Mortality in relation to disability pension: Findings from a 12-year prospective population-based cohort study in Sweden

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Abstract

Aims: Knowledge is limited regarding the association between disability pension (DP) and mortality. The aim of this study was to examine the relative risk (RR) of mortality associated with DP among women and men of different ages over a 12-year period, for DP in general, and for full-time DP, part-time DP, and DP for labour-market reasons, respectively.

Methods: A prospective cohort study was performed covering the total population of the Swedish county of Östergötland aged 16–64 years in December 1984 (n=245,704) followed up from 1985 to 1996. The RR of mortality was analysed in relation to DP, age, and gender using a Cox proportional hazards model.

Results: The RR of mortality was higher for DP recipients than for individuals without DP, and this was true for both women (RR 2.79, 95% confidence interval (CI) 2.63 to 2.96) and men (RR 2.97, CI 2.83 to 3.11), and for all age groups. The RR of mortality was highest among the youngest DP recipients. The RR of mortality was especially high the first year of DP and remained elevated over the whole follow-up period. The RR of mortality among part-time DP recipients was lower than among full-time DP recipients and was significantly higher than seen for non-DP recipients. Individuals granted DP for labour-market reasons exhibited much lower RR of mortality than all other DP recipients.

Conclusions: Further research is needed to investigate which factors explain the very high RR of mortality among disability pensioners.

Key Words: Cohort analysis, disability pension, early retirement, mortality

Background

The use of disability pension (DP) funds in Sweden and several other industrialized countries has increased in recent decades, and this situation has led to high costs for society and a large burden on the individual [1]. Possible explanations for this increase in permanent incapacity must be sought at both macro levels (design of the social insurance system, demography, working life) and the level of the individual (medical and sociodemographic predictors) [2]. Despite general improvements in health and longevity [3], an increasing number of people are on long-term sick leave or are receiving DP, and the actual ill health of those individuals is increasingly being questioned [1,4,5].

One way to assess the ill-health component of DP is to study to what extent DP is related to an excess mortality [6]. Very few studies have considered mortality among disability pensioners; however, a few have found such associations. Studies that have addressed this topic have been restricted to certain occupations [7–9], or particular age groups [10,11].

To our knowledge, no prospective population-based cohort study including all ages has yet been conducted to compare the relative risk of mortality in relation to DP.
Aims

The main aim of this study was to examine the relative risk (RR) of mortality associated with full- or part-time DP among women and men of different ages over a 12-year period. A further aim of the study was to examine the RR of mortality associated with DP for labour-market reasons for individuals older than 55 years.

Material and methods

Study population

The investigation included all 245,704 individuals who, in December 1984, lived in Östergötland County (392,887 inhabitants), Sweden, and were 16 to 64 years old. For each of these individuals, the following data were obtained from the National Social Insurance Board: date of birth, gender, and for individuals with a DP during the period 1985–1996, the date of first DP decision, the grade of DP (part-time or full-time) and reason for DP (medical or labour-market) (Figure 1). Dates of deaths during the period 1985–1996 were obtained from the National Board of Health and Welfare.

Disability pension in Sweden

All residents of Sweden aged 16 to 64 years (including those unemployed) are covered by the national sickness insurance scheme, which entitles them to DP if their capacity to work is reduced permanently or for several years due to disease or injury. In addition, up to 1991, persons older than 55 years could be granted DP for labour-market reasons, for instance, if the company where they worked went out of business and there were no other jobs in the area. In the period analysed, full-time (1/1) or part-time (1/2 or 2/3) disability pensions were granted.

A full DP accounts for at least 65% of lost employment income. In Sweden, there is no limit to the duration of a sick-leave spell. A person can be on sick-leave for several years before being granted a DP.


The unemployment rate in Sweden was low (3%) in 1985, and increased during the subsequent economic recession and was 8% in 1996. By comparison, the employment rates in Sweden were high for both women (77%) and men (84%) in 1985 and had dropped to 70% and 73%, respectively, in 1996 [12].

Statistical methods

Each individual in the study population was followed up from January 1985 until death or to the end of the study period on 31 December 1996. Participants...
were grouped according to the following age groups at baseline (December 1984): 16–24, 25–34, 35–44, 45–54, and 55–64 years. The RR of mortality was analysed for both men and women in the different age groups by a Cox proportional hazard model with DP as a time-dependent predictor. The RR of mortality among disability pensioners compared with all others was estimated with a 95% confidence interval (CI). The date of DP was the date of first DP decision in the period of observation. Since age is such a strong determinant of mortality, the time scale used in the Cox regression was attained age [13].

In order to estimate the effect of time on the RR of mortality for disability pensioners, the years since the date of DP in one-year intervals were covariates in a Cox model.

In analyses of part-time DP, observations were censored at the date of full-time DP. In analyses of DP for labour-market reasons among individuals older than 55 years, observations were censored at the date of DP granted for medical reasons. A test of interaction of RR of mortality associated with DP for labour-market reasons by gender was performed [13]. A difference was considered statistically significant at \( p < 0.05 \).

