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Work disability following major organisational change: the Whitehall II study

Marianna Virtanen ^{1*}, Mika Kivimäki ^{2,3}, Archana Singh-Manoux ^{2,4,5}, David Gimeno ^{2,6,7}, Martin J. Shipley ², Jussi Vahtera ^{1,8}, Tasnime N. Akbaraly ^{2,9}, Michael G. Marmot ², Jane E. Ferrie ²

¹ *Finnish Institute of Occupational Health Finnish Institute of Occupational Health, Helsinki, FR*

² *Department of Epidemiology and Public Health University College of London (UCL), 1-19 Torrington Place London WC1E 6BT, GB*

³ *Faculty of Behavioral Sciences University of Helsinki, FI*

⁴ *Santé publique et épidémiologie des déterminants professionnels et sociaux de la santé INSERM : U687, IFR69, Université Paris Sud - Paris XI, Université de Versailles-Saint Quentin en Yvelines, Hôpital Paul Brousse 16, av Paul Vaillant Couturier 94807 VILLEJUIF, FR*

⁵ *Centre de Gérontologie Assistance publique - Hôpitaux de Paris (AP-HP), Hôpital Sainte Périne, FR*

⁶ *Division of Environmental and Occupational Health Sciences The University of Texas School of Public Health, Health Science Center at Houston, San Antonio Regional Campus, San Antonio, Texas, US*

⁷ *The Institute for Work and Health The Institute for Work and Health, Toronto, CA*

⁸ *Department of Public Health University of Turku, Turku University Hospital, Finnish Institute of Occupational Health, Turku, FI*

⁹ *Pathologies du système nerveux : recherche épidémiologique et clinique INSERM : U888, IFR76, Université Montpellier I, Hôpital la Colombière 39, avenue Charles Flahault BP 34493 -pav 42 Calixte Cavalier 34093 MONTPELLIER CEDEX 5, FR*

* Correspondence should be addressed to: Marianna Virtanen <marianna.virtanen@ttl.fi >

Abstract

Background

Privatisation and private sector practices have been increasingly applied to the public sector in many industrialised countries. Over the same period, long-term work disability has risen substantially. We examined whether a major organizational change - the transfer of public sector work to executive agencies run on private sector lines - was associated with an increased risk of work disability.

Methods

The study uses self-reported data from the prospective Whitehall II cohort study. Associations between transfer to an executive agency assessed at baseline (1991–1994) and work disability ascertained over a period of approximately 8 years at three follow-up surveys (1995–1996, 1997–1999, 2001) were examined using Cox proportional hazard models.

Results

In age- and sex-adjusted models, risk of work disability was higher among the 1263 employees who were transferred to an executive agency (hazard ratio 1.90, 95% confidence interval 1.46–2.48) compared with the 3419 employees whose job was not transferred. These findings were robust to additional adjustment for physical and mental health, and health behaviours at baseline.

Conclusions

Increased work disability was observed among employees exposed to the transfer of public sector work to executive agencies run on private sector lines. This may highlight an unintentional cost for employees, employers and society.

Over the past three decades, increases in long-term work disability have been seen in many industrialised countries.^{1–4} Over the same period there were substantial changes in the labour market, with widespread downsizing, outsourcing, mergers, and job insecurity; results of the quest for efficiency. In the public sector these changes have taken the form of privatisation of services or the implementation of private sector practices. In the United Kingdom privatisation of the public utilities, which commenced in 1984, was followed by the “Next Steps” programme, through which the executive functions of government were transferred to executive agencies. These agencies are run on private sector lines and periodically have to bid for their own work through competitive tender.^{5,6}

Few studies have been able to conduct a methodologically rigorous analysis of the associations between major organizational changes in the public sector and health outcomes. The Whitehall II study of civil servants originally designed to take advantage of the stability of jobs in the British Civil Service provided an opportunity to observe work disability associated with major organizational changes. Screening on recruitment to the Whitehall II study (1985–88) was complete before the gradual implementation of “Next Steps” commenced and thus provides data on health not only prior to the change itself but also prior to widespread rumour of change. Existing work using

these data has shown major organizational change to be associated with poor self-reported health and greater increases in blood pressure and weight for employees transferred to executive agencies compared to those who remained in the Civil Service, and the health effects were seen even during the anticipating phase of change.⁷ This and other earlier work on the association between major organizational change, such as outsourcing and mergers, and impaired health of employees,⁸ suggests that the association may also be found for work disability, that is, being unable to work because of illness or injury.

