

Sickness Presenteeism: Prevalence, Attendance-Pressure Factors, and an Outline of a Model for Research

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Objective: Sickness presence, that is, going to work despite judging one's current state of health as such that sick leave should be taken, was investigated in relation to different work and background factors.

Methods: The study group comprised a random sample of 3136 persons who responded to a questionnaire administered in conjunction with Statistics Sweden's labor market survey. Logistic regressions were used in the analyses. **Results:** Fifty-three percent reported the presence of sickness (on more than one occasion during the preceding year). Having a health problem is a strong determinant of sickness presenteeism (odds ratio = 3.32). For any given health status, there are certain other factors (personally and work-related demands) that impact on the risk of sickness presence, such as difficulties in staff replacement, time pressure, insufficient resources, and poor personal financial situation.

Conclusions: The study has identified different types of determinants of sickness presence. Under the assumption that there is a connection between high sickness presence and risk for future ill health, the results may provide assistance in the formulation of preventive measures. (J Occup Environ Med. 2005;47:958–966)

In recent years, there has been a growing interest in research concerning sickness presenteeism. The concept refers to the phenomenon that people, despite complaints and ill-health that should prompt them to rest and take sick leave, go to work in any case. Sickness absenteeism decreases at the cost of higher sickness presenteeism.

Sickness presenteeism may be expected to be related to increased risk of ill health, primarily because it restricts opportunities for recuperation. This presumption, however, rests more on general knowledge of the importance of recuperation than on any wide-ranging empirical investigations of the consequences of sickness presenteeism. Recent stress research, however, has provided evidence that inadequate recuperation after acts of straining as a mediating mechanism in the relationship between stress and ill-health.¹ Furthermore, in experimental studies, significant associations have been found between mental exhaustion and susceptibility to the common cold.²

Studies of sickness presenteeism have focused on its prevalence in different occupational groups, its determinants, and its effects on productivity. There is, however, a scarcity of studies of the health consequences of sickness presenteeism. A British study found that low sickness absence acted as a potential health problem among medical doctors and accountants/consultants. Both these groups had low absenteeism.³ It was shown that a large majority—largest among doctors—had worked on some occasion when feeling ill. The

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most common reasons given by doctors for working when sick was that there was no one else to do the job, that absence was unfair to colleagues, and that patients had already been scheduled. Also, McKevitt and Morgan⁴ found high sickness presenteeism and strong cultural barriers (in the forms of norms, workplace culture, and work ethics) against the taking of sick leave among hospital physicians. These cultural barriers were reinforced by organizational arrangements in that absence imposed a further burden of work on colleagues. Similar results were obtained in a study of Norwegian physicians.⁵

In another British study, of public-sector workers, Grinyer and Singelton⁶ identified two principal factors in relation to why people did not take sick leave in case of a health problem. First, working in a team meant that they felt responsibility for that team; second, they were subject to a monitoring system stipulating that four separate occasions of sick leave would entail their being summoned to an interview to explain themselves. The authors regard sickness presenteeism from a multi-dimensional risk perspective. The individual makes a choice between a risk to his or her health and a professional risk, eg, to future career and social relationships.

Interesting findings on factors behind sickness presenteeism also were reported in a Swedish epidemiological study of the effects of downsizing.⁷ Calculations of the effects of downsizing on subjects with and without cardiovascular risk showed a stronger reduction in long-term sick leave in women with a high cardiovascular risk score than in women without a high-risk score. There were no consistent findings for men. These results may be interpreted to mean that “medically vulnerable” employees in a downsizing situation feel that they have a reduced chance of finding a new job if they become unemployed. Accordingly, they refrain from exercising their right to stay away from work when they feel

ill to a greater extent. Little control over one’s own labor market situation may increase the risk of sickness presenteeism. In a recent report from the Whitehall II study, Kivimäki et al⁸ examined the association between sickness presenteeism and incidence of serious coronary events among 5000 British civil servants aged 35 to 55. They found that 17% of unhealthy employees took no sickness absence during a 3-year follow-up period. The incidence of serious coronary events in that group was, after correction for conventional risk factors, twice as high as that of the unhealthy employees with moderate levels of sickness absence.

