

Socioeconomic inequalities in health in the working population: the contribution of working conditions

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- Background** The aim was to study the impact of different categories of working conditions on the association between occupational class and self-reported health in the working population.
- Methods** Data were collected through a postal survey conducted in 1991 among inhabitants of 18 municipalities in the southeastern Netherlands. Data concerned 4521 working men and 2411 working women and included current occupational class (seven classes), working conditions (physical working conditions, job control, job demands, social support at work), perceived general health (very good or good versus less than good) and demographic confounders. Data were analysed with logistic regression techniques.
- Results** For both men and women we observed a higher odds ratio for a less than good perceived general health in the lower occupational classes (adjusted for confounders). The odds of a less than good perceived general health was larger among people reporting more hazardous physical working conditions, lower job control, lower social support at work and among those in the highest category of job demands. Results were similar for men and women. Men and women in the lower occupational classes reported more hazardous physical working conditions and lower job control as compared to those in higher occupational classes. High job demands were more often reported in the higher occupational classes, while social support at work was not clearly related to occupational class. When physical working conditions and job control were added simultaneously to a model with occupational class and confounders, the odds ratios for occupational classes were reduced substantially. For men, the per cent change in the odds ratios for the occupational classes ranged between 35% and 83%, and for women between 35% and 46%.
- Conclusions** A substantial part of the association between occupational class and a less than good perceived general health in the working population could be attributed to a differential distribution of hazardous physical working conditions and a low job control across occupational classes. This suggests that interventions aimed at improving these working conditions might result in a reduction of socioeconomic inequalities in health in the working population.
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Socioeconomic inequalities in health have been the subject of many studies, mostly revealing higher morbidity and mortality rates among the socially disadvantaged.^{1,2} Many factors have been studied in attempts to explain the socioeconomic gradient in health, but the contribution of working conditions has been

the subject of only a few studies.^{3–6} From research on cardiovascular disease incidence, occupational risk factors such as high psychological demand and low job control have been identified.^{7,8} These factors, which originally come from the job-strain model developed by Karasek,⁹ might also explain part of the association between socioeconomic status and ill health. Both demands and control may be related to socioeconomic status and also to less specific health measures than cardiovascular disease incidence,

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such as perceived general health.¹⁰ Other working conditions which may be related to both socioeconomic status and health are physical working conditions and social support at work. Hazardous physical working conditions may have a direct detrimental effect on health, while social support may act as an effect modifier of the association between other categories of working conditions and health.^{8,11}

In this paper we report on the contribution of different categories of working conditions (physical working conditions, job demands, job control, and social support at work) to the association between occupational class and perceived general health in the working population.

Data and Methods

Data were collected through a postal survey held in 1991 among 27 000 inhabitants (15–74 years) of 18 municipalities in the southeastern Netherlands. The study area consists of Eindhoven, the fifth largest city of the Netherlands (about 200 000 inhabitants) and a number of surrounding municipalities, ranging from small and rural to medium-sized and urban in character. Specific characteristics of the region are the high percentage of Roman Catholics and the presence of several industries (electro-technical industry and car industry). The socioeconomic distribution of specific risk factors as observed in our study population is comparable with that of other (national) Dutch studies.¹²

The response rate of the postal survey was 70.1% ($n = 18\,973$) and the difference in response rate by socioeconomic status, age and gender was rather small.¹³ The survey was the first measurement of the Longitudinal Study on Socio-Economic Health Differences (LS-SEHD), which aims at explaining socioeconomic inequalities in health in the Netherlands. The design and objective of this study have been described in detail elsewhere.¹³ Only respondents ($n = 7028$) who were employed at the time of the survey were included in this study, because other respondents had not been asked to answer the questions on working conditions.

