Risk Assessment for Work-related Stress:

A Development Study With UK Hospital-based Doctors

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Thesis submitted to the University of Nottingham

for the degree of Doctor of Philosophy, October 2000

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ABSTRACT

This thesis describes the development and implementation of a risk assessment strategy to deal with the problem of work-related stress in hospital-based doctors in the United Kingdom. Risk assessment is the initial phase of the risk management approach to work stress, and is followed by the 'translation' phase, risk reduction and evaluation of interventions.

Three case studies were carried out in two National Health Service (NHS) Trusts to explore how standardised implementation procedures and adequate data analysis can be developed to ensure the sound application of the principles of the framework. The case studies were commissioned and funded by the British Medical Association.

The thesis begins by considering the definition of work-related stress and summarising the extent of the problem in terms of its economic and social cost. The new risk management approach is introduced as an alternative research framework that may address some of the shortcomings of contemporary stress research. The background to the case studies is described, and then the assessment methodology and strategy developed for the project are explained in detail. The subsequent chapters report the main results for each NHS Trust, and then illustrate how the assessment data can also be used for research-oriented purposes, such as the development and testing of models.

The final chapter brings together the results and conclusions from the preceding sections and examines them in the light of the wider debates taking place within stress research. The strengths and weaknesses of the risk assessment methodology are discussed, and some possible ways forward are considered that may build on its strengths and address its weaknesses.

Keywords: work-related stress; risk assessment; occupational health psychology; hospital-based doctors; individual and organisational health; self-report data

PREFACE

"The unsatisfactory mental health of working people consists in no small measure of their dwarfed desires and deadened initiative, reduction of their goals and restriction of their efforts to a point where life is relatively empty and only half meaningful"

Arthur Kornhauser, "Mental Health of the Industrial Worker", 1965, p. 270

During my period as an undergraduate psychology student at the University of Nottingham, I became increasingly interested in the area of organisational interventions for the management of work-related stress. For me, this was, and still is, an area in which psychologists can "make a difference". My interest could be summarised in a quote from an editorial written in 1994 by Sven Hernberg for the 20th anniversary special issue of the Scandinavian Journal of Work, Environment and Health:

> "The fact that classical occupational diseases still occur does not automatically mean that more *research* is needed. (...) What it really means is that we have failed to *implement* already existing knowledge".
>
> (Hernberg, 1994, p. 5)

Earlier, in his 1993 report to the British Health and Safety Executive, Prof Tom Cox had summarised the accumulated knowledge on work-related stress and described a risk management framework for organisational-level stress management interventions which could serve to implement that existing knowledge (Cox, 1993). During the 1990s, Prof Cox and Dr Amanda Griffiths led a team of researchers at the University of Nottingham's Centre for Organizational Health and Development (COHD) working on a programme of research and development projects to adapt a general model of risk management to the particular challenge of reducing work stress. The programme was funded by a number of external bodies, including the British

Health and Safety Executive, the Home Office and the British Medical Association (BMA). I joined the team working on the project commissioned by the BMA to address the problem of occupational stress amongst UK hospital-based doctors. The team included Prof. Tom Cox and Dr. Amanda Griffiths, my thesis supervisors, Ms. Margaret Macafee and me. Although on applied projects of this magnitude teamwork is necessary, the present thesis has developed from my own work on the BMA-funded project. All the field work and data analyses presented here were my sole responsibility, and the theoretical and methodological arguments represent my contribution to other projects within the overall programme of risk management case studies, and have been published elsewhere (Cox & Rial-Gonzalez, 2000; Cox *et al.*, 2000a, Cox *et al.*, 2000b,).

The project was designed to develop and evaluate a risk management framework to the problem of work-related stress in hospital-based doctors. Specifically, the project aimed to:

1. Tailor existing risk assessment procedures for work-related stress to the particular needs and situations of UK hospital-based doctors in various environments and specialties

2. Apply those procedures for the assessment of risk to different groups of doctors, drawing conclusions about particular and common sources of risk

3. Evaluate the availability and quality of any existing systems to deal with work-related stress in the assessment groups

4. Feed back and discuss the risk assessments with the groups involved, and explore the nature and practicability of interventions to reduce that risk

5. Describe and monitor those interventions, drawing conclusions about the nature of their implementation and their effectiveness where possible

It was agreed with the BMA that there would be at least two case studies, undertaken sequentially, with the results of each case study being used to inform the design of the subsequent cases. As will be discussed in Chapter 3, the project eventually comprised three case studies, two of which included junior and senior staff within the same National Health Service Trust.

Aims and Focus of the Thesis

The main aims of the thesis are [1] to describe the theoretical background of the risk management framework to work-related stress, and how the framework relates to the more traditional research in this field, and [2] to explore how standardised implementation procedures and adequate data analysis can contribute to the sound application of the principles of the framework.

The thesis focuses on the initial phase of risk management: risk assessment. It would be beyond the scope of a single thesis to cover in detail the entire range of activities encompassed within risk management (see Chapter 2). Furthermore, the risk assessment phase requires careful attention for two main reasons:

First, risk management is a sequential process, and risk assessment is the essential step prior to risk reduction and evaluation, both of which depend fundamentally on the design and results of the assessment phase. In simple terms, this reflects the strategy of first asking and then answering the question. This may seem a statement of the obvious. However, both researchers and practitioners have often failed to carry out a comprehensive and effective assessment of the work environment prior to the implementation of interventions: many off-the-shelf stress management programmes are little more than 'solutions in search of a problem' (Cooper *et al.*, 1996; Cox *et al.*, 2000b), and some practitioners offer "sovereign remedies regardless of the presenting symptoms" (Kahn & Byosiere, 1992). As Briner (1997) has indicated, "it appears that few organizations undertake any kind of valid assessment to first establish whether or not an SMI [Stress Management Intervention] is actually required or to establish the purposes of intervention". It is, therefore, crucially important to "ask the question" –and to ask it in an appropriate way– before answers are offered.

Second, risk assessment is the phase within risk management that differs most from traditional research into work-related stress. There are a number of challenges when trying to adapt a framework which originates in the field of physical[1] hazards to the psychosocial work environment. The process of assessment should be thorough and scientifically sound –not least because it should be defensible before the organisation, the employees and, potentially, the courts. There is a need to develop "good practice" in terms of psychometrics and methodology: the philosophy of the approach dictates the methodology, and both suggest that some statistical analyses and techniques may be preferable or better suited. These issues are explored in the thesis using data from the three BMA case studies.

Structure of the Thesis

Risk management operates in real organisations with real people: risk management initiatives are often driven by the urgent need to make immediate and practical *case* assessments at the level of the workplace or work group. As *an application* of science, risk management faces considerable practical constraints, and has to rely on quasi-experimental designs (Cook and Campbell, 1979) and aim for 'good enough science' (see section 2.4.1). As Kompier *et al.* (2000) put it:

> The hectic organizational arena, rapid changes in companies, and the fact that managers and not scientists rule companies, do make it practically impossible to 'play fully by the methodological rules'"
>
> Kompier *et al.* (2000), p. 385

Despite these constraints, there is a need –for practical, scientific and moral reasons– to *try to* adhere to those methodological rules, as a gold standard to be aimed for: without good scientific evidence, what credibility can researchers and practitioners claim? How can they prove to be different from those who are criticised for seeking to benefit from the 'stress industry' in a less than scrupulous manner?

[1] Throughout this thesis, the term "physical hazards" is used in its wider sense, as opposed to "psychosocial hazards", and includes –among others– chemical, biological and radiological hazards.

In the knowledge that applied science often stretches the existing natural science paradigm to its limits (see Griffiths, 1999), Cox and Griffiths (1996) have outlined four requirements that risk assessments should possess in order to retain a sound scientific methodology:

1 An adequate theoretical framework

2 Reliable and valid measuring instruments

3 Standard implementation procedures

4 Adequate data analysis

This thesis explores how these requirements can be met in practice, using the data from the case studies commissioned by the British Medical Association. Chapter 1 begins to address the first of the above points by considering the definition of work-related stress. It then examines the extent of the problem in terms of its economic and social cost. After identifying some of the shortcomings of contemporary research into work-related stress, the new risk management approach is introduced as an alternative research framework.

Chapter 2 provides an overview of the risk management model as applied to work-related stress. Chapter 3 describes the background to the three risk assessment case studies on whose data the remaining part of the thesis is based. Therefore, chapters 2 and 3 together aim to set the rest of the thesis in its theoretical and organisational contexts and illustrate how the risk management model fulfils the first three requirements set out by Cox and Griffiths (1996) enumerated earlier.

Chapters 4, 5 and 6 explore how the data collected by risk assessments may be analysed in keeping with the principles of the risk management framework and Cox & Griffiths' (1996) fourth requirement. Chapter 4 describes how the psychosocial hazards and likely risk factors were identified for the junior and senior doctors at one of the two National Health Service Trusts involved in the project. The rationale for the analyses is discussed, followed by a summary of the main findings and how they were reported to the Trust.