In a Swedish study of teachers schools, it was found that both sickness absenteeism and sickness presenteeism were several times higher among a group of teachers with difficulties in winding-down after work/recuperation than among an other group of teachers without problems of these kinds.⁹

There also is a rapidly growing interest on the part of employers and insurance companies in estimating productivity losses related to sickness presenteeism.¹⁰ Productivity losses associated with illness have been examined in several studies.^{11,12} Lofland et al¹³ have performed a comprehensive overview of published survey instruments to measure health-related workplace productivity loss. Of the 11 instruments identified, five measured both absenteeism and presenteeism. Most of the instruments focused on specific diseases. One well-known instrument of this kind is the so-called Stanford Presenteeism Scale, developed by a group at Stanford University.¹⁴

The first major study of sickness presenteeism in Sweden was performed in 1997.¹⁵ The phenomenon was investigated in relation to occupation and a number of work-environment and background conditions. The study group comprised 3801 persons who were interviewed by telephone in conjunction with

Statistics Sweden’s labor market survey.

Just more than a third of persons (37%) in the study group reported that they had gone to work two or more times during the previous year despite the feeling that, in light of their self-perceived health, they should have taken sick leave. The highest presenteeism levels were found in the care-and-welfare and education sectors (nursing and midwifery professionals, registered nurses, nursing-home aides, compulsory-school teachers, and preschool/primary educationalists). The interpretation was that workers in these so-called human service organizations are more disposed to work when sick because their work involves caring, helping, teaching, or providing service to others, that is, their job is to meet some of the fundamental human needs of other people.^{16–18} These factors may be described as relation-related or concerned with demands for social attendance. Also, all the occupational groups involved work in sectors that have faced personnel cutbacks during the 1990 seconds in Sweden.

Concerning other work-organization aspects, it also was found that low replaceability in case of absence was associated with high sickness presenteeism. A further result was that the individual’s private financial circumstances were of significance to presenteeism. Concerning health aspects, it was found that workers with high sickness presence report medical symptoms (upper back/neck pain, fatigue/slightly depressed) more often than those without. However, that finding must be interpreted cautiously, since this was a cross-sectional study.

In the current study, based on a new sample from Statistics Sweden’s series of labor market surveys, we have extended the number of work-organizational variables. A first class of variables may be named “work-related attendance demands.”^{19–21} In addition to low replaceability, four new variables were used: two types

of necessary resources, control of pace of work and conflicting demands. For at least three of these variables, there is a theoretical link to the broader concept of “lean organization.” Low replaceability may be a consequence of understaffing and a lack of resources, but may also be attributable to task specificity preventing the work of one person being taken over by another. Also, necessary resources can be seen as an aspect of a lean organization. Two resource aspects are analyzed: the individual’s assessment of whether there are sufficient resources for work to be performed well (qualitative aspect), and assessed time pressure at work (quantitative aspect). The hypothesis is that these aspects of work-related demands for presence impact on sickness presenteeism.

A further aspect of work organization, which may influence sickness presenteeism, is the extent to which the individual has control in the work situation. Control in this sense is a concept closely related to what Johansson and Lundberg²² call “sickness flexibility.” Control over pace of work enables the individual to adapt task performance to his or her physical or mental condition “on the day.” In this context, low control is a factor that increases the risk of sickness absence at the cost of sickness presence.

But low control also may contribute to poorer health, which implies that the level of sickness presence (as well as sickness absence) would increase because of the relationship between control and health. Many studies of the relationship between control and health affirm this hypothesis.²³ What the relationship between control over pace of work and sickness presenteeism might be is harder to predict. If control allows individuals to work despite a degree of health impairment, it would be expected that control is positively related to sickness presenteeism; that is, the higher the level of control, the more presenteeism there would be. However, it might also be the case

that the health-promoting aspect of control makes for better individual health, and thus for a lesser need to be present when sick; that is, the problem of having to work when sick would arise less often.

A different type of attendance demand is related to the individual’s private life, ie, to his or her private financial situation and other personal factors. Financial loss caused by absence is assumed to have a more severe impact on the lowly paid, who have narrow financial margins, than on their better-paid counterparts. Accordingly, their disposition to be present is higher.

In this study, one personality-related variable was introduced, individual boundarylessness, meaning finding it hard to set limits with regard to excessive demands. Individual boundarylessness can be hypothesized to be a risk factor for sickness presenteeism. The hypothesis is that boundarylessness is especially critical when an individual faces conflicting job demands or a heavy workload. Accordingly, a specific question was introduced concerning conflicting demands. Individual boundarylessness was measured by an item concerning the ability to resist the demands and expectations of others.²⁴ In summary, this study aims to examine the extent to which the presence of work-related and personal attendance demands is associated with an increased risk of sickness presenteeism.

Materials and Methods

Sample

The study group consisted of a representative sample ($n = 3136$), based on a supplement to Sweden’s regular labor market survey 2000 to 2001 (AKU). For the study, 91% ($n = 2730$) were employed until further notice. This means that time-restricted employees ($n = 258$) are under-represented because this group comprises approximately 15% of the Swedish labor force. Stratification by form of employment meant that, for

some analyses, Statistics Sweden’s weighting coefficients had to be employed to adjust for sampling probability. The response rate for the current questionnaire survey was 69.1%, and missing cases for the AKU came to 13.5%.

