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Employment status and health after privatisation in white collar civil servants: prospective cohort study

Jane E Ferrie, Pekka Martikainen, Martin J Shipley, Michael G Marmot, Stephen A Stansfeld, George Davey Smith

Abstract

Objectives To determine whether employment status after job loss due to privatisation influences health and use of health services and whether financial strain, psychosocial measures, or health related behaviours can explain any findings.

Design Data collected before and 18 months after privatisation.

Setting One department of the civil service that was sold to the private sector.

Participants 666 employees during baseline screening in the department to be privatised.

Main outcome measures Health and health service outcomes associated with insecure re-employment, permanent exit from paid employment, and unemployment after privatisation compared with outcomes associated with secure re-employment.

Results Insecure re-employment and unemployment were associated with relative increases in minor psychiatric morbidity (mean difference 1.56 (95% confidence intervals interval 1.0 to 2.2) and 1.25 (0.6 to 2.0) respectively) and having four or more consultations with a general practitioner in the past year (odds ratio 2.04 (1.1 to 3.8) and 2.39 (1.2 to 4.7) respectively). Health outcomes for respondents permanently out of paid employment closely resembled those in secure re-employment, except for a substantial relative increase in longstanding illness (2.25; 1.1 to 4.4). Financial strain and change in psychosocial measures and health related behaviours accounted for little of the observed associations. Adjustment for change in minor psychiatric morbidity attenuated the association between insecure re-employment or unemployment and general practitioner consultations by 26% and 27%, respectively.

Conclusions Insecure re-employment and unemployment after privatisation result in increases in minor psychiatric morbidity and consultations with a general practitioner, which are possibly due to the increased minor psychiatric morbidity.

Introduction

Traditionally the public sector in the United Kingdom was immune to the pressures of the marketplace, and among its main attractions were job security, a career,

and good conditions of service. However, much of this changed during the 1980s, when the United Kingdom led the way among industrialised countries in moves away from planned public ownership and provision.¹ Privatisation of the first public service occurred in 1984. By the end of 1997 most public utilities had been privatised, and currently privatisation is being introduced into education, health care, transport, and central and local government. The future privatisation of the executive functions of government came on to the agenda with the introduction of the "Next Steps" programme in August 1988. Early in the restructuring, one of the 20 departments participating in the Whitehall II study, the Property Services Agency, was sold to the private sector.

Whitehall II is an ongoing study of the health of civil servants, and baseline data were collected before any indication of major restructuring. It is thus ideally placed to address some of the methodological limitations of previous studies of the effects of workplace closure on health. Rumours of the forthcoming privatisation reached the work force two to three years before the sale, and during this "anticipation" phase there was a deterioration in self reported health both compared with baseline and, crucially, compared with that reported in other departments in the Whitehall II study.² By the "pre-termination phase," immediately before the sale, both self reported morbidity and physiological risk factors had increased relative to those seen in respondents in the control departments.³ These increases in morbidity were not explained by changes in other psychosocial work characteristics or changes in health related behaviours.⁴

We examined the effects on health and general practitioner consultations of employment status 18 months after the privatisation and whether any associations could be explained by changes in financial strain, psychosocial measures, and health related behaviours.

Methods

The privatisation of the Property Services Agency, which was responsible for the design, construction, and maintenance of all government buildings, was complete by the end of 1993. Between April 1990 and July

International Centre for Health and Society, Department of Epidemiology and Public Health, University College London Medical School, London WC1E 6BT

Jane E Ferrie
senior research fellow

Martin J Shipley
senior lecturer in medical statistics

Michael G Marmot
director

Department of Sociology, PO Box 18, 00014

University of Helsinki, Finland
Pekka Martikainen
senior research fellow

Department of Psychiatry, Basic Medical Sciences Building, Queen Mary, University of London, London E1 4NS

Stephen A Stansfeld
professor of psychiatry

Department of Social Medicine, University of Bristol, Canynge Hall, Bristol BSS 2PR

George Davey Smith
professor of clinical epidemiology

Correspondence to: J Ferrie
j.ferrie@public-health.ucl.ac.uk

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1991 the agency was split into six separate businesses. Most of the Whitehall II respondents in this department at baseline were in projects division, the design and construction side, which was sold to Tarmac plc in December 1992.³ After privatisation all employees lost their original jobs.

