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## Medically certified sickness absence with insurance benefits in women with and without children

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**Background:** Sickness absence in Sweden is high, particularly in young women and the reasons are unclear. Many Swedish women combine parenthood and work and are facing demands that may contribute to impaired health and well-being. We compared mothers and women without children under different conditions, assuming increased sickness absence in mothers, due to time-based stress and psychological strain. **Methods:** All women born in 1960–79 (1.2 million) were followed from 1993 to 2003. Information on children in the home for each year was related to medically certified sickness absence with insurance benefits the year after. We used age and time-stratified proportional hazard regression models accounting for the individual's changes on study variables over time. Data were retrieved from national

administrative registers. **Results:** Sickness absence was higher in mothers than in women without children, the relative risks decreased by age, with no effect after the age of 35 years. An effect appeared in lonely women irrespective of age, while in cohabiting women only for the ages 20–25 years. Mothers showed increased sickness absence in all subgroups of country of birth, education, income, sector of employment and place of residence. The relation between number of children and sickness absence was nonlinear, with the highest relative risks for mothers of one child. The upward trend of sickness absence at the end of 1990s was steeper for mothers compared to women without children. **Conclusion:** Despite the well-developed social security system and child care services in Sweden, parenthood predicts increased sickness absence, particularly in young and in lone women.

## Introduction

After a period of falling sickness absence in Sweden during the 1990s, there was a rapid increase from 1997 through 2002 that was steeper in women than in men. Since 2003, the rates are now decreasing.<sup>1</sup> Nevertheless, sickness absence in Sweden, particularly absence of long duration, is still high compared to the OECD average.<sup>2</sup>

In general, female employees in European countries have more sickness absence than men.<sup>1</sup> In Sweden, around two-thirds of all days with sickness benefits from the social insurance system can be ascribed to women.<sup>3</sup> The reasons for the high level of sickness absence in women are not fully understood. To some extent, the high level depends on medical problems related to pregnancy, which have been estimated to account for ~4% of sickness benefit costs among women.<sup>3,4</sup>

There is evidence that certain jobs are related to sickness absence, such as employment in the health care, educational and social sector, jobs that most often are held by women.<sup>3</sup> Further, the psychosocial work environment is influential, with low job satisfaction<sup>5,6</sup>, high demands, low or high decision latitude increasing the risk of sickness absence in women.<sup>7–16</sup> Work-related conditions have been suggested as the most important explanation for the gender difference in sickness absence in Sweden.<sup>3</sup>

The potential health effects in women of combining work and family life have been debated for a long time, often in terms of the 'role enhancement' and the 'role overload' hypotheses.<sup>17–21</sup> 'Role enhancement' meaning that multiple roles entail beneficial effects by increased stimulation, extended access to environmental resources and social affirmation. 'Role overload' meaning that the 'double burden' is detrimental due to time- and strain-based overload or conflicts. Certainly, both hypotheses have validity and a pertinent question should be to identify specific conditions leading to an overload that may affect health and work ability.

A Finnish research group found that having children increased the domestic work hours from 15.5 to 23.1 per week in women and that a high level of total work hours was associated with sickness absence, attributed to high levels of domestic work and commuting hours.<sup>10,22</sup> Other studies have found associations between having children, or difficulties to combine employment and care of children/family and sickness absence,<sup>23–28</sup> while others have reached other conclusions.<sup>9,29–31</sup>

In two previous studies, we found that women with children had higher risks of poor self-rated health and fatigue than women without children, and that the risk estimates were most pronounced among lone women, high-income earners and women with fulltime employment.<sup>32,33</sup> The current study has its focus on sickness absence and the idea is to explore if an impaired health in mothers may be observed also by increased sickness absence. We used a prospective population study design, taking different demographical and socio-economical conditions into consideration. The study is unique because of the size and representativeness of young Swedish women holding all kinds of occupations.

Sickness absence with economic compensation from the Swedish Social Insurance System (SSIS), a measure of medically certified illness tied to reduced work ability, was studied. The measure is more directly related to societal costs and may therefore be perceived as more relevant among policy makers, compared to self-reported health symptoms.

## Methods

### Study base

The population comprised all women in Sweden born in 1960–79 provided, they had reached the age of 20 years, in total 1 233 701

women. The time of observation was from 1 January 1993 through 2003. Data were retrieved from the Longitudinal integration database for health insurance and labour market studies (LISA), a register which in turn is based on more than 10 national administrative registers.