Survey Questions

Regular questions posed in Statistics Sweden’s labor-market surveys cover personal background factors, kind of employment, sector, occupation, and employer.²⁵ To these were added validated questions from other of the statistical agency’s studies (including its work-environment survey).²⁶ The questionnaire study also included items concerned with some work–organization conditions.^{9,15,27} A couple of further questions concerning individual circumstances were also posed.^{24,28,29} Some questions had very few responses in the extreme response categories so, for statistical reasons, the number of categories was reduced to two or three. There follows a more detailed description of the variables/items.

Dependent Variables

Sickness presenteeism is the study’s dependent variable and was measured by the following question: Has it happened over the previous 12 months that you have gone to work despite feeling that you really should have taken sick leave because of your state of health?

The variable’s five-point scale was dichotomized for the purpose of logistic regression: (0) Not relevant—have not been sick over the previous 12 months/No, never/Yes, once, (1) Yes 2–5 times/Yes, more than 5 times.

Independent Variables

Five questions were posed in order to reflect various aspects of work conditions/organization.

Work-Related Demands for Presence

1. *Replaceability* (“work left undone”): If you are absent from work for up to a week, what

- proportion of your tasks must you take up again on your return? Responses on a four-point scale: (1) None or only a small proportion, (2) Somewhat less than half, (3) Somewhat more than half, and (4) Virtually all.
2. Are the necessary resources available for you to be able to perform your work tasks well? The four-point scale was dichotomized into the following categories: (0) Always/Usually, (1) Never/Usually not.
 3. Are conflicting demands imposed on you at work? A six-point scale with four categories was created: (1) Nearly all the time/about three-quarters of the time, (2) Half the time/about a quarter of the time, (3) A little, perhaps one-tenth of the time, (4) not at all.
 4. Do you have the opportunity to determine your pace of work (control in work)? A six-point scale with three categories was created: Nearly (0) all the time/About three-quarters of the time; (1) Half the time/About one-quarter of the time; (2) A little, perhaps one-tenth of the time/Not at all.
 5. Do you have so much to do that you are forced to miss lunch, work late, or take work home? The six-point scale was dichotomized into the following categories: Nearly (0) all the time/About three-quarters of the time/Half the time, (1) About one-quarter of the time/A little, perhaps one-tenth of the time/Not at all.

Personally Related Demands for Presence

1. *Individual boundarylessness in work*: I find it hard to say no to others' wishes and expectations. Responses on a five-point Likert scale from (1) Do not agree at all to (5) Agree entirely. Categorization for the logistic regression was as follows: responses 1 to 2 (0), Response 3 (1) Response 4 (2), and Response 5 (3).

5. *Private financial situation—financial demands for presence*: Over the previous 12 months have you had difficulties in handling ongoing expenses for food, rent, and bills? The five-point scale was dichotomized into the following categories: (0) Never over the last 12 months, (1) Every month/A couple of times over the last 3 months/A couple of times over the last 6 months/A couple of times over the last 12 months.

Health Status. Health status was used as a control variable in the analyses.

1. How do you assess your general state of health? The five-point scale was dichotomized into the following categories: (0) Good/Fairly good, (1) Variable/Rather poor/Poor.

Background Conditions. Age was broken down into five categories: (1) 16 to 25 years, (2) 26 to 35, (3) 36 to 45, (4) 46 to 55, and (5) 56 to 65. An *education* variable was created with five categories: (1) Compulsory school, (2) High school of two years or less, (3) High school of more than two years, (4) Post high school of three years or less, (5) Post high school of more than 3 years, ie, postgraduate studies.

Statistical Processing

Two kinds of computations were performed. To illustrate levels, there is first a presentation of percentage-based tables in which comparisons are made of sickness-presence rates in relation to background conditions. For the analyses, Statistics Sweden calculated correction weights to take account of missing cases by gender and occupation. On application of the weights, it emerged that the proportion of subjects who were present at work when sick on two occasions or more fell by 0.3%.

Subsequent multiple logistic-regression analyses were conducted with work-related demands for presence (having to catch up with tasks on return to work after short-term

absence), pace of work, time pressure, resources, personal financial situation, individual boundarylessness in work, conflicting demands, health status, and the three demographic factors (gender, age, and education) as independent variables. A reference group was determined for each independent variable. Odds ratios (ORs) were only slightly affected (<8%) by form of employment and working hours, and these two variables were removed from the model. Missing data, for occupation, replaceability and sickness absenteeism, reduced the number of persons considered in the regression model from 3136 to 2897.