The Whitehall II study

The target population for the Whitehall II study was all office staff based in London who were working in 20 civil service departments between late 1985 and early 1988. With a response rate of 73%, the final cohort consisted of 10 308 participants (6895 men and 3413 women). Although mostly white collar (office) workers, respondents covered a wide range of grades. The baseline screening of the cohort involved a clinical examination and a self administered questionnaire that contained sections on demographic characteristics, health, lifestyle, and work.⁶

Property Services Agency study

A study specifically designed to investigate effects of the privatisation started in 1994. The study population was all 666 (153 women and 513 men) Whitehall II respondents who were working in the agency at baseline screening. In addition to using baseline data, we gathered follow up data by self administered questionnaire 18 months after privatisation, eight to nine years after baseline screening. We have used the baseline survey and data from the follow up questionnaire.

Measures

Personal details—Items drawn from the baseline and follow up questionnaires include age, marital status, civil service employment grade at baseline, and employment status 18 months after privatisation.

Health outcomes and consultations with general practitioner—Self reported health outcomes at baseline and follow up included health over the past year rated as average, fair, or poor versus good or very good; presence of longstanding illness; number of symptoms in the past fortnight (from a checklist of 17); number of health problems in the past year; and minor psychiatric morbidity assessed with the 12 item general health questionnaire.⁷ In the follow up questionnaire we also asked about the number of general practitioner consultations in the preceding 12 months.

Exposure measures—We determined employment status 18 months after privatisation from responses to the follow up questionnaire. From the answer to “How secure do you feel in your present job?” we divided employed respondents into two groups: those who were “secure” or “very secure” and those who were “not very secure” or “very insecure.” We divided those not in paid employment according to their response to the question “Would you like to find another job?” and classified those seeking work as unemployed and those not seeking work as permanently out of paid employment. The final four categories were secure re-employment, insecure re-employment, unemployment, and permanently out of paid employment.

Explanatory factors—We assessed negative affectivity with the five negative items from Bradburn’s affectivity balance scale.⁸ Financial strain was assessed by combining responses to two questions from Pearlin and Schooler’s list of chronic strains (scores ranged from 0 to 8).⁹ Questions covered problems with paying

bills and buying the kind of food and clothing the respondent thought she or he and the family should have. For psychosocial measures we investigated perception of low ability to influence health (external locus of control) and two or more adverse life events in the past year, versus 0 or 1, in all employment groups. For those in employment we examined four other psychosocial work characteristics. Decision authority, skill discretion, and job demands were adapted from the job content instrument of Karasek.¹⁰ Social support at work comprised three components: support from colleagues, support from supervisors, and clarity and consistency of information from supervisors. All the questions required responses on a four point scale from “often” to “never/almost never.” We divided each scale into thirds, and, for analysis, change from third at baseline to a more adverse or beneficial third by follow up formed the explanatory factor. Those who experienced adverse change were compared with those who experienced no change or beneficial change and vice versa. We investigated three behaviours related to health: alcohol consumption over the recommended limits, smoking, and exercise. We measured all explanatory factors, except negative affectivity, at baseline and follow up.

Statistical analysis

Our overall aim was to determine whether change in morbidity between baseline and follow up differed between respondents in the four categories of employment after privatisation. In the absence of a control group who had not experienced privatisation we used participants in the most favourable category in the labour market (secure re-employment) as the reference group.

Sex differences for all measures were small (analyses not shown) so we combined the sexes for further analysis. Initially, we compared baseline characteristics of respondents who comprised the employment groups after privatisation. For continuous variables we used linear regression (general linear models procedure in SAS) to produce adjusted means with 95% confidence intervals, with adjustment consecutively for age, employment grade, marital status, and the baseline level of the variable of interest. Results for continuous variables compare the exposure groups with the reference group in terms of adjusted mean differences. For dichotomous variables we used logistic regression (LOGIST procedure in SAS) with results presented as odds ratios and 95% confidence intervals.

After the analysis of morbidity measures and general practitioner consultations we identified potential mediators of increases in these outcomes. These were explanatory factors which had changed between baseline and follow up, relative to the reference group, at conventional levels of significance ($P < 0.05$). Such factors were included in the final model for each health outcome. Models were also adjusted separately for negative affectivity, which is characterised by a disposition to overreport negative events and experience chronically high levels of distress. The datasets used in these analyses include only respondents who have data for the health outcome of interest and the potential mediator(s), hence odds ratios or differences may differ slightly.

Ethical approval

Ethical approval for the Whitehall II study was obtained from the University College London Medical School committee on the ethics of human research.

Results

Employment status

Of the 666 respondents in the Property Services Agency at baseline, 541 (81%) responded to the follow up questionnaire. Non-responders were younger than responders, and a smaller proportion did vigorous exercise at baseline. The 539 respondents who provided usable data were categorised by employment status 18 months after privatisation (table 1). Less than 10% of respondents in the study population were re-employed by Tarmac plc.

