

## **Sickness absence and stress factors at work**



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## **Sickness absence in general**

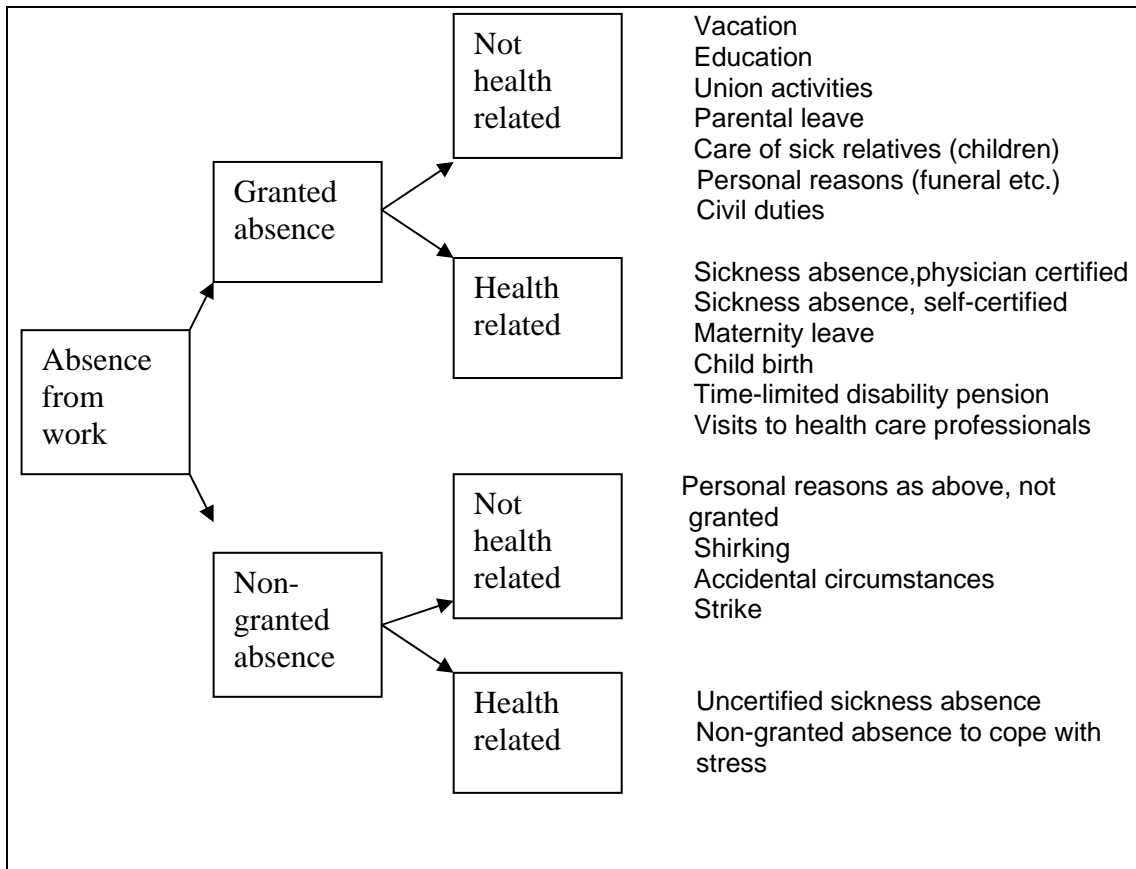
Sickness absence has received attention in recent years in many countries and from many different actors (Alexanderson, 1998). It has been viewed from many perspectives e.g. as an indicator of health, as a path to exclusion, and as a cost to companies and society. It has been studied within e.g. medical, sociological, political, economical and psychological disciplines. All these modes of research have discovered factors that are associated with sickness absence. However, despite the increasing knowledge of the correlates of sickness absence, it has proven to be difficult to form holistic theories and subsequent intervention strategies that could incorporate all aspects of the phenomenon.

The aim of this paper is to present different aspects of the sickness absence phenomenon. It is not intended to provide any answers or draw attention to any specific factor or theory explaining sickness absence. On the contrary, the aim is to illustrate the multi-aetiology and complexity of the sickness absence phenomenon. Also, the aim is to investigate and clarify the role of stress and work factors in sickness absences in relation to all the different perspectives.

### **Definitions of sickness absence**

Increasingly, sickness absence is studied based on registered sickness absence data, attained from the registers of organisations, insurance companies, health care providers or national institutions. Therefore, the researchers do not explicitly generate the definition of absence. For most part, the studies refer to the specifications of the register. Only few studies rely on sickness absence data attained by self-reports. Alexanderson (1998) points out that in many studies the type of [sickness] absence examined is not clearly stated. She classifies absence from work to four main classifications (see figure 1).

**Figure 1.** Different types of absence from work (taken from Alexanderson, 1998)



### Measures of sickness absence

There are many ways of calculating the rates of sickness absences for research purposes as well as for national and employers' registers. Hensing et al. (1998) reviewed different measures used in sickness absence studies and suggested the use of five basic measures.

1. Frequency of sick leave: Current or new sick-leave spells during the study period / No. of persons in the study group (including currently sick listed).
2. Length of absence: sick leave days for current and new spells during study period / No. of persons sick listed for current and new spells during study period.

3. Incidence rate:  $\frac{\text{New sick leave spells during the study period}}{\text{No. of persons at risk} \times \text{no. of days in study period} - \text{all sick leave days in new and current spells during study period}}$ .
4. Cumulative incidence:  $\frac{\text{Persons with at least one new sick leave spell irrespective of duration during study period}}{\text{No. of persons at risk at the beginning of the study period}}$ .
5. Duration of absence:  $\frac{\text{Sick leave days in new spells during study period}}{\text{No. of new sick leave spells during study period}}$ .