Occupational class was classified and ordered according to the original EGP-scheme. The ordering of classes according to the scheme is not strictly hierarchical; the category 'self-employed' is placed in between the routine non-manual and high skilled manual workers.¹⁴ The following seven occupational classes are distinguished: higher grade professionals; lower grade professionals; routine non-manual employees; self-employed; high skilled manual workers; low skilled manual workers; unskilled manual workers. For women, the categories of high and low skilled manual workers were combined, because of small numbers, leaving six categories in the analyses.

The measure of outcome was perceived general health, estimated through the question 'How do you rate your health in general?' The five possible answers (very good, good, fairly good, sometimes good and sometimes bad, bad) were dichotomized into 'very good or good' versus 'less than good'. A less than good perceived general health was reported by 18.4% of men and 16.4% of women.

The survey included questions concerning current working conditions, to which the respondent could answer yes or no. These questions covered four main categories of working conditions (number of questions between brackets): physical

working conditions (6); job control (5); job demands (3), and social support at work (3) (Appendix). For each subscale a count was made of the number of negative aspects; the resulting categories are shown in Table 2.

Demographic confounders of the association between occupational class and perceived general health which were included in the analyses are age (5-year categories), marital status (four categories), religious affiliation (three categories), and degree of urbanization (five categories). These variables were treated as confounders in the analyses, because they are both related to occupational class and to perceived general health, without being intermediate factors of the association between occupational class and perceived general health.

After excluding respondents with missing values on any of the variables included in the analyses (1.4%), 6932 respondents were left in the analyses (4521 men and 2411 women).

To study the association between occupational class and a less than good perceived general health, logistic regression analyses were performed, adjusting for demographic confounders. Logistic regression models were also fitted to study the association between different categories of working conditions and a less than good perceived general health, adjusted for occupational class and demographic confounders. The distribution of working conditions across occupational classes is presented by age-standardized percentages of respondents in each category of working conditions by occupational class, using the direct method.

To study the impact of different categories of working conditions on the association between occupational class and perceived general health, each category of working condition was added separately to a model with occupational class and demographic confounders. We then calculated the percentage change in odds ratios (OR) for occupational categories caused by adding each category of working condition to a model without this factor.

Finally, we tested interaction terms between each of the categories of working conditions that were part of the final model. Furthermore, interactions between social support and the other categories of working conditions were tested, because it is very plausible that the effect of other categories of working conditions is mediated by social support.

Results

Table 1 shows the association between occupational class and a less than good perceived general health. For both men and women we found a higher OR in the lower occupational classes. Among women, only the OR for the two lowest occupational classes were statistically significantly elevated as compared with the reference group.

We found no interaction between job demands and job control (results not shown), and therefore we decided to concentrate on the main effects of these categories of working conditions in the remainder of the analyses.

The association between different categories of working conditions and a less than good perceived general health is described in Table 2. Odds ratios are presented for each category of negative conditions, adjusted for occupational class and demographic confounders. We found a higher OR with a larger number of hazardous physical working conditions, lower job

Table 1 Association between occupational class and a less than good perceived general health (PGH) (% and odds ratio [OR] with 95% confidence interval [CI]); men and women

Men				Women			
Occup. class ^a	N	% < good PGH	OR (95% CI) ^b	Occup. class	N	% < good PGH	OR (95% CI) ^b
1	527	11.6	1.00	1	64	9.4	1.00
2	1394	15.1	1.43 (1.05–1.95)	2	538	12.8	1.43 (0.59–3.46)
3	650	17.7	1.84 (1.31–2.59)	3	1074	12.8	1.49 (0.62–3.55)
4	166	21.7	2.11 (1.32–3.36)	4	64	18.8	2.30 (0.79–6.67)
5	328	19.8	2.07 (1.40–3.06)	5, 6	65	21.5	3.07 (1.08–8.75)
6	739	22.5	2.58 (1.86–3.58)				
7	717	25.0	2.92 (2.11–4.04)	7	606	25.9	3.28 (1.37–7.86)
Total	4521	18.4		Total	2411	16.4	

^a 1 = higher grade professionals; 2 = lower grade professionals; 3 = routine non-manual employees; 4 = self-employed; 5 = high skilled manual workers; 6 = low skilled manual workers; 7 = unskilled manual workers.