### Exposure

Having children was treated as a time-dependent exposure variable. For each year of observation, the prevalence of any children <18 years of age living in the home was assessed as well as the number of children (no children, one, two and three or more children).

### Outcome variable

We studied medically certified sickness absence with sickness benefits from the SSIS, in 1993–2003. Sickness benefits were paid by the SSIS if a spell of absence exceeded 14 days. Except for one qualifying day (with no economic compensation), the employer covered the sick pay from the 2nd to the 14th day of absence. This was the rule for all years in 1993–2003, except for 15 months from January 1997 through March 1998, when the employer's sick pay period was 28 days.

A woman was recorded as a case if she had at least one spell of sickness absence lasting for  $\geq 15$  (or 29) days during a year. One day of sickness absence corresponds to a calendar day without adjustment for part-time compensation.

### Stratification variables

The relation between having children and the incidence of sickness absence was studied overall and in demographic and socio-economic subgroups to reveal potential effect modification. The stratification also reduces the potential for confounding within the subgroups.

Demographical and socio-economic characteristics were assessed on a yearly basis:

- (i) control for age and calendar year (1-year intervals) was built into the programme. In the explicit analyses of age, 5-year intervals were used starting at the age of 20 and with 35–43 years as the upper category;
- (ii) place of residence comprised metropolitan areas including Stockholm, Gothenburg or Malmö (with surrounding municipalities), city areas (municipalities with more than 90 000 inhabitants within 30 km from the centre) and rural areas (remaining areas);
- (iii) partner status was dichotomized into cohabiting (married or cohabiting with children in common) and lone women, also including women living with a partner but with no children in common, divorced and widowed. According to the registration system, an unmarried woman is classified as cohabiting only if the couple has children in common. This means that the reference group (no children) for cohabiting women only comprises married women without children;
- (iv) education was classified as low ( $\leq 9$  years), medium (10–12 years) and high education ( $> 12$  years);
- (v) income corresponds to the individual's total income including salary, social benefits and financial compensation. High income was above the upper quartile of the income distribution, low income below the lower quartile and medium income comprised the values in between. Other family income was not included;
- (vi) employment sector was divided into state governmental, local governmental or county council employment and private sector employment;

(vii) country of birth was classified into three groups: Sweden, other Nordic countries (Norway, Denmark, Finland and Iceland) and countries outside the Nordic region.

Furthermore, some socio-economic variables were combined: partner status with age group and income, income level with education and employment sector (table 2).

### Statistical methods

The analytical approach was to take into account the individual's changes over time regarding the exposure, the potential confounders and the stratification variables. We based the analyses on the SAS MPHREG macro developed at the Channing Laboratory.<sup>34</sup> The programme has been used in other studies also.<sup>35,36</sup> The difference from a traditional Cox proportional hazard regression was that the units of observation did not correspond to individuals. Instead, a new personal data record was created for each year at which the participant was at risk of sickness absence, which allowed the values of the study variables to change for each person-year at risk. The method means that all individual changes in e.g. educational level or family composition across time were taken into account. Person-years at risk for different exposure categories in a year were linked to case status, i.e. sickness absence/no sickness absence in the following year. The relative risk (RR) was estimated by the pooled RR with a 95% confidence interval. A joint control for age and calendar year was built into the programme. The analyses were performed on subgroups according to the descriptions of demographical and socio-economical characteristics given above.

The exposure classification started in 1993 or the year of entry into the cohort and was related to case status during the following year. If the woman was on sick leave during two or more subsequent years, the exposure classification started/restarted the next year to come with no sickness absence. Thus, if a woman had a record of sickness absence during two consecutive years, the exposure classification was restarted in the third year provided she was still at risk of sickness absence. The classification was discontinued in case of emigration, disability pension or death.

A prerequisite for exposure classification was that the woman had an income tax declaration with a registered employer for the year in question. Unemployment was treated as person time at risk. In total, 1128 894 women were included in the analysis corresponding to 7436 902 person-years.