It has been suggested that different measures of sickness absence describe different aspects of the absenteeism phenomenon. Absence frequency has been interpreted to be associated with voluntary absence, where the medical condition is less compelling, whereas absence duration has been seen as a measure of involuntary absence, which can be attributed to an illness or injury. Therefore, it is argued that long spells are better measures of health status than short spells, which are often also influenced by a number of other factors (Marmot et al., 1995). Indeed, there seem to be quite a few differences between the determinants of short and long spells of sickness absence. For example, socio-economic class seems to be a strong correlate for long but not for short spells (e.g. Vahtera et al., 1996). This is why in many studies short and long spells are studied separately. However, the cut-off point is usually somewhat arbitrary and depends on the registration policy of the country or the company studied. Hensing et al. (1998) point out that only seldom is the choice of measures related to the aim of the study and few attempts are made to discuss the measures in relation to different sick leave patterns among different groups. To allow comparisons to be made between studies, the choice of measure should be as free as possible from the national or company policies.

### **Sickness absence regulation systems**

Sickness absence is governed by a multitude of different legislation and various actors in each European country. Though the principles and aims are somewhat similar the actual legislation and practises differ substantially

between different EU-countries (MISSOC, 2000). If the absence is short usually the employee's own notice is sufficient, in most countries and companies and the limit is 3-7 days. For longer absences a certificate (e.g. physicians) is usually required. Sickness absence is, however, a complex phenomenon combining physical, psychological and social aspects and therefore there is some room for flexibility between the decisions to attend or to be absent. According to some estimates in 70 % of all sickness absence cases, the reason for absence is not convincing and other factors influence the decision to be absent (Allegro & Veerman, 1998). The main actors in sickness absence situations are the employee, the employer, the occupational and public health services, private insurance companies and the national insurance organizations. Especially in long-term absences liability and compensation are important factors, because of possible conflicting interests. In most countries the compensation and liability schemas are divided between occupational and non-occupational diseases and injuries.

### **The scale of sickness absence**

The National Health Services in the UK have calculated the rate and cost of sickness absence (Verow & Hargreaves, 2000). In a sample of 2542 employees the total amount of hours lost was 253 206, i.e. 99.6 hours per employee in a year. Absences of less than 7 days accounted for 32.7 % and absences longer than 7 days 67.3 % of the total hours lost. In a Finnish survey of the working times in the industry, time used for actual work accounted for around 80 % of the theoretical working time (Teollisuus ja Työnantajat, 2003). Vacations accounted around 10 % and granted sickness absence around 5 %. Childcare accounted for around 2 % and is included almost exclusively in women's absences. Education, strikes, temporary suspensions and absences for other granted reasons each accounted less than 1 % of time lost.

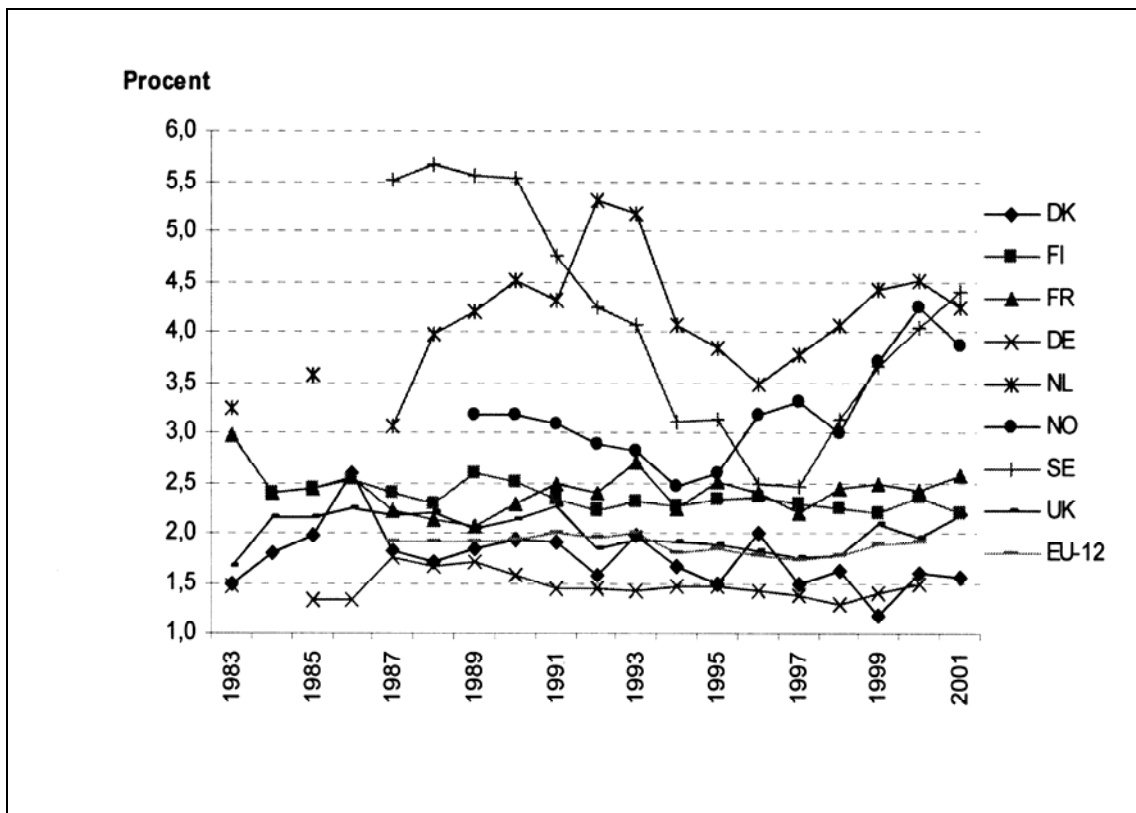
The direct costs of sickness absence to the employer include wages paid during sick leave, costs of occupational health care and insurance payments. In the year 2000, these cost made up 4.4% of the total cost of wages for blue-

collar workers and 2.1% for white-collar workers in Finnish industry (Teollisuus ja Työnantajat, 2003). Indirect costs include loss of production, wages for replacements, recruitment of replacements, maintaining a labour reserve, overtime, administrative expenses, bottlenecks in production, lower quality of work of the replacements, delays, and effects on work climate. These costs are difficult to calculate, but it is safe to say that they are comparable to the direct costs.

