



the Whitehall II study



WORK STRESS AND HEALTH: the Whitehall II study

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Contents

Foreword	2
Introduction	3
The Whitehall II study	3
The Social Gradient	4
Demands and control at work	6
Social support at work	8
Effort-reward imbalance at work	10
Job insecurity	12
Organisational change	14
Health behaviour	16
Social support outside work	18
The Work-home interface	20
Retirement	22
Summary	24

Foreword

Joint CCSU/Cabinet Office laypersons' guide to the Whitehall II research

People are the Civil Service's greatest resource and biggest asset. Their health and well being is of paramount importance to civil servants themselves, their families, employing departments, Government and the trade unions. Ensuring a healthy Civil Service workforce is an essential part of the drive to provide quality public services throughout the UK

It is important that any debate around the health of the Civil Service workforce, or indeed any other workforce is based upon hard facts drawn from substantive research. Effective health improvement programmes cannot be based upon anecdote and stereotype. They must be founded on a clear understanding of the factors that impact on the health of employees wherever they live and work, whatever their grade or gender even after correcting for factors such as differences in smoking across social groups.

The Civil Service is particularly fortunate that it has provided the study group for world renowned and long-term research projects into the health of its workforce. A team from University College London (UCL) led by Professor Sir Michael Marmot has carried out these projects, widely known as the Whitehall and Whitehall

II studies. The team has published numerous academic papers, which provide deep insights into the underlying causes of ill health amongst civil servants.

Unfortunately, for too long these valuable findings have been restricted to the readers of academic journals. They have not been readily available to civil servants themselves or Civil Service management and unions, who, working together, have the ability to make a positive impact on the health and well being of the workforce. Consequently, Cabinet Office and the Council of Civil Service Unions have co-operated with the UCL team to produce this "plain English" guide to the findings of the Whitehall studies with the specific aim of promoting and informing debate across the Civil Service. Its clear, practical layout provides an ideal foundation for future discussions across departments on new ways of looking at occupational health issues.

We believe this guide is required reading for Civil Service HR staff, line managers, trade unions reps and indeed anyone with a positive interest in the well being of civil servants and the Civil Service. It is also likely to be of interest to management, unions and employees working in many other occupational settings.



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PCS, PROSPECT, POA, NIPSA
AND FDA.

Introduction

Health policy has commonly focussed on the organisation and funding of health services or genetic predisposition to disease. Concern with prevention of the major chronic diseases has tended to focus on individual behaviours grouped under the term lifestyles.

The Whitehall Studies of British civil servants have been in the lead in showing that health and its determinants should be viewed much more broadly. The circumstances in which people live and work are not just crucial for perceived well-being but they are major influences on health. One way that this is seen is with the big differences in health between people in different social groups which remain even after correcting for factors such as differences in smoking.

The Whitehall Studies are long-term studies of men and women examining the influences on health of circumstances at work, at home and in the wider community. The results of these studies are now feeding in to policy discussions. They are highly relevant to the current concern with social inequalities in health – the fact that people in lower social positions have worse health than those more favoured.

To help policy discussions, the Cabinet Office and the Council of Civil Service Unions asked us to produce a summary of the key findings that have come out of the Whitehall studies. The key findings from this original research are presented in the following ten chapters. Each chapter is aimed at helping those concerned with policy make use of this new evidence.

The Whitehall study

The name 'Whitehall' originates from the first Whitehall study of 18,000 men in the Civil Service, set up in 1967. The first Whitehall study showed that men in the lowest employment grades were much more likely to die prematurely than men in the highest grades. The Whitehall II study was set up to determine what underlies this grade or social gradient in death and disease and to include women.

In 1985, all non-industrial civil servants aged between 35 and 55, in 20 departments in Central London were invited to a cardiovascular screening examination at their workplace. This covered all major government departments as they were structured at the time (most have since been reorganised). They were mainly departmental headquarters, setting up and administering policies, but two were district offices implementing policy and providing services to the public.

Most of those invited were office-based, administrative employees, ranging from mandarins to messengers. Others were professional or technical employees, or provided office support. Of those invited, 10,308 (73%) participated in the baseline survey, of which two-thirds were men and one-third women. In addition to a medical screening all participants were sent a self-completion questionnaire which covered a wide range of topics. This first phase was completed in 1988, since when there have been a further six phases of data collection, alternating postal self-

completion questionnaires with medical screenings and questionnaires. Phase 7, currently underway (2002-2004) includes a medical screening. At phase 6, we had responses from 7,770 participants, or 75% of the original group.

In addition to the usual cardiovascular screening measures – blood pressure, blood cholesterol, height, weight, and ECG – we have over the years added further measures, such as walking and lung function, questions about diet, screening for diabetes and some tests of mental functioning. As many of the participants are now moving out of employment there are more questions about retirement and activities outside work.

We give participants results from the medical screening so that they can consult their GPs if there are any abnormalities. We keep them informed of findings and developments via a Newsletter. We publish our findings in learned journals, books, articles, and on our website (www.ucl.ac.uk/whitehallIII).

Our support comes from a variety of sources, particularly the Medical Research Council, British Heart Foundation and Health and Safety Executive in the UK and significantly from the US government-funded National Institutes of Health, one of the few projects outside the US to receive such funding. Interest in Whitehall II is such that similar studies are now underway in Japan, France and Finland, and there is a proposal for a "Whitehall in Washington" study.





The social gradient

The Whitehall studies have dispelled two myths. The first is that people in high status jobs have higher risks of heart disease. The second is that the gradient of health in industrialised societies is simply a matter of poor health for the disadvantaged and good health for everyone else.

The evidence

How did the Whitehall studies dispel these misconceptions? The first Whitehall Study compared mortality of people in the highly stratified environment of the British Civil Service. It showed that the more senior you are in the employment hierarchy, the longer you might expect to live compared to people in lower employment grades. This is particularly interesting when we reflect that the Civil Service excludes the richest and poorest members of society. Twenty years after the original Whitehall study, the Whitehall II study documented a similar gradient in morbidity. A striking finding from the Whitehall Studies was that the social gradient was observed for a range of different diseases: heart disease, some cancers, chronic lung disease, gastrointestinal disease, depression, suicide, sickness absence, back pain and general feelings of ill-health. A major challenge, and a reason for the importance of these studies, was to understand the causes of this social distribution of so many disorders.

The social gradient in health is not a phenomenon confined to the British Civil Service. Throughout the developed world, wherever researchers have had data to investigate, they have observed the social gradient in health. An American study, the Panel Study of Income Dynamics, classified people according to household income and demonstrated a continuous gradient in mortality. The poorest people had the highest mortality rates, while the mortality rates of people in middle income groups were

intermediate between those at the bottom and those at the top. Studies in Europe and Australasia show a clear relationship between position in the social hierarchy and mortality. The social gradient is present for most of the major causes of death.

The Whitehall studies have gone some way towards unravelling the mystery of why someone in the middle of the social hierarchy should have worse health than those above them and better health than those below them. There is a social gradient in smoking, in lack of physical activity, and in obesity (particularly in women). These aspects of lifestyle, and associated measurements such as plasma cholesterol and blood pressure are responsible for about a quarter of the social gradient. This suggested two avenues of investigation. Why there should be a social gradient in smoking and other health behaviours and second what else may be responsible for the social gradient in health. The Whitehall II study has shown evidence that the way work is organised, the work climate, social influences outside work, influences from early life, in addition to the health behaviours listed above all contribute to the social gradient in health. These lead to the uncomfortable (for some) finding that inequalities in health cannot be divorced from inequalities in society. The inescapable conclusion is that to address inequalities in health it is necessary both to understand how social organisation affects health and to find ways to improve the conditions in which people work and live.