Chapter 5 describes the use of logistic regression to explore the combination of work characteristics that may predict specific individual or organisational health outcomes. This strategy may be useful when organisations are particularly concerned about certain negative outcomes and would like to target their efforts on the factors that appear to be associated with those outcomes. The chapter discusses the appropriateness of logistic regression for the analysis of risk assessment data, and uses the combined data from the three case studies to illustrate the analytical procedure.

Chapter 6 describes how data analysis can be extended from the identification of 'likely risk factors' to 'likely risk groups', this is, the detection of group criteria that appear to be associated with the report of particularly poor levels of individual or organisational health. These criteria could be bio-demographic data (such as age, gender or tenure), or work- and job-related factors (for example, working in a particular ward or directorate). Thus, the identification of groups that may be particularly 'at risk' can help the organisation to prioritise resources in their direction. Together, chapters 5 and 6 explore how the basic analyses described in Chapter 4 can be extended 'upwards and outwards' to explore relationships across samples (chapter 5) and 'downwards and inwards' to the level of smaller work groups (chapter 6).

This final Chapter brings together the results and conclusions from the preceding chapters and examines them in the light of the wider debates taking place within stress research. The strengths and weaknesses of the risk assessment methodology are discussed, and some possible ways forward are considered that may build on its strengths and address its weaknesses.

In the same editorial in which he called for the implementation of already existing research knowledge, Hernberg also wrote:

> "There are still severe gaps in our knowledge about a great many occupational hazards –especially if we consider the logical chain from risk identification to risk prevention. Filling these gaps is what research is needed for".
>
> (Hernberg, 1984, p. 6)

I hope that this thesis will illustrate how the data from risk assessments can contribute to filling some of those gaps by providing a sound basis for the design of interventions to reduce or eliminate work-related stress.

ACKNOWLEDGEMENTS

First of all, I am indebted to the doctors who gave generously of their scarce time to take part in the case studies described in this thesis. I am also grateful to the management of the two Trusts involved in the project and to the British Medical Association for their co-operation and support. The kind of work described in this thesis would simply be impossible without the active commitment of participants and their organisations.

I would like to thank my supervisors, Prof Tom Cox CBE and Dr Amanda Griffiths, for their guidance, inspiration and encouragement throughout my period as an undergraduate and as a postgraduate at the University of Nottingham.

Particular mention must be made of the members of the team who have worked on the programme of risk management projects at various times: Raymond Randall, Dr Louise Thomson, Dr Claire Barlow and Margaret Macafee, led by Prof Cox and Dr Griffiths. Working with, and learning from, such a talented and friendly group of individuals enriched this thesis beyond what any single individual could have achieved. I would also like to thank all the present and past colleagues at the then Centre for Organizational Health and Development (COHD), now Institute of Work, Health and Organisations (I-WHO), and especially the long-suffering inhabitants of room B9, who have mercilessly kept me going through the write-up period with smiles, chocolates and the occasional insult.

A few personal thanks are also due. First, to my dear friends Rosa Camiña and Mike Vijande. Rosa kept me going with her encyclopaedic knowledge of everything and a veritable cornucopia of classic tunes from Broadway – sometimes, unfortunately, in her own voice. Mike's blatant lack of interest or faith in this thesis drove me more than anything else to complete it. He has long been, as Hart was to Rodgers, "a partner, a best friend, and a source of permanent irritation".

Thanks also to my mother-in-law, Margaret Barker, for her continuous encouragement and support for many years. Her hard work has always been a source of inspiration. To Rosa Rebouras, who was always there with a spot of retail therapy and good humour to ease the pain of statistics; and to my sister Marién who, very thoughtfully and timely, brought little Pablo into the world for me to revise for my developmental psychology exams.

I must give special thanks to my parents, whose hard work, sacrifices and devotion opened up a entire new world of possibilities for me, and have made my life a much easier journey than theirs has been. What I may achieve is to their eternal credit, while my many shortcomings are all my own.

Finally, to my wife Carol: now arguably one of the world's experts in work-related stress after four years of listening to my rants and proof-reading endless drafts. I could not have done it without her. Her love, patience, wit and faith in me have seen me through the last ten years, and will no doubt see me through many more.

PAGE

NUMBERING

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1. INTRODUCTION

This thesis describes the development of a risk assessment framework for work-related stress, focusing on its methodological and statistical aspects. In order to set the framework in its theoretical context, this introductory chapter begins by considering the definition of its subject matter, work-related stress. It then examines the extent of the problem in terms of its economic and social cost. After identifying some of the shortcomings of contemporary research into work-related stress, the new risk management approach is introduced as an alternative research framework.

1.1 A question of definition

The scientific literature on stress has grown dramatically over the last 30 years, and the nature and definition of stress has been the focus of much debate. A comprehensive analysis of the various theories and definitions of stress is beyond both the scope and aims of this thesis. Therefore, I will briefly review the definitions of stress that have been proposed, in order to place the working definition that has been adopted for this thesis in its historical and theoretical context.

Reviews of the scientific literature on stress have identified various approaches to the definition and study of stress (Lazarus, 1966; Appley & Trumbull, 1967; Cox, 1978, 1990; Cox & Mackay, 1981; Fletcher, 1988, Cox *et al.*, 2000a). The 'engineering approach' was probably the earliest attempt at a definition, and conceptualised occupational stress as an aversive or noxious characteristic of the work environment leading to ill health. For example, Symonds (1947) described stress as "that which happens *to* the man, not that which happens *in* him; it is a set of *causes* not a set of *symptoms*". In contrast, the 'physiological approach' defines stress as "a state manifested by a specific syndrome which consists of all the non-specific changes within the biologic system" that occur when challenged by aversive or noxious stimuli (Selye, 1936). Repeated, intense or prolonged elicitation of

this physiological response, it has been suggested, increases the wear and tear on the body, and contributes to what Selye (1956) has called the 'diseases of adaptation'.

Although some contemporary authors still emphasise the physiological aspects of the stress process (e.g., Scheuch, 1996), the engineering and physiological approaches characterise early stress research. Both definitions of stress are now considered to be conceptually dated because they reflect a stimulus-response paradigm that is too simplistic and fails properly to account for individual differences of a psychological nature or to give due consideration to the cognitive processes which make up the stress process (e.g., Sutherland & Cooper, 1990; Cox, 1993). These models treat the person as a passive vehicle for translating the stimulus characteristics of the environment into psychological and physiological responses. They also tend to ignore the interactions between the person and their various environments which are an essential part of systems-based approaches to biology, behaviour and psychology. In particular, they ignore the psychosocial and organisational contexts to work stress.

Partly in response to the perceived shortcomings in the engineering and physiological approaches to stress, contemporary research has generally conceptualised stress in terms of the dynamic interaction between the person and their environment. For this 'psychological' approach, stress is either inferred from the existence of problematic person-environment interactions or measured in terms of the cognitive processes and emotional reactions which underpin those interactions.

Within the psychological approach, two 'families' of theories have evolved: on one hand, the interactional definitions, represented mainly by the Person-Environment Fit theory of French *et al.* (1982) –building on work by Bowers (1973) and Ekehammer (1974)– and the Demand-Control theory of Karasek (1979), expanded by the work of Johnson and colleagues (Johnson, 1989; Johnson *et al.*, 1991) to add social support as a third dimension to the model.

On the other hand, the transactional theories also focus on the person's interaction with their work environment, but are more concerned with the psychological mechanisms underpinning that interaction, specifically cognitive appraisal (the evaluative process which gives emotional meaning to the

interaction with the environment) and coping. For example, Siegrist's model of "effort-reward imbalance" (Siegrist, 1996) argues that stress is experienced as a result of an imbalance between, on one hand, the individual's efforts to perform his or her job, and, on the other hand, low levels of reward for those efforts. The model distinguishes between two sources of effort (*extrinsic*, or situational demands and obligations, and *intrinsic*, the personal motivation of the individual worker) and three "transmitter systems" of rewards: "money, esteem, and career opportunities, including job security" (Peter & Siegrist, 1999). "High cost / low gain conditions" are considered the crucial work-related stressors in this model. Adverse health effects, such as cardiovascular risk, are predicted by the theory to be most prevalent in occupations where situational constraints prevent workers from reducing "high cost / low gain" conditions.

Most transactional models build on the conceptual structures suggested in the interactional models of stress, and focus on the possible imbalance or lack of fit between demands from the environment (broadly defined) and an individual's ability or competence to deal with those demands (e.g., Lazarus & Folkman, 1984; McGrath, 1976; Cox, 1978).

1.1.1 A working definition of 'work-related stress'

This thesis will adopt the definition of work-related stress developed by Cox and his colleagues (Cox, 1978, 1993; Cox & Mackay, 1981; Griffiths & Cox, 1998; Cox *et al.*, 2000a). According to this transactional model, stress can be defined as a negative psychological state which is part of and reflects a wider process of interaction between the person and their environment. Stress arises from the imbalance between perceived demands and perceived resources to cope with those demands. It is worth noting that the term *psychological state* is used to include aspects of both cognition and emotion present in the experience of stress, but does not imply that its antecedents and outcomes are restricted to any particular domain, psychological or otherwise.