Sickness absence costs funded by public resources are also significant. In Finland, in 2001, 301 300 persons received compensation from the Social Security Institution due to sickness (KELA, 2002). The amount of sickness allowance paid was 522,8 million euros, i.e. 1735 euros per recipient.

According to workforce studies there has been a steep increase in long-term sickness absences in some European countries in the past few years (Bergendorff et al., 2002). In the Netherlands, Sweden and Norway the amount of the workforce who had been on a sick leave of over a week has raised to over 4 %. Other European countries have more moderate and stable figures and the EU-average has been around 2% for about 15 years (see figure 1). Because of the rapid increase of sickness absence in Sweden, a number of projects assessing sickness absence have been initiated (Nyman et al. 2002). Special attention has been paid to long-term absences and especially psychological problems, because the percentage of long-term absentees due to psychological problems has increased from 14 % in the early 1990's to 25 % in 2001 (Riksförsekringsverket, 2002).

**Figure 2.** Percentage of workforce who have had a sick leave lasting over 7 days during the year in 8 European countries (taken from Bergendorff et al., 2002)



It is hard to find comparable statistics across Europe on the reasons for absence. In the Third European survey on working conditions the EU-average was 9 % for reported absence due to work-related health problems, ranging from 18 % in Finland to 4 % in Portugal (Paoli & Merllie, 2000). Work-related stress, depression or anxiety has been estimated based on self-reports to affect 563 000 people in Great Britain, with an estimated 13.5 million working days lost due to these work related conditions in 2001, i.e. 29 working days lost per year per affected case (SWI01/2).

There are no comparable statistics in EU categorised according to diagnosis. As an example, in 2000 in Finland the main diagnosis for which sick leave (physician certified, over 9 days) was granted of all absence periods were musculo-skeletal illnesses 35 %, injuries 14%, psychiatric conditions 13 %, cardiovascular illnesses 6 % and illnesses of the respiratory system 6 %

(KELA, 2001). The corresponding figures for absences lasting between 180 and 300 (the limit for compensation) days were musculo-skeletal illnesses 30 %, injuries 7 %, psychiatric conditions 30 %, cardiovascular illnesses 9 % and illnesses of the respiratory system 2 %. Only 5 % of the registered sickness absences lasted over 180 days. In 2001, psychiatric illness was listed as grounds for 40 % of all the employees receiving disability pension thus being the largest category (KELA, 2002). The percentage of the workforce on disability pensions in European countries is around 10 %, from which comparable statistics are available (Bergendorff et al., 2002). Some studies still suggest that mental health problems are under-reported in the records because they remain unrecognised or are covered-up by a somatic complaint (Hensing & Spak, 1998; Stansfeld et al., 1995).

### **Theories utilised for explaining sickness absence**

Alexanderson (1998) reviewed studies on sickness absence and identified factors, which the studies utilised in explaining the phenomenon. She categorised the factors into three structural levels: national, workplace and local community, and individual level factors.

#### National level

- Overall economic level and the fluctuations of it
- Industrial development of the nation
- Degree of freedom in the contract between employers and employee
- Status and organisation of unpaid work
- Climate and meteorology
- Composition of the labour force (selection into and out of the labour force, employment intensity among different groups)
- Organisation of the labour market (gender segregation, structural rationalisations)
- Social insurance systems (sickness benefits, disability pension, pregnancy and parental leave)
- General changes in attitudes in society



### Workplace and local community

- Nature of work environment (physical hazards, repetitiveness, monotony, no learning possibilities, size of workplace, job type or sector, personnel policy, social network and support, stress, sense of control)
- Absence culture at work
- Absence culture at the local community and family
- Organization of the local community (geography, socio-economic levels, labour market, access to daycare/healthcare, prevalence of violence etc.)
- Local practises applied in medical care and social insurance

### Individual

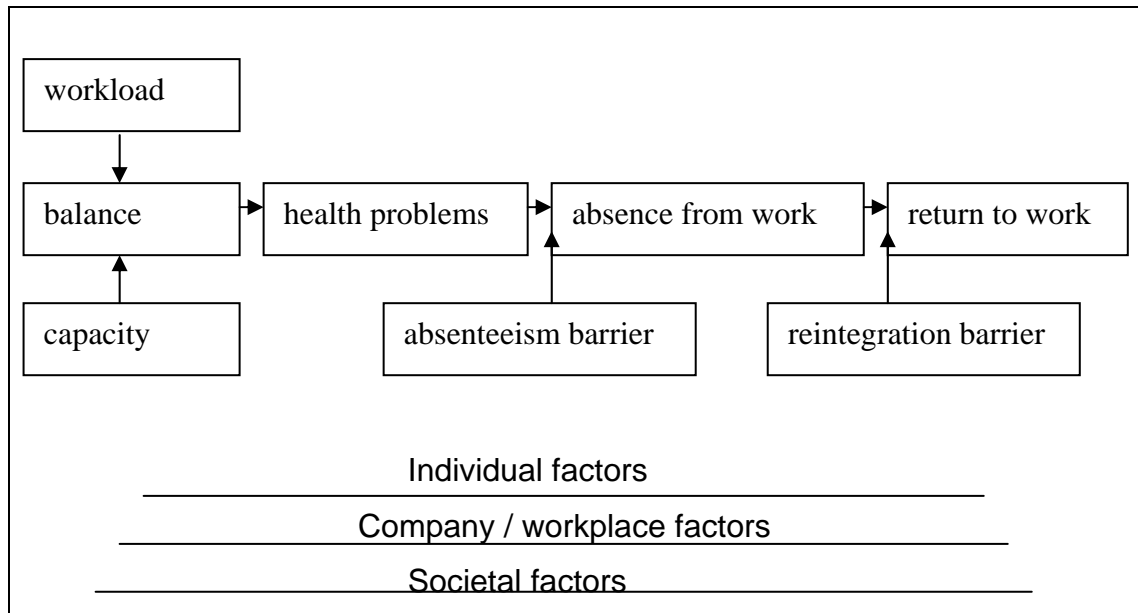
- Characteristic of the individual (age, gender, health, genetic and acquired disposition, lifestyle, education, race, immigrant status, personality, family situation, personal resources and capabilities, life situation and phase in the life cycle, occupation and/or working hours,
- Attitudes and motivation
- Malingering
- Coping strategy