Table 1 Distribution of respondents by employment status 18 months after privatisation of previous department. Figures are number (percentage) of respondents

Employment status	Women	Men	Total
Secure re-employment	33 (27)	132 (32)	165 (31)
Insecure re-employment	35 (28)	120 (29)	155 (29)
Unemployment	21 (17)	80 (19)	101 (19)
Permanent exit from labour market*	35 (28)	83 (20)	118 (22)
All	124	415	539

*Includes respondents who retired at usual age of 60 years.

Baseline differences

In general, respondents with less favourable employment outcomes had greater morbidity and poorer psychosocial profiles and health related behaviours at baseline (table 2). Results of tests of heterogeneity between the groups were not significant for psychosocial factors and health related behaviours but were significant for health measures except longstanding illness. However, analyses of health outcomes after privatisation adjusted for the baseline values of all the

Table 3 Health outcomes for participants in insecure re-employment, permanently out of paid employment, and unemployed compared with those in secure re-employment 18 months after privatisation. Figures are odds ratios (95% confidence intervals) except for symptom score, health problems, and general health questionnaire, which are differences (95% confidence interval)

	Insecure re-employment	Permanent exit from employment	Unemployment
Health measures*:			
Self rated health average or worse	1.48 (0.9 to 2.5)	0.88 (0.5 to 1.7)	1.20 (0.7 to 2.2)
Longstanding illness	1.31 (0.7 to 2.3)	2.25 (1.1 to 4.4)	1.62 (0.7 to 3.0)
Symptom score	0.27 (-0.3 to 0.8)	-0.30 (-1.0 to 0.4)	0.32 (-0.3 to 1.0)
No of health problems	0.10 (-0.2 to 0.4)	-0.06 (-0.5 to 0.3)	0.16 (-0.2 to 0.5)
General health questionnaire score	1.56 (1.0 to 2.2)	0.07 (-0.7 to 0.8)	1.25 (0.6 to 2.0)
Health service use†			
≥4 general practitioner visits	2.04 (1.1 to 3.8)	1.93 (0.9 to 4.0)	2.39 (1.2 to 4.7)

*Adjusted for sex, age, grade, marital status, and baseline value of outcome of interest.

†Adjusted for sex, age, grade, and marital status.

health measures and all the potential explanatory variables were similar to the results presented in table 2.

Health outcomes and general practitioner consultations

Insecure re-employment and unemployment—After adjustment for baseline measures, morbidity was greater among insecurely re-employed or unemployed respondents than among securely re-employed respondents. For minor psychiatric morbidity and consulting a general practitioner four or more times in the past year differences were significant (table 3).

Permanent exit from paid employment—Among respondents permanently out of paid employment outcomes for health self rated as average or worse and number of symptoms in the past fortnight compared favourably with the reference group (secure re-employment). There was little difference in number of health problems in the past year, but the relative difference in longstanding illness was significant. Levels of minor psychiatric morbidity were similar in the two groups, and although general practitioner use was

Table 2 Means and percentages* at baseline for demographic factors, negative affect and outcomes measures by employment status 18 months after privatisation. Figures are means (95% confidence interval)

