parental benefits and studying are likely to cover part of the remaining labor market positions. Unfortunately, all possible position cannot be tracked down with the registers. As the measurements were taken in single dates some misclassification may also follow from short-term interruptions for example in the receipt of unemployment benefits.

The measurements were based on registers which can generally be considered reliable. However, of the medical causes of work disability only the primary diagnosis is registered obligatorily. Thus, some secondary diagnoses may not be included in the register data which might underestimate the associations of secondary diagnosis and labor market positions.

The follow-up was started from the date of the rejection, i.e. the date when a decision on the application was made. Particularly regarding employment status at the beginning of the follow up, the date of application could have been more appropriate. However, in most cases the time period between the date of the application and the date of the decision is quite short.

We conducted two sets of sensitivity analyses. In the first set the exploratory variables were examined one at a time and in the second set the labor market positions were measured two years after the rejection (supplementary tables S1-S6). When the exploratory variables were examined without adjustment for the other characteristics the associations - especially with employment and unemployment - tended to be somewhat stronger. When the labor market positions were measured two years after the rejection the results remained broadly similar compared to those with the four-year follow-up.

Conclusions

As the rejection of a disability pension application implies that at least some of the applicant's work ability has been evaluated to remain, work resumption or retaining

work could be presumed. Yet, it seems that for many rejected applicants return to work is challenging. Four years after the rejection, less than a third of the rejected applicants were employed, and nearly equal proportions were unemployed or receiving disability pension. On the other hand, an employment rate of one third can be considered rather high, as applying for disability pension requires a documented long-lasting lack of work ability.

In addition to ending up having a disability pension, the existence of work ability problems may also affect the high unemployment rate after the rejection. Many rejected applicants have also experienced unemployment already a long time before the rejection. This stresses the need for a close co-operation between health care, public employment services and rehabilitation organizers from the early stages of decreasing work ability. However, previous studies have found difficulties in co-operation especially between unemployment agencies and return-to-work professionals in other organizations [24, 25]. As a disability pension application, even if rejected, clearly indicates work ability problems of some degree, special efforts should be targeted at this time point to support the remaining work ability, cut the persistent unemployment and promote employment prospects of the rejected applicants.

Declaration of interest

The authors report no conflicts of interest

References

1. OECD. *Sickness, Disability and Work: Breaking the Barriers. A synthesis of findings across OECD countries.* Paris: OECD, 2010.
2. The Sotkanet Indicator Bank. Population aged 25-64 receiving disability pension, as % of total population of same age 2016. [cited 2016 Dec 13] Available from: <https://www.sotkanet.fi/sotkanet/fi/haku?q=kansanel%C3%A4ke>
3. Niemelä H, Salminen K. *Social security in Finland.* Helsinki: Social Insurance Institution, Finnish Centre for Pensions, Finnish Pension Alliance and Ministry of Social Affairs and Health; 2006.
4. Finnish Centre for Pensions. *Earnings-related pension recipients in Finland 2015.* Helsinki: 2016.
5. Ydreborg B, Ekberg K, Nordlund A. Health, quality of life, social network and use of health care: a comparison between those granted and those not granted disability pensions. *Disabil Rehabil.* 2006;28:25-32. Epub 2006/01/06.
6. Ydreborg BA, Ekberg K. Disqualified for disability pension--a case/referent study. *Disabil Rehabil.* 2004;26:1079-86. Epub 2004/09/17.
7. Galaasen AM, Bruusgaard D, Claussen B. Excluded from social security: rejections of disability pension applications in Norway 1998-2004. *Scand J Public Health.* 2012;40:142-9. Epub 2012/02/07.
8. Gould R, Nyman H. *Työkyvyttömyyseläkepäätökset 2000-2011 (Applications for disability pension 2000-2011)* In Finnish. Helsinki: 2012.
9. Bonoli G, Natali D, editors. *The Politics of the New Welfare State.* Oxford: Oxford University Press 2012.
10. Nevala N, Turunen J, Tiainen R, Mattila-Wiro P. *Persons with partial work ability at work. A study of the feasibility and benefits of the Osku-concept in different contexts.* Ministry of Social Affairs and Health, 2015.
11. Gould R, Laaksonen M, Kivekäs J, Ropponen T, S. K, Hannu T, Käppi I, Ripatti P, Rokkanen T, Turtiainen S. *Työkyvyttömyyseläkettä edeltävät vaiheet. Asiakirja-aineistoon perustuva tutkimus (Phases preceding disability pension. A study based on documentary data)* In Finnish. Helsinki: 2014.