Findings from the Whitehall studies have influenced policy deliberations. In Britain, an Independent Inquiry into Inequalities in Health made several recommendations to government about how the social gradient in health could be reduced. The good news is that governments are listening and improvements are possible. Reduction of health inequalities is the current priority for government.

Policy implications

We endorse the three headline recommendations of the Independent Inquiry into Inequalities in Health chaired by Sir Donald Acheson, namely:

1. As part of health impact assessment, all policies likely to have an effect on health should be evaluated in terms of their effect on health inequalities.
2. A high priority should be given to policies aimed at improving health and reducing health inequalities in women and children.
3. Policies should be introduced which will further improve the living standards of those worse off.

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■ van Rossum CTM., Shipley MJ, Van de Mheen H, Grobbee DE, Marmot MG. Employment grade differences in cause specific mortality. A 25 year follow up of civil servants from the first Whitehall study. **Journal of Epidemiology and Community Health** 2000;**54**:178-184. <http://jech.bmjournals.com/cgi/reprint/54/3/178.pdf>

Further information

On the Acheson Inquiry, the most important government-backed examination of inequalities in health in the past 20 years, see: Acheson D. *Inequalities in Health: Report of an independent inquiry*, HMSO, London 1998. Further details about the Acheson Inquiry and how to order the report are given at: <http://www.doh.gov.uk/ih/recs.htm>

For an overview of social and economic determinants of population health in modern societies see: Marmot MG. and Wilkinson RG. Eds. *Social determinants of health*, Oxford University Press 1999

Figure 1 Death rate and employment grade over a 25 year period in men

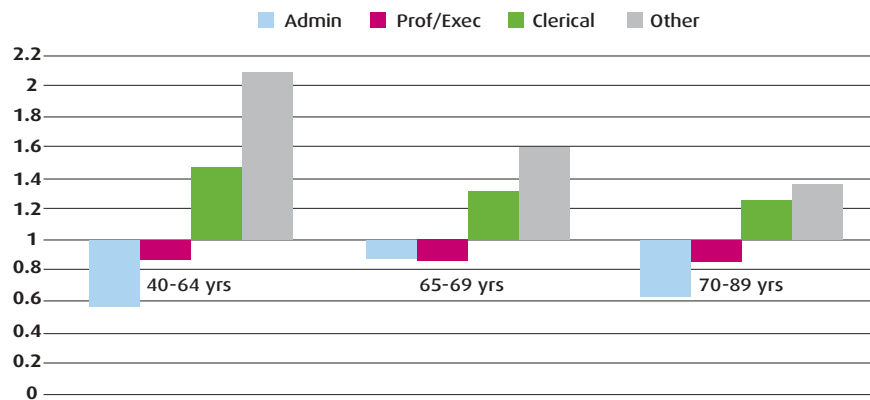


Figure 1 shows the death rate in each grade relative to the average for the whole civil service population (set at 1). The Administrators have about half the average mortality at age 40-64 yrs, while the office support staff who make up the 'other' grade have about twice the average. Hence there is a four-fold difference between the bottom and top grade.

Source of data for Figure 1: Marmot, M.G. and Shipley, M.J. Do socioeconomic differences in health persist after retirement? 25 year follow up of civil servants from the first Whitehall study. **BMJ**, 1996; **313**: 1177-80.



Demands and control at work

Stress in the workplace increases the risk of disease and ill health

The evidence

Stress at work is a major concern. The Health and Safety Executive reports that it is the number one cause of lost time at work and estimates that in 2002 there were 13.4 million days lost from work because of stress. Conventional wisdom has it that a stressful job is one characterised by a high degree of pressure and responsibility. New research, to which Whitehall II has contributed, notably shows that that is incorrect.

A way of thinking about stress at work that more closely accords with people's experience is that it results from an imbalance between the psychological demands of work on the one hand and the degree of control over work on the other. Many jobs involve high demands. It is not demands themselves that are the major cause of illness although high demands are independently associated with ill health. It is the combination of high demand and low control.

The two elements of work that go into the measurement of control are degree of authority over decisions and use of skills, including opportunity for developing skills. While it is common for demands to increase as the occupational hierarchy is ascended, degree of control over work decreases with lower position. Whitehall II provides ample documentation of this: the lower the grade of employment, the less control over work.

This combination of imbalance between demands and control predicted a range of illnesses. The evidence from Whitehall II suggested that low control was especially important. People in jobs characterised by low control had higher rates of sickness absence, of mental illness, of heart disease and pain in the lower back.

Of course, people are not randomly allocated to jobs and are to some extent self-selected. Whitehall II showed that the association between low control and increased risk of heart disease was independent of a range of personal characteristics of individuals. The implication was that the relationship related to the way work was organised and the opportunity it gives people for control rather than to any characteristics of the individuals in those jobs.

Low control at work makes an important contribution to the social gradient in mental and physical ill health.

This way of conceptualising work stress was first developed by an American and a Swede, Robert Karasek and Töres Theorell, and is referred to either as the Karasek model or the demand-control model. Accordingly, a body of research, particularly in the United States and Sweden, supports the importance of a combination of high demands and low control in predicting ill health. The demand-control model has been developed further by showing that, in addition, the degree of social support at work further influences the onset of illness. Social support at work is covered in the next chapter.

Policy implications

1. Improved conditions of work could lead to a healthier work force and greater productivity.
2. Appropriate involvement in decision making is likely to benefit employees at all levels of the workplace
3. Redesigning practices in offices and other workplaces, to enable employees to have greater control, benefits health.
4. Introducing mechanisms for measuring and monitoring employees' level of control over their work provides evidence for making improvements in conditions of work.

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Further information

More detailed coverage of the health effects of the demand-control model can be found at:

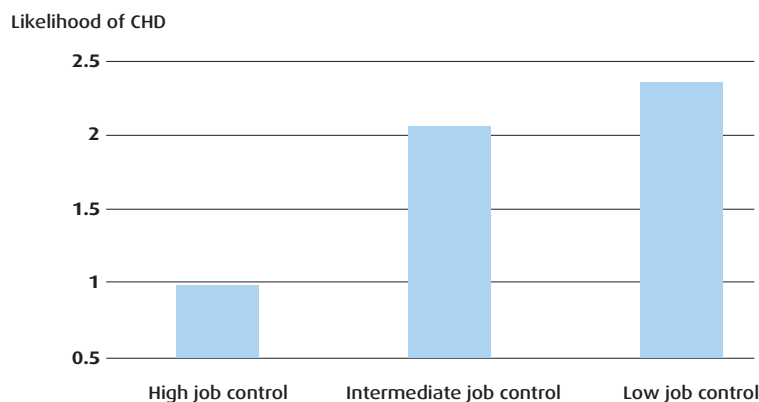
<http://www.macsf.ucsf.edu/Research/Social%20Environment/notebook/demand.html>

The National Institutes for Occupational Health and Safety (NIOSH) in the US have an interesting website dedicated to work stress that includes details of publications and a video that can be viewed online called Working with Stress.