Steers, and Rhodes (1984) categorised causal factors behind absence behaviour into eight clusters: personal factors, work attitudes, job content factors, organisation wide factors, economic and market factors, immediate work environment factors, external environmental factors (such as seasonal fluctuations and weather conditions), and organisational change factors (such as alcohol programmes, health examinations, disciplinary programmes). Many researchers (e.g. Kristensen, 1991) have, however, noted that merely presenting factors associated with sickness absence does not provide an explanation for it

There are also few theoretical models describing the sickness absence process focusing on the antecedents (Steers & Rhodes, 1978) or the absence

/ resumption thresholds (Allegro & Veerman, 1998; Gründeman & van Vuuren, 1997) of sickness absence.

**Figure 3.** A process model of sickness absence (Gründeman & van Vuuren, 1997)



Kristensen (1991) proposed five requirements, which should be incorporated into theories of sickness absence:

1. A theory of sickness absence should be holistic, incorporating factors at all levels.
2. A theory of sickness absence should consider the individual as a product of his or her environment, and at the same time, as a conscious actor who makes choices within a given social framework. Thus absence cannot be explained by using only a deterministic or a voluntaristic model.
3. A theory of sickness absence should not regard absence from a normative point of view, i.e. see it as something bad that must be reduced or minimized. Such a theory should deal instead with the purpose the absence serves for employees and attempt to uncover, which type of absence is appropriate seen from a health perspective.

4. Sickness absence is not a simple function of sickness but reflects a person's general subjective perception of his/her own health and the factors that influence it.
5. The greater the job demands and the fewer the coping possibilities in the work situation the higher the sickness absence rate.

In this review different determinants and correlates of absence are described starting from general societal factors and moving into more specific and individually controlled factors.

### **Economic and market factors**

Legislation and different policies concerning sickness absence seem to play a large role for the absence rates. Prins (1990) concluded that the substantial differences between the absence rates in culturally rather similar countries Belgium, The Netherlands and Germany were mainly due to differences in legislation and social insurance schemes. Also even more general social factors such as economical fluctuation may have an influence. For example, in Sweden and The Netherlands the rise of absence rates coincides with growth of the economy and lowered unemployment (Bergendorf et al., 2002). Also, sickness absence figures tend to decrease during economic recession and growing unemployment, which has been attributed to the greater difficulties for those who are less healthy to get and keep jobs (Alexanderson, 1998). Other possible factors could be that employees, in fear of being made redundant, try to limit their absences during economic decline. Absence regulation policies might also be more lenient during periods of high economic fluctuation. Therefore social security figures may tell little about actual health. This can be seen in Sweden, where other health indices are very good (e.g. expected lifetime) but sickness absence remains high (Bergendorf et al., 2002). However, sickness absence has been associated with "hard" measures of health such as mortality within countries (Kivimäki et al., 2003). Therefore, it is probable that strong intra-class correlations exist within countries or even regions or companies and associations should be analysed using multilevel models.

## **External environment factors related to sickness absence**

A study of Virtanen et al. (2000) examined different communities with regard to the properties of the community and scale of sickness absence. In explaining the differences the authors used Bourdieu`s (1977, 1984) concepts of “field” or social ranking, “habitus, “practise” and “capital”. They found that sickness absence was connected to the historical development and relative dominance of social classes in the community. They concluded that simple work-place interventions influence absences only marginally and temporarily. In order to achieve long lasting changes the whole working community and locality must undergo profound changes.

Social norms regarding absence also influence the absence behaviour of the employee`s. A study of Geurts et al. (1998) demonstrated the impact of two social comparison processes on absence frequency. Absenteeism was affected by the perception that one is less well off than one's colleagues on several job aspects. Also, the discrepancy of one's personal absence norm and that of the work group had an effect on absenteeism. Subsequently employees may develop feelings of resentment in response to perceived inequity and a tolerant group absence norm. However, the study examined absence frequency, which might be more vulnerable to social influences than absence duration and long-term absence.

## **Organizational factors related to sickness absence**

Farrel & Stam (1988) found in their meta-analysis that organizational factors were better predictors of general absence than psychological and demographic correlates. A control policy, independent of whether it was based on negative or positive actions, was a strong and stable correlate. Some studies (Ariëns et al., 2002; Kivimäki et al., 1998) suggest that high job insecurity could be a risk factor for sickness absence. Also, organizational downsizing raises the incidence of sickness absences for the remaining employees (Kivimäki et al., 2000; Vahtera et al. 1997). The effect is partially

explained by increases in physical demands, job insecurity and lowered job control (Kivimäki et al., 2000). However, temporary employment contract is a negative predictor of sickness absence as such (Bergendorf et al., 2002). This could be due to the fact that the employees on temporary contracts are usually younger compared to regular employees. Also, the fear of contract renewal might limit absences. There are no clear differences between full-time or part-time workers in overall absences (Bergendorf et al., 2002), but working part-time is a predictor of disability pensions (Gjesdal & Bratberg, 2002). A recent review indicates that working overtime is associated with adverse health effects (van der Hulst, 2003). However, some studies suggest that working overtime is associated with decreased sickness absence (Kivimäki et al. 2001; Voss et al. 2001).