12. Perhoniemi R, Sohlman P, Heino S, Lundell K, Pekkarinen L. Työkyvyttömyyseläkkeen hylkäävät päätökset julkisella sektorilla – tutkimus hylkäävän päätöksen 2009-2013 saaneista (Rejections of disability pensions in the public sector - a study of rejected applicants 2009-2013) In Finnish. 2015.
13. Kornstad T, Skjerpen T. Avslagsrisiko for førstegangssøkere av uførepensjon (Rejection risk for first-time applicants of disability pension) In Norwegian. Økonomiske analyser. 2010;29:57-66.
14. French E, Song J. The Effect of Disability Insurance Receipt on Labor Supply. American Economic Journal: Economic Policy. 2014;6:291-337.
15. Laaksonen M, Gould R. Return to work after temporary disability pension in Finland. J Occup Rehabil. 2015;25:471-80.
16. Statistics Finland. Sosioekonomisen aseman luokitus 1989 (Classification of socio-economic groups 1989). Handbooks 17. Helsinki: Central Statistical Office of Finland; 1989.
17. Finnish Centre for Pensions and The Social Insurance Institution of Finland. Statistical yearbook of pensioners in Finland 2015. Helsinki: 2016.
18. Leinonen T, Laaksonen M, Chandola T, Martikainen P. Health as a predictor of early retirement before and after introduction of a flexible statutory pension age in Finland. Soc Sci Med. 2016;158:149-57. Epub 2016/05/08.
19. Official Statistics of Finland. Labour force survey. Employment and unemployment 2015 Helsinki: Statistics Finland; 2016 [cited 6.10.2016]. Available from: http://www.stat.fi/til/tyti/2015/13/tyti_2015_13_2016-04-12_tie_001_en.html.
20. Cornelius L, van d, Klink, JJ, de B, MR, Groothoff J, Brouwer S. Predictors of functional improvement and future work status after the disability benefit claim: a prospective cohort study. J Occup Rehabil. 2014;24:680-91.
21. Polvinen A, Laaksonen M, Gould R, Lahelma E, Leinonen T, Martikainen P. Socioeconomic Differences in Cause-Specific Disability Retirement in Finland, 1988 to 2009. J Occup Environ Med. 2016;58:840-5. Epub 2016/08/09.
22. Kaila-Kangas L, Haukka E, Miranda H, Kivekas T, Ahola K, Luukkonen R, Shiri R, Kaaria S, Heliövaara M, Leino-Arjas P. Common mental and musculoskeletal disorders as predictors of disability retirement among Finns. J Affect Disord. 2014;165:38-44.

23. Ervasti J, Vahtera J, Pentti J, Oksanen T, Ahola K, Kivekas T, Kivimaki M, Virtanen M. The role of psychiatric, cardiometabolic, and musculoskeletal comorbidity in the recurrence of depression-related work disability. *Depress Anxiety*. 2014;31:796-803. Epub 2014/07/06.
24. Liukko J, Kuuva N. Cooperation of return-to-work professionals: the challenges of multi-actor work disability management. *Disabil Rehabil*. 2016:1-8. Epub 2016/07/05.
25. Eriksson UB, Engstrom LG, Starrin B, Janson S. Falling between two stools; how a weak co-operation between the social security and the unemployment agencies obstructs rehabilitation of unemployed sick-listed persons. *Disabil Rehabil*. 2008;30:569-76. Epub 2008/04/03.