<http://www.cdc.gov/niosh/stresshp.html>

There is also a NIOSH publication on work stress available online at: <http://www.cdc.gov/niosh/stresswk.html>

Figure 2. Self-reported job control and coronary heart disease incidence



Adjusted for age, sex, length of follow-up, effort/reward imbalance, grade, coronary risk factors and negative affect.

Figure 2 compares the incidence of coronary heart disease in three groups of people from the Whitehall II study: those who report that they have a high level of control at work (high job control, incidence of CHD set at 1), intermediate job control and low job control. People with intermediate or low job control had over twice the incidence of coronary heart disease as people with high job control.

Source of data for Figure 2: Bosma, H., Peter, R, Siegrist, J. and Marmot, M.G. (1998). Two alternative job stress models and the risk of coronary heart disease. **Am. J. Publ. Hlth.** 1998;**88**: 68-74.





Social support at work

Working with supportive colleagues and managers improves health and reduces sickness absence

The evidence

In the previous chapter, we described the impact that high job demands and low control over working conditions can have on health. Another aspect of the work environment that may be stressful is a lack of support from work colleagues and managers. A supportive work environment is one where employees receive good support from both colleagues and supervisors (for example, colleagues and immediate line managers are willing to talk about work-related problems) and where employees receive clear and consistent information from their supervisors.

We found that good levels of work social supports had a protective effect on mental health and reduced the risk of spells of sickness absence. Lack of support from supervisors and unclear or inconsistent information was associated with a two-fold increased risk of poor general mental health. Similarly, a lack of support from colleagues was also associated with worse mental health.

Since the Whitehall II cohort was recruited, there has been considerable change in the Civil Service. This appears to be

reflected in the changes seen in work characteristics; job demands, job control and social support. We found that levels of social support at work have tended to decrease among our participants. These adverse changes in levels of work support were associated with worsening mental health, including symptoms of depression, and with an increased risk of angina. On the other hand, where work social supports had improved, they protect against both the risk of poor mental health and also the future risk of myocardial infarction.

In our research investigating social inequalities in depression, we have shown that a poor work environment, including poor social support at work, was one of the main factors explaining the higher prevalence of depressive symptoms among participants in the lower employment grades.

Many other studies both in the UK and elsewhere have also demonstrated that poor social support at work is associated with worse health. Researchers in Sweden have shown that poor support at work is related to an increased risk of mortality from cardiovascular disease. Both bullying at work and workplace violence have also been linked to ill health. For example, a study of hospital staff carried out in Finland, showed that victims of bullying were more likely to take time off work through illness.

Policy implications

1. Improved levels of support from managers may reduce ill-health and sickness absence.
2. Work environments that facilitate mutual support between colleagues and do not tolerate antisocial behaviour will promote health and well-being.
3. Clear and consistent information from managers can have a positive effect on employee wellbeing and health.

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Further information

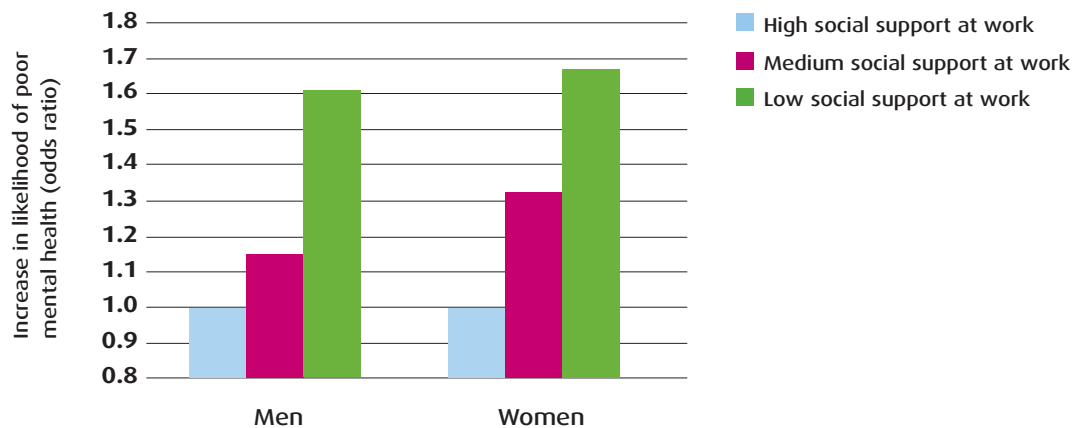
The Health and Safety Executive has developed draft management standards to tackle stress at work. Details of this recent initiative and related publications can be found at: <http://www.hse.gov.uk/stress>

Bully online has information on bullying at work including advice for employers on how to tackle bullying: www.bullyonline.org

The TUC website also has information on workplace bullying including advice on what to do if you are being bullied: www.tuc.org.uk/tuc/rights_bullyatwork.cfm

The European Foundation for the Improvement of Living and Working conditions has numerous free publications available on its website. These include psychosocial characteristics of the work environment: <http://www.eurofound.eu.int/404.htm>

Figure 3. Social support at work as a risk factor for subsequent poor mental health



Adjusted for age and employment grade.

Figure 3 shows the increased risk of poor mental health in those with medium and low levels of work social supports compared to those with high levels of work social supports.

Source of data for Figure 3: Stansfeld SA, Fuhrer R, Head J, Ferrie J and Shipley M. (1997) Work and psychiatric disorder in the Whitehall II study. **Journal of Psychosomatic Research** 43: 73-81.



Effort-reward imbalance at work

Employees reporting high effort-reward imbalance are at increased risk of coronary heart disease and poor health

The evidence

Crucial to all social relationships is a sense of reciprocity. One-way relationships are likely to be a source of stress and anything that is a source of stress has the possibility of increasing rates of illness. Colleagues in Germany have developed this concept into a new way of looking at stressful work environments. They propose that a combination of high effort without appropriate reward is stressful and increases the rate of illness. Effort may come from one's own individual drive but it may also be demanded by the work environment. High effort by itself is not stressful. Reward is conceived and measured in three different ways; esteem, career opportunities including job security and promotion prospects, and financial remuneration.

The Whitehall II Study introduced these measures and showed that imbalance between efforts and rewards increased risk of heart disease. This increased risk was in addition to, and independent of, the contribution to heart disease of low control at work (see page 6).

Imbalance between effort and reward also predicted other measures of ill health including declines in physical and social functioning. These findings from the Whitehall II Study have

been replicated in other studies in France, Sweden, Germany and several countries in central and Eastern Europe.

High effort in the work place is a desirable quality. These research findings demonstrate that high effort must be matched by appropriate rewards. The way work is organised and the climate of feedback in the workplace all potentially affect each of the three crucial aspects of rewards; self-esteem, status and income.

The Whitehall II Study examined the independent impacts of income and wealth on illness. Income, of course, is highly correlated with employment grade, so much so that once employment grade was taken into account, income made no additional contribution to predicting illness. There was, however, a continued importance of wealth in predicting illness. Wealth represents a balance of income and expenditure over the whole of life and includes contributions from previous generations. The association between wealth and health may, therefore, represent the effect of accumulation of material and psychosocial factors on health. In addition, wealth will relate to financial security and prospects for the future, which in turn are likely to have an impact on rates of illness.

There is an important gender difference. Household income and employment status of the spouse or partner is an important predictor of women's health. This is less true for men.

Policy implications

1. A good balance between the effort expended by employees and their reward structure will promote good mental and physical health.
2. This balance may best be achieved by improving rewards rather than reducing efforts, for instance, by increasing praise and encouraging individual development, as well as raising salaries.
3. Improving social support at work could reduce the health risk associated with effort-reward imbalance.