Furthermore, the prevalence of sickness absence of different duration across the years was computed. The total number of days of sickness absence with benefits from the SSIS was classified into no days, 1–30 days (short duration), or >30 days (long duration) for 1993–2003. The

percentages of women with sickness absence of shorter and longer duration among lone and cohabiting women with and without children, standardized to the age distribution for all years combined, were calculated. The analysis was done to explore if the results from the main analyses (which did not take the amount of absence into account) were attributed to long or short duration of absence or both (figures 1 and 2).

## Results

### Incidence of sickness absence, by demographical and socio-economic strata

The risk of sickness absence was 44% higher in mothers compared with women without children and the RR was highest for the first 5-year period (1993–97). There was no evidence of a linear increase in risk of sickness absence with increasing number of children. The risk was higher in women with three or more children than in women with two children in the home. However, the highest RR was found for having one child in the home, which pertained to all strata, except for lone women (table 1).

The RRs decreased by age with the highest estimate in women in the age group of 20–30 years; whereas in the oldest age group (>35 years), there was no difference between mothers and other women (table 1).

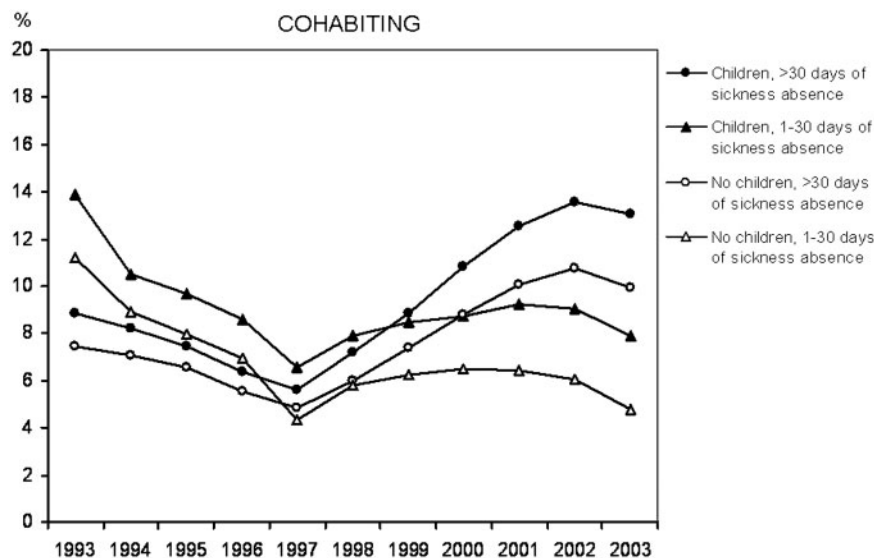
Regardless of country of birth, there was an effect on sickness absence of having children. The RR was highest among women born in Sweden. The place of residence did also make a slight difference, in that the RR was somewhat lower in women living in rural areas (table 1).

Cohabitation status was an important effect modifier. Mothers had a 66% increase in risk compared with women without children among lone women. Married or cohabiting mothers showed a lower risk of sickness absence compared to married women without children (table 1).

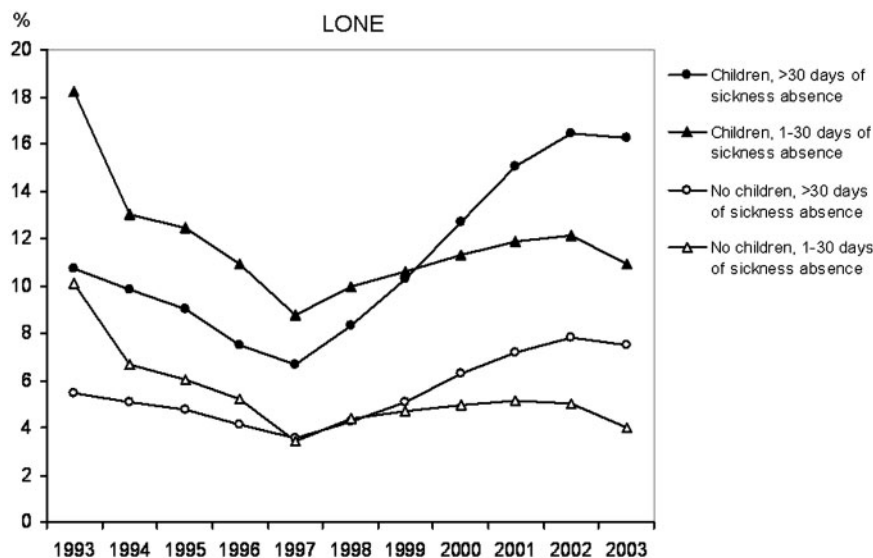
In all educational groups, the risk of sickness absence was increased in mothers, with small differences between the strata. A similar pattern was found for income and employment sector. For income, the highest RR pertained to women with low income, followed by the high-income group. For employment sector, the highest estimate was found for the private sector followed by state governmental employment (table 1).