### **Demographic variables related to sickness absence**

There seems to be a quite linear negative association between socio-economic class and sickness absence that is not dependent on gender (e.g. North et al., 1993; Fuhrer et al., 2002). Also rates of sickness absence are lower for people with a higher education (Ala-Mursula et al., 2002). The greatest distinction seems to be that white-collar (non-manual) workers are absent less than blue-collar (manual) workers. This trend can be seen in many European countries and in various sectors of employment e.g. French national gas and electric company and British civil servants (Fuhrer, et al. 2002), within a Swedish county (Alexanderson et al. 1994) and in transportation services in Spain (Benavides et al, 2003). However, it seems that this depends on the type of the illness. Psychological problems seem to be over-represented among white-collar workers whereas blue-collar workers have an increased number of physical illnesses (Riksförsekrinsverket, 2002). Different occupations have been found to have different pathways linking psychosocial work factors and sickness absence (Pousette & Johansson Hanse, 2002). Also public sector workers have a higher ratio of long-term absences than private sector workers (Riksförsekrinsverket, 2003; Bergendorf et al., 2002). There is some evidence that large workplaces have higher rates of absence than smaller ones (Voss et al. 2001; Vahtera et al. 1997).

According to European workforce studies (see Bergendorff et al., 2002) there is a positive linear association between age and sickness absence, but in other studies there has been no straightforward association (Voss et al. 2001; Peter & Siegrist, 1997). In the meta-analysis undertaken by Farrel & Stam (1988) age had only a small negative association (-.06) with total absence. The difference could be due to the fact that in most studies the sample group contains only certain sectors of work, only certain occupations or only certain reasons for absence where age has no effect or a reverse effect on sickness absence. One explaining factor could also be that younger people have more short spells of absence whereas older workers have more long spells of absence (Vahtera et al., 1996). Overall, age seems to increase the risk for long-term absences for both men and women (Riksförsekringsverket, 2003). Thompson et al. (2000) found that age had a negative linear relationship with non-certified absence and a positive linear relationship with certified absence. In contrast, curvilinear relationships were found between tenure and absence that were U-shaped for non-certified and inverse U-shaped for certified absence.

According to a number of European studies women have a higher level of absence due to sickness than men (e.g. Bergendorff et al., 2002; North et al., 1993; Niedhammer et al., 1998; Voss et al., 2001). There have been numerous explanations for this difference starting from childcare responsibilities to job type and sector variations. However, in a Norwegian study (Mastekaasa & Modesta Olsen, 1998) where most of these possible explanations were controlled for, the difference remained unchanged. In the study women had 1.5 to 1.7 times more physician-certified absences and 1.3 times more self-certified absences than men after variables like child-care responsibilities and organisation or occupation were controlled. Women had slightly more short absences, an increased amount of mid-term absences and again only slightly more long-term absences than men. Because these ratios also correspond with studies on other measures of health, such as reported symptoms and visits to physicians (Gijsbers van Wijk & Kolk, 1997), the

authors concluded that the difference is primarily health related and psychological and societal factors have a smaller role, if any.

There also seems to be very little evidence that the double burden of family and work increases sickness absences in general (Mastekaasa, 2002; Ala-Mursula, 2002). This is to say that the number of children and having a family do not seem to be risk factors for absence as such. It should be noted, however, that most studies are cross-sectional, meaning a healthy worker selection only within the women with (care for) children. Hardly any longitudinal studies have been performed. Also, self-reported absence has been associated with having children under six and with difficulties with childcare (Erickson et al., 2000). These factors also moderated the association between burnout and absence. This could suggest that having a family has both positive and negative effects on sickness absence and that excessive strains due to family responsibilities may result in absences or at least increase the risk of stress related illnesses.

### **Physical variables related to sickness absence**

Some of the strongest predictors of sickness absences are previous absences and previous ill health (Andrea et al., 2003; Farrel & Stam, 1988). Also lifestyle factors have a quite strong stable association with sickness absence. Self-rated health status is a good predictor of sickness absences (Marmot, 1994). In addition, overweight, smoking and sedentary lifestyles have been found to be stable linear predictors of sickness absence in many studies (e.g. Kivimäki et al. 1998; Ala-Mursula et al. 2002). However, alcohol consumption does not seem to have a straightforward relationship with sickness absence (Kivimäki et al., 1997; Ala-Mursula et al. 2002).

### **Stress factors and sickness absence**

Different forms of stress e.g. somatic, behavioural, emotional and cognitive are all correlated moderately to sickness absence (Nielsen et al., 2002).

Psychological distress, both general and job related, predict increased absences irrespective of demographic variables (Hardy et al., 2003). Two models of stress components, namely, the job demands – job control model by Karasek (1979) as well as the effort-reward imbalance model of Siegrist (1996) have received support as a risk factor for various illnesses such as coronary heart disease (e.g. Schnall et al., 1994; Kivimäki et al., 2002) but contradictory results as predictors of sickness absences (e.g. North et al. 1996; Siegrist & Peter, 1997).

We wanted to examine the effect that the components of these stress models have on sickness absence. After taking methodological issues into consideration, we found enough representative studies only on the Karasek model. Social support, job demands and job control were selected as predictors, because they have been proven to be significant risk factors for stress and overall health. Other relevant risk factors, such as bullying or organisational fairness have not yet been studied in regard to sickness absence to a larger extent.

### **Method for the review**

Because we wanted to exclude studies that reflect primarily voluntary absences that are not health related, we selected only studies where the outcome measurement was based on registered sickness absence data on absence duration. We also included data on registered spells which were medically certified or lasted over 7 days. Absence days are considered a better predictor of involuntary absence related to health than absence frequency, which is regarded to reflect voluntary absence (Thompson et al., 2000). Long spells of absence have also been proven to be a good predictor of health status (Kivimäki et al., 2003). Registered absence is also free from error due to subjective factors (Ganster & Schaubroeck, 1991). Moreover, short and long spells of absence have different correlates and different aetiology (Marmot et al., 1995, Vahtera et al., 1996)



Because there were only few prospective studies, which controlled for baseline sickness absence or health, we included also longitudinal and cross-sectional studies. Therefore, causal inferences should be made with caution because the possibility of reversed causality between the variables.

