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## **Job dissatisfaction and the older worker: baseline findings from the Health and Employment After Fifty study**

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### **What this paper adds**

- Job dissatisfaction can lead to labour turnover and ill-health, but little is known at a population level about the negative perceptions of work that contribute most importantly to dissatisfaction, especially in older workers.
- In a large population-based sample of people aged 50-64 years from across England, rates of job dissatisfaction were higher at younger ages, and in men, the better educated, those living alone, workers employed by larger organisations, and those living in London and the South East of England.
- Important potential contributors, as assessed cross-sectionally, included perceptions of job insecurity, feeling unappreciated and unfairly criticised, lacking a sense of achievement at work, and difficult relationships with work colleagues.
- Most of the negative perceptions of work that appeared to contribute to dissatisfaction were associated with worse self-rated health, depression and poor well-being.
- There is a case for employment policies being directed at tackling these potentially avoidable occupational determinants of job dissatisfaction.

## **Abstract**

### **Objectives**

Demographic changes are requiring people to work longer. Labour force participation might be promoted by tackling sources of job dissatisfaction. We aimed to describe the epidemiology of job dissatisfaction in older British workers, to explore which perceptions of work contribute most importantly, and to assess possible impacts on health.

### **Methods**

Subjects aged 50-64 years were recruited from 24 English general practices. At baseline, those currently in work (N=5,437) reported on their demographic and employment circumstances, overall job satisfaction, perceptions of their work that might contribute to dissatisfaction, and their general health, mood and well-being. Associations of job dissatisfaction with risk factors and potential health outcomes were assessed cross-sectionally by logistic regression and the potential contributions of different negative perceptions to overall dissatisfaction were summarised by population attributable fractions (PAFs).

### **Results**

Job dissatisfaction was more common among men, below age 60 years, those living in London and the South East, in the more educated and in those working for larger employers. The main contributors to job dissatisfaction among employees were feeling unappreciated and/or lacking a sense of achievement (PAF 55%-56%), while in the self-employed, job insecurity was the leading contributor (PAF 79%). Job dissatisfaction was associated with all of the adverse health outcomes examined (odds ratios of 3-5), as were most of the negative perceptions of work that contributed to overall dissatisfaction.

### **Conclusions**

Employment policies aimed at improving job satisfaction in older workers may benefit from focussing particularly on relationships in the workplace, fairness, job security and instilling a sense of achievement.

## Introduction

The proportion of older people in developed countries is steadily growing, such that by 2060 30% of the European population will be aged over 65 years. Currently, however, many workers from OECD (Organisation for Economic Co-operation and Development) countries leave the labour market before the normal pension age [1] and the so-called “Total Dependency Ratio” (that of those not working to those in the labour force) is rising [2]. In response, governments have implemented policies to encourage workers to retire later, including delayed payment of state pensions and reduced pension incentives (to make early retirement less attractive), and legislation against age and disability discrimination (to make employment more flexible and accommodating) [3].

Retention of older workers in the labour market might also be promoted by measures aimed at improving their job satisfaction. Job dissatisfaction has previously been linked with labour turnover [4-6], intentions to retire early [7-11] and sickness absence [12-14]. However, reports to date have typically focussed on selected occupations [15,16], rather than representative samples of the general population, and there has been little emphasis on the older worker [10,11]. As such, the epidemiology of job dissatisfaction in later working life remains ill-defined.

A notable area of uncertainty is the relative importance of different negative perceptions of work that might contribute to job dissatisfaction, and whether this varies across subgroups of the population. Job dissatisfaction is a complex phenomenon with many potential determinants, of which some are personal and some relate to the work environment (e.g. dissatisfaction with pay or working hours, job insecurity, and problematic relationships with colleagues). However, the most important occupational drivers of dissatisfaction could vary importantly between subgroups defined by age, sex, or employment circumstances.

Furthermore, while the link between job dissatisfaction and poorer psychological health is well-recognised and much studied [17], it remains unclear whether some aspects of dissatisfaction are more important than others in influencing workers’ health.