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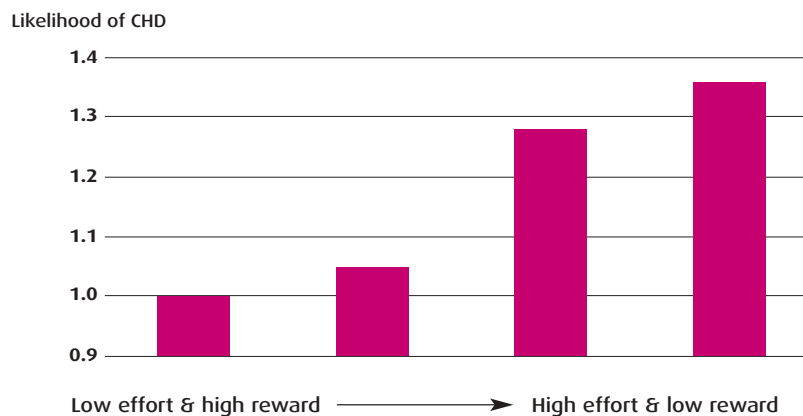
Further information

Interview with Professor Johannes Siegrist, architect of the effort-reward imbalance model, at: <http://pandh.fss.uu.nl/siegrist.htm>

A short description of the effort-reward imbalance model can be found at: <http://www.uni-duesseldorf.de/MedicalSociology/eri/theorie.htm>

More detailed coverage of the health effects of the effort-reward imbalance model can be found at: <http://www.macses.ucsf.edu/Research/Social%20Environment/notebook/effort.html>

Figure 4. Effort-reward imbalance at work and coronary heart disease



Adjusted for age, sex and grade.

Figure 4 shows that people who reported a high ratio of effort compared to rewards were at increased risk of coronary heart disease compared to people who reported low effort and high reward. (Incidence of CHD set at 1 for low effort and high reward).

Source of data for Figure 4: Kuper, H., A. Singh-Manoux, J. Siegrist, and M. Marmot. 2002. When reciprocity fails: effort-reward imbalance in relation to coronary heart disease and health functioning within the Whitehall II Study. *Occupational and Environmental Medicine* 59;11:777-784.



Job insecurity

Secure jobs increase health, wellbeing and job satisfaction

The evidence

A lot of research, much of it conducted in the 1930s and 1980s, documented the adverse effects of unemployment on mental health, physical health and premature death. However, job insecurity, which is the fear of job loss and unemployment, did not become a subject of study in the health field until the 1990s.

When the Whitehall II study was set up the Civil Service was still largely seen as a 'job for life'. However, the complete privatisation in 1992 of the Property Services Agency (PSA), suggested to us the importance of studying the effects of job insecurity on health. All PSA employees eventually lost their job in the original organisation. Using data we had already collected, we were able to compare their health with the health of civil servants in the other 19 departments in the study, none of which was being sold off at the time. As the Whitehall II study started well before the privatisation process we were able to take into account any pre-existing differences in health between employees in PSA and those in other departments. We found that during the periods of insecurity in the run up to the privatisation, civil servants in PSA suffered more physical ill-health than their unaffected counterparts and they also experienced adverse changes in some of the well-known risk factors for heart disease, such as blood pressure.

In an extension to these inquiries we investigated what happened to PSA employees after the sale of their department. We contacted everyone who used to work in PSA, 18 months after the privatisation. Compared with those who reported

having found secure employment, those who reported their new job to be insecure experienced more physical and mental ill-health. In addition they were much more frequent users of GP services. None of these changes could be attributed to changes in health-related behaviours, such as smoking.

This small study was the first time we had investigated self-reported job insecurity in Whitehall II. Self-reported job insecurity is when workers tell us their job is insecure, rather than us assuming they are insecure because their jobs are threatened by privatisation. Since then we have investigated self-reported job insecurity among all the participants in the Whitehall II study who are still in paid employment.

These studies confirmed our earlier findings of increased ill-health, in particular mental health problems, and found that workers who are insecure are much more dissatisfied with their jobs. By studying effects on health over time we were able to show that job insecurity acts as a chronic stressor and that some of its effect remains after the removal of the threat. We found that the association between job insecurity and health was only partly explained by financial anxiety, personal characteristics, such as pessimism, and other characteristics of the work environment, such as low control.

Since we started our work in the early 1990s, other research groups in the UK and abroad have instigated programmes of research into job insecurity and its effect on health. The findings of these studies confirm those from the Whitehall II study and there is now a large body of evidence that job insecurity increases ill-health, particularly mental illness and use of health services.

Policy implications

1. Jobs should be made as secure as possible to reduce the burden of ill-health in the workforce and reduce health service use.
2. If unavoidable, any period of job insecurity should be resolved quickly to avoid the health consequences of exposing workers to a chronic stressor.
3. Workers should be kept well informed to reduce rumour and anxiety and maintain job satisfaction.

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Further information

An individualistic approach to coping with job insecurity can be found at:

<http://healthcare.monster.com/articles/insecurity/>

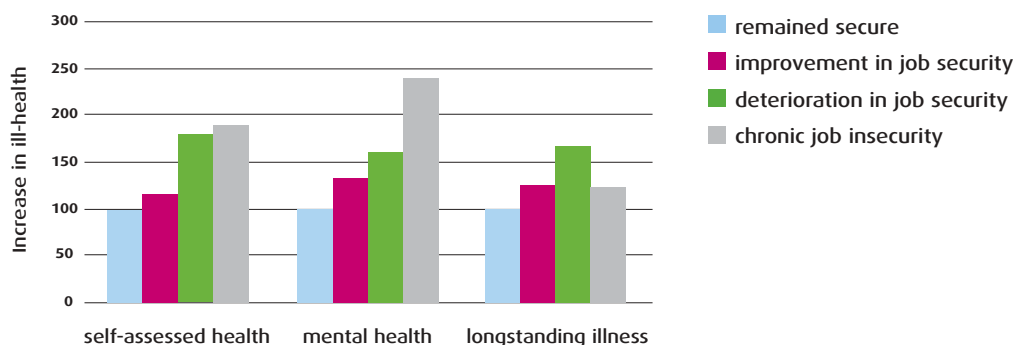
A WHO project to address job insecurity and work stress at the organisational level can be found at:

<http://www.who.int/oeh/OCHweb/OCHweb/OSHpages/OSHDocuments/ROs/EURO/Enterprise%20for%20Health%201.pdf>

General information on coping with stress can found at:

<http://www.channel4.com/health/microsites/0-9/4health/stress>

Figure 5. Effects of loss or gain of job security and of chronic job insecurity in women



Adjusted for age, employment grade and health at the beginning of the follow-up period.

Figure 5 shows the effect on health of change in job security and chronic job insecurity over a 2 1/2 year period at the end of the 1990s in women. Chronic job insecurity had the worst effect on health, followed closely by deterioration in job security. Even women whose job security improved had worse health than women whose job was secure at both time points. This indicates that the adverse effects of job insecurity are not completely reversed by the removal of the threat. There were similar effects in men.

Source of data for Figure 5: Ferrie JE, Shipley MJ, Stansfeld SA, Marmot M. Effects of chronic job insecurity and change in job security on self-reported health, minor psychiatric morbidity, physiological measures and health-related behaviours in British civil servants: the Whitehall II study. **J.Epidemiol.Community Health** 2002;56:450-4.