**Ethical approval**

The study was approved by the Swedish National Data Inspection Board and the Local Research Ethics Committee.

**Results**

The RR of mortality was statistically highly significantly higher than 1 \( (p < 0.001) \) among both male and female disability pensioners in all age groups, and was highest in the youngest group (16–24 years) and decreased with age. The RR of mortality among DP recipients aged 35 to 44 years was greater for men than for women (Table I). The RR of mortality rose with increasing degree of DP (from part-time to full-time pension; Table II).

The RR of mortality in relation to the time elapsed since starting to collect DP is shown in Figure 2. The RR of mortality was especially high during the first year of collecting DP (RR for women = 3.40 (CI 2.88 to 4.02); RR for men = 3.37 (CI 2.96 to 3.84)), with a later decrease but remained high during the whole follow-up period for both genders. The RR of mortality after five years with DP were: RR for women = 2.42 (CI 2.02 to 2.89); RR for men = 2.68 (CI 2.34 to 3.06). After 10 years of DP, a high RR of mortality was still observed: RR for women = 2.13 (CI 1.74 to 2.61); RR for men = 2.84 (CI 2.47 to 3.27).

Among persons who reached 55 years, those receiving DP for labour-market reasons and those not collecting DP were compared with regard to mortality. In the labour-market associated DP group, the RR of mortality was not statistically significantly higher than 1 among women (RR = 0.99; CI 0.78 to 1.24), and slightly higher than 1 among men (RR = 1.24; CI 1.06 to 1.45). However, the gender difference was not statistically significant \( (p = 0.09) \). Compared with all other DP recipients, the group granted DP for labour-market reasons (both men and women) showed much lower RR of mortality.

**Discussion**

The objective of the present study was to assess the association between DP and mortality in a large

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Total population</th>
<th>All disability pensions</th>
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<tbody>
<tr>
<td></td>
<td>n</td>
<td>No. of deaths</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No. of deaths RR 95% CI</td>
</tr>
<tr>
<td>Women</td>
<td>16–24</td>
<td>24,217</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>25–34</td>
<td>25,557</td>
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<td></td>
<td>35–44</td>
<td>28,022</td>
<td>536</td>
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<td></td>
<td>55–64</td>
<td>23,056</td>
<td>2,929</td>
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</tr>
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<td>25,677</td>
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<td></td>
<td>25–34</td>
<td>27,109</td>
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<td>29,292</td>
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<td>20,443</td>
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<td></td>
<td>55–64</td>
<td>21,732</td>
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<tr>
<td>Total</td>
<td></td>
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\*Age in years, December 1984.
cohort. The results show that DP awarded for medical reasons was associated with a high RR of mortality for both men and women in all age groups, and the RR of mortality was highest among younger individuals. The RR of mortality among part-time DP recipients was lower than among full-time DP recipients and was significantly higher than seen for non-DP recipients. Individuals granted DP for labour-market reasons exhibited much lower RR of mortality than all other DP recipients.

**Methodological considerations**

This study is the first prospective population-based cohort study of DP and mortality that has had access to information on the entire population aged 16–64 years in a whole county. All data on DP were obtained from the National Social Insurance Board, and they were taken from administrative registers of payments, which can be considered a very reliable source [1]. The fairly equal and high employment frequency for both men and women that was characteristic of the labour market in Sweden in the mid-1980s [14] was an advantage for gender comparisons.

**Disability pension and mortality**

The present results are consistent with previous investigations reported in the literature. In a study of 4,440 Danish men applicants for DP and 4,457 non-retired men from the same trade union matched by

![Figure 2. Mortality risk for disability pensioners compared with all other members of the population shown in relation to year after being granted disability pension.](image)
age and followed up for 10 years, the applicants for DP had a high RR of mortality compared with the reference group [7]. The RR of mortality was high up to 10 years after being granted DP. In a study of 1,353 Danish men disability pensioners and 1,353 non-retired men from the same trade union matched geographically and by age and followed for 3.5 years, DP recipients had a high RR of mortality [8]. In a study based on a small study population (n=64 Danish men early age and disability pensioners compared with 121 matched non-retired men in the same union), a high RR of death was observed among the disability pensioners [9]. In a population-based Danish study of 496,532 persons followed up from age 60 to 70 years in 1986–1996, DP recipients among both men and women had a high RR of mortality and this was much higher than among early retirement recipients [10]. The RR of mortality was high up to eight years after being granted DP. In a study of 7,697 Swedish men aged 48 to 58 years, the mortality rate among the disability pensioners was higher than among those without a pension [11].

There are several possible explanations for the high RR of mortality among disability pensioners. Due to the fact that the chief criterion for being granted DP is a reduced capacity to work due to disease or injury, the first explanation to consider for the high RR of mortality among disability pensioners is the underlying disease (i.e. the diagnosis certifying the DP). Studies have, however, shown that the most common diagnoses for DP are musculoskeletal and psychiatric disorders, that is, conditions which are seldom fatal [1,3,15].