The results of the logistic regression are presented in the form of ORs with 95% confidence intervals. Nagelkerke R^2 represents an attempt to imitate the interpretation of multiple R-Square, and is used to determine the proportion of variance explained.³⁰ A chi-square value is presented for the entire model.³¹ Data processing was performed using SPSS version 11.5 (SPSS Institute, Chicago, IL).

Results

Sickness Presenteeism and Demographic/Socioeconomic Factors

Table 1 provides an overview of frequency distributions in relation to various background conditions and sickness presenteeism. The most remarkable change is the major upswing during the 3-year period with regard to people working when sick on more than one occasion.¹⁵ In the study group there was an increase from 37% to 53%. The tendency is for women to show somewhat greater presence when sick than men.

Sickness presenteeism was primarily to be found among workers of middle age. No tendency was found in the material for individuals with a child at home to show higher sickness presenteeism than those without. There were no clear patterns in relation to education, nor was sick-

TABLE 1

Has it Happened Over The Previous 12 Months That You Have Gone to Work Despite Feeling That You Really Should Have Taken Sick Leave Due to Your State of Health? Percentage Distributions

Variable	Not Relevant/ Have Never Been Sick	Yes, Once	Yes, 2–5 Times	Yes, More Than 5 Times
Gender				
Women (n = 1650)	27	17	39	17
Men (n = 1446)	33	17	37	13
Age				
16–25 (n = 236)	26	21	36	17
26–35 (n = 725)	27	17	42	14
36–45 (n = 808)	26	19	41	14
46–55 (n = 887)	32	14	38	16
56–65 (n = 440)	40	16	30	15
Child at home				
Yes (n = 1523)	29	18	39	15
No (n = 1573)	31	16	38	15
Education				
Compulsory school (n = 525)	35	12	38	15
High school ≤2 years (n = 997)	27	14	42	17
High school >2 years (n = 504)	33	21	33	14
Post high school ≤3 years (n = 548)	28	20	38	15
Post high school >3 years (n = 518)	30	20	39	11
Part-time/full-time				
Full-time (n = 2255)	30	17	39	15
Part-time (n = 697)	31	16	36	17
Trade-union affiliation				
Not affiliated (n = 66)	30	17	35	18
LO – blue-collar (n = 1178)	29	14	40	17
TCO – white-collar (n = 963)	29	16	40	15
SACO – white-collar (n = 355)	30	20	38	12
Form of employment				
Permanent (n = 2696)	30	17	39	15
Temporary (n = 255)	29	19	37	15
Employer				
State (n = 231)	32	18	39	12
Municipality (n = 714)	26	14	41	19
County council (n = 252)	29	18	40	14
Private (n = 1815)	31	18	37	14
Total (n = 3096)	30	17	38	15

ness presenteeism found to be related to full-time/part-time working in either year. Differences with regard to sickness presence are small between groups with different trade-union affiliations (including white-collar groups). In 1997, the group of permanent employees was found to have a higher rate of sickness presenteeism than temporary employees (38% compared with 30%), but this tendency was not evident in the current study.³² Municipal employees show a substantially higher level of sickness presenteeism than national-government (state) employees and the personnel of privately owned

companies. It emerges from the data that there are major systematic differences in sickness presence between occupational groups. In this regard, the results of the studies of 1997 and 2000 are similar.³²

Logistic Regressions

Table 2 shows, as expected, that health status is a major determinant of sickness presenteeism (OR = 3.32). Seventy-eight percent of the group with varying/rather poor/poor health status had been at work when sick twice or more. The corresponding value for the healthier group is 44%. In the cases of the three

variables indicating work-related demands for presence, ie, replaceability, sufficient resources, and time pressure, there are clear relations to sickness presenteeism. Conceptually, these variables are significantly associated with the organizational structure of work (lean production or understaffing). By contrast, the conflicting demands and control over pace of work variables are more associated with the ongoing organization of work. Being exposed to conflicting demands may stand for the individual being exposed to both quantitative and qualitative pressure at work. The initial hypothesis posed—of a positive, linear relationship between conflicting demands and sickness presenteeism—obtained strong support. Also, people who cannot themselves determine their pace of work show higher sickness presenteeism.

Increased sickness presence also appears among people who find it hard to resist the expectations and wishes of others (individual boundarylessness in work). Here, our hypothesis was that individual boundarylessness in combination with conflicting work demands would interact with regard to sickness presenteeism. However, the logistic regressions designed to test this hypothesis provided no support for the presence of an interaction effect, nor was any significant interaction found between individual boundarylessness and time pressure with regard to presenteeism.