	Secure re-employment (n=165)	Insecure re-employment (n=155)	Permanent exit from employment (n=118)	Unemployment (n=101)	P value for test of heterogeneity among categories
Demographic measures:					
Age (years)	42.4 (41.6 to 43.3)	42.6 (41.8 to 43.4)	50.9 (50.1 to 51.7)	45.4 (44.3 to 46.4)	0.001
High employment grade (%)	37.5 (33.4 to 45.7)	22.0 (15.0 to 29.0)	22.3 (13.3 to 31.3)	16.3 (9.4 to 23.2)	0.001
Married or cohabiting (%)	83.9 (77.7 to 90.1)	84.7 (78.6 to 90.7)	71.9 (51.9 to 91.8)	77.9 (69.5 to 86.3)	0.69
Health measures:					
Self rated health average or worse (%)	18.9 (12.2 to 25.5)	19.6 (12.5 to 26.7)	16.0 (7.4 to 24.6)	36.2 (26.7 to 45.7)	0.006
Longstanding illness (%)	30.7 (21.7 to 39.7)	34.6 (26.0 to 43.3)	29.0 (18.5 to 39.4)	29.8 (20.3 to 39.2)	0.57
Symptom score	1.72 (1.4 to 2.0)	2.07 (1.7 to 2.4)	2.82 (2.0 to 3.7)	2.62 (2.1 to 3.1)	0.04
No of health problems	1.10 (0.9 to 1.3)	1.07 (0.9 to 1.3)	1.66 (1.1 to 2.2)	1.52 (1.2 to 1.8)	<0.001
General health questionnaire score	1.39 (1.0 to 1.8)	1.43 (1.0 to 1.8)	1.90 (0.8 to 3.0)	2.19 (1.6 to 2.8)	0.01
Financial strain:					
Financial strain score	1.76 (1.5 to 2.1)	2.04 (1.7 to 2.4)	1.86 (0.0 to 3.7)	1.78 (1.3 to 2.2)	0.18
Psychosocial measures:					
≥2 life events in past year (%)	29.4 (21.9 to 36.8)	37.5 (28.8 to 46.2)	49.0 (30.1 to 67.9)	34.4 (24.9 to 44.0)	0.52
Negative affect (%)	17.1 (10.3 to 23.9)	25.3 (17.3 to 33.4)	14.9 (5.8 to 24.0)	18.2 (10.0 to 26.4)	0.52
External locus of control (%)	2.6 (-1.2 to 6.3)	0.6 (-0.6 to 1.7)	2.8 (0.2 to 5.4)	4.7 (0.4 to 9.0)	0.55
Health behaviours:					
Alcohol intake over recommended limits (%)	10.7 (6.7 to 14.7)	6.6 (3.2 to 10.0)	8.9 (1.1 to 16.6)	9.8 (4.0 to 15.6)	0.47
Current smoking (%)	7.9 (3.6 to 12.1)	14.8 (8.4 to 21.2)	23.0 (5.1 to 40.9)	13.1 (6.5 to 19.7)	0.51
Hour or more vigorous exercise/week (%)	59.0 (50.5 to 67.5)	53.4 (45.0 to 61.9)	35.6 (25.2 to 45.9)	50.1 (40.5 to 59.8)	0.53

*Adjusted for age (except age) and sex.

Table 4 Financial strain and change in psychosocial measures and health related behaviours for respondents in insecure re-employment, permanently out of paid employment, and unemployed compared with those in secure employment 18 months after privatisation. All figures are odds ratios (95% confidence interval) except for financial strain, which is difference (95% confidence interval)

	Insecure re-employment	Permanent exit from employment	Unemployment
Financial strain*:			
Financial strain score	0.22 (-0.1 to 0.6)	0.26 (-0.1 to 0.7)	0.59 (0.2 to 1.0)
Psychosocial measures*:			
External locus of control	0.65 (0.1 to 7.0)	1.04 (0.1 to 9.7)	1.51 (0.2 to 11.4)
Social support at work:			
Adverse change	1.40 (0.9 to 2.3)	NA	NA
Beneficial change	0.67 (0.4 to 1.2)		
Decision authority at work:			
Adverse change	1.70 (1.0 to 3.0)	NA	NA
Beneficial change	0.84 (0.5 to 1.4)		
Skill discretion at work:			
Adverse change	1.56 (0.9 to 2.8)	NA	NA
Beneficial change	0.48 (0.3 to 0.9)		
Job demands at work:			
Adverse change	1.07 (0.6 to 1.8)	NA	NA
Beneficial change	1.37 (0.8 to 2.4)		
≥2 Life events in past year	1.15 (0.7 to 1.8)	1.31 (0.7 to 2.4)	1.48 (0.9 to 2.5)
Health related behaviours*:			
Alcohol intake over recommended limits	0.84 (0.4 to 1.7)	0.62 (0.2 to 1.6)	0.98 (0.5 to 2.1)
Current smoking	0.82 (0.3 to 2.6)	1.87 (0.4 to 8.0)	0.90 (0.2 to 3.6)
Hour or more vigorous exercise/week	0.96 (0.6 to 1.6)	1.71 (0.9 to 3.3)	1.92 (1.1 to 3.5)

NA=not applicable.

*Adjusted for sex, age, grade, marital status and, apart from life events in past year, for baseline value of outcome of interest.

considerably raised, the relative difference was not significant (table 3).

Potential explanatory factors

All the less favourable employment outcomes were associated with a relative increase in financial strain, which was significant in the unemployed. Relative to securely re-employed respondents, those in insecure re-employment generally experienced adverse changes in other psychosocial work characteristics (table 4). Overall, health related behaviours among those with less favourable employment outcomes were better than among the securely re-employed, including

an increase in vigorous exercise among unemployed respondents. However, there was a considerable relative increase in smoking among respondents permanently out of paid employment.