### Incidence of sickness absence, by combined socio-economic strata

In cohabiting women, aged 20–25 years, the risk of sickness absence in mothers was increased, but a reverse relationship was seen in higher age



**Figure 1** Cohabiting women: prevalence (%) of medically certified sickness absence with social insurance benefits (1–30 days, >30 days in a year) in women with and without children, by year (1993–2003), based on cross-sectional data. Proportions standardized to the age distribution of all years combined



**Figure 2** Lone women: prevalence (%) of medically certified sickness absence with social insurance benefits (1–30 days, >30 days in a year) in women with and without children, by year (1993–2003), based on cross-sectional data. Proportions standardized to the age distribution of all years combined

groups. Lone mothers showed an effect regardless of age and the RR decreased by age (table 2).

Among lone women, the RR of sickness absence was highest in the high-income group and decreased with decreasing income. In cohabiting women, on the other hand, the RR was highest in women with low income and the RRs were below unity in high- and medium-income earners (table 2).

When education and income were combined, all subgroups showed increased risks in mothers, particularly among women with high- or medium education combined with a low income. For different employment sectors and income, again, all subgroups revealed increased risks in mothers, particularly in women employed in the public sector with a low income, although working in the private sector on a low income did also show a clear increase in risk in mothers (table 2).

The relatively high RRs for mothers of three or more children among lone women with a high income, among women in private or public employment with a high income and among women with medium or low education with a high-income level should also be pointed out (table 2).

Before 1997, sickness absence of 1–30 days with insurance benefits in a year was more prevalent than >30 days, while >30 days of absence became more prevalent thereafter—the sickness absence spells were prolonged by time. The upward trend for long duration in women with children raised from 6% in 1997 to about 15% in 2002–03 (data not shown). The dip coincides partly with the extended employer responsibility for benefits but the causation is uncertain. Figures 1 and 2 show a consistently higher prevalence of sickness absence in mothers than in women without children over the years and the association was attributed to both short and long duration of absence.

In cohabiting women, the upward trend for long duration after 1997 was slightly more pronounced in mothers compared with cohabiting women without children (figure 1). Also in lone women, the shift towards more days of sickness absence during the last part of the period was evident. The prevalence of long sick leave duration increased steeply in lone mothers after 1997 (figure 2).

## Discussion

We studied sickness absence in employed women, with a focus on the implications of having children in the home, and the results showed a 44% increase in risk of sickness absence in mothers. From previous

studies, we know that mothers compared with women without children are less burdened by chronic diseases, ‘a healthy mother effect’,<sup>26,32</sup> a selection mechanism that may have suppressed the effect of having children. Another mechanism which counteracts an increased risk of sickness absence in mothers is the comparatively long periods of parental leave. Illness that would have caused sickness absence during active work may often go unregistered among women on parental leave. Concurrently, we could not exclude pregnancy-related medical problems from the sickness absence measure. However, the effect of pregnancy-related sickness absence was partly limited by the requirement of no sickness absence in the year of exposure assessment, since sickness absence during a year was always linked to the number of children the year before without sickness absence. Thus, if sickness absence was pregnancy related, it was linked to no children or the number of children before delivery of the new child, yielding a bias working against an association.

The increased risk of medically certified sickness absence exceeding 2 weeks in women with children may be due to illness such as post-delivery depression and persistent respiratory infections in families with children, but we also believe that specific socio-economic conditions may contribute to seriously reduced work ability leading to sickness absence. The results suggest that these conditions may be found particularly among young employed mothers and lone employed mothers, and we assume that a heavy total workload and poor coping resources (e.g. financial and social) may be crucial.