Organisational change

Poorly managed organisational change harms health

The evidence

Despite the sale of PSA, widespread compulsory redundancy has remained a rarity in the Civil Service. However, over the last decade few departments have escaped a degree of organisational change. Major organisational change often generates feelings of job insecurity and in that respect this evidence reflects that of the previous chapter. However, the effects of organisational change are much wider, including changes to the nature and conditions of work, change in management style and occasionally change of employer.

We examined the creation of executive agencies as an example of major organisational change in the Civil Service. Since August 1988 an increasing proportion of the executive functions of Government, such as the payment of social security benefits, have been transferred to executive agencies. Before the decision is made to transfer a service from a department to an executive agency the options of eliminating the service, or transferring it to the private sector are considered.

Data from the Whitehall II study enabled us to compare changes in health among civil servants working in agencies and civil servants expecting their work to be transferred to an executive agency with those whose work was to remain unaffected.

In men we found that working in an executive agency was associated with poorer physical health, poorer mental health,

unhealthy patterns of sleep and adverse changes in risk factors for heart disease, such as blood pressure. Men who were awaiting transfer to an executive agency were similarly affected. Among women in both groups the patterns of effects were similar to those for men, but less dramatic. We also found that for both sexes working in an executive agency was associated with an increase in sickness absence.

Economic recession and deregulation of the labour market during the 1990s resulted in major downsizing of the workforce and changes to employment contracts in most post-industrial countries. Studies in Europe, Scandinavia and the United States showed that major downsizing is associated with an increase in ill health among the survivors, which is reflected in an increase in medically certified sickness absence and premature death from heart disease. Temporary employment has also been shown to be associated with an increase in premature death, even though those hired on temporary contracts initially tend to be healthier than employees on permanent contracts. There is also evidence that the business benefits of organisational change have been limited and bought at a cost of decreased motivation, morale and loyalty.

These programmes of work have recently sparked renewed interest in the effects on health of the work climate, for example justice in the workplace. Unjust procedures and unfair treatment of individuals have been shown to have significant adverse effects on health. Such findings are of particular relevance in the context of organisational change where open and fair procedures, including employee involvement as far as possible, can reduce adverse effects on health.

Policy implications

1. Policy makers should be aware of the wider consequences for employees and the organisation when implementing change to improve efficiency.
2. If change is unavoidable, strategies are needed to minimise job losses and reduce adverse effects on survivors.
3. In the aftermath of a period of organisational change restorative strategies should aim to repair the damage done to commitment and morale.

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Further information

A comprehensive review of the health and safety problems generated by organisational change can be found in a booklet 'The Changing Organisation of Work and the Safety and Health of Working People'. It is published by the National Institute for Occupational Health and Safety in the US and available online at:

<http://www.cdc.gov/niosh/pdfs/02-116.pdf>

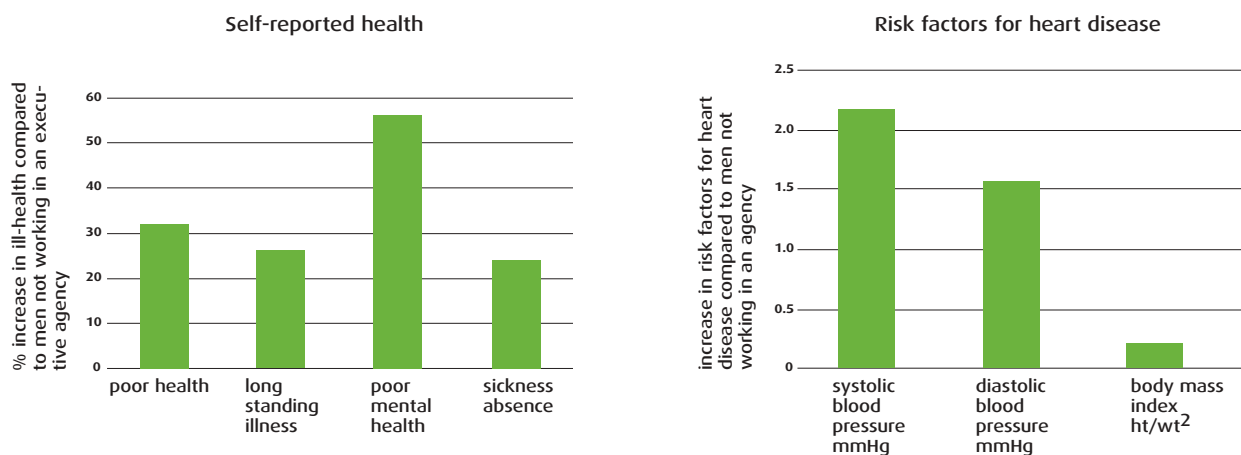
Recent approaches to organisational change and reform in the UK, with case studies, can be found at:

<http://www.servicefirst.gov.uk>

A number of perspectives on organisational change and organisational change management can be found via the Social Science Information Gateway website:

<http://www.sosig.ac.uk/roads/subject-listing/World-cat/orgchan.html>

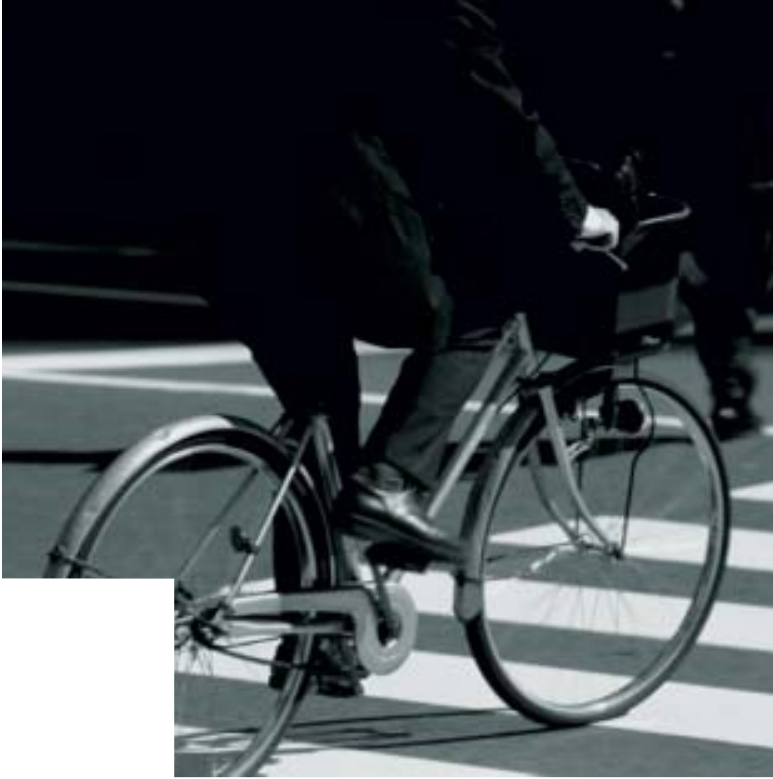
Figure 6. Effects of transfer to an executive agency in men



Adjusted for age, employment grade, marital status and health at the beginning of the follow-up period.

The histogram on the left of Figure 6 shows that transfer to an executive agency is associated with a 30% excess risk of poor health, a 25% excess risk of longstanding illness and sickness absence and a 55% excess risk of poor mental health. These changes are accompanied by an increase in blood pressure and body mass index, a marker of weight gain, as seen in the histogram on the right.