Potential explanations

Table 5 gives details of health effects adjusted for potential explanatory factors. Adjustment for negative affectivity had a negligible effect on the relation between permanent exit from paid employment and longstanding illness. The only potential mediator that attenuated the association between insecure re-employment and minor psychiatric morbidity was adverse change in decision authority (6%). Financial strain attenuated the association between unemployment and minor psychiatric morbidity by 9%.

Adjustment for minor psychiatric morbidity attenuated the association between employment status and general practitioner consultations in the past year by 26% among respondents in insecure re-employment and by 27% among the unemployed. Financial strain attenuated the relation between unemployment and general practitioner consultations by 9%, but adjustment for increased exercise strengthened the association by 11%. The effect of adjustment for all the potential mediators and negative affectivity together shows that these effects are partially independent and partially overlapping. Adjustment for negative affectivity had no effect on the association between permanent exit from paid employment and longstanding illness (adjusted odds ratio 2.28, fully adjusted 2.28 (1.2 to 4.5), log % change 0.4%).

Discussion

This large study of employment after privatisation shows that insecure re-employment and unemployment are both associated with increases in minor psychiatric morbidity and that being permanently out of paid work is associated with longstanding illness. These results cannot be explained by changes in financial strain, psychosocial factors, or health related behaviours.

Table 5 Health effects of employment status adjusted for potential explanatory factors. Adjusted odds ratios or adjusted differences between respondents permanently out of paid employment, insecurely re-employed, or unemployed compared with securely re-employed respondents

Potential explanatory factors added into fully adjusted model	Difference in general health questionnaire score			Odds ratio for ≥4 GP visits in past year		
	Adjusted*	Fully adjusted† (95% CI)	Change‡	Adjusted*	Fully adjusted† (95% CI)	Change‡
Insecure re-employment						
Negative affect	1.49	1.49 (0.8 to 2.2)	1%	2.02	2.00 (1.0 to 4.0)	-1%
Decision authority (at phase 1 (third) and adverse change phase 1 v 18 months after privatisation)	1.59	1.49 (0.9 to 2.1)	-6%	1.92	1.97 (1.0 to 3.7)	4%
Skill discretion (at phase 1 (third) and lack of beneficial change phase 1 v 18 months after privatisation)	1.60	1.58 (0.9 to 2.2)	-1%	2.04	2.10 (1.1 to 4.0)	4%
General health questionnaire score§				1.88	1.60 (0.8 to 3.0)	-26%
All above factors	1.48	1.33 (0.6 to 2.1)	-11%	2.15	1.88 (0.9 to 4.0)	-18%
Unemployment						
Negative affect	1.18	1.18 (0.4 to 1.9)	0%	2.01	1.96 (0.9 to 4.1)	-4%
Financial strain§	1.12	1.02 (0.3 to 1.80)	-9%	2.01	1.88 (0.9 to 3.9)	-9%
Hour or more vigorous exercise/week§	1.24	1.24 (0.5 to 1.9)	0	2.15	2.34 (1.2 to 4.6)	11%
General health questionnaire score§	—	—	—	2.17	1.77 (0.9 to 3.5)	-27%
All above factors	1.18	1.10 (0.3 to 1.9)	-7%	2.01	1.74 (0.8 to 3.8)	-21%

*Adjusted for age, sex, grade, marital status, and baseline value of outcome of interest.

†Adjusted for age, sex, grade, marital status, baseline value of outcome of interest, and factors in table.

‡% change in log of odds ratios or differences between adjusted and unadjusted values.

§At phase 1 and 18 months after privatisation.

Methodological considerations

Many studies on workplace closure have been limited by their inability to collect data from a period of secure employment before any rumour of job loss. Whitehall II has personal details and data on health status, psychosocial measures, and health related behaviours that were collected before privatisation of the Property Services Agency was anticipated. History of ill health is often the strongest predictor of subsequent morbidity. Comparison of data for individuals from the baseline screening, a phase of secure employment, with those collected 18 months after privatisation enabled us to determine changes related to loss of secure employment separately from the effects of previous health status and other demographic factors.

The combination of data from a time of secure employment and the longitudinal design allowed us to use an analytic strategy equivalent to an intention to treat analysis used in clinical trials. Thus, the analyses included all participants who were in the agency at baseline and from whom data were collected at follow up. This means the cohort was entirely unselected and included respondents who left the agency before any rumour of privatisation and those who left or transferred to another department during the process but for reasons other than privatisation. Inclusion of respondents who had little or no exposure to privatisation, or were relatively unaffected by it, results in conservative estimates of effects but avoids overstating its impact.

