

# Occupational disability caused by dizziness and vertigo: a register-based prospective study

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## ABSTRACT

### Background

Despite the magnitude of dizziness/vertigo in primary health care, prospective studies are scarce, and few studies have focused on vocational consequences. Using the International Classification of Primary Health Care (ICPC), GPs have two alternative diagnoses, H82 (vertiginous syndrome) and N17 (vertigo/dizziness), when issuing sickness certificates to these patients.

### Aim

To assess the incidence of dizziness/vertigo in long-term sickness absence and to identify sociodemographic and diagnostic predictors for transition into disability pension.

### Design of study

Register-based prospective study, 5-year follow-up.

### Setting

All individuals in Norway eligible for sickness absence in 1997 (registered employed or unemployed).

### Method

The risk of disability pension was assessed with Cox proportional hazards analysis, with medical and sociodemographic information as independent variables, stratified for sex.

### Results

Six-hundred and ninety-four women and 326 men were included. Dizziness/vertigo made up 0.9% of long-term sickness absence among women and 0.7% among men. Among both women and men, 41% was certified with H82 and 59% with N17: 23% of women and 24% of men obtained a disability pension. Age was the strongest predictor for obtaining a disability pension. Subjects with only basic education had an almost doubled risk of obtaining a disability pension compared to the highest educational group. Women with H82 had significantly higher risk for obtaining a disability pension than those with N17. The difference increased after adjustment for sociodemographic variables. Sex had no effect when all other variables were controlled for.

### Conclusion

Dizziness/vertigo is an infrequent cause of certified sickness absence, but long-term sickness absentees with dizziness/vertigo have a considerable risk of obtaining a disability pension in the future.

### Keywords

disability insurance; dizziness; health insurance; risk factors; sick leave; vertigo.

## INTRODUCTION

Dizziness/vertigo challenges clinicians and researchers due to its subjective nature. Traditionally dizziness is subclassified into vertigo, presyncope, disequilibrium, and 'other types of dizziness'.<sup>1</sup> This classification was introduced 35 years ago and is still in use.<sup>2,3</sup> Vertigo indicates vestibular disorder: benign paroxysmal positional vertigo (BPPV), vestibular neuritis, or Ménière's disease, and has constituted 30% of cases in previous studies.<sup>3-7</sup> It has been claimed that vertigo can easily be distinguished from other causes of dizziness.<sup>3,8</sup>

Dizziness/vertigo is a common symptom, increasing with age,<sup>7</sup> and the frequency is higher in women than men.<sup>7,9-15</sup> Lifetime prevalence was estimated to be 30% in a German survey,<sup>11</sup> while a study from Scotland reported 21% vertigo, 29% unsteadiness, and 13% other types of dizziness.<sup>10</sup> In a sample of general practices in London, 24% reported patients with dizziness in the last month.<sup>16</sup> The studies differ, with unequal populations, different case definitions, and different measures of prevalence.

Prospective studies indicate that nearly 30% of the patients have symptoms after 12–18 months,<sup>17,18</sup> however, knowledge of the vocational consequences is scarce. In a UK survey, 23% reported symptoms of dizziness, but only 1.5% had taken days off work.<sup>7</sup> Sickness absence is an important measure of ill-health and social functioning,<sup>19,20</sup> and permanent withdrawal

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## How this fits in

Few prospective studies have assessed the long-term prognoses of subjects with dizziness/vertigo. This study adds that dizziness/vertigo is a relatively rare cause of certified sickness absence, but long-term sickness absentees with dizziness/vertigo have a considerable risk of obtaining a disability pension in the future.

from the labour market is common after longer spells of absence.<sup>21,22</sup>

### Aims of the study

The aims of this study were to assess the incidence of dizziness/vertigo in long-term sickness absence in Norway, and to identify sociodemographic and diagnostic predictors for transition into disability pension.

## METHOD

### The Norwegian sickness absence benefit scheme

All employed and registered unemployed subjects are covered by the scheme. After 8 weeks, GPs must fill in an '8 weeks' sickness absence certificate' that includes a main diagnosis based on the International Classification of Primary Care (ICPC).<sup>23,24</sup>

### The disability pension scheme

All legal inhabitants aged 16–66 years are covered by

the scheme. Disability pension is granted in cases of permanent, at least 50%, incapacity for work, when all relevant treatment and rehabilitation approaches have been applied.

### Setting and participants

In 1997, 920 139 women and 1 019 216 men in Norway were eligible for sickness absence benefits. All cases with at least 8 weeks' sickness absence were recorded by The National Insurance Services. Anonymous data were transferred to a research database established by The National Insurance Services and Statistics Norway. Information from patients aged below 63 years with a main diagnosis of dizziness/vertigo were included in the study.