Figure 1. The proportion of the employed, the unemployed and those receiving a disability pension from 4 years before a rejection of a disability pension application to 4 years after the rejection (%)

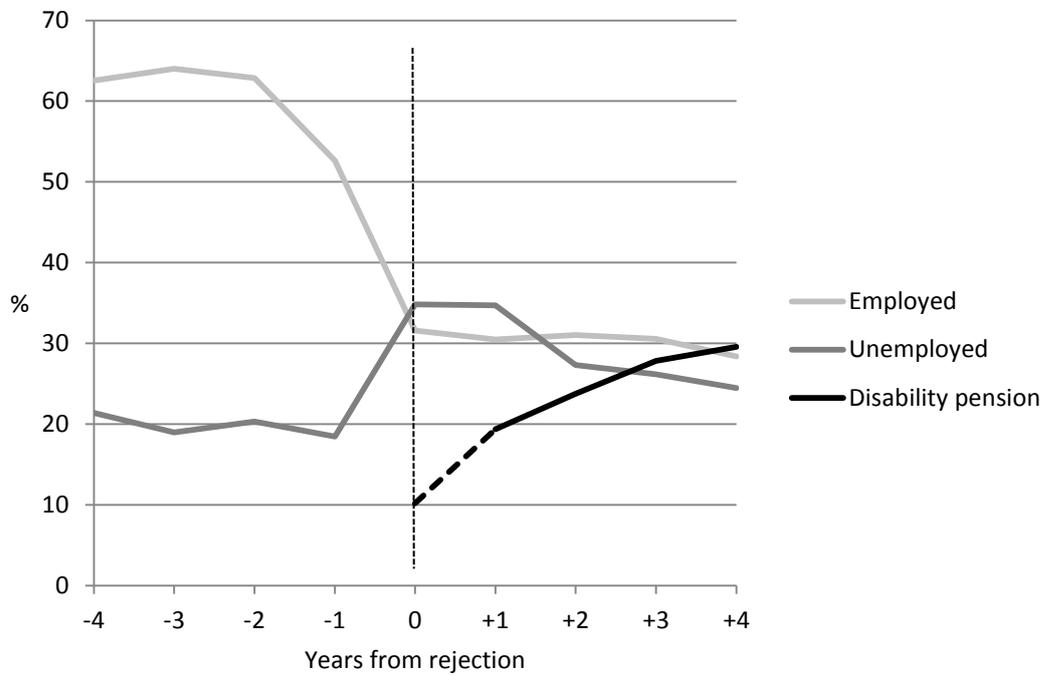


Table 1. Distributions of the explanatory variables and the proportion (%) of those who were employed at the time of rejection by the explanatory variables

	N (%)	% employed at the time of rejection
Gender		
Men	2768 (48)	26
Women	2972 (52)	37
Age at the time of rejection		
18-34	862 (15)	22
35-44	1121 (20)	27
45-54	2125 (37)	34
55-63	1632 (28)	36
Occupational class		
Manual workers	2389 (42)	31
Lower non-manual employees	1471 (26)	45
Upper non-manual employees	545 (9)	41
Entrepreneurs	360 (6)	44
Unknown	975 (17)	2
Employment sector		
Private	4357 (76)	26
Public	1383 (24)	49
Unemployment during the preceding 4 years		
None	2260 (39)	64
Up to 1 year	1802 (31)	17
More than 1 year	1678 (29)	3
Primary diagnosis		
Musculoskeletal diseases	2374 (41)	38
Other somatic diseases	1093 (19)	36
Depression	906 (16)	26
Other mental disorders	920 (16)	17
Injury	447 (8)	28
Secondary diagnosis		
No	2567 (45)	36
Yes	3173 (55)	28
Type of DP applied		
Full	5132 (89)	25
Partial	608 (11)	85
All	5740 (100)	32

Table 2. Associations of the explanatory variables with the risk of being employed 4 years after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI)