^b Adjusted for age, marital status, religious affiliation, degree of urbanization.

Table 2 Association between number of negative working conditions and a less than good perceived general health (PGR) (% and odds ratio [OR]^a with 95% confidence interval [CI]), men and women

Men				Women			
	N	% < good PGH	OR, 95% CI		N	% < good PGH	OR, 95% CI
Hazardous physical working conditions				Hazardous physical working conditions			
0 (low)	1687	13.9	1.00	0 (low)	876	12.3	1.00
1	1131	16.0	1.25 (1.01–1.56)	1	840	15.5	1.39 (1.05–1.85)
2	592	19.9	1.51 (1.17–1.97)	2	422	19.4	1.71 (1.23–2.37)
3	445	25.8	2.22 (1.67–2.96)	3 to 6 (high)	273	27.8	2.64 (1.85–3.77)
4	380	25.3	2.22 (1.62–3.02)				
5 or 6 (high)	286	30.8	3.12 (2.24–4.35)				
Job demands				Job demands			
0 (low)	925	18.9	1.00	0 (low)	733	15.1	1.00
1	1102	18.5	1.23 (0.97–1.55)	1	600	16.7	1.28 (0.94–1.75)
2	1077	17.3	1.19 (0.94–1.51)	2	558	17.4	1.38 (1.01–1.88)
3 (high)	1417	18.8	1.51 (1.20–1.91)	3 (high)	520	16.9	1.61 (1.15–2.25)
Job control				Job control			
0 (high)	1626	12.4	1.00	0 (high)	522	12.8	1.00
1	1244	17.7	1.43 (1.15–1.77)	1	593	14.3	1.10 (0.77–1.57)
2	799	22.4	1.89 (1.49–2.40)	2	551	18.1	1.39 (0.98–1.98)
3	535	22.6	1.84 (1.41–2.41)	3	470	17.4	1.33 (0.92–1.92)
4 or 5 (low)	317	35.0	3.23 (2.39–4.35)	4 or 5 (low)	275	22.5	1.65 (1.10–2.46)
Social support at work				Social support at work			
0 (high)	2743	14.6	1.00	0 (high)	1511	13.8	1.00
1	1128	20.7	1.54 (1.29–1.85)	1	628	18.6	1.40 (1.08–1.81)
2	492	27.4	2.09 (1.65–2.63)	2	215	24.2	1.85 (1.30–2.65)
3 (low)	158	39.2	3.17 (2.23–4.51)	3 (low)	57	33.3	2.68 (1.47–4.88)

^a Adjusted for age, marital status, religious affiliation, degree of urbanization and occupational class.

control or lower social support at work. For job demands we only found a statistically significantly elevated OR for those reporting two (women) or three (men and women) negative aspects. Results were similar for men and women with regard to the overall patterns observed. Only for job control, was the gradient much stronger for men than for women.

The percentage of respondents reporting a large number of hazardous physical working conditions was higher in the lower occupational classes for both men and women, although the gradient was not entirely consistent. High demands were clearly more common in the higher occupational classes, while low job control was reported more often in the lower occupational classes with a less consistent gradient for women than for men. Finally, for both men and women social support was not clearly related to occupational class (Table 3).

Table 4 shows the results from logistic regression models in which we adjusted for different categories of working conditions to evaluate the effect of each category of working condition on the OR for occupational classes. Adjustment for physical working conditions resulted in a large reduction of the OR for occupational classes, with a larger effect among men (Table 4a) than among women (Table 4b).