In terms of personal background conditions, people facing personal financial demands to be present at work were found to face an increased risk of sickness presence. The highly educated and the elderly show a lesser tendency to be present when sick. Following statistical control for the above-mentioned variables, there were no sex differences.

Discussion

There is a rapidly growing research interest in the phenomenon of sickness presenteeism. In our view,

TABLE 2

Multiple Logistic Regression With Sickness Presenteeism As Dependent Variable. Responses: Yes, 2–5 Times/More Than 5 Times (1), No, Never/Once/Not Relevant–Never Been Sick (0)

Independent Variable	n*	Odds Ratio	CI
Work-related demands for presence			
Replaceability (“work left undone”)			
None or only a small proportion†	1418	1	
Somewhat less than half	294	1.07	0.80–1.42
Somewhat more than half	262	0.84	0.62–1.14
Virtually all	923	1.34	1.08–1.65
Resources for good performance of work tasks			
Always/Usually†	2428	1	
Never/Usually not	469	1.66	1.29–2.13
Conflicting demands			
Not at all†	903	1	
A little (perhaps 1/10 of the time)	860	1.23	1.00–1.51
Half the time/About ¼ of the time	690	1.45	1.15–1.84
Nearly all the time/About ¾ of the time	444	1.59	1.18–2.14
Control – determining pace of work			
Nearly all the time/About ¾ of the time†	1183	1	
Half the time/About ¼ of the time	859	1.16	0.96–1.42
A little (perhaps 1/10 of the time)/Not at all	855	1.43	1.16–1.76
Time pressure – missing lunch, working overtime, etc.			
Not at all/A little/about ¼ of the time†	2071	1	
Nearly all the time/About ¾ of the time/Half of the time	826	1.83	1.48–2.26
Personally related demands for presence			
Individual boundarylessness (hard to say no)			
Do not agree at all (responses 1–2)†	705	1	
Response 3 (intermediate)	712	1.24	0.99–1.55
Response 4 (intermediate)	955	1.32	1.06–1.64
Agree entirely (Response 5)	525	1.55	1.20–2.01
Private-financial demands for presence			
No problem in handling ongoing expenses†	2168	1	
Some problems in handling ongoing expenses	729	1.68	1.38–2.04
Education			
Compulsory school†	486	1	
High (upper-secondary) school ≤2 years	929	1.26	0.98–1.61
High (upper-secondary) school >2 years	483	0.71	0.54–0.95
Post high school ≤3 years	518	0.85	0.64–1.13
Post high school >3 years	481	0.66	0.49–0.89
Age			
26–35†	692	1	
16–25	225	1.15	0.82–1.63
36–45	759	0.93	0.74–1.17
46–55	818	0.90	0.71–1.13
56–65	403	0.67	0.51–0.89
Gender			
Men†	1366	1	
Women	1531	1.16	0.98–1.36
Health status			
Good/Fairly good†	2125	1	
Variable/Rather poor/Poor	772	3.32	2.71–4.07
Total	2897		

*Regression based on reduced sample due to partial missing data in 7.6 percent of cases (n = 2897).

†Reference category for the independent variable.

Nagelkerke R² 0.22, chi² (df = 24) 519.95, p < 0.0001.

the main contributions of the current study are that our earlier findings regarding the factors that influence sickness presenteeism were replicated and that some new factors were identified. In what follows, we briefly discuss some of the results and then attempt to outline a model that brings together our empirical findings and raises questions for further research.

The logistic regressions showed that, given a certain level of health, there are various factors that increase or decrease the risk of sickness presenteeism. The hypotheses concerning associations between high sickness presenteeism and organizational conditions, such as low replaceability and insufficient resources, obtained support. “Negative” values on these variables represent a range of expressions of demands for presence in a slimmed-down organization. Further, conflicting demands at work are related to presenteeism. These may reflect understaffing but also poorly demarcated work tasks and high sensitivity to environmental conditions.

In many studies, having control in one’s work, including personally being able to determine the pace of work, has been found to be a stress-alleviating and health-promoting factor. Further, self-determination in this sense is regarded as one of the keys to work-organization improvement. Personal work control involves the individual being able to adapt daily work efforts to his or her current personal state of health. There is variation between jobs concerning the extent to which people have opportunities to choose work tasks, work slower, or shorten their working day. On this basis, it would be expected that high control might increase sickness presence at the cost of sickness absence. People with a higher degree of control would be more disposed to be present when sick than those with a lower degree of control. The hypothesis was not supported; to the contrary, the findings point in the opposite direction.

Given a certain health-status level, workers who had high control also had low sickness presence. This result can be interpreted in several ways.