Applied to the specific context of work, the experience of stress results from exposure to particular conditions of work, both physical and psychosocial, and the worker's perception of a mismatch between the demands placed upon them by the working environment and the resources (physical, cognitive,

emotional, social, etc.) available to them. The experience of stress is usually accompanied by attempts to deal with the underlying problem (coping) and by changes in cognition, behaviour and physiological function (e.g., Aspinwall & Taylor, 1997; Guppy & Weatherstone, 1997). Although some of these changes are probably adaptive in the short term, they may become maladaptive and threaten health and well-being in the long term.

This is the working definition adopted in this thesis, and its use is supported by the growing consensus around the adequacy and utility of the psychological approach to stress (see, for example, Griffiths & Cox, 1998; Cox *et al.*, 2000a; Cox *et al.*, 2000b).

1.2 The Extent of the Problem

Work-related stress is widely acknowledged as a major challenge for most of the industrialised world in terms of its economic, health, social and political impact (see, for example, European Commission, 2000; Cox *et al.*, 2000a). To take the European Union as an example, the European Foundation's 1996 report on "Working Conditions in the European Union" revealed that 57% of the workers questioned believed that their work affected their health. The work-related health problems mentioned most frequently were musculoskeletal complaints (30%) and stress (28%). Twenty-three percent of respondents said they had been absent from work for work-related health reasons during the previous 12 months. The average number of days' absence per worker was 4 days per year, which represents around 600 million working days lost per year across the EU. The European Commission has suggested recently that "a conservative estimate of the costs caused by work-related stress amounts to some twenty billion euro annually" (European Commission, 2000, p. iii).

In the United Kingdom, it has been suggested that upwards of 40 million working days are lost each year in the UK due to stress-related disorders (Kearns, 1986; Health & Safety Executive, 1990b; Jones *et al.*, 1998). Recent figures published by the Confederation of British Industry (2000) indicate that 187 million days were lost through sickness absence in 1998, an average of 7.8 days per employee. This represents a loss of 3.4% of working

time. Despite a reduction of 0.7 days from 1998 figures, absence from work cost British business £10.5 billion in 1999, an average cost of £438 per worker. The survey shows that minor illness is perceived by employers as the largest cause of absence for manual and non-manual workers, with serious illness and home and family responsibilities also important for manual workers. For non-manual workers, workplace stress was perceived by employers to be the second highest contributor to absence, second only to minor illness.

The 1990 Labour Force Survey for England and Wales suggested that there were 182,700 cases of stress or depression which were caused or made worse by work (Hodgson *et al.*, 1993). In their questionnaire-based survey of the working population of Great Britain, Jones *et al.* (1998) found that 26.6% of the respondents reported suffering from work-related stress, depression or anxiety, or a physical condition which they ascribed to work-related stress. The authors estimated that 19.5 million working days[2] were lost in Great Britain due to work-related illness, of which 11 million were due to musculoskeletal disorders, and 5 million to stress. In an epidemiological survey of 17,000 randomly-selected people in Bristol, UK, Smith and his colleagues (Smith, 2000) found that nearly 20% of their sample reported "very high" levels of stress at work. Those in the top 20% also reported "more frequent exposure to potentially stressful (demanding) working conditions" (p. 297). Although these are self-report data, the study found that the sample in general were in quite good health and did *not* show any strong biases towards reporting a negative health status (for instance, they reported much lower levels of stress outside work than at work). However, such figures must still be treated with caution, since they rely mostly on uncorroborated self-report (Thomson *et al.*, 1998) or tend to be "educated guesses" (Smith, 2000). Other figures which could help provide a general picture in an *oblique* way (such as the number of early retirements on the grounds of ill-health) have to be interpreted with similar caution (Griffiths, 1998).

[2] Days lost per worker were defined as "number of days lost per person who has worked in the last 12 months, including people without a work-related illness".

The situation in the United States is similarly worrying: Sauter & Rosenstock (2000) cite data from the US Bureau of Labor Statistics to suggest that "disability due to anxiety and stress are currently among the most disabling conditions in terms of lost time, averaging about 20 days lost per incident". Moreover, spells of stress-related absence tend to last longer than other health-related instances of absence from work: "the median absence from work for these cases was 23 days, more than four times the median absence for all nonfatal occupational injuries and illnesses. Forty-four percent of occupational stress cases involved 31 or more lost workdays, compared to 19 percent of all injuries and illnesses" (Bureau of Labor Statistics, 1999).

To take Australia as a final example, the Ministry for Industrial Relations estimated the cost of occupational stress to be around A$30 million[3] in 1994 (approximately £13.8 million as of January 1994). The rising costs of work-related stress in Australia are illustrated by a recent study of 126 call centres (Deloitte & Touche, 1999), which revealed that impact of staff turnover and stress on call centre agents is costing organisations that use call centres to conduct business over the telephone a total of A$90 million a year (approximately £33.5 million as of January 1999). They calculated that stress-related absenteeism costs $150 per agent per year –a total cost of A$7.5 million per annum (approximately £2.8 million).

It is worth remembering that most estimates of the cost of work-related stress use narrowly-defined economic parameters. Some ignore the associated costs to the health services (both short- and long-term), and the damage to individual and organisational performance. In 1999, the European Agency for Safety and Health at Work commissioned a report to examine to what extent Member States carried out cost-benefit analyses. The report concluded that:

> "Avoided costs of illness is a common category in estimating the benefits. Reduction of health care costs and the costs of rehabilitation are estimated to a lesser extent. On the whole there is little experience in quantifying effects on productivity and product quality."
>
> (European Agency, 1999, p. 4)

[3] The Australian, June 17, 1994

It is worth remembering that –although less tangible or measurable– the deleterious effects of work-related stress on individuals' lives, families and on society in general are at least as important as purely financial considerations.

1.3 Managing Work-related Stress

Work-related stress is not only an economic and social problem, but also a scientific challenge. The psychological aspects of work have been the subject of study in their own right since at least the 1950s (Johnson, 1996). Research into the nature and effects of the psychosocial work environment has followed a similar trajectory to that of the debate surrounding the definition of stress, moving from an interest in person→environment adaptation, through environment→person [re-]engineering, to a more holistic consideration of the person **x** environment interaction. Initially psychologists concentrated mostly on the obstacles to employees' adaptation and adjustment to the work environment, rather than on the potentially hazardous characteristics the workplace itself may have for workers (Gardell, 1982). Later, with the emergence of psychosocial work environment research and occupational psychology, the focus of interest moved away from an individual perspective and towards considering the impact of certain aspects of the work environment on health. Perhaps as a natural progression, stress has become one of the major foci of research within the emergent discipline of occupational health psychology, and has gradually been placed in the *mainstream* of occupational health and safety, both in the scientific and legislative domains. As part of the conceptualisation of stress as a health and safety issue, a new approach to the problem has emerged which builds upon the framework already used in the field of physical hazard control: risk management and the 'control cycle'.

1.3.1 Risk Management: a framework for dealing with work-related stress

The scientific literature on stress has grown rapidly, particularly over the last three decades, and has produced a large number of papers studying stressors in almost every conceivable work setting and occupation throughout

the industrialised world. However, two major problems remain in contemporary stress research:

First, literature reviews on work-related stress have identified a number of recurrent design and methodological weaknesses: lack of application of theory to practice and/or lack of a framework for practice; interventions as a self-contained action, rather than as a logical step from problem diagnosis; inappropriate measurement of the subjective work environment; absence of meaningful and adequately designed evaluation studies; and failure to consider sensitive and sensible multiple outcome measures (Cox & Griffiths, 1994; Kompier *et al.*, 1998, 2000; Johnson & Hall, 1996; Cox, 1993; Kristensen, 1996; Landy *et al.*, 1994; Kasl, 1986, 1990; House *et al.*, 1986; Cartwright & Cooper, 1996; Israel *et al.*, 1996). This has led to a certain degree of stagnation in the theoretical and methodological development of the field. Many studies have simply identified and listed stressors with no attempt to establish the association between them and effects on health. Others have attempted to use measures of working conditions to predict particular health outcomes, but their focus has often been on the particular health outcome, and the research has been conducted out of theoretical rather than practical interest. Traditional research is generally more concerned with the characteristics shared by different occupational groups than with the problems specific to any particular work group. This has led to a lack of attention to context-specific issues. Moreover, most of the statistical analyses used in such studies have handled data at the level of the individual employee and not at the level of the employee group: this reflects a bias towards dealing with work stress as an *individual* problem.

Second, although our knowledge of the causes, mechanisms and effects of work-related stress has increased considerably, progress on the <u>management</u> of occupational stress (the elimination of its causes or the alleviation of its effects) has been slower. As Cox indicated in his 1993 review, "research into the nature and effects of a hazard is not the same as assessment of the associated risk". Indeed, many published studies would provide data that are too generic to be used for a targeted and effective intervention programme. There are few intervention studies in the literature, and even fewer which try scientifically to evaluate their effects (see, for example, Parkes & Sparkes'

1998 review of organisational interventions). This is also acknowledged by the European Commission in its recent report:

> "One of the cardinal sins in the area of occupational health is to conduct elaborate studies, describing in considerable detail the work-related stress of the employees, its causes and consequences – and then leave it at that. To diagnose, but not to treat and even less to prevent. If this is done it adds insult to injury"
>
> (European Commission, 2000, p. 71).