The high RR of mortality among DP recipients might also be explained by factors other than the diagnosis for DP. Such factors are, for example: social isolation, lifestyle elements (smoking, alcohol, and levels of physical activity), social deprivation, low socioeconomic status, genes (heredity), or a complex health-related selection process inherent to the workplace [1,15,16]. In a study among workers in the construction industry, a positive association was found between smoking and DP [17]. One study discerned a positive association between indicators of alcohol abuse and increased risk of DP in men [18], whereas other investigators detected a decrease in alcohol consumption among male alcoholics after disability retirement [19].

**Age differences**

The same high RR of mortality we found in young DP recipients has also been observed by other investigators [7]. There might be several possible explanations for this high RR of mortality in young DP recipients. It should be pointed out that we are studying all-cause mortality, which is strongly age-related. Even if the RR is highest in youngest age groups of DP recipients, the (absolute) mortality risk is lower than in the older age groups (see Table I). A second part-explanation may be that the DP is in fact granted for other reasons in the group of young disability pensioners compared with the older disability pensioners [18,20,21]. The distribution of diagnosis for DP that provides information on the medical obstacles to gainful employment is different between young and older disability pensioners [22]. Among DP granted at older ages (which constitutes the majority of disability pensioners), the dominant diagnosis group is musculoskeletal disorders while the second largest diagnosis group is psychiatric disorders. Among young disability pensioners, the dominant diagnosis group is psychiatric disorders. In addition, many of the young disability pensioners are granted a DP because of congenital disorders or innate handicaps. This needs further investigation.

**Time since disability pension**

The increased level of RR of mortality immediately after the award of DP with a later decrease of RR of mortality with time was consistent with findings from a previous study [10]. This pattern indicates a selection of individuals with poor health; a selection of the healthy would have had the opposite effect, a decrease of RR of mortality following selection and thereafter a re-levelling of RR of mortality with time. We noted that RR of mortality was still substantially elevated 12 years after being granted DP. A persistent high RR of mortality was also observed in another study 10 years after being granted DP [7]. A 13-year longitudinal prospective cohort study of the healthcare utilization among the disability-pensioned men showed a similar pattern of persistent ill-health among individuals a long time after being granted DP [23]. In this study, the disability pensioners still had twice the healthcare utilization as the referents 13 years after being granted DP and appeared to have a broader health deterioration than reflected by the retirement diagnosis. The job loss associated with DP represents the loss of an environment that provides the possibility of achieving a sense of self-worth and personal development and the lack of social support from workmates. This might have the same negative impact on health as unemployment does [16]. However, some researchers [24] have reported a decrease in the rate of healthcare consumption after the start of DP. This decrease might be the result of not having to contact health services to prolong
periods covered by sickness certificates or to establish a diagnosis of disease.

**Part-time disability pension and mortality**

The pattern of high RR of mortality that we observed for full-time DP was less pronounced for part-time DP, which agrees with previously reported findings [7,8]. The observation that part-time DP was associated with lower RR of mortality than full-time DP indicates that these persons may have fewer health problems, thereby fewer functional consequences and less impact on work ability. Part-time DP also offers the advantages of all the health-promoting aspects of work, such as social support from workmates and reduced social isolation [25].

**Labour-market related disability pension and mortality**

(\text{age group over 55})

We found that men receiving DP for labour-market reasons had a RR of mortality statistically significantly higher than 1. The increased RR of mortality associated with unemployment might be due to a health-related selection process in which there is an overrepresentation of disease preceding or following unemployment. Another explanation for the increased RR of mortality associated with unemployment is the possible harmful effects of lack of vocational activity [26]. For women, we did not find a significantly increased RR of mortality. However, the difference between genders in RR of mortality due to DP for labour-market reasons was not statistically significant ($p=0.09$).

The RR of mortality was much lower for DP for labour-market reasons than for such pensions given for medical reasons, and among the latter pensioners the RR of mortality was doubled for both men and women in the age group 55–64 years. This observation concurs with the results of the population-based Danish study [10]. In this study people over 60 years of age who retired early because they could not find jobs had a higher RR of mortality than those who were vocationally active, whereas they had a lower RR of mortality than those receiving DP for medical reasons.

**Conclusions**

There were large differences in RR of mortality regarding the type of DP: full-time, part-time, for labour-market reasons, indicating a relation to ill-health. The very high RR of mortality seen in both male and female disability pensioners of all ages warrants further research.

Studies have shown that musculoskeletal or psychiatric disorders are the two most common diagnoses for DP, that is, conditions that seldom lead to death [1,3,15]. The main causes of death in people of working age are myocardial infarction, cancer, and injuries, conditions which generally do not result in DP before death [3]. Consequently, it is obvious that more knowledge is needed regarding diagnoses underlying DP and death. A forthcoming study will take medical factors (i.e., the diagnosis for DP and cause of death) into consideration to further investigate the association between DP and mortality.

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**References**


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