	Odds ratios for being employed 4 years after the rejection		
	All (N=5351)	Employment status at the time of rejection	
		Employed (N=1617)	Non-employed (N=3680)
Employed at the time of rejection			
No	1.00		
Yes	2.79 (2.34-3.32)		
Gender			
Men	1.00	1.00	1.00
Women	1.18 (1.02-1.37)	1.22 (0.96-1.55)	1.23 (1.01-1.49)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.03 (0.83-1.27)	1.15 (0.77-1.70)	0.98 (0.76-1.26)
45-54	0.61 (0.50-0.75)	0.85 (0.60-1.22)	0.50 (0.39-0.64)
55-59	0.25 (0.20-0.32)	0.36 (0.24-0.53)	0.18 (0.13-0.26)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	1.18 (0.99-1.40)	1.18 (0.91-1.52)	1.14 (0.91-1.44)
Upper non-manual employees	1.03 (0.78-1.38)	0.87 (0.58-1.30)	1.16 (0.77-1.75)
Entrepreneurs	1.23 (0.97-1.56)	2.19 (1.54-3.12)	0.75 (0.53-1.08)
Unknown	0.52 (0.40-0.68)	0.59 (0.22-1.61)	0.52 (0.39-0.69)
Employment sector			
Private	1.00	1.00	1.00
Public	1.67 (1.40-1.99)	2.27 (1.76-2.93)	1.15 (0.89-1.48)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	1.16 (0.98-1.38)	0.96 (0.72-1.27)	1.38 (1.09-1.74)
More than 1 year	0.24 (0.19-0.31)	0.24 (0.12-0.47)	0.29 (0.21-0.38)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	0.83 (0.68-1.00)	1.05 (0.80-1.39)	0.68 (0.52-0.89)
Depression	0.65 (0.53-0.81)	0.72 (0.52-1.00)	0.62 (0.47-0.82)
Other mental disorders	0.62 (0.49-0.77)	1.00 (0.68-1.48)	0.47 (0.35-0.63)
Injury	1.41 (1.10-1.81)	1.67 (1.08-2.58)	1.28 (0.94-1.74)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	0.68 (0.59-0.78)	0.72 (0.58-0.90)	0.66 (0.54-0.79)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	3.00 (2.40-3.75)	2.89 (2.23-3.75)	3.08 (1.89-5.05)

Table 3. Associations of the explanatory variables with the risk of being unemployed 4 years after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI)

	Odds ratios for being unemployed 4 years after the rejection		
	All (N=5351)	Employment status at the time of rejection	
		Employed (N=1617)	Non-employed (N=3680)
Employed at the time of rejection			
No	1.00		
Yes	0.57 (0.46-0.69)		
Gender			
Men	1.00	1.00	1.00
Women	1.10 (0.96-1.26)	1.06 (0.76-1.47)	1.09 (0.94-1.27)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.14 (0.92-1.41)	1.40 (0.82-2.40)	1.11 (0.88-1.39)
45-54	1.16 (0.95-1.41)	1.19 (0.72-1.95)	1.18 (0.95-1.46)
55-59	0.95 (0.77-1.19)	1.13 (0.66-1.92)	0.92 (0.72-1.17)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	0.83 (0.70-0.98)	0.69 (0.49-0.99)	0.90 (0.74-1.09)
Upper non-manual employees	0.86 (0.63-1.17)	0.84 (0.47-1.52)	0.88 (0.61-1.26)
Entrepreneurs	0.77 (0.60-0.98)	0.21 (0.11-0.42)	1.04 (0.79-1.38)
Unknown	0.91 (0.76-1.10)	1.44 (0.49-4.24)	0.95 (0.79-1.15)
Employment sector			
Private	1.00	1.00	1.00
Public	0.66 (0.56-0.79)	0.35 (0.24-0.52)	0.78 (0.64-0.95)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	1.55 (1.29-1.87)	1.34 (0.94-1.92)	1.56 (1.25-1.94)
More than 1 year	3.10 (2.56-3.76)	2.42 (1.27-4.64)	3.14 (2.53-3.90)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	0.90 (0.75-1.08)	0.89 (0.60-1.32)	0.89 (0.73-1.10)
Depression	1.03 (0.86-1.25)	1.11 (0.70-1.76)	1.02 (0.82-1.25)
Other mental disorders	0.77 (0.64-0.94)	0.83 (0.47-1.49)	0.77 (0.62-0.94)
Injury	0.88 (0.69-1.13)	0.87 (0.47-1.59)	0.89 (0.67-1.17)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	0.99 (0.87-1.13)	1.23 (0.91-1.68)	0.94 (0.81-1.09)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	0.89 (0.67-1.18)	0.83 (0.57-1.20)	1.04 (0.65-1.65)

Table 4. Associations of the explanatory variables with the risk of drawing disability pension 4 years after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI)