The risk management approach –already in use in the control of physical hazards– provides a new framework for stress research, and one which is ideally suited to avoid the *cardinal sin* of diagnosis without treatment (Cox & Rial-Gonzalez, 2000). Risk management comprises two inter-related phases, risk assessment and risk reduction. Whereas most 'stress surveys' tend to identify only hazards or only outcomes, the explicit object of a risk assessment is to establish an *association* between hazards and health outcomes, and to evaluate the risk to health from exposure to a hazard. The detailed data gathered during a risk assessment represent –and are designed to be– an ideal basis for an intervention programme. With a sound theoretical grounding and adequate methodologies, risk management may also be able to deal with the weaknesses identified in the literature and alluded to earlier. The next chapter describes the development and characteristics of the risk management approach in more detail.

2. THE RISK MANAGEMENT FRAMEWORK

This chapter provides an overview of the risk management framework as applied to work-related stress, and examines how it differs from more traditional research. It then describes its development from the field of physical hazard control, giving due consideration to the challenges presented by the process of adaptation of the framework to the psychosocial work environment.

2.1 The development of the risk management framework

The previous chapter identified the two major reasons for the impetus to develop an alternative to the traditional approach to stress research: recurrent weaknesses in terms of design and methodology, and the lack of a framework that could provide a sound basis for stressor-reduction interventions in applied settings. The risk management (RM) approach has emerged as an alternative because it differs from traditional stress research in a number of fundamental ways. In order better to appreciate these differences, this section briefly describes the origins of the framework.

Occupational health psychology borrowed the concept of risk management from the field of physical hazard control (Cox & Cox, 1993). The existing general framework for the control of physical hazards is based on the 'control cycle', which has been defined as "the systematic process by which hazards are identified, risks analysed and managed, and workers protected" (Cox & Griffiths, 1996) and comprises 6 steps:

1. Identification of hazards
2. Assessment of associated risks
3. Implementation of appropriate control strategies
4. Monitoring of effectiveness of control strategies
5. Re-assessment of risk

6 Review of information needs, and training needs of employees exposed to hazards

Steps 1 through 5 are recursive and designed to ensure continuous improvement of occupational health and safety at work. Each step can be conceptualised as a further cycle of activities similar to a goal-seeking process as described by Schott (1992).

Cox (1993) suggested that "[this] framework (...) can be extended from the more tangible hazards of work to encompass psychosocial hazards, stress and stress management". 'Psychosocial hazards' have been defined by Cox & Griffiths (1996) as "those aspects of work design and the organisation and management of work, and their social and environmental contexts, which have the potential for causing psychological, social or physical harm". The control cycle would appear to be a suitable model for dealing with work-related stress for three main reasons:

1. The parallels with the control of physical hazards reflect the conceptualisation of stress as a mainstream occupational health and safety issue, providing an integrated framework which could ostensibly accommodate psychosocial hazards as an additional category of hazards to be found in the workplace.

2. Risk management is already a familiar model for most employers, trade unions and organisations across the European Union (EU). This would greatly facilitate the process of assessment interventions in 'real-world' settings and, eventually, the integration of the model into the general health and safety management systems used by organisations.

3. As a systematic and comprehensive approach to assessing the risks within the work environment, the control cycle satisfies current legal requirements in the United Kingdom and the rest of the EU (e.g., Council Directive 89/391/EEC ["Framework Directive"]; European Commission, 1996). The formalised approach required by EU legislation to assess and manage physical hazards (e.g., Council Directive 98/24/EC) is ideally implemented through a problem-solving approach such as the control cycle.

The legal argument is an increasingly important one. European and United Kingdom (UK) health and safety legislation have been broadened to cover psychosocial hazards. The UK's *Health and Safety at Work etc. Act 1974* already defined "personal injury" as "any decrease and any impairment of a person's physical or mental conditions", but psychosocial hazards were not included explicitly in legislation until the 1989 European Commission's *Directive on the Introduction of Measures to Encourage Improvements in the Safety and Health of Workers at Work* (Council Directive 89/391/EEC). This "Framework Directive", as it is often referred to, states that employers should develop "a coherent overall prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors related to the working environment" (*Article 6:2*). Both the Framework Directive and the *Management of Health and Safety Regulations 1992* (Health and Safety Commission, 1192: these represent the transposition of the Directive to UK legislation) make it clear that employers have a legal duty to "make a suitable and sufficient assessment of the risks to health and safety" (*Regulation 3:1*) in order to "decide on the protective measures to be taken" (*Article 9:1*). Furthermore, the European Commission guidance document clearly subscribes to the notion of the control cycle as the favoured approach in its definition of risk assessment:

> "a systematic examination of all aspects of the work undertaken to consider what could cause injury or harm, whether the hazards could be eliminated, and if not what preventive or protective measures are, or should be, in place to control the risks"
>
> (European Commission, 1996 § 3.1).

This legal imperative provides an important incentive for employers to take the need to assess <u>all</u> risks seriously –not least because of the possible adverse publicity, disruption and financial cost of litigation arising from employees' claims.

From a pure science perspective, the 'legal' and 'familiarity' arguments described above may be deemed at worst irrelevant, and at best secondary to academic considerations. However, there is little future for the 'ivory tower' attitude in work-related stress research: The ideal, methodologically strictest research design will be of no use if it never makes the journey from the

researcher's office to the field. If models and hypotheses are not tested in real settings, progress will be stunted and theoretical development arrested. Both for scientific and moral reasons, occupational health psychologists ought to be applied researchers, seeking realistic, 'real world' solutions for 'real world' problems. In such applied settings, the more pragmatic second and third arguments may be just as useful –if not more– than the academic discourse.

Having said that, it is clear that the process of applying the risk management (RM) framework to psychosocial hazards needs to be carefully considered and cannot be merely a point-by-point mapping of existing procedures to deal with physical hazards: psychosocial hazards are different in nature to physical hazards, and there are several practical and theoretical challenges to overcome. The next two sections of this chapter provide a description of the RM framework as applied to work-related stress, followed by an examination of the challenges inherent in the adoption of this model for dealing with the less tangible psychosocial hazards.

2.2 Overview of the Risk Management framework: Risk Assessment + Risk Reduction

Risk management represents systematic and logical problem-solving applied to occupational health and safety. There are a number of models of risk management in the occupational health and safety literature (e.g., Cox & Tait, 1991; Einhorn & Hogarth, 1981; Koopman & Pool, 1990; Lancaster *et al.*, 1999). However, they all operate within the same general framework (based on the 'control cycle', described on page 11) and share some basic characteristics:

- Risk management must have a clearly stated focus on a defined work population, workplace, set of operations or particular type of equipment

- Risk assessment is a crucial first step and should logically inform subsequent risk reduction interventions

- Those interventions must be evaluated using multiple and context-relevant outcome measures

- The whole process has to be actively managed

The model developed by Cox *et al.* (2000b) shares the conceptualisation of RM as a combination of two intimately related phases: risk assessment and risk reduction. The consideration of a thorough initial assessment as essential to the risk management framework is encapsulated in its formulation as a combination of risk assessment followed by risk reduction: RM=RA+RR. Furthermore, two other major phases can be identified: 'translation' (the process leading from risk identification to the design of risk reduction interventions) and evaluation. These four phases are discussed in more detail in the following sections.

2.2.1 Risk assessment

The risk assessment phase comprises five main steps:

1. Identification of **psychosocial and organisational hazards** for specified groups of employees, making an assessment of the degree of exposure

2. Assessment of **harm**, collecting evidence of possible impaired health or well-being in the assessment group or the organisation

3. Identification of **likely risk factors**, exploring the statistical associations between exposure to hazards and measures of harm to identify likely risk factors at the group level, and to make some estimate of their size and/or significance (the qualifier 'likely' is used to indicate that causality cannot be inferred from the methodology and statistical analyses used: see section 2.3.3)

4. Carry out an **Audit of Management Systems and Employee Support** (AMSES). The aim here is to identify and assess all existing management systems both in relation to the control of hazards and the experience of work stress, and to the provision of support for employees experiencing problems

5. Make **recommendations on residual risk**: after taking the AMSES findings into proper account, make recommendations on the residual risk associated with the likely risk factors related to work stress.

The recommendations are fed back to the organisation via its Steering Group. Steering Groups are set up to oversee and facilitate the risk management process, and it is important that they have both authority (to 'make things happen') and credibility (to maintain the sense of involvement for both management and employees). Their composition will vary according to the nature, structure and culture of the organisation, but they should represent the interests of all key stakeholders.