Adjustment for job demands resulted in an increase of OR for occupational classes, because demands were more common in the higher occupational classes. Furthermore, we observed a substantial impact of adjustment for job control, with again higher percentages change of OR for men (Table 4a) than for women (Table 4b). Adjustment for social support only resulted in relatively small changes of the OR for some occupational classes.

Finally, we adjusted for physical working conditions and job control simultaneously, as these were the most important explanatory factors of the association between occupational class and health. In this final model we did not include social support. Although the OR for occupational classes changed to some extent after adjustment for social support, this category of working condition was not clearly related to occupational class.

The resulting percentage changes in OR for the occupational classes after adjustment for physical working conditions and job control were substantial. For men they ranged from 35% to 83% (Table 4a) and for women from 35% to 46% (Table 4b).

We tested interaction terms between social support and both physical working conditions and job control. For both men and women, these interactions were not statistically significant ($P > 0.10$).

Discussion

The findings of this study show that a substantial part of the association between occupational class and perceived general health in the working population can be attributed to a differential distribution of hazardous physical working conditions and low job control across occupational classes. Job demands and social support at work did not contribute to the explanation of the association between occupational class and perceived general health. Job demands were more common in the higher occupational classes, while social support at work was not clearly related to occupational class.

Some methodological issues might have affected our results. First, the distribution of women across occupational classes was very skewed, with small numbers in three of the six occupational classes. As a consequence, the 95% confidence intervals around the OR for occupational classes in women were rather large, which warrants a careful interpretation of the results for women. We repeated the analyses with education level instead of occupational class as the measure of socioeconomic status for both men and women; the distribution of women across educational groups is more equal. The conclusions which could be drawn from these analyses were essentially the same as the conclusions from the analyses presented in this paper; both physical working conditions and job control were important explanatory factors of the association between education and health. The percentages change of the OR for educational groups

Table 3 Association between occupational class and high risk categories^a of negative working conditions, men and women; percentages directly standardized for age

	Occupational class ^b							Total
	1	2	3	4	5	6	7	
Hazardous physical conditions^c								
Men	1.2 ^d	0.7	1.6	6.1	8.6	17.6	11.3	6.3
Women	4.9	7.5	6.9	22.8	27.0		20.3	11.3
High demands								
Men	47.6	42.2	31.3	30.6	29.4	14.7	18.0	31.3
Women	45.9	29.8	22.2	15.5	12.8		10.4	21.6
Low job control								
Men	0.9	4.2	4.4	1.5	5.9	10.7	17.3	7.0
Women	0	6.8	11.0	4.6	22.1		17.8	11.4
Low social support								
Men	1.4	3.6	2.3	4.9	3.4	2.8	6.4	3.5
Women	0	2.9	1.8	2.1	2.7		2.9	2.4

^a Only categories with the highest odds ratio for a less than good perceived general health (Table 2) are presented.

^b 1 = higher grade professionals; 2 = lower grade professionals; 3 = routine non-manual employees; 4 = self-employed; 5 = high skilled manual workers; 6 = low skilled manual workers; 7 = unskilled manual workers.

^c The percentages include five or six hazardous physical conditions for men and three to six for women (Table 2).

^d For example 1.2% of men in the category 'higher grade professionals' report five or six negative physical working conditions.

Table 4a Effect of adjustment for different categories of working conditions on the association between occupational class and a less than good perceived general health, men