This report has three aims relating to these gaps in evidence: 1) to describe the epidemiology of job dissatisfaction in British workers at older ages; 2) to explore the contributions of different negative perceptions of work to overall job dissatisfaction, and whether their relative importance varies across subgroups of the working population; and 3) to determine whether these aspects of dissatisfaction differ in their associations with measures of health.

## Methods

For our analysis we used baseline data from the Health and Employment After Fifty (HEAF) study, which follows a large population-based cohort of older adults resident in England. The study's design and methods of data collection have been reported in detail elsewhere [18]. In brief, questionnaires were mailed to 39,359 adults born between 1948 and 1962 (target age band at recruitment 50-64 years) from 24 English general practices contributing data to a primary care research database, the Clinical Practice Research Datalink (CPRD). The practices were drawn from every region of England and all deciles of social deprivation [18], and all that agreed to support the study became foci of recruitment. Forms were sent to all people in the target age range who were registered with these practices after excluding those with terminal illness or recent bereavement, or who had de-registered between sampling and mailing (2.5% of the enumeration list). In all, 8134 participants completed an initial questionnaire during 2013-2014, and are now being followed up annually, initially for a 5-year period, through further questionnaires and record linkage. Ethical approval was obtained from the NHS Research Ethics Committee North West-Liverpool East.

Among other things, the baseline questionnaire covered: demographic characteristics; employment status; for those in paid work, its nature and their feelings about working conditions; and self-reported health.

Demographic characteristics relevant to the current analysis were: sex and age; highest educational qualification (school only, vocational training certificate, university or higher professional degree); household composition; and the location of the participant's general practice, which was used to classify them by an area-based measure of deprivation, the English Index of Multiple Deprivation 2010 [19].

Items on the nature of work concerned: the size of an employer's workforce (these were combined with employment status to create a variable with three levels, self-employed, employed and working for a small employer (<500 staff), employed and working for a large employer ( $\geq$ 500 staff)); tenure with the same employer (<1, 1-5, >5 years); type of contract (permanent vs. temporary/renewable) and type of salary (fixed vs. paid by output); hours worked per week ( $\leq$ 20, >20-40, >40); shift working (often vs. sometimes/rarely/never); entitlement to paid holiday; and whether or not a second paid job was held.

Overall job dissatisfaction was assessed from the question: "How satisfied have you been with your job as a whole, taking everything into consideration?" Response categories of "very

satisfied” and “satisfied/fairly satisfied” were combined, as were “dissatisfied” and “very dissatisfied”, to generate a binary variable "dissatisfied vs. not".

The questions on feelings about work were designed to ascertain various negative perceptions that might contribute to overall job dissatisfaction: satisfaction with pay and with working hours (scored as for overall dissatisfaction); whether there was choice in the job (often, sometimes, rarely/never) or support from colleagues or managers (often, sometimes, rarely/never); and whether the respondent felt appreciated at work by others (often, sometimes, rarely/never), had a work colleague who was very difficult to get on with (yes vs. no), had been criticised unfairly at work (often, sometimes, rarely/never), or felt insecure in employment, overall and in the event of illness (very secure/secure vs. rather insecure/very insecure). Before any associations with other variables were explored, answers to these questions were reclassified to create a set of binary variables.

Finally, three self-reported measures of health were assessed: self-rated health (SRH), determined with a single question [20] and dichotomised (as fair/poor vs. at least good); depressive symptoms, assessed by the Centre for Epidemiologic Studies Depression scale (CES-D) with participants scoring  $\geq 16$  considered ‘depressed’ [21]; and well-being (measured using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), with participants in the lowest quintile of scores classified as having ‘poor’ well-being (score  $< 32$ ) [22].

Analysis was restricted to respondents in paid work who completed the question on overall job satisfaction. In evaluating the epidemiology of job dissatisfaction at older ages, its associations with demographic factors and employment conditions were estimated using logistic regression, with results expressed as odds ratios (ORs) with 95% confidence intervals (95%CI). Risk estimates were initially adjusted for age and sex, and then derived from mutually adjusted models.