2.2.2 The translation process

With the feedback of the results, the process of 'translation' begins: this term is used by Cox *et al.* (2000b) to describe the progression from a list of likely risk hazards to the identification of a smaller number of more general, *latent* issues that underlie the observed problems. To use a medical analogy, likely risk factors are conceptualised as *symptoms*, and the objective of the translation process is to identify the underlying *organisational pathology* that is manifested through such symptoms. This process reflects the overall philosophy of risk management for work-related stress described earlier in two ways: First, the organisation, not the individual, is considered as the generator of risk. Second, the search for the pathology behind the symptoms emphasises the focus on prevention, not treatment. This is also an important consideration for managers, since it is more cost-effective for an organisation to address the root cause of problems, rather than to continue to treat the recurring symptoms.

2.2.3 Risk reduction

From the translation process, a cost-effective programme of interventions should emerge that targets the maximum number of observed problems [via the underlying pathology] with the minimum number of actions. This is a crucial phase of the process, and one which aims to avoid the *cardinal sin* of

"diagnosis without treatment" against which the European Commission's (2000) report warned.

Stress management programmes have been classified according to three basic principles of intervention (Cox *et al.*, 2000a):

1. Objective: prevention (primary), timely reaction (secondary), or treatment/rehabilitation (tertiary)

2. Agency: organisation, employees or both

3. Target: organisation, employees or both

These three types of programmes are found throughout the scientific literature (see, for example, Murphy, 1988; Cooper & Cartwright, 1997; Dollard & Winefield, 1996; Kompier *et al.*, 1998; Cox *et al.*, 2000a). Although risk management focuses on the organisation as the generator of risk, and has prevention at the core of its philosophy, in reality what tends to happen at the risk reduction phase is that interventions are designed at a variety of levels and usually covering all three 'objectives' as described above: primary, as redesign or re-engineering of work (including systems, technologies, and work organisation); secondary, as, for example, employee training; and tertiary, as treatment and subsequent rehabilitation of employees (often involving the re-focusing or re-marketing of existing support services).

The existing literature suggests that organisational-level, preventative interventions should be preferred to individual-level, palliative programmes (e.g., Burke, 1993; Cox *et al.*, 2000b; Ganster *et al.*, 1982; Shinn *et al.*, 1984; Cooper & Williams, 1997; Ivancevich *et al.*, 1990). However, in the real world the opposite is generally the case: most stress management interventions are individually focused, designed for managerial and white-collar workers and concerned with changing the worker, rather than the work environment. For example, Williamson (1994) found that out of 24 evaluative studies of stress interventions being conducted at the time, 21 focused on the individual, (e.g., stress management programmes, relaxation, etc.) and only 3 focused on change at the organisational level.

This pre-eminence of individual-level interventions is attributed to a combination of financial and political reasons: organisational interventions are

generally perceived by organisations as expensive and more difficult and disruptive to design, implement and evaluate –factors which make them less popular alternatives to secondary and tertiary interventions (Murphy *et al.*, 1992). Kompier *et al.* (1998) offer additional reasons: "the opinions and interests of company management, the nature of psychology, the difficulty of conducting methodologically 'sound' intervention studies and the denominational segregation of stress research". Briner (1997) has also noted that 'primary' interventions are the least popular, and has suggested that "in an organizational context [...] changing the nature of the job or the organization may be considered more daunting and complex than simply buying-in some of the other types of interventions".

This may be a reflection of the nature and influence of management views in some countries. Surveys in the United States among management and union groups have revealed clear differences in their views of stress (for example, Singer *et al.*, 1986). Whilst managers emphasise individual (secondary and tertiary) interventions, seeing personality, family problems or lifestyle as being prominent sources of stress, trades unions consider social and organisational factors, such as job design and management style, as being both more responsible for stress problems and more suitable targets for intervention. Dollard & Winefield (1996) suggested that "the politics involved in conceptualizing the stress problem and in recognizing psychological disorder as a leading occupational health issue in Australia has impaired advances towards its prevention and treatment and the status of occupational stress as a national policy issue". It has been suggested that in Scandinavia, where responsibility for working conditions tends to be shared more equitably between labour and management groups, organisational approaches to stress management are generally more common than elsewhere (Landsbergis, 1988). The dominance of management views, particularly in the United States, has contributed to the development of Employee Assistance Programmes (EAPs) and stress management training for individuals ahead of –and sometimes instead of– stressor reduction interventions.

This combination of factors has produced a fertile ground for an ever-growing industry of commercial organisations offering 'stress management programmes'. Such programmes could be characterised as "solutions

looking for a problem": they tend to offer top-down, off-the-shelf interventions without a prior analysis or diagnosis of the problem. They invariably target the individual, are seldom based on research findings or scientifically evaluated studies, and almost never attempt to evaluate their effects and, therefore, justify their cost to organisations. As a result, to avoid surprises later in the process, it is often necessary to ensure from the beginning of the risk management cycle that the expectations of the organisation (including members of the Steering Group) are *steered away* from the prevailing culture of looking for a politically non-threatening 'quick fix'.

2.2.4 Evaluation

The evaluation phase has a dual purpose and, like Janus, could be said to face both fore and aft: Its objectives should be to evaluate the effectiveness of the interventions carried out, and –bearing in mind the cyclical nature of risk management– also to feed its conclusions forward into the next process of assessment and reduction of risk. In this later respect, the evaluation process should be considered as a super-ordinate phase, including a critical appraisal of the success or otherwise of all the preceding phases of risk management, in terms of both the outcomes and the process.

Evaluation has been defined by Nutt (1981) as the measurement of the degree to which objectives have been achieved, and by Green (1974) as the comparison between an object of interest and a related standard of acceptability. In contrast to basic research, evaluation implies and requires from the outset criteria and procedures for making judgements of merit, value or success. This requirement to bear in mind the evaluation phase early on, at the assessment and translation stages, can be summarised in the exhortation to "design to evaluate", this is, [1] the assessment phase should be designed to provide some baseline data, and [2] the interventions chosen should be designed and implemented in such a way that makes them amenable to scientific evaluation.

An ideal evaluation strategy would fulfil three main purposes: First, to ask whether the programme is effective; specifically whether the programme objectives are being met. Second, to determine the efficiency or comparative effectiveness of two or more programmes or methods within a programme.

Third, to assess the cost-benefit relationship or the cost-effectiveness of the programme.

Many authors (e.g., Murphy *et al.*, 1992, Kompier *et al.*, 1998; van der Hek & Plomp, 1997) have suggested that evaluations should include cost-benefit analyses and assessments of employee satisfaction, job stressors, performance, absenteeism and health status. However, they rarely do so: despite a burgeoning literature on the subject, the relative effectiveness of stress management interventions has been difficult to determine, mostly because of methodological deficiencies inherent in much of the relevant research (e.g. Briner, 1997). For example, van der Hek & Plomp (1997) reviewed 342 scientific papers on stress management interventions, and found that only 37 referred to some kind of evaluation research, of which 7 were 'evaluated' on the basis of anecdotal comments from participants.

Cost-benefit analysis (CBA) has recently been gaining ground in the field of occupational health and safety: CBA is a technique for evaluation of the total costs and benefits in monetary units at the level of society or of a specific project. CBA compares the prevention costs with the benefits (i.e. reduction in corrective costs plus additional gains). The European Agency reports that, at both national and enterprise level, the assessment of the economic impact via CBA is becoming "one of the standard pieces of information considered in political decision-making" (European Agency, 1999) as both a scientifically-valid evaluative technique and a useful tool to convince reluctant organisations of the (multiple) 'bottom-line' benefits that risk reduction interventions can accrue. Nevertheless, it is still the case that very few published stress reduction interventions present these data (e.g., Kompier *et al.*, 2000).

2.2.5 Summary

Section 2.1 has described the structure and logic of the risk management process, based on the 'control cycle'. Most risk management models for occupational health and safety also share a number of basic characteristics and are implemented according to a set of guiding principles (see page 14). Figure 1 below offers a diagrammatical representation of the framework of

risk management for psychosocial hazards used to guide the assessments presented in this thesis.