The present analyses focus on the question of major organizational change in Whitehall II. By using data collected across a number of phases and continued follow-up, we aimed to examine whether transfer to an executive agency is associated with long-term work disability-over a period of 10 years at maximum, as it was previously shown to be the latent period to observe plausible health effects for psychosocial factors at work.⁹

METHOD

Participants

The target population for Whitehall II was all London-based office staff aged 35–55 working in 20 civil service departments. Baseline screening (Phase 1, 1985–1988) involved a medical examination and a self administered questionnaire.¹⁰ With a response rate of 73%, the baseline cohort consisted of 10 308 participants (6895 men and 3413 women), covering a wide range of white-collar employment grades. Since Phase 1 there have been seven further data collection phases. The University College London ethics committee reviewed and approved the study, and written informed consent was obtained from each participant.

Major organizational change

A question on transfer to an executive agency was included at Phase 3 (1991–1994, n=8637), the baseline for our analysis. The statement “change of your department into an agency” was followed by the options: (1) has happened, (2) is planned, (3) not certain what will happen, and (4) is not planned. At phase 3, 7148 were still employed in the Civil Service, including executive agency, and 5259 participants selected options 1 or 4. Participants who selected options 2 or 3 (n=1889), those with missing data for any of the baseline variables collected at phase 3 (n=172) and those who had taken voluntary early retirement or had missing data on outcome (n=405) were excluded. Thus, the analytic sample comprised 4682 participants aged 39 to 62 years.

Work disability

Data on work disability were collected over a period of approximately 7.7 years (S.D. 2.0, range 2.0–10.1) via surveys at phase 4 (1995–1996), phase 5 (1997–1999), and phase 6 (2001). We considered cases of work disability to be those participants who retired from the Civil Service due to health reasons or left the Civil Service and subsequently classified themselves as longterm sick. Participants who were in the labour force (working, job-seeking, training etc.), and those who had retired at age 60 (mandatory retirement age in the Civil Service) formed the comparison group.

Covariates

Baseline covariates measured at Phase 3 included socio-demographic characteristics (age, sex, marital status [married/cohabited/not], and occupational grade¹¹), measures of health status (suboptimal self-rated health [yes/no], pre-existing CHD, elevated blood pressure [systolic/diastolic>140/90 mm Hg]¹², psychological distress¹³ measured as General Health Questionnaire (GHQ-30)¹⁴ caseness, overweight [≥ 25 kg/m²]¹⁵), and health behaviours (smoking and alcohol use). Survey data on unemployment periods (yes/no) were available at phases 5 and 6 but not at phase 4. In this variable, those with missing data were classified as “missing”.

Statistical analysis

Chi-squared statistics were used to compare the baseline characteristics of employees who were transferred to an executive agency with those who were not. The start of the follow-up was the date of Phase 3 screening and the end date was either the date of the phase where work disability was first reported or the date of the last phase where non-case status was confirmed. Cox proportional hazard models were used to estimate the association between transfer to an executive agency and the occurrence of work disability. Results were expressed as Hazard Ratios (HR) and 95% confidence intervals (CI). The interaction term between sex and transfer into an agency ($p = 0.086$) did not suggest different effects of organizational change on work disability in men and women. Thus, we did not stratify the analysis by sex and all analyses were adjusted for sex. Models were sequentially adjusted for age, demographics, health status, health behaviours and unemployment periods during the follow-up. Analyses were performed using SAS software version 9.1.

RESULTS

Of the 4682 participants in the analysis, 1263 (27%) reported having been transferred to an executive agency. Characteristics of the participants as a function of the transfer to an executive agency are presented in table 1. Transferred employees were slightly older, more

likely to be men, married or cohabited, and in higher occupational grades than those not transferred. They also had more psychological distress and were more likely to have high blood pressure than nontransferred employees. Altogether 239 new cases of work disability occurred during 36115 person-years of follow-up time, a rate of 6.6 per 1000 person-years. Work disability was more common among those with older age, the low grades, and participants with non-optimal self-rated health, psychological distress, or CHD (results not shown).

Table 2 shows the association between transfer to an executive agency and subsequent work disability. In the age- and sex-adjusted model, employees who experienced major organizational change were at greater risk of subsequent work disability (hazard ratio 1.90, 95% confidence interval (CI) 1.46–2.48), compared to those not transferred. Additional adjustment for marital status and occupational grade made little difference to the hazard ratio. Further adjustment for health, health behaviours and unemployment periods somewhat attenuated the hazard ratio, 1.61 (95% CI 1.23–2.10). Addition of an interaction term between sex and transfer to an agency showed some evidence ($p = 0.086$) for a higher hazard ratio in men, 1.93 (95% CI 1.37 to 2.73), compared with women, 1.22 (95% CI 0.78 to 1.91).

DISCUSSION

In this study from the Whitehall II cohort, we found an increased risk of work disability among employees who had previously experienced major organizational change - the transfer of public sector work to executive agencies run on private sector lines. Our findings are also consistent with our earlier study of this cohort which used the measure of organizational change but focussed on self-reported psychological and physical morbidity.⁷ The adjustment for health status assessed at the beginning of the follow-up and unemployment periods after the baseline suggests that our results were not attributable to pre-existing morbidity or unemployment experiences during the follow-up period.