	Occupational class						
	1	2	3	4	5	6	7
Model 1^a							
odds ratio + 95% CI	1.00	1.43 (1.05–1.95)	1.84 (1.31–2.59)	2.11 (1.32–3.36)	2.07 (1.40–3.06)	2.58 (1.86–3.58)	2.92 (2.11–4.04)
Model 1 + physical working conditions							
odds ratio + 95% CI	1.00	1.43 (1.05–1.95)	1.75 (1.24–2.47)	1.51 (0.93–2.43)	1.64 (1.10–2.44)	1.58 (1.11–2.25)	2.02 (1.44–2.85)
% change odds ratio ^b			11%	54%	40%	63%	47%
Model 1 + job demands							
odds ratio + 95% CI	1.00	1.45 (1.06–1.98)	1.95 (1.38–2.75)	2.24 (1.40–3.57)	2.21 (1.49–3.27)	2.92 (2.09–4.08)	3.26 (2.34–4.55)
% change odds ratio ^b							
Model 1 + job control							
odds ratio + 95% CI	1.00	1.26 (0.92–1.73)	1.55 (1.09–2.19)	1.98 (1.24–3.18)	1.63 (1.10–2.43)	1.85 (1.31–2.60)	1.93 (1.37–2.72)
% change odds ratio ^b		39%	34%	12%	41%	46%	52%
Model 1 + social support							
odds ratio + 95% CI	1.00	1.37 (1.00–1.87)	1.83 (1.29–2.58)	1.91 (1.19–3.06)	2.12 (1.43–3.14)	2.59 (1.86–3.61)	2.74 (1.97–3.80)
% change odds ratio ^b		14%	1%	18%			9%
Model 1 + physical working conditions + job control							
odds ratio + 95% CI	1.00	1.28 (0.94–1.76)	1.53 (1.08–2.16)	1.52 (0.94–2.46)	1.37 (0.92–2.06)	1.26 (0.88–1.81)	1.50 (1.05–2.14)
% change odds ratio ^b		35%	37%	53%	65%	83%	74%

^a Adjusted for age, marital status, religious affiliation, degree of urbanization

^b Calculated as: (odds ratio model 1 – odds ratio extended model)/(odds ratio model 1 – 1).

Table 4b Effect of adjustment for different categories of working conditions on the association between occupational class and less than good perceived general health, women

	Occupational class					
	1	2	3	4	5/6	7
Model 1^a						
odds ratio + 95% CI	1.00	1.43 (0.59–3.55)	1.49 (0.62–3.55)	2.30 (0.79–6.67)	3.07 (1.08–8.75)	3.28 (1.37–7.86)
Model 1 + physical working conditions						
odds ratio + 95% CI	1.00	1.37 (0.56–3.34)	1.40 (0.58–3.35)	1.87 (0.64–5.49)	2.39 (0.83–6.86)	2.72 (1.13–6.55)
% change odds ratio ^b			14%	18%	33%	25%
Model 1 + job demands						
odds ratio + 95% CI	1.00	1.50 (0.61–3.66)	1.66 (0.69–3.99)	2.45 (0.84–7.15)	3.68 (1.28–10.60)	3.83 (1.58–9.25)
% change odds ratio ^b						
Model 1 + job control						
odds ratio + 95% CI	1.00	1.29 (0.53–3.14)	1.33 (0.56–3.19)	2.23 (0.77–6.48)	2.58 (0.90–7.42)	2.77 (1.15–6.69)
% change odds ratio ^b		33%	33%	5%	24%	22%
Model 1 + social support						
odds ratio + 95% CI	1.00	1.37 (0.56–3.34)	1.51 (0.63–3.62)	2.30 (0.79–6.71)	3.06 (1.07–8.75)	3.25 (1.35–7.79)
% change odds ratio ^b		14%				1%
Model 1 + physical working conditions + job control						
odds ratio + 95% CI	1.00	1.27 (0.52–3.11)	1.29 (0.53–3.10)	1.85 (0.63–5.42)	2.12 (0.73–6.13)	2.42 (1.00–5.88)
% change odds ratio ^b		37%	41%	35%	46%	38%

^a Adjusted for age, marital status, religious affiliation, degree of urbanization.

^b Calculated as: (odds ratio model 1 – odds ratio extended model)/(odds ratio model 1 – 1).

were again larger for men than for women after adjustment for these types of working conditions (results not shown).