	Odds ratios for drawing disability pension 4 years after the rejection		
	All (N=5351)	Employment status at the time of rejection	
		Employed (N=1617)	Non-employed (N=3680)
Employed at the time of rejection			
No	1.00		
Yes	1.05 (0.88-1.25)		
Gender			
Men	1.00	1.00	1.00
Women	1.04 (0.91-1.18)	0.95 (0.74-1.21)	1.07 (0.92-1.26)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.65 (1.28-2.12)	1.15 (0.71-1.87)	1.85 (1.37-2.48)
45-54	3.15 (2.51-3.96)	2.70 (1.76-4.16)	3.25 (2.48-4.26)
55-59	6.26 (4.93-7.95)	5.14 (3.29-8.04)	6.76 (5.08-8.98)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	1.03 (0.88-1.21)	0.95 (0.74-1.23)	1.06 (0.86-1.30)
Upper non-manual employees	0.91 (0.70-1.19)	0.67 (0.44-1.02)	1.16 (0.81-1.65)
Entrepreneurs	1.22 (0.98-1.52)	0.88 (0.61-1.26)	1.55 (1.18-2.03)
Unknown	0.71 (0.58-0.86)	0.73 (0.23-2.34)	0.75 (0.61-0.92)
Employment sector			
Private	1.00	1.00	1.00
Public	1.44 (1.24-1.68)	1.93 (1.50-2.49)	1.18 (0.97-1.44)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	0.83 (0.70-0.99)	0.83 (0.62-1.12)	0.89 (0.72-1.11)
More than 1 year	0.87 (0.72-1.04)	0.94 (0.51-1.76)	0.93 (0.75-1.15)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	1.10 (0.93-1.29)	0.80 (0.61-1.05)	1.33 (1.08-1.64)
Depression	1.17 (0.97-1.40)	1.13 (0.81-1.57)	1.21 (0.97-1.50)
Other mental disorders	1.12 (0.92-1.36)	1.17 (0.78-1.74)	1.14 (0.91-1.43)
Injury	0.67 (0.51-0.87)	0.65 (0.40-1.04)	0.71 (0.52-0.97)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	1.30 (1.15-1.48)	1.17 (0.93-1.46)	1.33 (1.14-1.56)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	0.96 (0.78-1.18)	0.97 (0.76-1.24)	0.80 (0.49-1.30)

Supplementary Table S1. Associations of the explanatory variables with the risk of being employed 4 years after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI). **Each of the explanatory variables individually**

	All	Employed at the time of rejection	Not employed at the time of rejection
Employed at the time of rejection			
No	1.00		
Yes	5.63 (4.96-6.40)		
Gender			
Men	1.00	1.00	1.00
Women	1.67 (1.49-1.89)	1.76 (1.45-2.13)	1.23 (1.04-1.45)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.13 (0.94-1.36)	1.55 (1.07-2.23)	0.91 (0.72-1.15)
45-54	0.93 (0.79-1.10)	1.39 (1.01-1.91)	0.51 (0.41-0.64)
55-59	0.47 (0.39-0.58)	0.48 (0.34-0.66)	0.18 (0.13-0.24)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	1.70 (1.47-1.95)	1.68 (1.36-2.08)	1.23 (1.00-1.51)
Upper non-manual employees	1.46 (1.14-1.86)	1.26 (0.89-1.78)	1.09 (0.76-1.57)
Entrepreneurs	1.26 (1.03-1.55)	1.56 (1.15-2.12)	0.74 (0.53-1.02)
Unknown	0.26 (0.20-0.33)	0.67 (0.26-1.71)	0.38 (0.30-0.50)
Employment sector			
Private	1.00	1.00	1.00
Public	2.02 (1.77-2.30)	2.25 (1.85-2.75)	0.94 (0.75-1.16)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	0.63 (0.55-0.72)	0.78 (0.61-1.00)	1.78 (1.45-2.20)
More than 1 year	0.10 (0.08-0.12)	0.22 (0.12-0.42)	0.29 (0.22-0.37)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	0.77 (0.65-0.90)	0.92 (0.72-1.17)	0.63 (0.49-0.80)
Depression	0.62 (0.52-0.74)	0.81 (0.61-1.08)	0.70 (0.55-0.90)
Other mental disorders	0.44 (0.36-0.53)	1.11 (0.78-1.56)	0.48 (0.37-0.63)
Injury	1.11 (0.90-1.38)	1.28 (0.87-1.87)	1.41 (1.07-1.85)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	0.60 (0.53-0.67)	0.94 (0.78-1.13)	0.50 (0.43-0.60)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	5.66 (4.70-6.81)	2.65 (2.13-3.29)	2.33 (1.50-3.64)