**Table 1. Key words used in the literature search**

Group	Key words	Number of hits
1) Sickness absence	Sickness absence Absenteeism Sick leave	Medline(Pubmed):7176 PsycINFO: 1774
2) Social support	Social support Co-worker support	Combined with search 1: Medline(Pubmed):101 PsycINFO: 68
3) Job demands	Demand Demands Workload	Combined with search 1: Medline(Pubmed):204 PsycINFO: 88
4) Job control	Job control Skill discretion Autonomy Decision latitude	Combined with search 1: Medline(Pubmed):168 PsycINFO: 50

For the literature search we used two internet based search archives: Medline (Pubmed) and PsycINFO. Within each group of key words we used the Boolean term OR. Subsequently search 1 was combined in turn with search 2, 3 and 4 using the Boolean term AND. We also conducted a manual search using citations identified in the database search. Also, the personal archives of the researchers were used.

There were a number of publications based on the same cohort study and therefore were not independent. From these study programs we selected the publications, which had the longest follow up and/or men and women studied separately. There were also studies that had divided the length of the absence spells into more than two categories. From these the effect of the longest spell category is described in the table. The final number for studies included is 15 (table 2).

**Table 2. Studies on registered sickness absence and social support, job demands and job control.**

<b>Article</b>	<b>Study group</b>	<b>N</b>	<b>Design</b>	<b>Method</b>	<b>Outcome</b>	<b>Estimate for effect size.</b>	<b>Significant effect on sickness absence</b>
Ala-Mursula, Vahtera, Kivimäki, Kevin & Pentti (2002).	Municipal employees, Kunta-8 Cohort Study, Finland.	6442, (1490 men/ 4952 women)	Longitudinal, Follow up of 2.8 years.	Job Content Questionnaire: -Demands -Control	Registered medically certified sickness absence spells > 3 days.	RR, adjusted for age, socio-economic class, physical health and health behaviours.	Low control
Andrea, Beursken, Metsemaker, van Amelsvoort, van den Brandt & van Schayck (2002).	45 companies and organisations, The Maastricht Cohort Study, the Netherlands.	1271(851 men / 420 women).	Longitudinal, Follow up 1.5 years.	Job Content Questionnaire: -Demands -Control -Social support	Registered sickness absence spells: 1-3 months, 3-6 months, >6 months for employees who visited the gp/op.	OR, adjusted for gender, age, education.	Low control
Bakker, Demerouti, de Boer & Schaufeli (2003).	Nutrition production employees, the Netherlands.	214 (147 men / 67 women)	Longitudinal, Follow up 1 year.	Job Content Questionnaire: -Demands Control (six items, van Veldhoven & Meijman, 1994)	Registered absence days	Correlation	High demands Low control

Article	Study group	N	Design	Method	Outcome	Estimate for effect size.	Significant effect on sickness absence
Boedeker (2001).	Metal processing and retail companies, Germany.	42 508 (13603/28905 women)	Longitudinal, Follow up 3 years.	Objective job analysis -Psychosocial demands -Low control	Registered medically certified sickness absence spells.	RR, Adjusted for age, sex, company, education, work hours and duration of employment.	Low demands Low control
Bourbonnais & Mondor (2001)	Six acute care hospitals in Québec, Canada.	1891 (all women)	Longitudinal, Follow up 1.67 years.	Job Content Questionnaire: -Social support Demand*Control interaction.	Registered medically certified sickness absence spells > 3 or 5 days.	IDR, adjusted for age, socio-economic class, physical health and health behaviours.	Low support
Dwyer & Ganster (1991).	Industrial workers, USA.	90 (all men)	Longitudinal, Follow up 1 year.	Demands (internal job analysis). Control (22 items) Demand*Control interaction	Registered sickness absence days	Correlation	Demands*Control interaction
Elders, Heinrich & Burdorf (2003).	Workers of a scaffolding company	288	Longitudinal, Follow up 3 years.	Demands (four items) Control (four items)	Registered medically certified sickness absence spells > 14 days (only low back pain).	PR	

Article	Study group	N	Design	Method	Outcome	Estimate for effect size.	Significant effect on sickness absence
Hoogendoorn, Bongers, de Vet, Ariëns, van Mechelen & Bouter (2002).	34 companies, the SMASH Cohort Study, the Netherlands.	751	Longitudinal, Follow up 3.1 years.	Job Content Questionnaire: -Demands -Control -Social support	Registered physician coded sickness absence spells > 7 days. (Only musculo-skeletal)	RR, adjusted for gender, age, socio-economic class, physical health, health behaviours and other psychosocial factors.	
Kivimäki, Elovainio, Vahtera & Ferrie (2003)	10 hospitals, "Work and health in Finnish hospital personnel" Cohort Study, Finland	3773(416 men / 3357 women)	Prospective, Follow up 2 years.	Workload (five items) Skill discretion (six items) Social support (six items)	Registered medically certified sickness absence spells > 3 days.	RR, adjusted for gender, age, socio-economic class, physical health, health behaviours and health indicator at baseline.	High demands Low control
Krantz & Östegren (2002).	A rural community, working women 40-50 years of age, Sweden	301 (all women)	Longitudinal, Follow up 1 year.	Job Content Questionnaire: -Demands -Control Social support (Hanson & Östegren, 1987)	Registered medically certified sickness absence spells of 14-180 days.	Crude OR.	High demands