In exploring negative perceptions of work that might drive job dissatisfaction, we first summarised their pairwise associations by crude ORs, and then after combining those with high ORs and which appeared to measure closely related attributes (e.g. job insecurity in illness vs. job insecurity in health), we analysed associations with overall job dissatisfaction (again the dependent variable). As well as ORs, we computed the population attributable fractions (PAF) for each perception, indicating the proportion of cases (people dissatisfied with their job) that might be eliminated if no one experienced that perception (i.e. if all people had the same risk of dissatisfaction as in the reference category). We used the formula  $PAF = p * (RR - 1) / RR$ , where  $p$  represented the proportion of cases exposed to that risk factor

and RR the odds ratio obtained through a logistic regression model adjusted for age and sex. PAFs were derived for the population as a whole, and also within strata defined separately by sex, age band, level of educational attainment and employment status.

Finally, with overall job dissatisfaction and negative perceptions of work treated as independent variables, we used logistic regression to assess associations with fair or poor SRH, depressive symptoms (CES-D score  $\geq 16$ ) and poor well-being score (WEMWBS score lowest quintile). In this analysis ORs were adjusted for age, sex, and educational attainment as a proxy for social class. Statistical analyses were carried out with Stata (Version 14.0) software (StataCorp LP, College Station, Texas).

## Results

From 8134 responders to the baseline questionnaire, we excluded 2625 who were not in paid work, and a further 72 who did not provide usable information about job satisfaction. This left a total of 2649 men and 2788 women who were included in the analysis. Within this sample, the prevalence of job dissatisfaction overall was 6.7%, while that of negative perceptions of work that might contribute to job dissatisfaction ranged from 2.3% for often being criticised unfairly to 44.4% for job insecurity in illness.

Table 1 summarises the associations of overall job dissatisfaction with various demographic and personal risk factors. After adjustment for other variables, overall dissatisfaction was less common in women than men (OR 0.76, 95%CI 0.61-0.94), and at older ages (OR 0.59, 95%CI 0.44-0.79 for age 60-64 years vs. 50-54). There were also geographical differences, the highest rates of dissatisfaction being reported in London and the South East (OR vs. North East and North West 1.68, 95%CI 1.08-2.59) and in the East (OR 1.42, 95%CI 1.01-2.00). In addition, there was a higher prevalence of job dissatisfaction in participants who were more educated (ORs 1.25 to 1.31), and in those who lived alone (OR 1.63, 95% 1.28-2.08).

Table 2 shows associations of overall job dissatisfaction with various aspects of employment. Dissatisfaction was most common among subjects working for large employers (OR 2.25, 95%CI 1.32-3.81 vs. self-employed), and was less frequent in those who worked for  $\leq 20$  hours per week or had a longer tenure of current employment. There was also a weak positive association with shift work (OR 1.37, 95%CI 1.04-1.82).

All of the negative perceptions were mutually associated (online Supplementary Table 1), ORs for pairwise associations being particularly high for: rarely/never having a feeling of achievement and rarely/never feeling appreciated (15.9); having difficult colleague(s) and often being criticised unfairly (9.8); and perceived job insecurity in illness and when well (8.4). It seemed likely that in these cases, the two perceptions reflected the same problem. Therefore, in subsequent analyses, new variables were created, defined by the presence of either or both perceptions (e.g. either rarely/never having a feeling of achievement or rarely/never feeling appreciated or both).

Table 3 shows how overall job dissatisfaction related to different negative perceptions of work. The strongest association was with rarely/never feeling appreciated or a sense of achievement (OR 12.9, 95%CI 10.2-16.2), and although only 13.7% of subjects made this complaint, the PAF was 53.6% (95%CI 47.9% to 58.7%). An even higher PAF (56.1%) was estimated for job insecurity, which was less strongly associated with overall dissatisfaction (OR 4.0, 95%CI

3.1-5.1), but more prevalent (47.8% of subjects). Least important were lack of choice in activities (OR 2.7, PAF 22.4%) and lack of support when in difficulty at work (OR 3.8, PAF 23.2%).