Source of data for Figure 6: Ferrie JE, Shipley MJ, Marmot MG, Stansfeld S, Davey Smith G. The health effects of major organisational change and job insecurity. **Soc.Sci.Med.** 1998;**46**:243-54.



Health behaviour

A healthy diet, exercise and quitting smoking all reduce the risk of disease and promote well-being.

The evidence

Smoking Whitehall II confirms the harmful effects of smoking. An important question is who continues to smoke despite the evidence of its adverse effects on health. The 20 years separating the two Whitehall studies had seen a very welcome decline in smoking. What is worrying is that the social gradient persists. Efforts to bring the smoking levels of those in the lower grades down to those for the higher grades are urgently needed. The decline in women's smoking has not been as great as that for men so the rates are little different or even greater than those for men.

Alcohol There are considerable differences in consumption patterns by sex and employment grade. Men in the higher grades are more likely to consume alcohol every day, but to have only 1 or 2 drinks on each occasion. Men in the lower grades are more likely to drink only once a week and to consume larger amounts when they do. On the whole, women drink less than men, although higher grade women drink considerably more than lower grade women. We found that consuming small amounts of alcohol had a protective effect on heart disease and cognitive function. However frequent drinkers were more likely to have long spells of sickness absence; and stress at work was related to alcohol dependency. The benefits of alcohol are more strongly experienced by those who prefer to drink wine, but are also found for those who drink beer or spirits.

Diet We identified six common dietary patterns among Whitehall II study participants. The patterns reflected considerable differences in consumption of nutritious foods such as wholemeal bread, oily fish, fruit and green salad, and

less healthy foods such as sweet biscuits, sausages and full cream milk. Women, and participants in higher grades of both sexes, were more likely to eat a healthy diet. Dietary patterns reported in 1992 predicted risk of angina and heart attack in the subsequent eight years. Dietary patterns partly explained the higher levels of protective HDL cholesterol in higher-grade staff. It is clear from our nutritional studies that good food habits are a key positive influence on health.

Obesity and stress Our research points to a link between stress and obesity. Overweight and obese individuals produce more stress hormones such as adrenaline and cortisol, and these excess levels of hormone output seem in part to be due to psychosocial factors such as work stress. There is also a link between overweight and higher than normal heart rate. Thus, obesity or overweight together with stress appear to be a particularly undesirable combination for heart health. Stressed individuals are more likely than others to eat a poorer diet and to take less exercise. Stress may well lead to weight gain via these changes, and a vicious circle is set up.

Exercise Exercise is good for health in many respects, but opinions differ about whether moderate exercise is good enough to protect the heart and circulation. Research suggests that moderate intensity activity is not as effective as vigorous activity as far as the heart is concerned, but still provides significant benefit. A higher level of moderate exercise – such as walking and gardening – was associated with reduced risk of having a cluster of risk factors known as the metabolic syndrome (obesity, high blood pressure, glucose intolerance, disturbed lipid levels), independently of age, smoking and high alcohol intake. Moderate and vigorous physical activity levels are each associated with reduced body weight and increased cardiovascular fitness, including lower heart rate.

Policy implications

1. Patterns of behaviour are conditioned by the environment, in which people live and work.
2. Drinking during work hours should be discouraged, both to reduce the risk of accidents and longer term health problems.
3. Stopping smoking improves individual health and could reduce social inequalities in the health of the population. Designated non-smoking areas at work reduce the effects of passive smoking.
4. Availability of healthy food at work and in the canteen e.g. fruit, salads, brown bread, low calorie dishes, is an important aspect of the healthy workplace. Vending machines selling confectionery and soft drinks should be replaced by water dispensers.
5. Workplaces should encourage physical activity by supporting exercise participation, for example facilities should be provided for cyclists.

Key sources

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Further information

Advice and support on giving up smoking can be found at: <http://www.givingupsmoking.co.uk/>

Fact sheets for employers and organisations on alcohol and its affect in the workplace can be downloaded from: <http://www.alcoholconcern.org.uk/>

Individuals worried about their drinking could try: <http://www.downyourdrink.org> or phone "drinklink" 0800 917 82 82

Information about how to lose weight can be found at: <http://www.weightconcern.com>

Figure 7. Employment grade and smoking among civil servants aged 35 to 55 years



Age adjusted.

Figure 7 shows that men in the lowest civil service grades smoke more than men in the higher grades. There is a similar gradient among women, except that there are more smokers among women in the highest grade.

Source of data for Figure 7: Marmot MG, Davey Smith G, Stansfeld S, Patel C, North F, Head J, White I, Brunner E, Feeney A. Health inequalities among British civil servants: the Whitehall II Study. **Lancet** 1991;337:1387-93.





Social support outside work

An active social life outside work can have health benefits.

The evidence

We have been studying the relation between people's social life outside work and their health. Broadly speaking, there are two kinds of social activities: informal contact with family and friends and more formal involvement in organised groups and associations. To capture informal contact, we have asked questions about the *quantity* of social support a person has (the size of their social network and how often they have contact with their family, friends, and acquaintances) and also about the *quality* of the support they receive from close family or friends. Three dimensions of social support from close persons were found to be important:

- i. Confiding/emotional support: this is the extent to which people close to the respondent share their interests, boost their self-esteem, and can be relied on.
- ii. Practical support: this is the level of help received with major and minor practical problems.
- iii. Negative aspects of close relationships: family and friends can also be a source of worry and the amount of support they give may seem inadequate.

To capture formal contact, we have asked about active membership of groups including social or recreational groups, professional organisations, and sports or cultural groups.

Our work shows that having a large circle of friends and seeing them regularly is good for overall health. These friends do not all have to be intimate friends – contact with acquaintances or friends of friends has health-promoting effects too. There was no indication that social network size was important for mental health.

We found that the quality of confiding/emotional support had a larger effect on mental health and overall health status than practical aspects of support. People receiving low confiding/emotional support had a greater risk of developing poor mental health compared with people receiving high confiding/emotional support. We also found that high negative aspects of close relationships led to an increased risk of poor mental health and poor physical functioning as well as increased rates of sickness absence.

Two psychological mechanisms have been proposed for a potential beneficial effect of social support on health: first, that support has a direct effect on well-being and secondly, that the benefits of social support are seen only for people who are experiencing some kind of stress. (The latter is called the “buffering hypothesis”, indicating that social support can be a cushion which gives some protection from life's difficulties. Examples of difficult situations where social support might be useful include serious illness, major financial problems, and being the victim of crime or accident.) In the Whitehall II study health benefits were seen both for people who were not experiencing life's difficulties as well as for those who were.

Active membership of groups is associated with better overall health. As yet, it is not clear whether certain groups are more health promoting than others, but it seems that social participation is good for general health.

We have also considered the social life of the neighbourhood. There are some neighbourhoods where people trust each other, feel able to rely on each other for practical help when it is needed, and feel attached to the area they live in. There are other

places where residents have very little contact with each other, don't trust each other, and don't have a sense of attachment to where they live. The first kind of neighbourhood could be called a socially cohesive one – relationships between neighbours are generally good. We have found that living in a more socially cohesive neighbourhood is associated with better overall health.

Policy implications

1. Organisations have a responsibility for ensuring that working conditions and the demands of the job do not jeopardise employees' domestic and other relationships.
2. Staff development and training courses aimed at developing interpersonal skills in the workplace may have additional benefits for employees when they are outside work.
3. Corporations could consider ways in which they can make a positive contribution to the area in which they are located, for example through corporate community involvement.