Article	Study group	N	Design	Method	Outcome	Estimate for effect size.	Significant effect on sickness absence
Melchior, Niedhammer, Berkman & Goldberg (2003).	National gas and electricity company, the Gazel Cohort Study, France.	13226 (9631 men /3595 women)	Prospective, Follow up 4.3 years for men and 4.8 years for women.	Job Content Questionnaire: -Demands -Control -Social support	Registered medically certified sickness absence spells > 21 days.	RR, adjusted for age, socio-economic class, physical health, health behaviours and baseline health status.	Low control (men) Low support (men)
North, Syme, Feeney, Shipley & Marmot (1996).	Civil servants in London, The Whitehall II Cohort Study, UK.	6830 (4760 men / 2070 women)	Longitudinal, Follow up 2.4 years.	Job Content Questionnaire: -Demands -Control -Social support Demands*Control interaction	Registered medically certified sickness absence spells > 7 days.	RR, adjusted for age and grade of employment.	High demands (women)
Peter & Siegrist (1997)	Male middle managers of a car-producing company, Germany	132 (all men)	Cross-sectional, 1 year of accumulated data.	Lack of reciprocal support (one item)	Registered medically certified sickness absence spells > 3 days.	Cell frequencies (transformed to OR)	
Vahtera, Kivimäki, Pentti & Theorell (2000).	Municipal employees, Finland	530 (138 men/ 392 women)	Prospective, Follow up 6.7 years.	Change in Social support (four items)	Registered medically certified sickness absence spells > 3 days.	RR, adjusted for physical health, health behaviours and level of predictor before change.	Low support (women)

<b>Article</b>	<b>Study group</b>	<b>N</b>	<b>Design</b>	<b>Method</b>	<b>Outcome</b>	<b>Estimate for effect size.</b>	<b>Significant effect on sickness absence</b>
Väänänen, Toppinen-Tanner, Kalimo, Mutanen, Vahtera & Peiro (2003).	Industrial corporation, Finland	3895 (2950 men / 945 women).	Prospective, Follow up 1.8 years.	Job autonomy (five items) Social support (four items)	Registered medically certified sickness absence spells > 21 days.	RR, adjusted for age, socio-economic class and baseline sickness absence.	Low control Low support (men)

Each of the variables support, demand and control have received some support for effects on sickness absence. However, the effects are relatively small, and there are as many non-significant studies as significant results. There do not seem to be large differences between the sexes in any of the variables, there is no straightforward trend between the length of the absence and the variables studied to demonstrate that longer absences would have larger effects. There could, however, be a trend towards an increase in the effect in longer absences that is not picked up here, due to the small amount of studies and small variation in length of absence spell.

However a recent meta-analysis on similar studies shows that simple qualitative reviews or analyses based on vote counting could lead to spurious conclusions, because though there is a similar effect observed in many studies, almost half of the individual studies are non-significant as such (Joensuu et al., manuscript). It was also noted that subjective measures provide consistent and similar results on all these variables whereas objective measures yield significant contradictory results on job demands.

### **Interaction effects between support, demands and control**

Smulders & Nijhuis (1999) found seven studies that examined the relationship between Karasek's model and different measures of sickness absence. Only one of these (Kristensen, 1991) supported the model. In a Swedish study, however, an increased percentage of long-term absentees experienced their work to be high-strained with low personal control and little social support compared to regular workers (Riksförsekrinsverket, 2003). Also, job demands predict burnout symptoms and are subsequently associated with absence duration (Bakker et al., 2003). In Sweden burnout and work-related causes can be used as grounds for sick leave. In 2000 of the people who had been long-term absent (over 60 days) 3.3 % had a burnout or work-related diagnosis (Riksförsekrinsverket, 2002). The percentage of all psychiatric conditions was 22.5. An interesting factor is that where previous absences

predicted subsequent absences in other illnesses, this was not the case for burnout.

### **Other stress risks**

Aronson et al. (2000) studied the phenomenon of 'sickness presenteeism', i.e. working though one really should be absent due to illness. They found the highest levels of 'sickness presenteeism' among nursing and educational staff. 'Sickness presenteeism' was also associated with musculoskeletal problems, fatigue /depression and high sickness absenteeism.

One interesting variable that has been linked to sickness absence is job satisfaction (e.g. Hoogendoorn et al., 2002). Studies on absenteeism in general and job satisfaction have produced unstable effects (see Hackett & Guion, 1985), but some authors (e.g. Scott & Taylor, 1985) claim that a strong association can be found if both variables are measured reliably. The association seems to be stronger for short absences than long-term absences (Marmot et al., 1995). Hardy et al. (2003) found that low job satisfaction predicted absences and that satisfaction and psychological distress were independent predictors of absences.

Bullying and low organisational fairness have been found to be good predictors of sickness absences (Kivimäki et al., 2000; Elovainio et al., 2002). In a Swedish study long-term absentees had experienced more conflicts and bullying in the workplace than the regular workforce (Riksförsekrinsverket, 2003). Some studies (Piirainen et al., 2003; Stansfeld et al., 1997) have found an increased risk of sickness absence if the employee evaluated the atmosphere at work to be poor and unsupportive. However, social support outside of work might have a negative effect on sickness absences suggesting that strong social relationships might encourage absence at a time of an illness (Rael et al., 1995; Stansfeld et al., 1997).

Negative life-events have an effect on sickness absence (Kivimäki et al. 2002, Kivimäki et al. 1997). The effect is mediated through increased psychological



problems and behavioural risks and is greater for men than women. Also psychiatric disorders have been found to be more important risk factors for sickness absences of male employees than of women (Laitinen-Krispijn & Bijl, 2000; Hensing et al., 2000). These differences could be explained by a lower threshold for women in seeking help and stronger social networks and support for women (Laitinen-Krispijn & Bijl, 2000).

There has been some evidence that psychological vulnerability models predict sickness absence. Factors such as hostility or low sense of coherence have been found to be associated with sickness absence especially with women (Kivimäki et al., 1997; Kivimäki et al., 1998). A majority of people do believe that work has consequences on their health (Paoli & Merllié, 2001). Therefore, individuals might attribute their health problems to work and may blame factors at work for their situation. This might lead to a decreased motivation to return to work.