### Explanatory variables

The main diagnosis for each case based on the ICPC. The ICPC is organised in chapters corresponding to organ systems: H includes otological and N neurological conditions. With respect to dizziness/vertigo, two diagnoses are available: H82 (vertiginous syndrome), and N17 (vertigo/dizziness). Sociodemographic variables were age, sex, income before tax in 1996, and educational level (years).

### Follow-up and endpoint

The sample was followed from the start of the sickness absence spell until 31 December 2002, with granting of disability pension as the endpoint.

**Table 1. Descriptive statistics of study sample, and percentages obtaining disability pension during follow-up, according to diagnosis and sociodemographic variables. *n* = 326 men and 692 women on long-term sick leave >8 weeks with a diagnosis of dizziness or vertigo.**

Variables	Women					Men				
	<i>n</i>	%	95% CI	DP, %	95% CI	<i>n</i>	%	95% CI	DP, %	95% CI
<b>Diagnosis</b>										
H82	282	41	37 to 44	29	24–34	134	41	36 to 46	23	16 to 30
N17	412	59	56 to 63	18	15–22	192	59	54 to 64	24	18 to 30
All	694	100		23	18–27	326	100		24	20 to 27
<b>Age, years</b>										
16–29	85	12	10 to 15	2	0–6	36	11	8 to 14	3	0 to 8
30–39	204	29	26 to 33	9	5–13	79	24	20 to 29	9	3 to 15
40–49	212	31	27 to 34	22	17–28	87	27	22 to 31	17	9 to 25
50–62	193	28	24 to 31	47	38–52	124	38	33 to 43	44	33 to 52
<b>Education, number of years</b>										
Basic, 7–9	82	12	9 to 14	46	36–57	59	18	14 to 22	44	31 to 57
Lower middle, 10–12	333	48	44 to 52	25	21–30	131	40	35 to 46	21	14 to 28
Higher middle, 13–14	163	23	20 to 27	12	7–17	102	31	26 to 36	15	8 to 22
Academic, ≥15	113	16	14 to 19	14	8–21	32	10	7 to 13	19	5 to 32
<b>Annual income 1996, NOK</b>										
0–79 999	63	9	7 to 11	22	19–25	18	6	3 to 10	13	9 to 16
80 000–159 999	236	34	30 to 38	25	22–29	37	11	8 to 13	27	23 to 32
160 000–239 999	311	45	41 to 49	18	15–21	143	44	38 to 49	25	20 to 30
≥240 000	84	12	10 to 15	26	23–30	128	39	34 to 45	20	15 to 24

DP = disability pension. NOK = Norwegian kroner (1 GBP = 9.7 NOK).

**Table 2. Results of Cox regression analysis in full sample and separately for sexes: risk of transition to disability pension according to diagnosis and sociodemographic variables:  $n = 326$  men and  $n = 692$  women on long-term sick-leave with a diagnosis of dizziness or vertigo.**

Variables	All			Men			Women		
	HR	95% CI	P-value	HR	95% CI	P-value	HR	95% CI	P-value
<b>Diagnosis</b>									
N17	1.0			1.0			1.0		
H82	1.5	1.1 to 1.9	0.003	1.0	0.6 to 1.6	0.992	1.7	1.3 to 2.4	<0.001
<b>Age, years</b>									
16–39	1.0			1.0			1.0		
40–49	2.7	1.7 to 4.2		2.4	1.0 to 5.7		2.7	1.6 to 4.7	
50–62	6.6	4.3 to 10.1	<0.001	6.2	2.8 to 13.5	<0.001	6.6	3.9 to 10.9	<0.001
<b>Education, number of years</b>									
Academic, $\geq 15$	1.0			1.0			1.0		
Higher middle, 12–14	1.0	0.6 to 1.6		0.9	0.4 to 2.1		0.9	0.5 to 1.7	
Lower middle, 10–11	1.6	1.1 to 2.5		1.3	0.5 to 3.1		1.7	1.0 to 2.8	
Basic, 7–9	2.0	1.2 to 3.2	0.001	1.8	0.7 to 4.4	0.024	1.9	1.1 to 3.4	0.004
<b>Annual income 1996, NOK</b>									
$\geq 240\ 000$	1.0			1.0			1.0		
160 000–239 999	1.0	0.7 to 1.5		1.2	0.7 to 2.0		1.0	0.6 to 1.7	
80 000–159 999	1.2	0.8 to 1.8		0.8	0.3 to 2.1		1.3	0.7 to 2.3	
0–79 999	1.2	0.6 to 2.2	0.120	0.4	0.0 to 2.8	0.490	1.4	0.7 to 2.8	0.170
<b>Sex</b>									
Men	1.0								
Women	1.1	0.8 to 1.4	0.670						

HR = hazard ratio. DP = disability pension. NOK = Norwegian Kroner (1 GBP = 9.7 NOK).