One interpretation is that people with low control have “poorer work,” and thus lower pay, and are under greater financial pressure to go to work; however, the relationship remains even after controlling for personal financial situation.

A second interpretation is that people with a high degree of self-determination are healthier and therefore have less need to be present when sick (ie, they are not present at work when sick quite simply because they are not sick). However, the relationship remains after statistical control for general health status.

A third possibility is that people with a high degree of self-determination at work and those who are able to adapt their pace of work have a higher threshold for regarding themselves as being present when sick than those with less scope to adjust their pace of work to their current state of health. Investigation of the threshold problem would require a different methodological approach that needs to be carefully thought through.

An interesting question raised by the results is whether some conditions are “double in risk.” Such a factor is in itself a stressor (time pressure, lacking resources) but may also, in a situation of understaffing, contribute to increased sickness presence at the cost of lowered sickness absence.

Individual boundarylessness can be regarded and analyzed as a risk factor. People who find it hard to resist other people’s wishes and expectations show an increased risk of being present when sick. In our view, continued research is needed to elucidate this finding. The hypothesis that there is an interaction between individual boundarylessness and conflicting demands with regard to sickness presenteeism received no support.

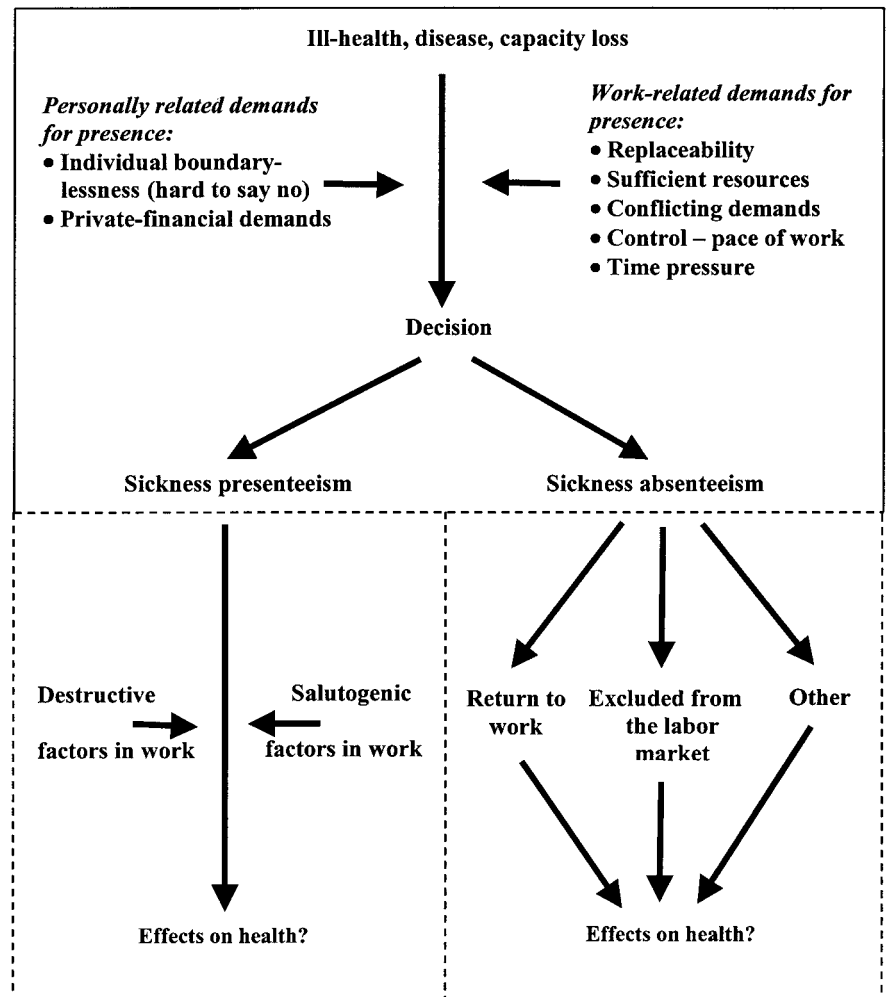


Fig. 1. Outline of a model for research into sickness presenteeism.

In the first study the relation between personal financial situation and sickness presenteeism was investigated on the basis of average pay by occupational group, ie, by using aggregated data. The associations found were clear, but not entirely consistent. For example, physicians constitute a high-income group with high sickness presenteeism.¹⁵ In the present study, individual data were used, which means that there is dispersion within each single occupation. People with financial problems, ie, facing private financial demands for presence at work, showed an obviously elevated risk of sickness presenteeism. The other background variables included in the analyses (age and gender) had relatively little or no explanatory value with regard to presenteeism.