### **The sickness absence process**

According to a survival analysis (Andrén, 2001) the probability of return to work from sickness absence decreases significantly after four months of absence. A similar point for increased risk of disability pension was found around 170 days of absence (Gjesdal & Bratberg, 2003).

Ockander & Timpka (2003) conducted a phenomenological study on the experiences of long-term absent women. According to their analysis, three different accounts could be distinguished: crisis, breakpoint and migration. The crisis category was characterised by the discrepancy between the present existence and the future plans of possibly returning to work. They had also been disappointed by the medical support and had lost their power of initiative, which had led to feelings of hopelessness. The breakpoint category was characterised by the conflict of wanting to go back to work and a feeling of resignation. Compared to the crisis category, these women had the power of initiative, but were unsure of where to direct their efforts. The migration category was characterised by no plans for returning to work. These women

had achieved a balance in their lives and had redirected their goals in other areas of life than work.

A study based on grounded theory highlighted the importance of the relationships between the absentee and the rehabilitation personnel (Östlund et al., 2001). The absentees described their rehabilitation mainly through the person handling their case rather than the actual procedures and measures taken. Supportive and individually focused measures were evaluated to promote the rehabilitation. Also a study of laypersons views of the sickness absence process emphasized the importance of the employer and a need for a structured back-to-work program (Nordqvist et al., 2003).

## **Conclusions**

In recent years meta-analyses of data from different studies have become more popular for accumulating knowledge in many areas of medical science. However, as Alexanderson (1998) points out, it would be extremely difficult to carry out meta-analyses on data from different studies on sickness absence due to the major temporal and international dissimilarities in study design and measurements used. Moreover, e.g. the sickness absence and disability compensation and registration systems, the composition of the labour force, work environment, national economics, and public health, vary greatly between countries making cross-country comparisons difficult.

What also makes studying the correlates of sickness absence challenging is the amount of possible interaction effects between variables. Most of the explaining variables behave differently between various combinations of dependent variables like age, gender, socio-economic class, length of absence, type of illness and occupation. Also, studies about the association between individual variables like job satisfaction and psychological problems are hampered by common method variance due to self-reports. This makes it difficult to assess if e.g. low job satisfaction leads to stress symptoms or whether stress decreases job satisfaction or if the perception of both can be attributed to a third factor.

It is surprising that only few studies on sickness absence focus on the actual health of the individuals and discuss medical theories in relation to the factors associated with sickness absence (Alexanderson, 1998). Serxner et al. (2001) compared the impact of different behavioural health risk on self-reported absence. They found significant relationships between 8 of the 10 risk areas examined. A decrease in the risks of mental health, stress and musculo-skeletal problems reduced also subsequent absenteeism. Overall reductions in health risks also lead to decreased absenteeism. This suggests that general health promotion programs could reduce absenteeism rates.

In general the highest risks for sickness absence reviewed here were found when people had suffered previous ill health and chronic diseases. For those factors there is generally more than a two-fold risk. The risk was also of similar magnitude for lower socio-economic class and low-grade jobs. Psychological distress, job satisfaction, behavioural risks and organizational risk, such as organisational unfairness and bullying, all yield risk ratios around 1:5. Components of stress models such as low social support, high job demands and low job control generally yield modest risk ratios around 1:2.

General absence measures do not capture the effects of stress easily. It seems that the effect of stress is most evident in absences lasting for several months and without being preceded by shorter absences. In countries where work related causes or burn-out are classified separately, the proportion of these out of the total absences is relatively small. Stress has, however, aetiological influence on many health problems and a moderating effect on most, if not all, concepts related to health and well-being.

Theories of stress have received some attention in relation to absenteeism, but the association between [occupational] stress and sickness absence remains ambiguous. It would seem that every “push” to absence due to stress is equalled by a “pull” to work due to the factors related to stress (Aronson 2000; Bakker et al., 2003). However, factors reviewed here i.e. low social support, high job demands and low job control increase the risk of sickness

absence of different durations. However, it should be noted, that these associations come from self-reported variables. The two studies reviewed (Boedeker, 2001; Dwyer & Ganster, 1991), which used an objective measure of job demand, reported a strong opposite effect and no effect at all on registered sickness absence, respectively. Morrison et al. (2003) point out that the demands-control-support model is about jobs and not a model about individual perceptions of jobs. It is concluded that the effect of jobs per se on psychological distress is very small (van der Hoef & Maes, 1999). Therefore new models that are purposefully designed to measure occupational stress should be developed. One such perspective suggested by Morrison et al. (2003) would be the role set approach (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964).

Also, the motivational and active behaviour of the absentee is often neglected. If low perceived control indeed leads to sickness absence it could mean that the employee tries to control the situation by being absent. One perspective to the issue is to view absence as a part of social exchange between the employee and the employer. Chadwick-Jones, Nicholson, & Brown (1982) argued in their social theory of absenteeism that absence should be considered to be negative exchange behaviour, with employees withholding their presence from work to make up for work load pressures, stress or other negative aspects of the job. Social theories of sickness absence could have a larger role in the future in explaining the dramatic increases in sickness absence and disability figures, which can already be seen in some countries e.g. Sweden, for which explanations relying on medical epidemiology are scarce.

Some general patterns in sickness absence, however, can be identified. First of all, the percentage of psychiatric illnesses corresponds to the length of the absence i.e. the prognosis for recovery is worse for psychological problems than other illnesses. Second, there are many possibilities to influence absences on a community and organisational level. These might include general health promotion programs, defining an absence policy, increasing job security and organisational fairness, and controlling bullying and investing in

the social climate of the organisation. There are also certain risk groups who could benefit from tailored intervention campaigns. For example, the oldest age groups, people doing physical work or public sector workers.

One of the most challenging questions concerning studies of absenteeism and applying that knowledge to practise is to define a preferred level for sickness absence. Because the association between sickness absence and health is not straightforward, a reduction in absence figures does not necessarily reflect improvements in public health and vice versa.

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