Table 4 compares the possible contributions of different negative perceptions of work to overall job dissatisfaction in various subgroups of the study sample. There were no major differences between men and women, but at older ages, concerns about working hours seemed to be less of a problem than in younger participants (PAF 24.6% at age 60-64 years vs. 40.8% at 50-54). In comparison with those whose education had not progressed beyond school, overall dissatisfaction among participants with a university degree or higher professional qualification appeared less likely to be driven by concerns about pay, lack of appreciation or a feeling of achievement, or lack of choice in occupational activities. Dissatisfaction among the self-employed appeared to be driven mainly by concerns about working hours and pay.

Table 5 summarises the relationship of overall job dissatisfaction and contributing negative perceptions to three health outcomes – fair/poor self-rated health, depression (CES-D score  $\geq 16$ ) and poor well-being (lowest quintile of WEMWBS score). Overall job dissatisfaction was associated with each of the health outcomes, the ORs (3.16, 5.26 and 5.52 respectively) being higher than for any of the individual perceptions. Among the perceptions, lack of support at work appeared to have little effect (ORs 0.94 to 1.22), whereas the three health outcomes were each significantly associated with difficulty with colleagues/feeling unfairly criticised, and job insecurity, while all but well-being were significantly associated with dissatisfaction about pay. Not feeling appreciated or a sense of achievement was also associated with all three measures of health, and particularly with poor well-being (OR 3.18, 95%CI 2.25- 4.49). Dissatisfaction with working hours related to depression and poor well-being but not to self-rated health, whereas lack of choice in occupational activities showed no relationship to poor well-being but was weakly associated with fair/poor self-rated health and depression.

## Discussion

Within our study sample, the main perceptions of work driving job dissatisfaction among employees were lack of appreciation and/or a feeling of achievement, and difficulty with colleagues at work and/or feeling unfairly criticised, whereas in the self-employed they were job insecurity and dissatisfaction with pay. Overall job dissatisfaction was more common in men than women, below age 60 years, in London and the South East, and in those working for large employers. It was also associated with longer education and living alone. Most potential drivers of job dissatisfaction contributed to overall associations with worse self-rated health, depression and poor well-being, but lack of support and choice in work had relatively little impact.

Potential strengths and limitations have to be considered when interpreting these findings. A notable strength was the large, geographically dispersed, population-based sampling strategy. Almost everyone in Britain registers with a general practice for healthcare free at the point of delivery, so the patient lists of general practices provide a comprehensive and representative sampling frame. The response rate at baseline was relatively low and responders tended to be somewhat older, more affluent, and more often female than non-responders, although the sample's profile approximated reasonably to national statistics for this age band [18]. The prevalence of overall job dissatisfaction could have been under- or over-estimated if those dissatisfied with their work were less or more likely to participate. However, associations of job dissatisfaction with the variables of interest (demographic and workplace factors, its occupational components, and the report's health outcomes) would only be biased if they differed importantly between responders and non-responders. We have no reason to expect this. Moreover, questions on job dissatisfaction and its potential drivers formed only a small part of a larger question set (in all 91 questions and up to 154 responses), and are unlikely therefore to have influenced decisions to participate in the research.

A further strength stemming from population sampling was the opportunity (assuming causal relationships) to estimate PAFs for negative perceptions contributing to job dissatisfaction, overall and within strata with differing characteristics. To our knowledge such information has never previously been available. New insights are offered into the relative importance of different potential drivers at a population level and within important subgroups.

Set against these strengths, it should be noted that our analysis was based on the baseline phase of the HEAF study and cross-sectional in nature, imposing limits on interpretation. Thus, for example, while poor quality of relationships at work and lack of fulfilment are credible sources of job dissatisfaction, we cannot exclude the possibility that disaffection with work

may have soured some people's working relationships with others. Likewise, while job dissatisfaction may well lead to poorer self-assessed health, circumstances can be imagined in which poor health could erode satisfaction with one's own work performance and lead to overall job dissatisfaction. Survivorship effects are also evident in this cross-sectional analysis: for example, the inverse relationship between dissatisfaction and job tenure probably reflects a propensity of people to remain longer in a job that appeals to them.