Key sources

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British Civil Servants. *Psychological Medicine* 1998;28:881-892. http://titles.cambridge.org/journals/journal_catalogue.asp?memonic=psm

■ Stafford M, Bartley M, Mitchell R, Marmot M. Characteristics of individuals and characteristics of areas: investigating their influence on health in the Whitehall II study. *Health and Place* 2001;7:117-129.

<http://www.elsevier.nl/inca/publications/store/3/0/5/1/9/>

Further information

Publications relating to the links between social support, social cohesion and health are available through the Health Development Agency

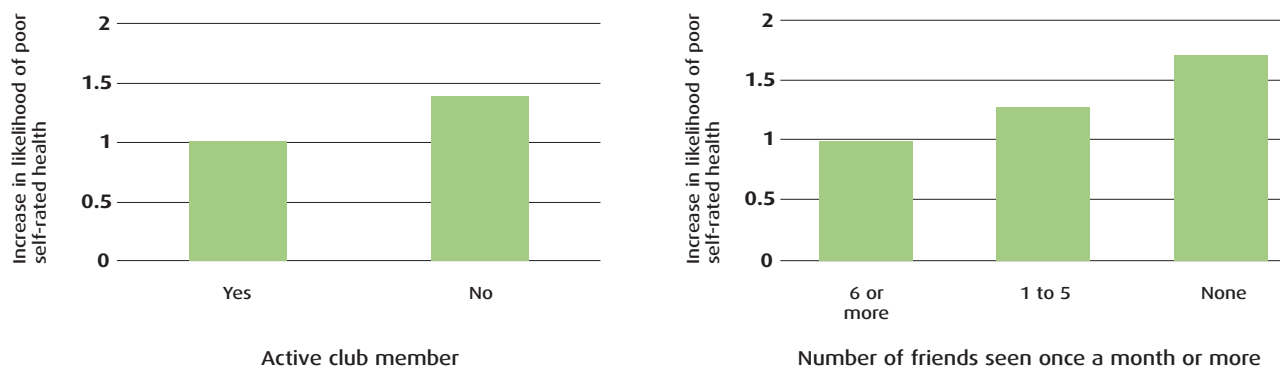
<http://www.social-action.org.uk/hdaresearch/research.asp>

Information about the possible benefits of organisations getting involved in communities and practical suggestions on setting up projects is available at:

<http://www.bcconnections.org.uk/>

On how to develop and maintain a social support network, see <http://www.cnn.com/HEALTH/library/MH/00041.html>

Figure 8. The effect of social contact on health



Adjusted for sex, employment grade, marital status, and deprivation.

The figure on the left shows that people who are active club members are less likely to rate their health as poor than those who actively participate. The figure on the right shows that people who regularly see their friends are less likely to rate their health as poor. People who don't see any friends regularly are more than 1.5 times as likely to report poor health compared with people who see 6 or more friends regularly.

Source of data for Figure 8: Stafford M, Bartley M, Mitchell R, Marmot M. Characteristics of individuals and characteristics of areas: investigating their influence on health in the Whitehall II study. *Health and Place* 2001;7:117-129.



The work-home interface

Stresses from conflicting work and family demands result in poor health

The evidence

Much of the research in the Whitehall II study has been about explaining why lower grade civil servants have higher chances of disease and ill health. However, we have also investigated factors beyond working life and looked at how factors associated with home and family life and the interaction between home and work factors affect health.

We have found similar patterns of a social gradient in health when we used household income or wealth, instead of Civil Service employment grade, to measure social status. This suggests that, in addition to work related factors, factors related to family or home life may also contribute to the social gradient in health. Similar to the results about the negative effect of having low control at work on heart disease, we found that women who reported having low control at home had higher risks of heart disease. In contrast, among men, having low control at home was not a predictor of heart disease. Having control over one's life thus appears to be important for health, although there may be differences between men and women in terms of control over work or home life. Having financial problems, and caring for dependent children and elderly relatives predicted low control at home.

There has been considerable research on the work and family interface and work-family conflicts in recent years. The questions around the work and family interface have been guided, in part, by the influx of women, including those with young children and other family responsibilities, into the labour force. Work-to-family conflict occurs when work demands interfere with the demands of being a spouse/partner, parent or carer. Conversely, family-to-work conflict may be an obstacle to successfully meeting work-related demands and responsibilities. As both work and family roles represent core aspects of adult identity, barriers to work-and family-related identity formation such as work-to-family conflict or family-to-work conflict are stressful experiences.

Some people argue that work is a less central aspect of women's identity compared to their role in taking care of family demands, and that family-to-work conflict matters less for women.

Conversely, as taking care of the family is not a traditional male role, work-to-family conflict may not be so important for the health of men. However, research from the Whitehall II study suggests that both work-to-family conflict and family-to-work conflict affect the mental and physical health of men and women. Furthermore, the deleterious effect of both types of conflict on mental health can be observed in diverse countries such as Finland and Japan, although they are different from the UK in terms of social expectations of men's and women's roles.

Policy implications

A better work-life balance may help reduce the stresses between conflicting demands from work and family roles. This may be achieved through:

1. maximising time spent at home through flexible working hours
2. better leave arrangements for caring for children and the elderly
3. reducing work-related commuting through encouraging working at home

Key Sources

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- Frone M. Work-to-family conflict and employee psychiatric disorders. *Journal of Applied Psychology* 2000;85:888-895.
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Further information

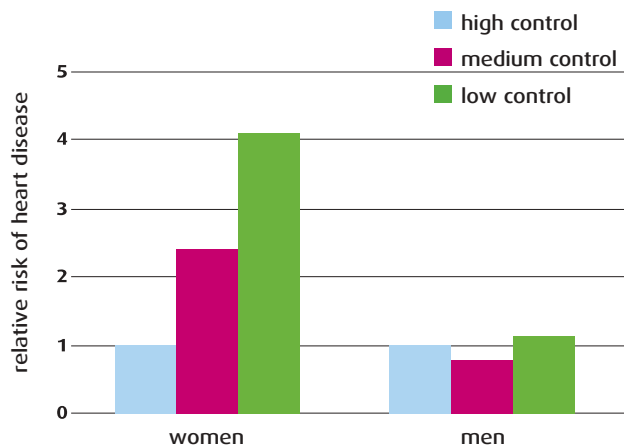
On how to achieve a better work-life balance can be found at: <http://www.publicservantlifestyle.co.uk/dynamic/index.php>

On the new legislation designed to help working parents <http://www.dti.gov.uk/er/workingparents.htm>

On the government's suggested policies on achieving a better work-life balance can be found at <http://www2.dti.gov.uk/work-lifebalance/>

On setting the agenda for human resources managers in public service <http://www.workingbalance.co.uk>

Figure 9.1 The effect on heart disease of control at home

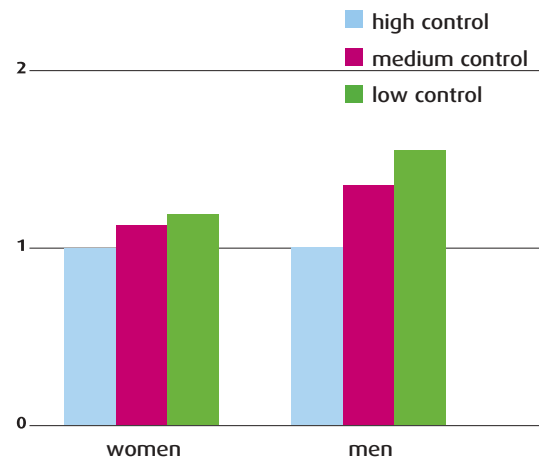


*age adjusted

The figure shows that for women, having lower control at home is associated with higher risks of heart disease.