### Analysis

Survival analysis was carried out with Cox proportional hazards analysis for the full sample, and stratified for sex, with disability pension as the dependent variable. Sociodemographic variables and diagnoses were entered as explanatory variables. The hazard ratio (HR) for obtaining disability pension, with 95% confidence intervals (CI), was identified for each variable. The statistical software program SPSS (version 13.0) was used.

### RESULTS

Among all spells of long-term sickness absence in 1997, cases with dizziness/vertigo made up 0.9% of women and 0.7% of men. The descriptive statistics of the study sample are shown in Table 1; 694 women and 326 men were included, corresponding to an annual incidence for women of 7.5/10 000 at risk (vocationally active) and for men of 3.2/10 000 at risk (vocationally active). Among both women and men, 41% were certified with H82, and 59% with N17.

#### Transition to disability pension

Disability pension was obtained by 23% of the women and 24% of the men. Among women with an H82 diagnosis, 29% (95% CI = 24 to 34) obtained disability pension versus 18% (95% CI = 15 to 22) for those with N17. There was no difference in the male groups. Disability pension rates increased linearly with age.

Among those with only basic education, 46% of women and 44% of men obtained a disability pension.

#### Multivariate analysis

Cox proportional hazards analysis (Table 2) showed age to be the strongest predictor of obtaining a disability pension. Subjects with an H82 or N17 diagnosis aged above 49 years had a HR of 6.6 compared to those aged less than 40 years. The elevated risk related to H82 diagnosis increased after adjusting for sociodemographic variables. Subjects with only basic education had an almost doubled risk compared to those in the highest educational group, controlled for age and income. After adjusting for diagnosis, age, and education, there was no income effect. There was no sex difference when all other variables were controlled for. The increased risk of disability pension among women with an H82 diagnosis remained in the stratified regressions.

### DISCUSSION

#### Summary of main findings

Dizziness/vertigo is an infrequent cause of long-term sickness absence; the annual incidence for women of 7.5/10 000 at risk (vocationally active) and for men of 3.2/10 000 at risk (vocationally active). Among both sexes, 41% were diagnosed with vertigo. One-quarter of women and men obtained a disability pension. Low education was a strong predictor of obtaining a

disability pension, while an H82 diagnosis was a risk factor for women only. The strongest predictor was age, probably caused by increasing comorbidity, a difficult labour market, and more lenient treatment of applications with increasing age.<sup>25,26</sup>

#### Strength and limitations of the study

This is the first population-based study on occupational consequences of dizziness. Sick-leave data are regarded as reliable and objective. The ICPC is a well-known classification instrument,<sup>23,24</sup> and confidentiality reduced the risk of 'false' diagnoses.<sup>27</sup> Weaknesses of register-based studies are lack of clinical data except for diagnoses, lack of information related to work conditions, and the fact that the diagnoses cannot be validated. Since cases were identified through the ICPC codes, patients whose dizziness was linked to mental health or cardiovascular problems were not included. The baseline data were recorded in 1997. The process of application, approval and delivery from Statistics Norway meant that the data were received in late 2005. There has been no secular change since baseline. No major alteration in the rules for the sickness absence benefit scheme or disability pension has been introduced, and the ICPC is still used on the sickness certificates.

#### Comparison with existing literature

Vertigo and dizziness reflect a distinction between vestibular and non-vestibular symptoms.<sup>1,3</sup> The possibility of differentiating between types of dizziness is disputed,<sup>3,11</sup> although a high degree of sensitivity has been reported in identifying vertigo by history alone.<sup>28</sup> The proportion of subjects with vertigo (41%) was slightly higher than in previous studies.<sup>3-7</sup> In the present study, as well as in previous studies, dizziness/vertigo was more common for women than for men in all age groups.<sup>7,9-14,29</sup> However, women also have higher rates of sickness absence in general,<sup>19,30,31</sup> often explained by occupational differences.<sup>19,32,33</sup> Less control of working conditions increases the burden on employees, especially on women in low-paid jobs.<sup>19</sup> The present study confirmed findings of no sex difference in relation to the risk of transition from sickness absence to disability pension,<sup>22,30,34</sup> implying that the threshold for taking sick leave is not lower among women than men.

Disability pension is granted when 'all relevant treatment and rehabilitation approaches have been applied'. Treatment in primary care typically consists of reassurance and medication to relieve symptoms,<sup>3,5,6,35</sup> even though medication is not recommended beyond the acute stage.<sup>3,5,36</sup> Referral to vestibular rehabilitation<sup>37-40</sup> is uncommon in primary care.<sup>17,36,41</sup> Lack of guidelines may lead to persistent complaints with disability pension as the endpoint.<sup>25</sup> Vestibular

rehabilitation could play an important role in preventing disability if applied at an early stage.<sup>42</sup>

#### Implications for future research

Further studies should focus on GPs' role in the management of patients with dizziness/vertigo. Attention should particularly be directed towards female patients.

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#### Ethical approval

Not applicable

#### Competing interests

The authors have stated that there are none

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