On the basis of the empirical results, we have formulated a model that might be tested in future studies (Fig. 1). Illness and capacity loss are the strongest and most direct determinants of both sickness absenteeism and sickness presenteeism. Sickness absence and sickness presence are mutual alternatives when people are sick or lose their work capacity. As well as illness, there are other factors which, given a certain degree of illness, increase or decrease the risk of sickness or sickness presenteeism. These factors can be conceptualized as demands for attendance or attendance pressure. Further, there are different types of attendance demands, such as those related to work and those related to personal circumstances.

There may well be other factors related to sickness presence and absence that have not been included in our model so far. Kristensen,²⁰ for example, makes a distinction between positive and negative presence and absence factors. Positive presence factors are interesting and stimulating work, high job satisfaction, rewards for low absence rates, and good conscience. Negative presence factors are high risk of being dismissed and strict control of absence from work. Also factors outside job may contribute. Interesting leisure-time activities may act as a positive absence factor.

The current study is restricted to the upper part of the model we have outlined, that is, it is restricted to the work conditions that act as attendance demands. Another research question concerns the relationship between sickness presenteeism and health (the lower part of the model). Is there a risk that the people who are present when sick today are the ones who will be sick and absent in the future? Whether there is such a connection is a question of great societal relevance.

The simple cross-tabulations performed between sickness presence and ill-health showed a strong positive association in both the current and the earlier study.¹⁵ However, the results must be interpreted cautiously given that they are cross-sectional studies.

A reasonable hypothesis is that sickness absence is health-promoting in that it provides scope for physical and psychological recuperation following strain or disease. This is self-evident in the case of diseases with acute phases. Rest may counterbalance the positive effects of the social interaction and sense of belonging that may be provided in the workplace.

However, one question that can and should be posed in this context concerns the extent to which long-term sickness absence may be counter-productive from an individual perspective. In Sweden in 2005,

there are approximately 110,000 people who have been on sick leave for more than 1 year. In all likelihood, there is a significant group of individuals among them for whom the favorable effects of further sickness absence are doubtful.³³ Work, in a healthy social environment and with adapted demands, is likely to provide better therapy than long-term sickness absence. This situation, being on the job when ill or when functionally impaired, is indicated by the lower box to the left in Fig. 1; the outcome in terms of effects on health is seen as a result of the balance between destructive and salutogenic factors in the work situation.

In-depth analyses of the health impacts of sickness presenteeism will require the development of more complex analytic models, and also the adoption of a longitudinal research approach. The health risks associated with sickness presenteeism are likely to vary according to kind of complaint or disease, the individual's general state of health, and the extent to which work can be adapted to capacity impairment.

In the project reported, we have performed a follow-up study, which will provide further opportunities to analyze the relationships between sickness presenteeism and health. Are there any policy conclusions to be drawn from the study? It has not addressed the question of a possible connection between sickness presenteeism and risk to health; rather, it has simply identified different types of determinants of going to work when sick. For managers, occupational health and safety personnel, organizational designers and others who believe that there is a connection, the results of the study may provide assistance in the formulation of preventive measures.

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References

1. McEwen BS. Protective and damaging effects of stress mediators. *N Engl J Med*. 1998;338:171-179.
2. Cohen S, Tyrrell DA, Smith AP. Psychological stress and susceptibility to the common cold [see comments]. *N Engl J Med*. 1991;325:606-612.
3. McKeivitt C, Morgan M, Dundas R, Holland WW. Sickness absence and 'working through' illness: a comparison of two professional groups. *J Public Health Med*. 1997;19:295-300.
4. McKeivitt C, Morgan M. Illness doesn't belong to us. *J R Soc Med*. 1997;9:491-495.
5. Rosvold EO, Bjertness E. Physicians who do not take sick leave: hazardous heroes? *Scand J Public Health*. 2001;29:71-75.
6. Grinyer A, Singleton V. Sickness absence as risk-taking behavior: A study of organizational and cultural factors in the public sector. *Health Risk Society*. 2000; 2:7-21.
7. Theorell T, Oxenstierna G, Westerlund, H, Ferrie J, Hagberg L, Alfredsson L. Downsizing of staff associated with lowered medically certified sick leave in female employees. *Occup Environ Med*. 2003;60:E9.
8. Kivimäki M, Head J, Ferrie JE, et al. Working while ill as a risk factor for serious coronary events: the Whitehall II study. *Am J Public Health*. 2005;95:98-102.
9. Aronsson G, Svensson L, Gustafsson K. Unwinding, recuperation, and health among compulsory school and high school teachers in Sweden. *Int J Stress Manage*. 2003;10:217-234.
10. Goetzel RZ, Long SR, Ozminkowski RJ, Hawkins K, Wang S, Lynch W. Health, absence, disability, and presenteeism cost estimates of certain physical and mental health conditions affecting U.S. Employers. *J Occup Environ Med*. 2004;46:398-412.
11. Burton WN, Pransky G, Conti DJ, Chen C-Y, Edington DE. The association of medical conditions and presenteeism. *J Occup Environ Med*. 2004;46:S38-S45.
12. Boles M, Pelletier B, Lynch W. The relationship between health risks and work productivity. *J Occup Environ Med*. 2004;46:737-745.
13. Lofland JH, Pizzi L, Frick K D. A review of health-related workplace productivity loss instruments. *Pharmacoeconomics*. 2004;22:165-184.
14. Koopman C, Pelletier KR, Murray JF, et al. Stanford presenteeism scale: health status and employee productivity. *J Occup Environ Med*. 2002;44:14-20.
15. Aronsson G, Gustafsson K, Dallner M. Sick but yet at work. An empirical study