Supplementary Table S2. Associations of the explanatory variables with the risk of being unemployed 4 years after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI) **Each of the explanatory variables individually**

	All	Employed at the time of rejection	Not employed at the time of rejection
Employed at the time of rejection			
No	1.00		
Yes	0.31 (0.26-0.36)		
Gender			
Men	1.00	1.00	1.00
Women	0.89 (0.79-1.01)	0.82 (0.62-1.10)	1.07 (0.93-1.22)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.21 (0.99-1.48)	1.03 (0.62-1.71)	1.32 (1.05-1.65)
45-54	1.16 (0.97-1.39)	0.79 (0.50-1.25)	1.45 (1.18-1.78)
55-59	0.97 (0.79-1.19)	0.66 (0.40-1.07)	0.86 (0.69-1.08)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	0.67 (0.57-0.78)	0.55 (0.40-0.76)	0.86 (0.71-1.03)
Upper non-manual employees	0.62 (0.47-0.83)	0.58 (0.33-1.00)	0.70 (0.50-0.98)
Entrepreneurs	0.61 (0.48-0.77)	0.25 (0.13-0.48)	0.84 (0.65-1.10)
Unknown	1.23 (1.04-1.45)	1.82 (0.64-5.15)	0.98 (0.82-1.16)
Employment sector			
Private	1.00	1.00	1.00
Public	0.61 (0.52-0.71)	0.39 (0.28-0.56)	0.94 (0.79-1.13)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	2.20 (1.87-2.59)	1.92 (1.37-2.69)	1.64 (1.32-2.02)
More than 1 year	4.44 (3.79-5.21)	3.22 (1.74-5.95)	2.95 (2.41-3.63)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	0.90 (0.76-1.08)	0.86 (0.59-1.25)	0.85 (0.70-1.04)
Depression	1.10 (0.92-1.31)	1.03 (0.67-1.59)	0.99 (0.81-1.20)
Other mental disorders	0.98 (0.82-1.17)	0.88 (0.51-1.51)	0.83 (0.68-1.00)
Injury	0.94 (0.74-1.20)	0.96 (0.54-1.71)	0.85 (0.65-1.11)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	1.12 (0.99-1.26)	1.02 (0.77-1.36)	1.02 (0.89-1.17)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	0.42 (0.33-0.53)	0.70 (0.50-0.99)	1.04 (0.67-1.62)

Supplementary Table S3. Associations of the explanatory variables with the risk of drawing disability pension 4 years after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI). **Each of the explanatory variables individually**

	All	Employed at the time of rejection	Not employed at the time of rejection
Employed at the time of rejection			
No	1.00		
Yes	1.44 (1.27-1.62)		
Gender			
Men	1.00	1.00	1.00
Women	1.19 (1.06-1.33)	1.20 (0.98-1.47)	1.13 (0.98-1.30)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.76 (1.38-2.26)	1.35 (0.84-2.15)	1.93 (1.44-2.58)
45-54	3.49 (2.80-4.34)	3.21 (2.14-4.83)	3.42 (2.63-4.44)
55-59	6.89 (5.48-8.66)	3.97 (2.62-6.01)	5.00 (3.82-6.54)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	1.16 (1.01-1.34)	1.15 (0.92-1.43)	1.06 (0.88-1.28)
Upper non-manual employees	1.13 (0.88-1.44)	0.86 (0.59-1.24)	1.16 (0.84-1.60)
Entrepreneurs	1.30 (1.06-1.58)	0.77 (0.55-1.07)	1.73 (1.35-2.22)
Unknown	0.66 (0.56-0.79)	0.49 (0.16-1.50)	0.76 (0.63-0.91)
Employment sector			
Private	1.00	1.00	1.00
Public	1.63 (1.43-1.86)	2.07 (1.70-2.53)	1.23 (1.03-1.47)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	0.68 (0.59-0.78)	0.68 (0.52-0.89)	0.86 (0.71-1.05)
More than 1 year	0.81 (0.70-0.93)	0.75 (0.42-1.34)	1.02 (0.85-1.23)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	1.11 (0.95-1.30)	0.76 (0.59-0.98)	1.30 (1.07-1.58)
Depression	0.95 (0.80-1.12)	0.88 (0.65-1.19)	1.05 (0.86-1.29)
Other mental disorders	0.74 (0.62-0.88)	0.91 (0.64-1.30)	0.83 (0.68-1.02)
Injury	0.54 (0.42-0.69)	0.45 (0.29-0.71)	0.65 (0.48-0.87)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	1.44 (1.28-1.62)	1.63 (1.34-1.98)	1.42 (1.23-1.64)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	1.57 (1.31-1.87)	1.36 (1.10-1.68)	1.03 (0.65-1.63)