The measure of outcome in this study was perceived general health. A disadvantage of using this measure is that the differences in health found between groups (e.g. occupational classes)

cannot be identified exactly because perceived general health represents many aspects of health.¹⁵ Still, perceived general health is considered a good proxy measure of health status in epidemiological studies, because it is closely related to more objective measures of health status and mortality.^{16,17}

The cross-sectional nature of our study limits causal interpretations, because working conditions were measured at the same time as perceived general health. The results of our study are in agreement, however, with those from a recently published longitudinal study.⁴

Because we performed a cross-sectional study, our estimate of the association between occupational class and health may be biased by health selection. People may have changed jobs because of health problems before they participated in the survey. From follow-up data from the Longitudinal Study on Socio-Economic Health Differences we know that, between 1991 and 1995, 80% of the respondents aged 15–64 stayed in the same EGP class, while 8% ($n = 72$) moved at least one EGP class downward and 12% ($n = 114$) moved at least one EGP class upward. However, neither upward nor downward mobility was affected by health problems (personal communication H van de Mheen).

A change of jobs, either within or between EGP classes, caused by health selection probably also resulted in a change of hazardous working conditions, both physical and mental. We expect that in general, people will move from high to low exposure jobs when being confronted with health problems related to working conditions.¹⁸ In our cross-sectional study, the contribution of working conditions to the association between occupational class and health in the working population might therefore be underestimated.

Behavioural factors may confound the association between occupational class, working conditions and health, but behavioural factors are also intermediate factors in the association between working conditions and health. As part of the effect of working conditions on health may run through behavioural factors (e.g. people smoke to compensate for low job control), adjustment for behavioural factors would probably result in an underestimation of the contribution of working conditions to the explanation of the association between occupational class and health.

As our data-set also contains information on smoking, alcohol consumption, physical activity and body mass index, we repeated the analyses after adjustment for these behavioural factors. Apart from small differences in the OR, the changes in OR for occupational classes and the main conclusions from these analyses were the same as for the analyses presented in this paper.

In our evaluation of the impact of working conditions, we made a count of the number of negative aspects concerning each category of working conditions. However, the association between single negative working conditions and a less than good perceived general health might differ. We therefore checked these associations, and for men we observed a statistically significantly elevated OR for all but one of the separate working conditions. For women, two of the six physical working conditions and three of the five negative conditions concerning job control were not statistically significantly related to a less than good perceived general health. The latter explains the rather weak association between a low job control and a less than good perceived general health among women as compared with men.

Our results might be biased because we used self-reported data. The reporting of both working conditions and health may be affected by personality traits which are distributed unequally

across occupational classes, such as neuroticism. This personality trait refers to the tendency to experience negative, distressing emotions,¹⁹ and highly neurotic people may be inclined to overreport both hazardous working conditions and health problems. As the prevalence of neuroticism is higher in lower occupational classes, (part of) the associations found in our study may in fact be explained by differences in the tendency to complain. To evaluate the possible bias caused by an unequal distribution of neuroticism across occupational classes, we repeated our analyses on a subsample ($n = 1839$) for which we had a score on neuroticism. In this subsample, we studied the impact of different categories of working conditions on the association between occupational class and perceived general health, before and after adjustment for neuroticism. Results from the adjusted and unadjusted analyses in this subsample were very similar: job control and physical working conditions explained a substantial part of the association between occupational class and perceived general health. Furthermore, changes in OR for occupational classes resulting from models adjusted for neuroticism were similar to changes resulting from models unadjusted for neuroticism. We therefore conclude that our results do not seem to be biased by differences in a tendency to complain between occupational classes.

It may be hypothesized that job control is an almost perfect marker for socioeconomic status, which therefore explains a large part of the socioeconomic gradient in health. In our analyses, the effect of job control was studied after adjustment for occupational class. If job control was an alternative measure of socioeconomic status, it would have no or only a small independent effect on health after adjustment for occupation, which was clearly not the case in our study.