To our knowledge, this study is unique in terms of its prospective design and the ability to take account of a range of covariates. We treated our exposure group (employees experiencing major organizational change) in the same way as an “intention-to-treat group” in a clinical trial, that is, those reporting the exposure at phase 3 remained in the exposure group regardless of what happened to them after that. This approach is to minimise bias caused by exposure changes related to the outcome of interest; particularly appropriate when data on exposure during the follow-up are incomplete, as is the case in the present study. Although differential loss to follow-up among those transferred to agencies is possible, major bias is unlikely as the analyses controlled for differences in pre-existing health. We therefore believe that our findings are likely to be generalisable across the Civil Service and probably beyond to other office-based public sector employees.

It remains to be investigated whether there is a direct causal link between major organizational change, in terms of a transfer into an executive agency, and work disability. The unintentional drawbacks related to such changes may involve job insecurity, increased workload, and perceived injustice, especially if the process is insensitively managed and leads to major disruption of established social support networks. Many of these adverse psychosocial factors have been shown to be associated with poor health outcomes.^{8,9,16–18}

The intensity by which organizational change and job insecurity is perceived by individuals may be dependent on the labour market context.⁸ Work in the British Civil Service was believed to be secure “for life” and changes that took place during late 1980s and 1990s were most likely to be experienced as fundamental and beyond one’s control due to the change from secure to an insecure job.¹⁹

Empirical evidence from the UK has shown that increases in the unemployment rate result in increases in applications for incapacity benefit, suggesting that part of the rise in the incapacity rate is actually “hidden unemployment”.²⁰ Therefore, transfer of employees into executive agencies may have put higher demands on the capacities of transferred employees, competition for jobs, and unstable careers, eventually resulting in withdrawal from the labour market since they no longer “fit in”.

Conclusions

As the outsourcing and privatisation of public sector services become more common worldwide, our observation that the risk of work disability was greater among employees who experienced major organizational change highlights an important potential cost attendant on moves toward privatisation of the public sector.

What is already known on this topic

- Major organizational changes, such as outsourcing and privatisation, have been shown to be associated with impaired health among affected employees.
- Whether this impaired health subsequently translates into long-term work disability is unclear.

What this study adds

- Risk of subsequent work disability was higher among civil servants transferred to an executive agency (a form of outsourcing) than among those not transferred.

- This may highlight an unintentional cost for employees, employers and society.

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References:

1. Moncrieff J, Pomerleau J. Trends in sickness benefits in Great Britain and the contribution of mental disorders. *J Public Health Policy*. 2000; 22: 59 - 67
2. Editor: Järvisalo J, Andersson B, Boedeker W, Houtman I. Mental disorders as a major challenge in prevention of work disability. Helsinki Social Insurance Institution, Social Security and Health Reports; 66: 2005;
3. Holzmann R, Hinz R. Old age income support in the 21st century: an international perspective on pension systems and reform. Washington, DC The World Bank; 2005; 3 - 56
4. OECD. Transforming disability into ability: policies to promote work and income security for disabled people. Paris OECD Publishing; 2003; 16 - 176
5. National Union of Civil and Public Servants. Agenda for the Future: The Civil Service towards the Twenty First Century. London National Union of Civil and Public Servants; 1991;
6. Next Steps Team. Next Steps Briefing Note. Cabinet Office; March 1997;
7. Ferrie JE, Shipley MJ, Marmot MG. The health effects of major organisational change and job insecurity. *Soc Sci Med*. 1998; 46: 243 - 54
8. Ferrie JE, Westerlund H, Virtanen M. Flexible labour markets and employee health. *Scand J Work Environ Health Suppl*. 2008; 6: 98 - 110
9. Eller NH, Netterstrøm B, Gyntelberg F. Work-related psychosocial factors and the development of ischemic heart disease: a systematic review. *Cardiol Rev*. 2009; 17: 83 - 97
10. Marmot M, Brunner E. Cohort Profile: the Whitehall II study. *Int J Epidemiol*. 2005; 34: 251 - 6
11. Kaprio J, Sarna S, Fogelholm M. Total and occupationally active life expectancies in relation to social class and marital status in men classified as healthy at 20 in Finland. *J Epidemiol Community Health*. 1996; 50: 653 - 60
12. Karpansalo M, Lakka TA, Manninen P. Cardiorespiratory fitness and risk of disability pension: a prospective population based study in Finnish men. *Occup Environ Med*. 2003; 60: 765 - 9
13. Upmark M, Lundberg I, Sadigh J. Psychosocial characteristics in young men as predictors of early disability pension with a psychiatric diagnosis. *Soc Psychiatry Psychiatr Epidemiol*. 1999; 34: 533 - 40
14. Goldberg DP. The detection of psychiatric illness by questionnaire. London, UK Oxford University Press; 1972;
15. Månsson N, Eriksson K, Israelsson B. Body mass index and disability pension in middleaged men—non-linear relations. *Int J Epidemiol*. 1996; 25: 80 - 5
16. Michie S, Williams S. Reducing work related psychological ill health and sickness absence: a systematic literature review. *Occup Environ Med*. 2003; 60: 3 - 9
17. Kivimäki M, Virtanen M, Elovainio M. Work stress in the etiology of coronary heart disease - a meta-analysis. *Scand J Work Environ Health*. 2006; 32: 431 - 42
18. Netterstrøm B, Conrad N, Bech P. The relation between work-related psychosocial factors and the development of depression. *Epidemiol Rev*. 2008; 30: 118 - 32
19. Hartley J. Editor: Ferrie JE, Griffiths J, Marmot M. Models of job insecurity and coping strategies of organizations. Labour market changes and job insecurity: a challenge for social welfare and health promotion. WHO Regional Publications, European Series; (81) 1999; 127 - 49
20. Burchardt T. The evolution of disability benefits in the UK: Re-weighting the basket. London London School of Economics, Centre for Analysis of Social Exclusion; CASE/26 1999;