A further potential limitation stems from the challenge inherent in measuring a complex multi-faceted phenomenon. Different approaches have been taken to assessment of job dissatisfaction across studies. Some investigations have used elaborate scales containing many questions. By contrast, we assessed overall job dissatisfaction using a single item. However, Wanous *et al* [23] have conducted a meta-analysis to assess the validity of single-item scales and concluded that the correlation between single- and multi-item scales is acceptable.

Such complexity is a reason for also studying the potential drivers of job dissatisfaction. Our study encompassed only some of the many facets that have been proposed [24,25]. In particular, we did not consider "intrinsic" determinants of dissatisfaction, such as negative affectivity and other aspects of personality, although several theoretical models have been developed that are based on such attributes [26]. Collecting the extra detail was not feasible given the broad aims of the HEAF study, but confounding by personality differences between groups is unlikely to have importantly influenced findings in our area of primary interest.

In focussing on risk factors in the workplace that might be avoidable, we included some facets that have been little studied previously but appeared of interest *a priori*. Thus, for example, existing literature on the impact of perceived lack of recognition [27,28] and cohesiveness of working relationships [29] is fairly small.

Relationships of job dissatisfaction to younger age and male sex are well-established by other research and in agreement with our own findings. Others' findings also accord with ours on several less frequently studied demographic and occupational associations, such as shorter job tenure [30], longer working hours [29,31,32], working in large establishments [31,32] and higher educational attainment [31,32], relationships we have been able to confirm specifically in a sample of older workers. The greater propensity towards job dissatisfaction of Londoners and those living in the South East of England is a novel discovery, however. Among the possible drivers we considered, our findings on autonomy and decision latitude [27,33], working relationships [29], feeling undervalued with lack of recognition [27,28], and job

insecurity [31,34] are similar to those in a relatively small number of other reports, although supplemented here by quantification of effects at the population level. They are also compatible with some reports based on effort-reward imbalance and job dissatisfaction, such as that by de Jonge *et al* [35], which defined occupational rewards in terms of satisfaction with pay, social support and job security.

Associations between job dissatisfaction and psychological ill-health are well-recognised. Thus, in a meta-analysis of 485 mainly cross-sectional studies, Faragher *et al* found clear-cut correlations between job dissatisfaction and anxiety, depression and poorer general mental health [17]. However, the impact on self-reported health of the different negative perceptions that drive job dissatisfaction has been unclear, and Table 5 provides useful new information.

Studies in older workers (in the age bands of the HEAF study) have been uncommon to date and their focus has differed from that presented here. However, in the Survey of Health, Aging and Retirement in Europe (SHARE), a large cohort of 50-64 year olds from European 10 countries, overall job dissatisfaction was assessed using a very similar question to our own and a similar estimate of prevalence was derived [10]. In the same survey, in keeping with our findings, job satisfaction was greater among women, with advancing age, in those who felt there was recognition for the job and in those perceiving their job to be secure [36]; poor job quality (defined in part to include job dissatisfaction) was strongly associated with poor self-rated health and depression [37].

Our data suggest that feeling unappreciated, lacking a sense of achievement at work, perceptions about having critical colleagues, being dealt with unfairly and job insecurity, and concerns about pay may be important population drivers of overall job dissatisfaction, albeit with variation between subgroups. As such, they represent potential targets for interventions based on improved employment policies.

The impetus for employers to intervene is likely to be driven by costs and benefits, one consideration being the likely effect of job dissatisfaction on labour force participation. Workers from the SHARE study who were dissatisfied with their job were more likely to express retirement intentions [38] and twice as likely actually to retire two years later [10,11], Job dissatisfaction was the strongest predictor of early retirement [10,11], suggesting that the impact could be material. Findings in mixed-age workforces are less clear-cut, however, with some reports indicating increased labour turnover [4,5,7] but others indicating only a small effect [6]. Further research is required in older workers, since their employment outcomes may

differ from those in other age bands. Moreover, while dissatisfied younger workers may seek alternative employment, dissatisfied older workers may be lost permanently to the workforce.