The job-strain model postulates that a combination of high job demands and low job control has a detrimental effect on health.⁹ This was not replicated in our study, as we found no interaction between job demands and job control. Recently, results from the Whitehall study showed no effect of job demands and a clear effect of job control on coronary heart disease incidence.^{4,20} Low control at work even explained a larger part of the socioeconomic gradient in coronary heart disease frequency than coronary risk factors and factors that act early in life.⁴ In our study, demands were more common in the higher occupational classes and could therefore not contribute to the explanation of the association between occupational class and health. Those reporting low job control were clearly at high risk for a less than good health, the pattern being stronger among men than women. Adjustment for job control resulted in a substantial reduction of the OR for occupation, especially for men.

The mechanism through which hazardous working conditions influence health depends on the category of working condition under study. Physical working conditions such as exposure to fumes and dust, point at exposure to possible hazardous chemicals which might involve an elevated risk of respiratory diseases and certain cancers among exposed groups. Other hazardous physical working conditions (e.g. performing physically demanding work) could affect the occurrence of musculoskeletal disorders. A lack of job control (e.g. not being able to interrupt work if necessary) might have a negative impact on health, because such conditions result in biological arousal. Such arousal has been hypothesized to result in increases in catecholamines and blood pressure, which are risk factors for cardiovascular

disease.⁷ As our measure of outcome was perceived general health, in which people incorporate the chronic conditions which they suffer from,²¹ the mechanisms as described above might also be responsible for the effect of physical working conditions and low job control on perceived general health.

The results of our study have clear implications. Among a working population, the contribution of negative working conditions to the explanation of the association between occupational class and health is substantial. Hazardous physical working conditions are clearly more common among men and women classified as low skilled or unskilled manual workers than in the other occupational classes. Also self-employed men and high skilled manual workers reported a relatively large number of hazardous physical conditions at work. This is reflected in the relatively large effect of adjustment for physical conditions on the OR for a less than good perceived general health for these occupational classes. Therefore, especially among workers in these occupational classes, interventions aimed at improving the physical working conditions, are necessary. Furthermore, improving the possibilities of control over work and the work environment shows enormous potential for improving the health of the working population. The effect of such measures will even be larger, as the contribution of low job control to the explanation of the association between occupational class and health is larger than the effect of physical conditions. Furthermore the effect was found in practically all occupational classes.

We conclude that interventions aimed at improving working conditions would probably result in a reduction of socio-economic inequalities in health in the working population.

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Appendix

Physical working conditions (yes or no)

The number of times a respondent answered 'yes' to the following questions was counted; the total represents the number of hazardous physical working conditions (range 0-6).

- Do you often work in a noisy environment?
- Do you often perform dirty work, meaning work which results in dirty hands or hair or which makes you inhale dust?
- Is your work physically demanding?
- Do you work for long periods in the same posture?
- Is there often smell or fume in your work environment?
- Do you now and then perform dangerous work?

Job control (yes or no)

The number of times a respondent answered 'no' was counted; for item 4 a 'yes' was counted; the total represents the number of negative aspects concerning job control (range 0-5).

- (1) Can you interrupt your work when you find it necessary?
- (2) Can you organize your own activities at work?
- (3) Can you determine the beginning and end of your work day, and the timing of taking breaks?
- (4) Do you have a lot of monotonous work?
- (5) Can you develop your abilities by working?

Job demands (yes or no)

The number of times a respondent answered 'yes' was counted; the total represents the number of negative aspects concerning job demands (range 0–3).

- (1) Do you often work at a high pace?

- (2) Do you often have not enough time to get the job done?
- (3) Is your work psychologically demanding?

Social support (yes or no)

The number of times a respondent answered 'no' was counted; the total represents the number of negative aspects concerning social support (range 0–3).

- (1) Can you, if necessary, get support from one or more colleagues?
- (2) Do you get enough support concerning your work from your direct supervisor(s)?
- (3) Do you consider the atmosphere at work to be generally good?