- of sickness presenteeism. *J Epidemiol Community Health*. 2000;54:502–509.
16. Hasenfeld Y. *Human Service Organizations*: Englewood Cliffs, NJ: Prentice Hall; 1983.
 17. Aronsson G, Astvik W, Thulin AB. Home-care workers: work conditions and occupational exclusion: a comparison between carers on early-retirement and regular pensions. *Home Health Care Serv Q*. 1998;17:71–91.
 18. Bejerot E. *Dentistry in Sweden: Health Work or Ruthless Efficiency*. [Doctoral thesis]. Malmö: Department of Dental Health Center for Oral Health Sciences Malmö; 1998.
 19. Steers RM, Rhodes SR. Major influences on employee attendance: a process model. *J Appl Psychol*. 1978;63:391–407.
 20. Kristensen TS. Sickness absence and work as strain among Danish slaughterhouse workers: an analysis of absence from work regarded coping behavior. *Soc Sci Med*. 1991;32:15–27.
 21. Saksvik PO. Attendance pressure during organizational change. *Int J Stress Management*. 1996;3:47–59.
 22. Johansson G, Lundberg I. Adjustment latitude and attendance requirements as determinants of sickness absence or attendance. Empirical tests of the illness flexibility model. *Soc Sci Med*. 2004;58:1857–1868.
 23. Karasek R, Theorell T. *Healthy Work: Stress, Productivity and the Reconstruction of Working Life*. New York: Basic Books; 1990.
 24. Hallsten L. Burnout and wornout concepts and data from a national survey. In: Cooper C, Antonion A, ed. *Research Companion to Organizational Health Psychology*. Northampton: Edward Elgar Publishing; 2005;516–536.
 25. SCB. [Statistics Sweden]. *Arbetskraftsundersökningen. Frågeformulär. [Labor-Market survey: Questionnaire]*. Stockholm: Statistiska Centralbyrån; 1994.
 26. SCB, Arbetsmiljöverket. [Statistics Sweden, Swedish Work Environment Authority]. *Arbetsmiljön 2001 [The Work Environment 2001]*. Stockholm: Statistiska Centralbyrån (SCB); 2002.
 27. Vingård E, Josephson M, Aronsson G, Nilsson M. *Psykosocial arbetsmiljö i Gotlands kommun—en studie av nedvarvning, återhämtning och friskfaktorer [The psychosocial work environment in Gotland Municipality—a study of winding-down, recuperation and salutogenic factors]*, Sektionen för personalskade-prevention, Institutionen för klinisk neurovetenskap, Karolinska Institutet, Stockholm; 2000.
 28. SCB, [Statistics Sweden] *Living Conditions, The Swedish Survey of Living Conditions, Design and Methods, Appendix 16*, Statistics Sweden, Stockholm; 1982.
 29. Hallsten L, Bellaagh K, Gustafsson K. *Burnout in Sweden—a national survey*. Stockholm, Sweden: National Institute for Working Life, Arbete och Hälsa; 2002;6.
 30. Nagelkerke NJD. A note on a general definition of the coefficient of determination. *Biometrika*. 1991;78:691–992.
 31. Menard SW. *Applied Logistic Regression Analysis: Sage University Paper Series on Quantitative Applications in the Social Sciences*; 1995;31.
 32. Aronsson G, Gustafsson K. *Sickness presenteeism—prevalence and trends*. Stockholm, Sweden: National Institute for Working Life, Arbete och Hälsa. 2002;8.
 33. Floderus B, Göransson S, Alexanderson K, Aronsson G. The influence of long-term sick leave on daily life. *J Rehab Med.*, 2005. In press.