The study's weakest points are the absence of a control group and potential selection into re-employment. However, use of the securely re-employed, who also went through the privatisation, as the reference group is likely to result in further underestimation of effects. Furthermore, adjustment for all the morbidity measures and potential explanatory factors at baseline had little effect on health outcomes after privatisation (data not shown), indicating that selective re-employment is unlikely to explain our findings fully.

The generalisability of findings from most occupational studies is limited by the participants, often a relatively homogeneous group working in one particular specialty or organisation. Similarly, in this study, in addition to being white collar, many of the respondents were specialised professional and technical staff in the construction industry. However, the agency also employed a considerable number of administrators and general office staff such as personal assistants, secretaries, personnel and welfare officers, clerks, and messengers, who make it equivalent to many office based settings in the public and private sector.

Self reported morbidity

Respondents who found secure re-employment after the sale of the agency had the best self reported health, while those who were insecurely re-employed or unemployed had the worst outcomes for most measures. Among those permanently out of paid employment self reported health outcomes were similar to those for respondents in secure re-employment, except for longstanding illness, which was much higher than in any other group. Longstanding illness has been shown in other studies to be associated with permanent exit from paid employment (mostly people who were perma-

nently sick or had taken early retirement), particularly at times of high unemployment.¹¹

Minor psychiatric morbidity

Most studies of workplace closure have compared mental health in unemployed people with that in re-employed people.¹²⁻¹⁵ With one exception¹⁴ such comparisons show that re-employed people have better mental health than unemployed people, although long term unemployment narrows or eliminates this difference. The problem with such comparisons is that differences may be due to the selective re-employment of those with better mental health.¹⁶⁻¹⁷ After the privatisation in this study, however, re-employed people were divided into those in secure re-employment and those in insecure re-employment. This division showed that change in minor psychiatric morbidity was significant among the insecurely re-employed compared with those in secure re-employment. This relative increase is commensurate with Burchell's finding that increased depression scores in unemployed men are not reduced by re-employment in an insecure job.¹⁸ Compared with satisfactory re-employment, unsatisfactory re-employment after closure among male steel workers¹⁹ and car workers¹⁵ increased depression scores, while scores for the unemployed fell in between.¹⁹ Perceived job insecurity has also been associated with an increased risk of minor psychiatric morbidity in cross sectional studies in different occupational groups, predominantly white collar workers.²⁰⁻²²

Unemployment 18 months after privatisation was associated with minor psychiatric morbidity. Two recent reviews of the effect of unemployment on health concluded that longitudinal studies show that unemployment is associated with deteriorating mental health,²³⁻²⁴ although it is unclear how long such effects persist.²⁴ The mean score on the general health questionnaire for respondents permanently out of paid employment was almost the same as that for the securely re-employed. A workplace closure study among car workers showed that one year after closure securely re-employed people and retired people had similarly low levels of depression,¹⁵ as did older ship builders who accepted early retirement on full pay.²⁵

General practitioner consultations

Eighteen months after privatisation there was a strong positive association between those with less favourable employment outcomes and number of consultations with a general practitioner. This association was significant for the insecurely re-employed and the unemployed, which were also the employment outcomes associated with greater levels of self reported morbidity. Other studies which have data on this outcome have shown insecure re-employment²⁶⁻²⁷ and unemployment²⁸⁻³¹ to be associated with increased number of consultations with a general practitioner. Adjustment for minor psychiatric morbidity showed that over a quarter of the increase among the insecurely re-employed and the unemployed is attributable to increased minor psychiatric morbidity.

Explanations based on psychosocial factors, financial strain, and negative affectivity

Financial strain was associated with unemployment and explained 9% of the association between

unemployment and increased minor psychiatric morbidity. Most other work has shown that relations between unemployment and psychological symptoms become weaker or disappear after adjustment for financial hardship³² and that general health questionnaire scores are dependent on proportional change in family income.³³ However, Whelan has shown that although lack of household heat, food, and clothing and increased debt have a large role in mediating the impact of unemployment on minor psychiatric morbidity, unemployment itself continues to have a substantial independent effect.³⁴

Adverse changes in decision authority explained 6% of the association between minor psychiatric morbidity and insecure re-employment after privatisation. A recent Finnish study found that adjustment for decreased participation in decision making explained 19% of the association between major versus minor downsizing and medically certified sickness absence,³⁵ but a study among miners found that job control did not moderate the adverse effect of job insecurity on psychological strain.³⁶ Adjustment for negative affectivity had little influence on our findings, although respondents who report their employment as being insecure may also give adverse reports about other aspects of their life, and measures of negative affectivity may be rather limited in their ability to address this issue.³⁷