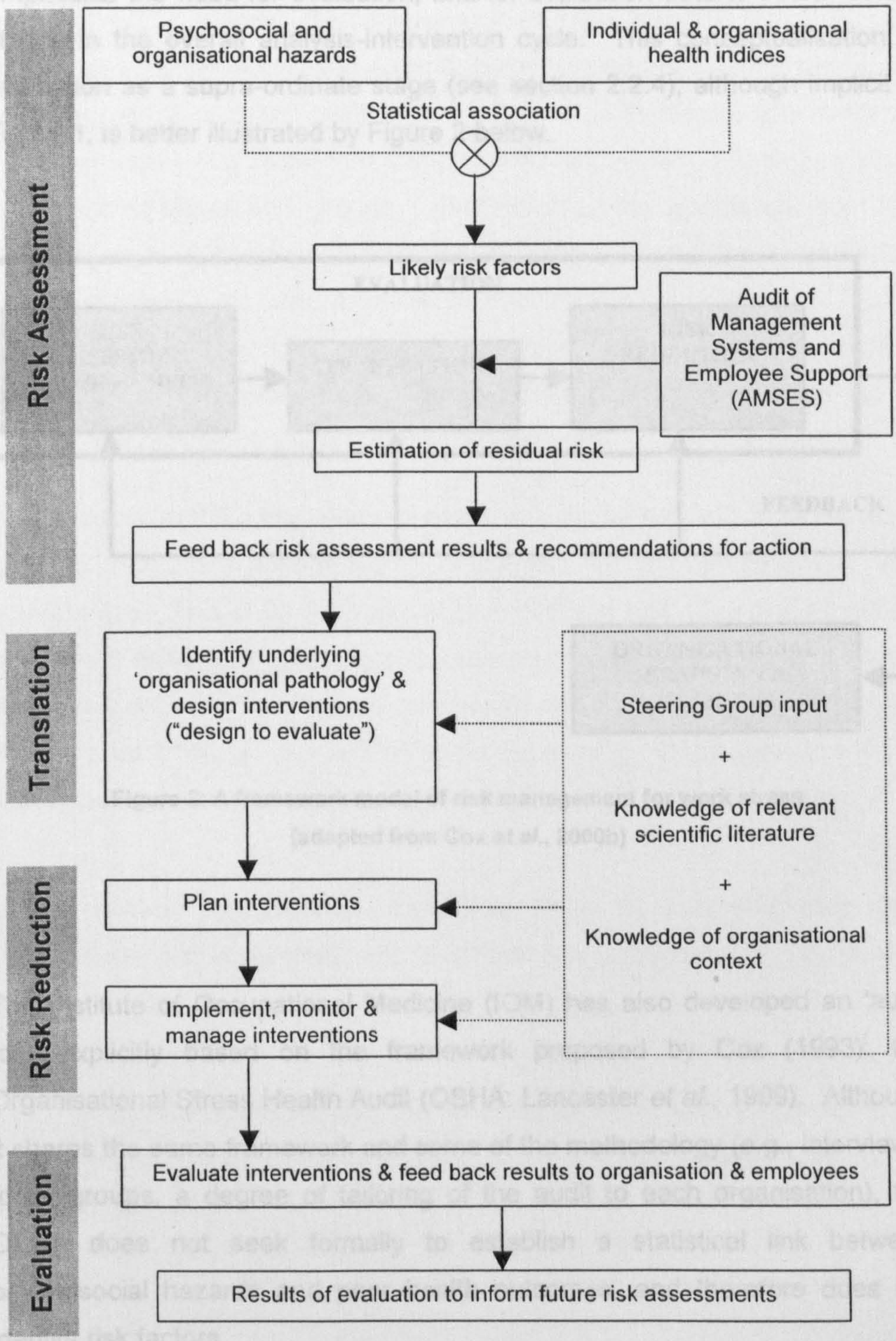

Figure 1: The risk management framework

The "Intervention Effectiveness Research" team at the USA's National Institute for Occupational Health and Safety (NIOSH), working as part of its

National Occupational Research Agenda (National Institute, 2000), are developing a framework with a similar philosophy. The NIOSH team also emphasise the need for evaluation, and for evaluation data to inform earlier stages in the overall analysis-intervention cycle. This conceptualisation of evaluation as a supra-ordinate stage (see section 2.2.4), although implicit in Figure 1, is better illustrated by Figure 2 below.

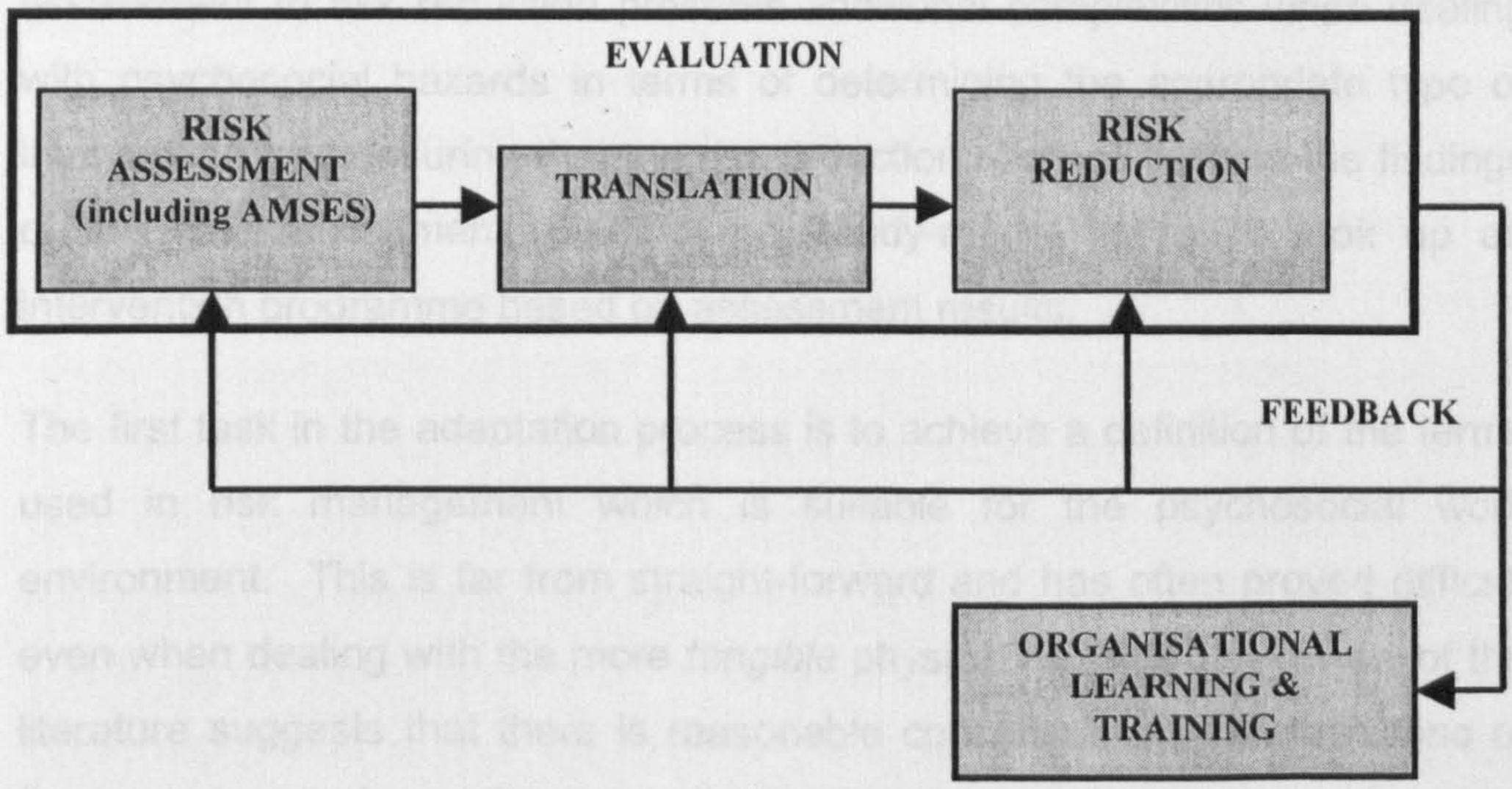

Figure 2: A framework model of risk management for work stress (adapted from Cox *et al.*, 2000b)

The Institute of Occupational Medicine (IOM) has also developed an 'audit tool' explicitly based on the framework proposed by Cox (1993): the Organisational Stress Health Audit (OSHA: Lancaster *et al.*, 1999). Although it shares the same framework and some of the methodology (e.g., interviews, focus groups, a degree of tailoring of the audit to each organisation), the OSHA does not seek formally to establish a statistical link between psychosocial hazards and poor health outcomes, and therefore does not identify risk factors.

2.3 Risk assessment: Definitions

As suggested in section 2.1, the development of the traditional risk management framework (i.e., focused on physical hazards) into a process that targets psychosocial and organisational hazards is a challenge from a scientific and a practical point of view: It must both remain a scientifically sound approach and be tailored to the specific needs and context of particular work organisations and groups. Furthermore, the translation from risk assessment to risk reduction presents additional complexities when dealing with psychosocial hazards in terms of determining the appropriate type of intervention and ensuring that the risk reduction strategy reflects the findings of the risk assessment: there is no 'ready-made' matrix to look up an intervention programme based on assessment results.

The first task in the adaptation process is to achieve a definition of the terms used in risk management which is suitable for the psychosocial work environment. This is far from straight-forward and has often proved difficult even when dealing with the more *tangible* physical hazards[4]. A review of the literature suggests that there is reasonable consensus on the definitions of the basic terminology. For example, the EU Member States have agreed on "accepted and practical" definitions for the following fundamental terms:

> *Hazard*: The intrinsic property or ability of something (e.g. work materials, equipment, work methods and practices) with the potential to cause harm.
>
> *Risk*: The likelihood that the potential for harm will be attained under the conditions of use and/or exposure, and the possible extent of the harm.
>
> (European Commission, 1996, §1.2)

Hurst (1998) has offered similar definitions: "Hazard: the situation or object that in particular circumstances can lead to harm, i.e. has the potential to cause harm [...] Risk: the probability that a particular adverse event occurs

during a stated period of time". Although these definitions are acceptable at a basic level and as a guideline for employers, from a scientific perspective there is a danger of stretching the parallel too far when the need arises to operationalise those definitions in the psychosocial work environment. The meaning of hazard, harm and risk in the psychosocial environment are explored below.