Supplementary Table S4. Associations of the explanatory variables with the risk of being employed **2 years** after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI).

	All	Employed at the time of rejection	Not employed at the time of rejection
Employed at the time of rejection			
No	1.00		
Yes	3.70 (3.12-4.38)		
Gender			
Men	1.00	1.00	1.00
Women	1.13 (0.97-1.30)	1.03 (0.81-1.30)	1.27 (1.05-1.54)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.11 (0.89-1.39)	1.34 (0.90-2.00)	1.00 (0.77-1.30)
45-54	0.89 (0.73-1.10)	1.27 (0.89-1.82)	0.73 (0.57-0.94)
55-59	0.45 (0.36-0.57)	0.67 (0.46-0.96)	0.33 (0.24-0.44)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	1.27 (1.07-1.50)	1.22 (0.95-1.57)	1.28 (1.02-1.60)
Upper non-manual employees	1.02 (0.78-1.35)	0.88 (0.59-1.30)	1.14 (0.77-1.70)
Entrepreneurs	1.36 (1.09-1.71)	2.51 (1.77-3.58)	0.85 (0.60-1.20)
Unknown	0.50 (0.38-0.65)	0.61 (0.22-1.66)	0.49 (0.37-0.65)
Employment sector			
Private	1.00	1.00	1.00
Public	1.85 (1.56-2.20)	2.54 (1.97-3.28)	1.32 (1.04-1.69)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	0.98 (0.83-1.17)	0.84 (0.64-1.10)	1.15 (0.91-1.44)
More than 1 year	0.25 (0.20-0.31)	0.20 (0.10-0.38)	0.30 (0.23-0.39)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	0.88 (0.73-1.05)	1.14 (0.87-1.50)	0.71 (0.54-0.92)
Depression	0.74 (0.60-0.90)	0.99 (0.71-1.37)	0.62 (0.47-0.81)
Other mental disorders	0.67 (0.53-0.83)	0.85 (0.57-1.25)	0.58 (0.43-0.76)
Injury	1.37 (1.07-1.75)	1.77 (1.14-2.74)	1.20 (0.88-1.62)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	0.75 (0.66-0.87)	0.81 (0.65-1.01)	0.72 (0.61-0.87)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	2.54 (2.03-3.17)	2.87 (2.20-3.73)	1.70 (1.03-2.83)

Supplementary Table S5. Associations of the explanatory variables with the risk of being unemployed **2 years** after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI)