Explanations based on health related behaviours

None of the studies on workplace closure have reported data on exercise. Cross sectional studies have found that unemployed people report levels of physical activity comparable with those for employed people.^{38, 39} However, a cross sectional population study in Sweden found that those unemployed for one year or more had raised levels of physical activity compared with men who had experienced little unemployment.⁴⁰ A study of male construction workers in Finland found a relative increase in exercise among those who were unemployed for over 24 months.⁴¹ Exercise data from this study seem to indicate that respondents who were not employed were spending some of their increased spare time in physical activity. Indeed, most sports and leisure facilities in the United Kingdom have special rates for unemployed and retired people. Adjustment for exercise showed that general practitioner consultations among unemployed people would have been greater by 11% had this group not taken up exercise.

Conclusions

All our findings suggest that employment status after privatisation has a direct effect on minor psychiatric morbidity and longstanding illness. In addition to this increase in individual morbidity, the loss of secure public sector employment adds to NHS costs through increased consultations with general practitioners, which our results show are partly related to the increased minor psychiatric morbidity associated with privatisation.

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Contributors: JEF organised the data collection at follow up, carried out the analysis, and wrote the original and successive

What is already known on this topic

Epidemiological evidence points to greater morbidity and more consultations with a general practitioner among those who remain unemployed after job loss

Re-employed people have better mental health than unemployed people

Most studies have failed to differentiate between secure employment and insecure re-employment

What this study adds

Insecure re-employment and unemployment increase minor psychiatric morbidity and the number of consultations with a general practitioner

Adjustment for change in minor psychiatric morbidity attenuated the association with general practitioner consultations by over 25%

Adjustment for financial strain, change in other psychosocial work characteristics, and health related behaviours accounted for only a small proportion of observed change

drafts of the paper. PM helped to interpret the data and commented on all drafts of the paper. MJS advised on the analysis and drafts of the paper. MGM designed and directs the Whitehall II study. SAS commented on drafts of the paper. GDS designed the substudy presented in this paper and commented on all drafts of the paper. JEF will act as guarantor for the study.

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- Hutton W. *The state we're in*. London: Jonathon Cape, 1995.
- Ferrie J, Shipley MJ, Marmot MG, Stansfeld S, Davey Smith G. Health effects of anticipation of job change and non-employment: longitudinal data from the Whitehall II study. *BMJ* 1995;311:1264-9.
- Ferrie J, Shipley M, Marmot MG, Stansfeld S, Davey Smith G. An uncertain future. The health effects of threats to employment security in white-collar men and women. *Am J Public Health* 1998;88:1030-6.
- Ferrie JE, Shipley MS, Marmot MG, Martikainen P, Stansfeld S, Davey Smith G. Job insecurity in white-collar workers: towards an explanation of associations with health. *J Occup Health Psychol* 2001;6:26-42.
- Draper P. The rise and demise of the PSA. *Government Purchasing* 1995;May:8-9.
- Marmot MG, Davey Smith G, Stansfeld S, Patel C, North F, Head J, et al. Health inequalities among British civil servants: the Whitehall II study. *Lancet* 1991;337:1387-93.
- Goldberg DP. *Manual of the general health questionnaire*. Windsor: National Foundation for Education Research Publishing, 1979.
- Bradburn NM. *The structure of psychological wellbeing*. Chicago: Aldine, 1969.
- Pearlin LI, Schooler C. The structure of coping. *J Health Soc Behav* 1978;19:2-21.
- Karasek R. Job demands, job decision latitude, and mental strain: implications for job redesign. *Admin Sci Q* 1979;24:285-311.
- Bartley M, Owen C. Relation between socioeconomic status, employment, and health during economic change, 1973-93. *BMJ* 1996;313:445-9.