Table 1

Characteristics of the participants at baseline in relation to a transfer to an executive agency. Figures are numbers (percentages) unless otherwise stated.

Characteristics at baseline	All (n=4682)	Transfer to agency		P-value
		No (n=3419)	Yes (n=1263)	
Age; Mean (S.D.)	48.5 (5.7)	48.4 (5.8)	48.8 (5.5)	0.030
Sex				<0.001
Men	3335 (71.2)	2376 (69.5)	959 (75.9)	
Women	1347 (28.8)	1043 (30.5)	304 (24.1)	
Married / cohabiting				0.002
Yes	3612 (77.2)	2598 (76.0)	1014 (80.3)	
No	1070 (22.9)	821 (24.0)	249 (19.7)	
Occupational grade level				0.002
I highest	874 (18.7)	663 (19.4)	211 (16.7)	
II	1101 (23.5)	765 (22.4)	336 (26.6)	
III	653 (14.0)	453 (13.3)	200 (15.8)	
IV	792 (16.9)	592 (17.3)	200 (15.8)	
V	612 (13.1)	459 (13.4)	153 (12.1)	
VI lowest	650 (13.9)	487 (14.2)	163 (12.9)	
Non-optimal self-rated health				0.142
No	3606 (77.0)	2652 (77.6)	954 (75.5)	
Yes	1076 (23.0)	767 (22.4)	309 (24.5)	
Psychological distress				0.006
No	3686 (78.7)	2726 (79.7)	960 (76.0)	
Yes	996 (21.3)	693 (20.3)	303 (24.0)	
CHD				0.594
No	4569 (97.6)	3334 (97.5)	1235 (97.8)	
Yes	113 (2.4)	85 (2.5)	28 (2.2)	
Hypertension				<0.001
No	4018 (85.8)	2989 (87.4)	1029 (81.5)	
Yes	664 (14.2)	430 (12.6)	234 (18.5)	
Obesity				0.051
No	2497 (53.3)	1853 (54.2)	644 (51.0)	
Yes	2185 (46.7)	1566 (45.8)	619 (49.0)	
Alcohol use				0.082
No	818 (17.5)	576 (16.9)	242 (19.2)	
Moderate	3073 (65.6)	2275 (66.5)	798 (63.2)	
High	791 (16.9)	568 (16.6)	223 (17.7)	
Smoking				0.796
No	4058 (86.7)	2966 (86.8)	1092 (86.5)	
Yes	624 (13.3)	453 (13.3)	171 (13.5)	

Unemployment (phase >3<6)					0.075
No	2752 (58.8)	2042 (59.7)	710 (56.2)		
Yes	837 (17.9)	604 (17.7)	233 (18.5)		
Missing	1093 (23.3)	773 (22.6)	320 (25.3)		

Table 2

Association between major organisational change (transfer to an executive agency) and subsequent work disability

Transfer to an agency	Work disability						
	No.	No. of events	Person-years	Rate / 1000 person-years	Hazard Ratio (95% CI) model 1 [*]	Hazard Ratio (95% CI) model 2 [†]	Hazard Ratio (95% CI) model 3 [‡]
No	3419	148	26696	5.5	1.00	1.00	1.00
Yes	1263	91	9419	9.7	1.90 (1.46–2.48)	1.85 (1.43–2.41)	1.61 (1.23–2.10)

^{*} Model 1: adjusted for age and sex.

[†] Model 2: as model 1 and additionally adjusted for marital status and occupational grade.

[‡] Model 3: as model 2 and additionally adjusted for health status, health behaviours and unemployment periods.