Participants of the HEAF study are being followed-up annually with linkage to the CPRD, and this prospective phase should provide much needed additional data on how job dissatisfaction influences future employment, how changes in work circumstances affect job dissatisfaction and health over time, and whether job dissatisfaction has long-term effects on health, including doctor-recorded as well as self-reported health outcomes.

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### **Competing interests**

The authors declare that they have no competing interests.

### **Authors' contributions**

KTP and DC identified the study questions and designed the study and its measuring instruments. KTP supervised data collection, and with SD and DC, planned the analyses. SD conducted the analyses, wrote the first draft of the paper and shared with KTP in reviewing the existing literature. KWB, ECH, CL, AAS, CG, ME, TS and CC contributed to the study's design, content, measuring instruments and plan of execution. Additionally, ECH and CL led in data collection, cleaning and preparation, and the enlistment of participating general practices. All authors read and approved the final manuscript.

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**Table 1 Demographic and personal risk factors for job dissatisfaction**

Risk factor	Number	Number of cases	Associations with overall job dissatisfaction			
			<sup>a</sup> OR	(95%CI)	<sup>b</sup> OR	(95%CI)
Sex						
Male	2649	199	Reference		Reference	
Female	2788	169	0.79	(0.64,0.98)	0.76	(0.61,0.94)
Age (years)						
50-54	1843	140	Reference		Reference	
55-59	2051	154	0.99	(0.78,1.25)	0.97	(0.76,1.24)
60-64	1543	74	0.61	(0.46,0.82)	0.59	(0.44,0.79)
Area of GP practice						
North East & North West	1221	71	Reference		Reference	
West Midlands	745	52	1.22	(0.84,1.76)	1.21	(0.83,1.77)
East	1245	95	1.34	(0.98,1.85)	1.42	(1.01,2.00)
South Central & West	1809	114	1.09	(0.80,1.48)	1.14	(0.82,1.59)
London & South East	417	36	1.54	(1.01,2.34)	1.68	(1.08,2.59)
Deprivation (thirds)						
Best	1157	75	Reference		Reference	
Intermediate	1666	116	1.05	(0.79,1.38)	1.16	(0.83,1.62)
Worst	2614	177	1.08	(0.80,1.46)	1.12	(0.83,1.51)
Educational level						
School only	1844	108	Reference		Reference	
Vocational training certificate	1749	127	1.22	(0.94,1.60)	1.31	(1.00,1.72)
University degree or higher professional	1844	133	1.21	(0.93,1.57)	1.25	(0.95,1.63)
Living alone						
No	4271	263	Reference		Reference	
Yes	1091	100	1.60	(1.26,2.04)	1.63	(1.28,2.08)

<sup>a</sup>Adjusted only for sex and age

<sup>b</sup>Mutually adjusted risk estimates derived from a single logistic regression

**Table 2 Associations of job dissatisfaction with aspects of employment**

Risk factor	Number	Number of cases	Associations with overall job dissatisfaction	
			<sup>a</sup> OR (95%CI)	<sup>b</sup> OR (95%CI)
Employment status				
Self-employed	884	30	Reference	Reference
Small employer (<500 staff)	2543	153	1.89 (1.27,2.83)	1.38 (0.82,2.33)
Large employer (≥500 staff)	1984	181	2.90 (1.95,4.31)	2.25 (1.32,3.81)
Time worked same employer				
Less than 1 year	336	34	Reference	Reference
1 to 5 years	965	77	0.77 (0.51,1.18)	0.86 (0.54,1.35)
More than 5 years	4071	255	0.60 (0.41,0.88)	0.56 (0.37,0.84)
Type of contract				
Permanent	4314	315	Reference	
Temporary/renewable	320	22	0.96 (0.61,1.51)	
Not applicable (self-employed)	775	29	0.48 (0.33,0.72)	
Salary				
Fixed	4502	324	Reference	Reference
Paid by output	885	40	0.60 (0.43,0.85)	1.03 (0.65,1.63)
Hours worked per week				
≤20	804	34	Reference	Reference
>20-40	3218	230	1.59 (1.09,2.32)	1.68 (1.09,2.59)
>40	1380	104	1.57 (1.03,2.39)	1.75 (1.09,2.82)
Fixed time of starting work				
Some or no work days	1329	61	Reference	Reference
Most or all work days	4091	306	1.73 (1.30,2.30)	1.39 (1.02,1.91)
Shift work				
Sometimes/rarely/never	4543	288	Reference	Reference
Often	843	76	1.43 (1.10,1.87)	1.37 (1.04,1.82)
Holidays				
Some entitlement	5254	356	Reference	Reference
No entitlement	20	2	1.57 (0.36,6.83)	1.14 (0.15,8.86)
Have a second paid job				
No	4612	317	Reference	Reference
Yes	418	27	0.95 (0.63,1.43)	1.00 (0.65,1.53)