The non-linear relationship between number of children and sickness absence, with a lower RR for the second child could signify that women with no health problems related to the first child are more inclined to have another child. The acquired experience may also facilitate the care of a second child and the children may care for each other. Three or more children may add substantially to household duties and may also include difficulties to cope with both teenagers and small children. Probably, the most demanding transformation of women’s everyday life occurs with the first child. The results of a non-linear relationship between number of children and sickness absence, partly confirm previous findings.<sup>29</sup>

The consistent results, with few exceptions across the socio-economic strata, suggest that the association should not be explained by confounding. The effect was clearly modified by age; in that, there was no association in women  $\geq 36$  years. Possibly, women approaching middle age without children have more health problems according to ‘the healthy mother effect’. Alternatively, mothers’ ability to cope with parenthood and work get better by increasing age and maturity. Also for self-rated health, we



Table 2 Incidence of sickness absence with insurance benefits in Swedish women with and without children, by combined socio-economic strata

	Person-years	Total no. <sup>a</sup> (in 1000s)	Crude rate	Number of children							
				Any number vs. none		1 vs. none		2 vs. none		≥3 vs. none	
				no <sup>a</sup> (in 1000s)	RR <sup>b</sup> (95%CI)	no <sup>a</sup> (in 1000s)	RR <sup>b</sup> (95%CI)	no <sup>a</sup> (in 1000s)	RR <sup>b</sup> (95%CI)	no <sup>a</sup> (in 1000s)	RR <sup>b</sup> (95%CI)
<b>Partner status and Age group, 1993–2003</b>											
Cohabiting and 20–25 years	254 306	40	0.16	32	1.25 (1.22–1.28)	23	1.33 (1.30–1.37)	8	1.05 (1.02–1.09)	1	1.14 (1.06–1.22)
Cohabiting and 26–30 years	907 939	131	0.14	111	0.98 (0.97–1.00)	54	1.15 (1.13–1.17)	45	0.83 (0.81–0.84)	12	0.97 (0.95–0.99)
Cohabiting and ≥30 years	2 105 989	248	0.12	232	0.78 (0.77–0.79)	56	1.02 (1.00–1.04)	114	0.68 (0.67–0.70)	62	0.80 (0.78–0.81)
Lone and 20–25 years	1940 601	121	0.06	10	2.41 (2.36–2.46)	8	2.39 (2.34–2.45)	2	2.49 (2.37–2.61)	0.14	2.43 (2.06–2.87)
Lone and 26–30 years	1 191 830	119	0.10	27	1.89 (1.86–1.92)	16	1.83 (1.80–1.87)	9	1.94 (1.90–1.98)	2	2.18 (2.09–2.28)
Lone and ≥30 years	1 036 237	137	0.13	68	1.40 (1.39–1.42)	29	1.36 (1.34–1.38)	28	1.37 (1.35–1.39)	12	1.63 (1.59–1.66)
<b>Partner status and Income, 1993–2003</b>											
Cohabiting and High	1 036 108	125	0.12	110	0.91 (0.89–0.92)	27	1.10 (1.08–1.12)	49	0.76 (0.75–0.78)	34	0.99 (0.97–1.01)
Cohabiting and Medium	1 736 515	235	0.14	213	0.87 (0.86–0.89)	78	1.06 (1.04–1.07)	100	0.73 (0.72–0.74)	35	0.82 (0.80–0.83)
Cohabiting and Low	486 148	57	0.12	51	1.18 (1.15–1.21)	28	1.41 (1.37–1.44)	17	0.93 (0.90–0.96)	5	0.78 (0.75–0.81)
Lone and High	1 022 290	118	0.12	64	1.88 (1.86–1.91)	23	1.79 (1.76–1.82)	28	1.87 (1.84–1.90)	12	2.18 (2.13–2.22)
Lone and Medium	1 969 292	198	0.10	37	1.49 (1.47–1.51)	26	1.53 (1.51–1.55)	9	1.38 (1.35–1.41)	1	1.37 (1.30–1.44)
Lone and Low	1 157 094	60	0.05	4	1.42 (1.37–1.47)	3	1.53 (1.47–1.59)	1	1.17 (1.08–1.25)	0.15	1.07 (0.91–1.26)
<b>Education and Income, 1993–2003</b>											
High-High	854 638	82	0.10	49	1.19 (1.18–1.21)	18	1.55 (1.52–1.58)	22	0.98 (0.96–1.00)	9	1.07 (1.04–1.10)
High-Medium	1 140 009	106	0.09	56	1.25 (1.23–1.26)	27	1.63 (1.60–1.65)	23	0.94 (0.92–0.96)	6	0.92 (0.90–0.95)
High-Low	573 506	28	0.05	13	1.87 (1.82–1.93)	8	2.32 (2.25–2.39)	4	1.32 (1.27–1.37)	1	1.07 (0.99–1.15)
Medium-High	1 012 885	128	0.13	97	1.41 (1.39–1.43)	26	1.58 (1.55–1.60)	44	1.25 (1.23–1.27)	27	1.51 (1.49–1.54)
Medium-Medium	2 243 430	275	0.12	160	1.23 (1.22–1.24)	64	1.51 (1.49–1.52)	72	1.02 (1.01–1.04)	24	1.10 (1.09–1.12)
Medium-Low	879 526	70	0.08	33	1.53 (1.50–1.56)	19	1.86 (1.83–1.90)	11	1.15 (1.12–1.18)	3	0.92 (0.89–0.96)
Low-High	1 889 965	32	0.17	28	1.41 (1.36–1.46)	6	1.42 (1.36–1.48)	12	1.36 (1.32–1.42)	10	1.46 (1.40–1.51)
Low-Medium	317 361	52	0.16	34	1.14 (1.12–1.16)	13	1.26 (1.23–1.29)	14	1.05 (1.02–1.07)	7	1.06 (1.03–1.09)
Low-Low	185 292	19	0.10	9	1.13 (1.10–1.17)	5	1.36 (1.31–1.41)	3	0.96 (0.92–1.00)	1	0.78 (0.74–0.84)
<b>Employment sector and Income, 1993–2003</b>											
Public and High	863 378	108	0.12	84	1.42 (1.40–1.45)	21	1.63 (1.60–1.66)	37	1.27 (1.25–1.30)	26	1.48 (1.46–1.51)
Public and Medium	1 891 135	231	0.12	139	1.28 (1.27–1.29)	55	1.59 (1.57–1.61)	63	1.06 (1.05–1.07)	21	1.12 (1.10–1.14)
Public and Low	589 981	46	0.08	22	1.99 (1.95–2.04)	13	2.37 (2.32–2.43)	7	1.50 (1.45–1.55)	2	1.23 (1.17–1.30)
Private and High	1 161 165	130	0.11	86	1.46 (1.44–1.48)	28	1.68 (1.65–1.70)	39	1.26 (1.24–1.28)	19	1.59 (1.56–1.62)
Private and Medium	1 683 633	186	0.11	98	1.37 (1.35–1.38)	45	1.67 (1.65–1.69)	41	1.10 (1.08–1.11)	12	1.19 (1.17–1.22)
Private and Low	786 990	54	0.07	22	1.76 (1.73–1.80)	13	2.18 (2.13–2.23)	7	1.28 (1.25–1.32)	2	1.11 (1.05–1.16)