2.3.1 Hazard

It is not possible to establish an exact conceptual or practical symmetry between physical and psychosocial hazards. For instance, exposure to specific levels of radiation is known to be an indisputable risk to *every* worker's health, while one can be quite certain that other substances are safe for *everyone*. However, it is not obvious that such statements can be made with any confidence for most psychosocial hazards. Moreover, could *anything* within the work environment be a potential psychosocial hazard? There remain some doubts as to whether the above definition of 'hazard' would include some characteristics of the work environment such as "broad corporate policies: paid leaves of absence, promotion, health insurance coverage, etc." (Landy *et al.*, 1994). If not, what aspects of work could never be hazardous, and why? The answer can only be obtained from a combination of the evidence provided by empirical data and the expected effects derived from tested theoretical models. Monitoring of hazards also needs to be an ongoing process: the work environment is experiencing a radical transformation, and new risks are likely to arise from this "changing world of work" (Cox *et al.*, 2000a), especially in relation to new working systems (such as "lean production" practices), new technology, and new organisational structures and employment practices (outsourcing, self-employment, subcontracting, 'precarious work', etc.). For instance, there is accumulating evidence from the USA and Finland that incidence of sick-leave absence, trauma and musculoskeletal- and stress-related disorders increases among the survivors of downsizing (Cox *et al.*, 2000a).

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[4] See, for example, the Internet-based project sponsored by the Organization for Economic Cooperation and Development to harmonise the definitions of the basic generic and technical terms involved in the risk assessment of chemical hazards (Organization for Economic Cooperation and Development, 2000)

The research corpus is still developing in these areas (e.g., see Rosenstock, 1997), but there is some preliminary evidence that even changes which may be thought to *enhance* the work environment can produce the opposite effect. For example, Windel (1996) studied the introduction of self-regulating team work in the office of an electronics manufacturer. Although self-regulated work may be a source of increased self-efficacy and offer enhanced social support, Windel found that after 1 year work demands had increased and well-being decreased when compared to baseline data. The data suggested that the increase in social support brought about by self-regulating teams was not sufficient to counteract increased demands caused by the combination of a reduction in the number of staff and increases in managerial duties. Meta-analytical studies have also shown either mixed consequences (Bettenhausen, 1991; Windel & Zimolong, 1997) or higher rates of absenteeism and staff turnover (Cohen and Ledford, 1994) as a result of the implementation of team work or self-regulated work. It is clear that changes which have such a profound impact on the way organisations operate may carry associated potential hazards that need to be monitored for their impact on health and well-being.

Similarly, many psychosocial hazards can be conceptualised as part of a continuum that is represented by "psychosocial hazard" at one end and "salutogenic factor" at the other (e.g. from *very low* to *very high* decision latitude), or an inverted "U-shape" distribution where the "happy medium" may be health- or performance-enhancing but the extremes may have negative consequences (e.g., task variety). However, physical hazards such as asbestos would seem to be negative *per se* and lacking a potential salutogenic role (even its absence would not be health-enhancing, but merely neutral).

Finally, some psychosocial aspects of work –which can be hazards on their own right (e.g., job control)– can, in fact, act as moderators and buffer the effects of other job characteristics (e.g. workload). This is related to another specific characteristic of psychosocial hazards, this is, that they are usually contingent upon the individual's appraisal, encompassing both cognitive and emotional elements: radiation is harmful whether one is aware of its presence or its effects, whereas role conflict can only be said to be a harmful characteristic if the individual is aware of it and perceives it as a threat or a

problem (primary appraisal), and considers that his or her attempts or resources to cope are inadequate (secondary appraisal: Lazarus, 1966).

2.3.2 Harm

A potential hazard becomes a risk factor when it is demonstrably associated with harm to individual or organisational health. The concept of 'organisational health' has been developed over the last decade from the perspective of a systems approach. The term is usually defined by analogy with individual health: it refers to the condition of the organisation in the same sense that 'individual health' refers to the general condition of the person. Healthy individuals and healthy organisations are those which are 'fit-for-purpose', thriving and able to adapt in the longer term (Cox & Thomson, 2000). Just as the health of the individual has been defined in terms of their condition of body, mind and spirit, the health of the organisation can be conceptualised as "the general condition of an organisation, its structure and function, management systems and culture" (Smewing *et al.*, submitted). This is the definition of organisational health adopted for this thesis. A variety of indicators of organisational health are used in occupational health psychology, such as absence behaviour, turnover, intention to quit, team climate, and so on. Following the analogy with individual health, these indicators are conceived as 'symptoms' of organisational health (or pathology).

In order to categorise "the extent of harm" referred to in its definition of risk, the European Commission's guidance document suggests the following range of outcomes (European Commission, 1996§ 4.8.3):

- Minor damage
- Non-injury accident
- Minor injury (bruise, laceration)
- Serious injury (fracture, amputation, chronic ill-health)
- Fatal
- Multiple-fatality

It would not be a simple task to achieve a consensus on a hierarchy of degrees of psychological (or organisational) harm similar to that which is more easily available for physical harm. Defining and measuring harm can be difficult in both the physical and psychological domains. For example, the debate surrounding musculoskeletal disorders (MSDs) illustrates how the diagnosis of physical harm is sometimes controversial. In fact, despite the vast literature on the subject and the agreed need for specific and sensitive clinical diagnostic criteria for MSDs, such criteria do not yet exist in the European Union. As Buckle & Devereux (1999) point out, "clinicians and researchers have relied upon different bodies of knowledge to justify the criteria used".

Moreover, a number of studies (Landy *et al.*, 1994; Kasl, 1987, 1990; Johnson, 1996) have identified the difficulties encountered when researchers and practitioners have to decide on what indicators of both physical and psychological well-being they should use:

> "In a scenario which repeated itself over and over, a particular approach was seen as pretty reasonable for surveillance of injuries, somewhat useful for a narrow band of work-related diseases, but inadequate for the intended broader spectrum of such diseases, and by implication inestimably useless for surveillance of psychological disorders".
>
> (Landy *et al.*, 1994)

It is clearly not just a matter of agreeing on what the appropriate indices are (individual health or organisational functioning? Both? Why? Should the selected indices take into account the culture of the organisation and/or occupational group, or should the culture itself be an index of organisational healthiness?). It is arguably *more* difficult to find reliable and valid sources of information for such indices: Psychiatric diagnoses, treatment and care-seeking records, symptom checklists, indices of functional effectiveness, 'positive mental health' measures, indicators of 'quality of life', health-related behaviours, employers' and trade unions' records (where they exist at all), data on take-up of occupational health services, and data on compensation and litigation are all either seriously or fatally flawed due to self-selection,

recording and reporting problems, complex operationalisation, or confounding variables (Cox & Rial-Gonzalez, 2000).

To be fair, these difficulties also arise in the risk assessment of physical hazards: for instance, organisational records are often inaccurate; companies or individuals are unwilling to report illness, accidents or "near-misses" which may reveal possible deficiencies in their control systems or illegal practices, etc. However, the problems for psychosocial hazards are compounded by the difficulties intrinsic to monitoring outcomes which are less perceptually obvious than physical injuries or fatalities. What is required for a sound risk assessment is the identification and quantification of outcome measures associated with, or diagnostic of, poor individual and organisational health. The existing scientific literature should guide this process of outcome selection, and good psychometric practice can help with the correct operationalisation of these measures. Chapter 3 describes the outcome measures used with the samples studied in this thesis, illustrating how such measures should be context-sensitive (in this case occupation-sensitive) and how data from previous studies and from the general population can be used to establish criteria for 'caseness' (i.e., guidelines according to which continuous assessment data can be usefully divided into harm / non-harm categories).

2.3.3 Risk and causality

Risk was defined earlier as "the likelihood that the potential for harm will be attained under the conditions of use and/or exposure, and the possible extent of the harm". The elusive, intangible nature of psychosocial hazards contributes to making *causal* relationships between hazard and harm considerably more difficult to establish than between physical hazards and harm.

The debate on the scientific criteria required to establish a cause-effect relationship between two events has a long history –one could say that it is as long as scientific inquiry itself. Causality is clearly an important concept for stress management interventions, but its real and practical meaning with regard to risk assessment is sometimes confused. This section will try to

summarise the evolution of the concept of causality and then examine how it applies to the risk assessment for psychosocial hazards.

Briefly, the history of causality can be divided into two eras: The first starts with Aristotle, who, in his *Metaphysics* (trans. 1993) defined four distinct types of cause: material, formal, efficient, and final. It ends with Hume (1748/1984), who proposed his classic rules of efficient causality (co-variation, temporal precedence and internal validity). That these disquisitions about causality were meant as purely metaphysical debates becomes clear if one tries to devise an *empirical* test for Aristotle's types of cause (except for "efficient cause", whose meaning is most similar to the modern definition of cause).