<sup>a</sup>Adjusted only for sex and age

<sup>b</sup>Mutually adjusted risk estimates derived from a single logistic regression model (type of contract was excluded because of overlap with work status)

**Table 3 Contributions of negative perceptions of work to overall job dissatisfaction**

Perception	Number (%) reporting perception		Association with overall job dissatisfaction	
	Among all subjects (n = 5437)	Among subjects with overall job dissatisfaction (n = 368)	<sup>a</sup> OR (95%CI)	<sup>b</sup> PAF (95%CI)
Dissatisfied with working hours	594 (11.0)	164 (44.7)	8.5 (6.8-10.7)	37.7 (32.3-42.7)
Dissatisfied with pay	1230 (22.7)	226 (61.6)	6.4 (5.2-8.1)	50.2 (43.7-56.0)
Rarely/never feel appreciated and/or sense of achievement	745 (13.7)	221 (60.1)	12.9 (10.2-16.2)	53.6 (47.9-58.7)
Rarely/never support when in difficulty	616 (12.9)	114 (33.2)	3.8 (3.0-4.9)	23.2 (17.7-28.3)
Rarely/never have choice in activities	1083 (20.0)	138 (37.7)	2.7 (2.1-3.4)	22.4 (16.2-28.1))
One or more colleagues difficult and/or often criticised unfairly	1781 (32.8)	239 (65.0)	4.2 (3.3-5.2)	47.5 (40.0-54.1)
Job insecure in illness and/or when well	2594 (47.8)	284 (77.2)	4.0 (3.1-5.1)	56.1 (47.3-63.4)

<sup>a</sup>Odds ratios (with 95% confidence intervals) adjusted for age and sex. Separate models were constructed for each negative perception

<sup>b</sup>Population attributable fractions (% with 95% confidence intervals)

**Table 4 Contributions of negative perceptions of work to overall job dissatisfaction in different population subgroups**

The figures presented are population attributable fractions % with 95% confidence intervals in brackets.