a: the total number of years with sickness absence in the study population and in women with children (exposed cases)

b: adjusted for age and year of observation within each stratum

saw no effect of having children after age 35.<sup>32</sup> Cohabitation status was also an important effect modifier. Among married or cohabiting women there was no effect, except for the youngest age group (20–25 years). The results are in line with the findings by e.g. Voss *et al.*<sup>31</sup> In our study on self-rated health,<sup>32</sup> on the other hand, there was an effect of having children not only in lone but also among cohabiting women. Possibly, the perception of poor health in cohabiting mothers does not lead to sickness absence to the same extent as among lone mothers, because the partner may take care of the children with parental benefits, should the mother fall ill and mothers in dual couples may be cared for by a wider social network, including the partner. The results for partner status and age combined, with decreasing RRs, particularly in cohabiting women, could indicate that married (or cohabiting) women with children remain married/cohabiting if they experience good work-family conditions. Less favourable conditions may by time (and age) lead to separation and a successive drain of vulnerable individuals from married into the group of lone mothers.

Lone mothers often have high financial obligations, holding them back from absence from work when ill. An even stronger association with ill-health could be hidden by sickness presence in this group, due to financial pressure. Swedish studies have shown a rather strong association between a bad financial situation and high sickness presence.<sup>37,38</sup> A financial pressure may also cause lone mothers to work long hours with shortage of time for child care. Having three or more children, more than doubled the risk of sickness absence in lone high-income earners. We analysed further the impact of a socio-economic influence behind the increased risk in lone mothers by comparing different age groups who had achieved different levels of education. The highest RR of having children was found for the youngest women with high education [RR=3.21, 95% CI (3.05–3.38)], the lowest for the oldest with medium education [RR = 1.12, 95% CI (1.11–1.14)].