- 12 Cobb S, Kasl SV. *Termination. The consequences of job loss*. Cincinnati: National Institutes for Occupational Safety and Health, 1977 (DHEW-NIOSH Publication No 77-224).
- 13 Iversen L, Sabroe S. Psychological well-being among unemployed and employed people after a company closedown: a longitudinal study. *J Soc Issues* 1988;44:141-52.
- 14 Dew MA, Bromet EJ, Penkower L. Mental health effects of job loss in women. *Psychol Med* 1992;22:751-64.
- 15 Hamilton V, Hoffman W, Broman CL, Rauma D. Unemployment, distress, and coping: a panel study of autoworkers. *J Pers Soc Psychol* 1993;65:234-47.
- 16 Claussen B, Bjørndal A, Hjort PH. Health and re-employment in a two year follow up of long term unemployed. *J Epidemiol Community Health* 1993;47:14-8.
- 17 Lahelma E. Unemployment and mental well-being: elaboration of the relationship. *Int J Health Serv* 1992;22:261-75.
- 18 Burchell B. The effects of labour market position, job insecurity, and unemployment on psychological health. In: Gallie D, Marsh C, Vogler C, eds. *Social change and the experience of unemployment*. Oxford: Oxford University Press, 1994:188-212.
- 19 Leana CR, Feldman DC. Finding new jobs after a plant closing: antecedents and outcomes of the occurrence and quality of reemployment. *Human Relations* 1995;48:1381-401.
- 20 Amick III BC, Kawachi I, Coakley EH, Lerner D, Levine S, Colditz GA. Relationship of job strain and iso-strain to health status in a cohort of women in the United States. *Scand J Work Environ Health* 1998;24:54-61.
- 21 Kuhnert KW, Sims RR, Lahey MA. The relationship between job security and employee health. *Group and Organization Studies* 1989;14:399-410.
- 22 Roskies E, Louis-Guerin C. Job insecurity in managers: antecedents and consequences. *J Organisational Behav* 1990;11:345-59.
- 23 Murphy GC, Athanasou JA. The effect of unemployment on mental health. *J Occup Organ Psychol* 1999;72:83-9.
- 24 Bjorklund A, Eriksson T. Unemployment and mental health: evidence from research in the Nordic countries. *Scand J Soc Welfare* 1998;7:219-35.
- 25 Mattiasson I, Lindgård F, Nilsson JÅ, Theorell T. Threat of unemployment and cardiovascular risk factors: longitudinal study of quality of sleep and serum cholesterol concentrations in men threatened with redundancy. *BMJ* 1990;301:461-66.
- 26 Beale N, Nethercott S. Job-loss and family morbidity: a study of a factory closure. *J R Coll Gen Pract* 1985;35:510-14.
- 27 Rowlands P, Huws R. Psychological effects of colliery closure. *Int J Soc Psychiatry* 1995;41:21-5.
- 28 Yuen P, Balarajan R. Unemployment and patterns of consultation with the general practitioner. *BMJ* 1989;298:1212-4.
- 29 Mathers CD, Schofield DJ. The health consequences of unemployment: the evidence. *Med J Aust* 1998;168:178-82.
- 30 D'Arcy C, Siddique CM. Unemployment and health: an analysis of "Canada Health" data. *Int J Health Serv* 1985;15:609-35.
- 31 Carr-Hill RA, Rice N, Roland M. Socioeconomic determinants of rates of consultation in general practice based on fourth national morbidity survey of general practices. *BMJ* 1996;312:1008-12.
- 32 Rodgers B. Socio-economic status, employment and neurosis. *Soc Psychiatry Psychiatr Epidemiol* 1991;26:104-14.
- 33 Jackson PR, Warr P. Unemployment and psychological ill-health: the moderating role of duration and age. *Psychol Med* 1984;14:605-14.
- 34 Whelan C. The role of income, life-style deprivation and financial strain in mediating the impact of unemployment on psychological distress: evidence from the Republic of Ireland. *J Occup Organ Psychol* 1992;65:331-44.
- 35 Kivimäki M, Vahtera J, Pentti J, Ferrie JE. Factors underlying the effect of organisational downsizing on the health of employees: a longitudinal cohort study of changes in work, social relationships and health behaviours. *BMJ* 2000;320:971-5.
- 36 Barling J, Kelloway EK. Job insecurity and health: the moderating role of workplace control. *Stress Med* 1996;12:253-9.
- 37 Macleod J, Davey Smith G, Heslop P, Oliver S, Hart C. Always look on the bright side of life? The influence of reporting tendency when exposure and outcome measurements are based on self report. *J Epidemiol Community Health* 1999;53:660
- 38 Grayson JP. Health, physical activity level and employment status in Canada. *Int J Health Serv* 1993;23:743-61.
- 39 Rodriguez E. Health consequences of unemployment in Barcelona. *Eur J Public Health* 1994;4:245-51.
- 40 Janlert U. *Work deprivation and health: consequences of job loss and unemployment*. Lulea, Sweden: Karolinska Institute, 1991.
- 41 Arjas-Leino P, Liira J, Mutanen P, Malmivaara A, Matikainen E. Predictors and consequences of unemployment among construction workers: prospective cohort study. *BMJ* 1999;319:600-5.

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