Population group	Dissatisfied with working hours	Dissatisfied with pay	Rarely/never feel appreciated and/or sense of achievement	Rarely/never support when in difficulty	Rarely/never have choice in activities	One or more colleagues difficult and/or often criticised unfairly	Job insecure in illness and/or when well
Sex							
Male	38.4 (30.8-45.2)	52.1 (43.2-59.6)	57.4 (49.3-64.2)	22.7 (14.5-30.1)	21.9 (13.9-29.1)	45.9 (35.5-54.7)	60.6 (48.4-69.9)
Female	37.1 (29.1-44.2)	48.2 (38.1-56.7)	49.3 (40.9-56.5)	23.2 (15.7-30.0)	23.0 (13.3-31.6)	50.0 (38.6-59.2)	51.3 (37.5-62.0)
Age (years)							
50-54	40.8 (31.5-48.9)	45.6 (34.3-55.0)	54.5 (44.8-62.6)	20.4 (11.8-28.1)	21.6 (11.4-30.5)	52.3 (39.2-62.7)	48.0 (32.0-60.2)
55-59	41.1 (32.4-48.7)	52.0 (41.6-60.5)	54.0 (45.0-61.6)	28.7 (19.9-36.5)	23.0 (13.4-31.6)	45.6 (33.4-55.7)	61.6 (47.8-71.8)
60-64	24.6 (13.4-34.4)	54.3 (38.9-65.8)	51.0 (37.3-61.7)	18.2 (5.0-29.5)	21.3 (6.7-33.5)	41.7 (25.9-54.8)	59.7 (38.3-73.7)
Educational level							
School only	42.0 (31.5-50.8)	61.2 (48.6-70.7)	71.2 (60.3-79.1)	30.6 (19.2-40.5)	33.1 (19.3-44.6)	53.2 (39.1-64.1)	53.3 (35.7-66.0)
Vocational training certificate	37.3 (27.7-45.7)	53.5 (41.3-63.1)	50.5 (40.1-59.1)	18.1 (9.2-26.2)	25.1 (13.9-34.9)	48.8 (35.3-59.5)	63.4 (48.0-74.3)
University degree or higher professional	34.9 (25.8-42.9)	39.4 (28.9-48.4)	43.7 (34.8-51.4)	23.0 (14.0-31.1)	13.6 (5.8-20.7)	42.0 (28.7-52.9)	51.9 (35.8-63.9)
Employment status							
Self-employed	55.3 (32.1-70.6)	76.1 (51.8-88.1)	25.4 (7.2-40.1)	21.1 (-20.1-48.2)	1.9 (-7.8-10.6)	7.2 (-10.5-22.1)	79.3 (21.6-94.5)
Small employer (<500 staff)	32.1 (23.7-39.5)	50.5 (39.7-59.4)	56.4 (47.1-64.1)	19.0 (10.7-26.5)	22.2 (11.8-31.3)	49.6 (37.4-59.4)	15.2 (10.1-19.9)
Large employer (≥500 staff)	39.4 (31.6-46.4)	44.6 (35.1-52.7)	55.3 (46.9-62.4)	27.5 (20.1-34.2)	23.5 (14.4-31.7)	52.2 (40.4-61.6)	56.8 (44.9-66.2)

**Table 5 Associations of health outcomes with overall job dissatisfaction and its negative perceptions of work**

	Fair/Poor self-rated health			CES-D score $\geq 16$			WEMWBS score poor (<32)		
	Cases exposed	<sup>a</sup> OR	(95%CI)	Cases exposed	<sup>a</sup> OR	(95%CI)	Cases exposed	<sup>a</sup> OR	(95%CI)
<b>Overall job dissatisfaction</b>	138	3.16	(2.52,3.97)	208	5.26	(4.21,6.58)	56	5.52	(3.97,7.67)
<b>Negative perceptions<sup>b</sup></b>									
Dissatisfied with working hours	161	1.13	(0.90,1.42)	264	1.92	(1.56,2.36)	59	1.78	(1.24,2.56)
Dissatisfied with pay	352	1.71	(1.44,2.03)	463	1.59	(1.35,1.87)	95	1.31	(0.95,1.81)
Rarely/never appreciated and/or sense of achievement	225	1.47	(1.19,1.81)	337	1.99	(1.64,2.42)	95	3.18	(2.25,4.49)
Rarely/never support when in difficulty	139	0.94	(0.75,1.18)	212	1.20	(0.97,1.48)	49	1.22	(0.84,1.78)
Rarely/never have choice in activities	275	1.28	(1.07,1.54)	359	1.12	(0.95,1.33)	68	0.93	(0.66,1.29)
One or more colleagues difficult and/or often criticised unfairly	425	1.53	(1.31,1.79)	607	1.74	(1.51,2.01)	118	1.63	(1.20,2.21)
Job insecure in illness and/or when well	582	1.58	(1.35,1.85)	785	1.67	(1.44,1.92)	149	1.56	(1.14,2.15)

<sup>a</sup>Odds ratios (with 95% confidence intervals), adjusted for sex, age, and educational attainment (3 levels)

<sup>b</sup>Risk estimates for negative perceptions of work were derived from a single logistic regression model for each health outcome, and were mutually adjusted