A limitation of the study was the coding rules of the central registries, mostly treating cohabitation with no children in common as being lone. Those classified as ‘lone women without children’ thus comprised women living with a partner (who might have children of his own). The ‘lone women with children’ also included women living with a partner (who also might have children of his own). If partnership improves health and well-being it may be that sickness absence is ‘underestimated’ in the groups classified as lone. The implications of the coding, as well as the importance of shared/unshared custody need further study.

Sickness absence varied considerably during the time of observation, with a decline towards 1997. After 1997, sickness absence started to rise until 2003, followed by a decline that has continued. In the beginning of 1993, a qualifying day was introduced with salary withdrawal for the first day of sick leave. The introduction of the qualifying day was followed by a decrease in sickness absence, which in women also included absence >14 days.<sup>39</sup> The qualifying day may have been a general signal of the necessity to reduce sickness absence. Later, in 1997 the sickness benefits rose from 75% to 80% of the salary (an ‘allowing’ signal), which may have contributed to more sickness absence after 1997, a trend that was particularly steep in women with children.

It may be surprising that motherhood is associated with sickness absence, considering the well-developed social security system and child care services in Sweden. The system comprise the possibility of 10 days of temporary paternal benefits when the child is born, it allows parents to stay away from work with parental benefits for a total of 480 days until the child attains the age of 8 years, it allows temporary parental benefits for taking care of sick children for up to 120 days per child and year until the age of 12 years. In addition, the parents have access to subsidized day care services. The current system seems to serve older mothers and mothers in dual couple families well, but not young mothers and lone women with children. The social security systems vary between countries and are continuously developing. The generalizability of the present results are limited to nations with similar structures. In particular, the Nordic countries with high levels of labour market participation among women and generous social security systems may be able to learn from these results.

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*Conflicts of interest:* None declared.

## Key points

- Female employees in Europe have a high level of sickness absence causing high societal expenses.
- There is no consensus about the impact of combined work and parenthood on sickness absence in women and it is unclear to what extent an effect of having children might be dependent on demographic and socio-economic conditions.
- This population study of Swedish women in the age group of 20–43 years of age show that having children in the home increases the risk of sickness absence, particularly among young women and lone women and that an association seems to be valid in most socio-economic strata.
- Governmental policy makers and employers should aim at increasing economic and total workload equality not only between men and women, but also among women with particular attention to family composition.

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## Variations in primary care physicians' sick leave prescribing practices

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**Background:** Several studies have shown great differences in physicians' way to sick list. The roles of physician-related factors and local structural factors on the length of the sick leaves have been ambiguous. The aim was to examine the variation in short-term sick-listing practices among primary care physicians. **Methods:** A questionnaire study with 19 hypothetical patient cases was conducted among 300 Finnish primary care physicians. The effects of both physician related and local structural background variables on sick leave prescribing were studied using univariate and multiple linear regression models. Economic consequences of the variation in sick leave prescribing were estimated. **Results:** On an average, the overall number of sick leave days prescribed for the entire group of the 19 patient cases was 97.4, varying between 42 and 165 days. The economic consequences to the society of the sick leaves prescribed to them would be €29 442 on average, varying between €11 837 and €51 613. Clinical specialists prescribed shorter sick leaves than general practitioners, with estimated costs of €27 888 and €30 789, respectively. More days of sick leave was prescribed in smaller municipalities than in larger ones. **Conclusion:** There is a lot of variation in physicians' sick leave prescribing practices and it depends both on physician-related factors and local structural factors. The speciality status of a physician was the most significant single factor affecting the variation. Notable savings for the society might be possible to achieve by increasing sick-listing education and training.

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## Introduction

Several studies have shown great differences in physicians' way to sick list.<sup>1–5</sup> In general practice, certification for sickness absence has

been estimated to be the single most expensive item, even more expensive than drug prescriptions.<sup>1,6</sup> When comparing the costs of prescribed tests, procedures, medication, sick leave and referrals as measures taken by a physician, the costs for sick leave constituted