Source of data for Figure 9.1: Chandola T, Kuper H, Singh-Manoux A, Bartley M, and Marmot M. The effect of control at home on CHD events in the Whitehall II study: Gender differences in psychosocial domestic pathways to social inequalities in CHD. *Soc Sci Med* 2004; 58: 1501-9.

Figure 9.2 The effect on heart disease of control at work



*age adjusted

The figure shows that for men, having lower control at work is associated with higher risks of heart disease.

Source of data for Figure 9.2: Kuper H, Marmot M. Job strain, job demands, decision latitude, and the risk of coronary heart disease within the Whitehall II study. *J.Epidemiol.Community Health* 2003;57:147-153.



Retirement

The social gradient in retirement is largely determined by circumstances during working life

The evidence

Retirement used to be associated with a general decline in income and health, but the experience of retirement has changed over the past two decades. People are living much longer, and many are retiring at an earlier age with well-resourced pensions. The Whitehall II study has a long-standing interest in older workers, those leaving the workforce, and changes in socioeconomic gradients in health and wellbeing in later life.

Using information from all our participants, we observed an increase in the social gradients for measures of poor health and risk factors for heart disease between 1985 and 1999. This indicates that, as participants age, the gap in health and health functioning between higher and lower grade civil servants has widened.

Since 1995, our Retirement Project has been exploring the experiences of participants before and after they retire using interviews in addition to our questionnaire data. Using the latter we found that mental health functioning deteriorated among those who continued to work, but improved among the retired, particularly amongst civil servants in the middle and higher grades. Physical functioning, on the other hand, declined in both working and retired participants.

Examining different routes of exit from the labour force we found that ill-health retirement acted as a constraint to participating in leisure activities after retirement, although it had less effect than

working in a lower employment grade. Activities were similar to health functioning, mental health and income in retirement, in that they were all conditioned more by employment grade during working life than by ill-health retirement, early retirement or redundancy. In contrast, attitudes to retirement were unaffected by employment grade and were positively affected by early retirement and negatively affected by poor health.

In the 1980s and 1990s numerous organisations went through periods of re-structuring and “downsizing”. Many, including the Civil Service, offered financially enhanced packages to specific groups to encourage them to retire early. Our questionnaire data showed that women and men from the higher grades, those who had suffered from ill health, those that were less satisfied with their jobs (see Quote 10.1) and those who were single with no dependants were more likely take up these packages, whereas financial problems tended to keep people working. Interviews with participants showed that early retirement was generally associated with positive outcomes in terms of health and fulfilment. However, for unsuccessful applicants, those who had to continue working to meet outstanding financial commitments (see Quote 10.2), and the ineligibility the existence of these schemes tended to undermine the quality of life at work and create anxieties about the future.

International research on the effect of retirement on health remains sparse. The little work that has been done comes largely from the US and reflects the findings from the Whitehall II study. Variations in post-retirement outcomes are most convincingly seen as continuities of status during working life, particularly in the areas of physical health, social and leisure activities, and general well-being and satisfaction.

Policy implications

1. Health and well-being during retirement are determined largely by circumstances during the working life.
2. Involving employees in deciding the timing of their retirement appears beneficial and can improve the transition from work into retirement.
3. Enabling employees to develop and pursue interests outside work before they retire may help new retirees adapt more easily to retirement.
4. Adequate financial provision helps ensure that retirement is a fulfilling and rewarding period of employees' lives.

Key sources

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■ Mein G, Ellison GTH 2003. The impact of early retirement on changing perceptions of life at work and at home: qualitative analysis of British civil servants participating in the Whitehall II Retirement Study. *International Journal of Ageing and Human Development* (under review).

Further information

The Pre-Retirement Association is an independent organisation. The PRA works to enable people to manage change from mid-life onwards and to act as the National Focus for this activity. They work with individuals and organisations. Further details can be found online at: <http://www.pra.uk.com/enter.html>

REACH brings together voluntary organisations and experienced people who want to offer their career skills as volunteers. Further details can be found online at: <http://www.volwork.org.uk/>

Quote 10.1

"That's why I had to get out. ...and when I, by the time I left, I was doing two people's jobs. They weren't pretend jobs, ..., it would have killed me, I think, if I'd stayed trying to do that - because I just didn't feel satisfied just trying to skip over the surface."
(female, professional grade)

Quote 10.2

"...we've got three kids, and my kids are very, very expensive... The children have school, university, and so I can't afford to retire... Financially, we're not able to manage with our commitments."
(male, clerical and support grade)

Source of **Quotes 10.1 and 10.2**: Mein G, Ellison GTH. The impact of early retirement on changing perceptions of life at work and at home: a grounded qualitative analysis of British civil servants participating in the Whitehall II Retirement Study. *International Journal of Aging and Human Development* 2004 (under review).

Summary

The first chapter of this publication showed that even among white-collar civil servants in an affluent country like the UK, those who are less well off have shorter lives and experience more illness than those who are better off. This original research from the Whitehall studies drew attention to some of the most powerful determinants of health in our society. Much original research on these 'social determinants' of health has been conducted through the Whitehall studies and the key findings from this research have been presented in the subsequent nine chapters of this booklet.

In addition to presenting the evidence, each chapter has focussed on the role that different aspects of organisational policy and public policy can play in shaping the social environment at work and outside work in ways conducive to better health. At one time health policy was concerned mainly with the provision and funding of medical care. Research on the social determinants of health has changed this. Policy makers are now increasingly aware that change in the social environment both at work and outside can prevent people from becoming ill in the first place. In addition to increased well-being for the individual, this illness prevention is of direct benefit to the employer, the economy and society.

One area of policy that may appear to have received only very limited coverage in this publication is health promotion messages, which exhort individuals to change their behaviour. While such change is obviously the desired result with regard to certain behaviour, such as smoking, original evidence from

Whitehall and other studies shows that environmental changes are more successful than individual exhortations.

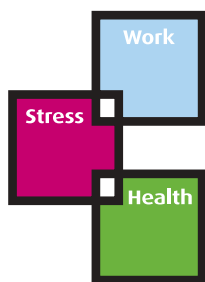
It may also have surprised some readers initially that there was no chapter with the heading 'work stress'. Although everyone feels they know what stress is, it remains an ill-defined term, and is often used loosely even by researchers like ourselves. The lack of a precise definition makes it difficult to measure 'stress' directly. It is for this reason that in Whitehall and other such studies, stress at work is conceptualised and measured using models such as the demand-control model described on page 6. Although the evidence provided by such research is very persuasive and despite some successful compensation claims, stress has not necessarily become an acknowledged part of employees' experience at work. We hope that this publication will go some way towards persuading policy makers to acknowledge that stress is a real issue and a cause for concern.

Many organisations will already have in place policies designed to address some of the social determinants of health that have been discussed in the preceding chapters. However, unless constantly monitored and consistently implemented, even the best policy is worthless. Best practice models, tailored to the needs of the organisation, are needed for reorganising work, work relations and the role of the workplace in the wider community if we are to deal effectively with stress at work and other social determinants of health. In building and implementing these solutions, increased union, management and government co-operation is essential.

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