	All	Employed at the time of rejection	Not employed at the time of rejection
Employed at the time of rejection			
No	1.00		
Yes	0.64 (0.52-0.77)		
Gender			
Men	1.00	1.00	1.00
Women	1.03 (0.91-1.18)	0.97 (0.71-1.33)	1.03 (0.89-1.19)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.00 (0.81-1.24)	1.11 (0.65-1.87)	1.00 (0.79-1.26)
45-54	1.12 (0.92-1.36)	1.01 (0.63-1.64)	1.15 (0.93-1.42)
55-59	1.24 (1.01-1.52)	1.02 (0.62-1.68)	1.31 (1.04-1.65)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	1.07 (0.91-1.26)	0.90 (0.64-1.26)	1.15 (0.95-1.39)
Upper non-manual employees	0.81 (0.60-1.09)	1.02 (0.59-1.78)	0.73 (0.51-1.04)
Entrepreneurs	0.75 (0.59-0.97)	0.28 (0.15-0.53)	0.95 (0.72-1.26)
Unknown	0.93 (0.78-1.12)	0.89 (0.27-2.88)	1.00 (0.83-1.20)
Employment sector			
Private	1.00	1.00	1.00
Public	0.65 (0.55-0.76)	0.39 (0.27-0.56)	0.73 (0.61-0.88)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	2.25 (1.87-2.70)	1.50 (1.06-2.12)	2.45 (1.95-3.08)
More than 1 year	4.45 (3.68-5.39)	6.11 (3.44-10.85)	4.60 (3.68-5.76)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	0.89 (0.75-1.06)	0.75 (0.51-1.11)	0.92 (0.76-1.13)
Depression	0.98 (0.81-1.18)	1.07 (0.69-1.66)	0.96 (0.78-1.18)
Other mental disorders	0.80 (0.67-0.97)	1.18 (0.71-1.99)	0.77 (0.63-0.95)
Injury	0.71 (0.55-0.92)	0.67 (0.36-1.26)	0.72 (0.54-0.95)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	1.12 (0.98-1.27)	1.49 (1.11-2.01)	1.06 (0.92-1.22)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	0.94 (0.72-1.22)	0.73 (0.51-1.05)	1.55 (1.00-2.40)

Supplementary Table S6. Associations of the explanatory variables with the risk of drawing disability pension 2 years after the rejection of a disability pension application among all who received a rejection in 2010 and separately among those who were and were not employed at the time of rejection, odds ratios (OR) and 95% confidence intervals (95% CI)

	All	Employed at the time of rejection	Not employed at the time of rejection
Employed at the time of rejection			
No	1.00		
Yes	1.22 (1.02-1.46)		
Gender			
Men	1.00	1.00	1.00
Women	1.00 (0.87-1.15)	0.99 (0.77-1.27)	1.01 (0.86-1.20)
Age at the time of rejection			
18-34	1.00	1.00	1.00
35-44	1.41 (1.08-1.83)	1.37 (0.82-2.31)	1.42 (1.04-1.93)
45-54	2.10 (1.65-2.66)	2.46 (1.54-3.92)	1.94 (1.47-2.57)
55-59	4.32 (3.40-5.49)	4.99 (3.11-7.99)	4.12 (3.11-5.46)
Occupational class			
Manual workers	1.00	1.00	1.00
Lower non-manual employees	1.00 (0.85-1.17)	0.93 (0.72-1.21)	1.01 (0.81-1.25)
Upper non-manual employees	0.97 (0.74-1.26)	0.62 (0.40-0.95)	1.35 (0.96-1.91)
Entrepreneurs	0.92 (0.73-1.16)	0.65 (0.44-0.96)	1.17 (0.88-1.57)
Unknown	0.72 (0.58-0.88)	0.97 (0.30-3.12)	0.75 (0.60-0.93)
Employment sector			
Private	1.00	1.00	1.00
Public	1.35 (1.15-1.58)	1.76 (1.35-2.28)	1.12 (0.91-1.38)
Unemployment during the preceding 4 years			
None	1.00	1.00	1.00
Up to 1 year	0.82 (0.69-0.98)	1.00 (0.74-1.35)	0.79 (0.63-0.99)
More than 1 year	0.89 (0.74-1.08)	0.97 (0.52-1.84)	0.91 (0.73-1.13)
Primary diagnosis			
Musculoskeletal diseases	1.00	1.00	1.00
Other somatic diseases	1.10 (0.93-1.31)	0.91 (0.69-1.20)	1.25 (1.00-1.55)
Depression	1.29 (1.07-1.56)	1.24 (0.89-1.74)	1.33 (1.06-1.67)
Other mental disorders	1.08 (0.88-1.32)	1.00 (0.65-1.53)	1.13 (0.89-1.43)
Injury	0.78 (0.59-1.02)	0.71 (0.44-1.17)	0.84 (0.61-1.17)
Secondary diagnosis			
No	1.00	1.00	1.00
Yes	1.09 (0.96-1.25)	1.08 (0.86-1.35)	1.07 (0.91-1.26)
Type of DP applied			
Full	1.00	1.00	1.00
Partial	0.64 (0.51-0.80)	0.56 (0.44-0.73)	0.86 (0.51-1.44)