Although an empiricist, Hume was still concerned with conceptual issues. The rise of empiricism shifted the emphasis from the conceptual to the concrete. It was not until John Stuart Mill that attention was paid to the practical problem of implementing those concepts. Mill (1843/1970) is probably the first philosopher to posit a wholly empirical definition of causality. His four general methods for establishing causation are:

1. The method of concomitant variation ["Whatever phenomenon varies in any manner, whenever another phenomenon varies in some particular manner, is either a cause or an effect of that phenomenon, or is connected with it through some fact of causation."]

2. The method of difference ["If an instance in which the phenomenon under investigation occurs and an instance in which it does not occur, have every circumstance in common save one, that one occurring in the former; the circumstances in which alone the two instances differ, is the effect, or the cause, or an indispensable part of the cause of the phenomena."]

3. The method of residues ["Subduct from any phenomena such part as is known by previous inductions to be the effect of certain antecedents, and the residue of the phenomena is the effect of the remaining antecedents."]

4. The method of agreement ["If two or more instances of a phenomena under investigation have only one circumstance in common, the

circumstance in which alone all the instances agree, is the cause (or effect) of the given phenomenon."].

Mill opened the second era in the history of causality, which extends to the present time: all modern experimental designs are based to some extent on one or more of his four "methods". Of course, both the definition of "cause" and the "way of knowing" whether X and Y are causally linked have changed significantly over time. Some philosophers deny the existence of "cause" altogether (taking Hume to its ultimate conclusion) and some philosophers accept its existence but argue that it can never be known by empirical methods. Some contemporary scientists and philosophers of science, on the other hand, define causality in specific circumstances. For instance, the probabilistic causality proposed by Suppes (1970) is defined for a limited setting. Suppes infers that X causes Y if the following two conditions are satisfied:

1. $P(Y \mid X) > P(Y \mid \sim X)$

2. $P(Y \mid X \text{ and } Z) \sim= P(Y \mid \sim X \text{ and } Z)$

   [where X and ~X denote the occurrence and non-occurrence of X respectively].

The first criterion ensures that the probability that Y will occur given that X has occurred is greater than the complementary probability that Y will occur given that X has not occurred. The second criterion ensures that X and Y are not asynchronous co-effects of Z. Similarly, "Rubin causality" (named after Donald B. Rubin; e.g. Rubin, 1974) is defined in the limited context of an experimental milieu: under Rubin causality, any relationship demonstrated in an experiment (where the units of analysis are randomly assigned to experimental and control groups) is a valid causal relationship; any relationship that *cannot* be demonstrated in an experiment is *not* causal. The fundamental dilemma of causality, according to Rubin, is that if we use an experimental unit (e.g., a patient to prove the effects of a new drug, or a work group to prove the effects of leadership training) to show that "X causes Y," we cannot use *that same* unit to show that some "non-X does not cause Y." The usual solution to this dilemma is to assume that all such units are more or less the same. This, for example, allows us to treat one patient with the drug

and another with a placebo, or to divide two groups into training and non-training. To ensure that the two units are virtually indistinguishable, researchers randomly assign them to the treatment and non-treatment groups. Since random assignment is impossible or unfeasible in some situations, Rubin suggests that certain variables (e.g., race; genetic disorders) cannot be "causes" as defined in this context.

In the field of epidemiology, often close in its methods to occupational health psychology, Rothman (1986) has defined a cause as "an event, condition, or characteristic that plays an essential role in producing an occurrence of the disease." Sir Austin Bradford Hill (1966; 1971) effectively set the standard for causality in clinical trials. Building on Rothman's and Hill's work, Johnson & Hall (1996) have summarised the six criteria that epidemiology has traditionally expected to be met before an association can be considered "causal":

1. Temporal sequence: cause must precede effect

2. Consistency: the repeated observation of an association in independent studies

3. Strength of association: large associations are considered less likely to be spurious. Weaker associations are more likely to be explained by undetected biases

4. Biological gradient: an observable dose-response (or 'exposure-response') relationship, in terms of intensity, frequency, or duration

5. Specificity of effect: the association of a single risk factor with a specific health effect. This criterion can be interpreted and applied too simplistically, and has lately fallen into disrepute (Rothman (1986) referred to it as "useless and misleading" as a criterion for causality).

6. Biological plausibility (also referred to as "coherence of evidence"): an association must be consistent with the natural history and biology of disease

Where do these definitions of causal inference leave risk assessment as a method to establish a link between a psychosocial or organisational hazard

and an instance of harm? Even if we accept that causation *can* be proved, and if we limit ourselves to certain criteria within a given field of study (e.g., epidemiology's criteria as defined by Johnson & Hall), the accepted standard of proof in the natural sciences is exceedingly difficult to meet in risk assessment: One only needs to apply most of the criteria identified above to some hypothetical relationships and consider the differential effort required to prove the effects of asbestos or radiation on an individual's health, and those of most of the psychosocial hazards mentioned earlier –see, for example, Theorell & Karasek (1996), Kristensen (1996) or Kasl (1996) for an overview of the literature accumulated over more than 15 years on the effects of job strain on cardiovascular disease.

The point here is, quite simply, that risk assessment does not attempt to establish causality. This does not mean that researchers in this field should renounce the search for a causal link, but this is not the aim of risk assessment case studies. Indeed, this is not the purpose of risk assessment for physical hazards either: the hazardous nature of certain physical aspects of the work environment is investigated elsewhere (epidemiology, occupational medicine, etc.). Risk assessments try to identify specific instances of the existence of those hazards in a given work environment, and to estimate the likelihood (risk) of harm arising from those hazards for a specific group of employees at a given point in time.

Some authors (e.g., Rick & Briner, 2000) seem to take the parallel between physical and psychosocial risk assessment too literally, and expect the latter to be able to assess the *precise* probability of one factor, or group of factors, leading to the occurrence of another:

> "With a physical hazard, such as a toxic chemical, risk can be assessed by taking into account such factors as how the chemical is stored, who has access, what are the handling procedures, how up to date is training, how well are procedures adhered to, how many people are close to it at any one time and what are the existing protective measures (...). For psychosocial hazards the task seems far more complex."
>
> (Rick & Briner, 2000, p. 312)

It would be naïve to expect risk assessment for psychosocial hazards to achieve such predictive power or to operate at such an apparently precise level. A study by Kang *et al.* (1999) in the physical hazards field illustrates these conceptual and practical differences in dealing with physical and psychosocial hazards. They examined the usefulness of an *automatic hazard analyser* (AHA). This AHA system performs hazard analysis in terms of both functional failure and variable deviation in the search for possible causes of accidents. The result of analysis provides a pathway leading to an accident, and, therefore, gives not only clear understanding of the accident, but useful information for hazard assessment. Kang *et al.* applied AHA to the feed section of an olefin dimerization plant, and the system performed better than traditional qualitative hazard analysis methods. It is unlikely that the assessment of psychosocial hazards would ever reach a stage that would permit the use of an expert system such as that described by Kang *et al.* The risk assessment described in this thesis does not attempt to *predict* harm based on exposure data. It is, in this sense, *ex post facto* because risk is induced from empirical data on exposure and harm, rather than deduced from probabilistic *a priori* models.

2.4 Adapting the risk management framework

It should be clear by now that what is proposed here is an adaptation of the physical risk management framework to psychosocial hazards, not an exact reproduction of the process. In any case, as indicated in section 2.2, there is not a single "risk assessment" methodology for physical hazards that could be *cloned*, but a family of methods that share the same basic principles: it is those principles that need to be adapted. Precisely because of some of the inherent differences between the psychosocial and physical work environments, one cannot expect the processes to be mirror images of each other, nor is it appropriate to judge them according to identical criteria.

2.4.1 The purpose of risk assessment and the role of theory

In order properly to evaluate the feasibility of risk assessment for psychosocial hazards, its nature and purpose must be made clear: To

reiterate, the demonstration of a *causal* link between exposure to a hazard and the occurrence of harm for a particular sample is not the stated object of risk assessment, and neither can it be the expected outcome of real-world assessments carried out in or by organisations: experimental *research* seeks evidence for causal relationships; risk *assessment*, in the epidemiological tradition, looks for associations and patterns of exposure/harm within given samples. The data from risk assessments cannot generally go beyond the level of statistical association, and therefore cannot claim to demonstrate causal inference in the manner described earlier: hence the label "likely risk factors". Applied researchers in this field have to be realistic and accept that the aim of an assessment is not to be perfect, but to be 'good enough' to warrant intervention and, hopefully, improve working conditions (Cox *et al.*, 2000b).

Despite these limitations, it is clear that *assumptions* about cause and effect are made by researchers and practitioners –otherwise it would not make sense to target the likely risk factors in order to reduce the degree of harm. These are, however, *informed* assumptions, based on theory and on the scientific literature (in the same way that risk assessments for physical hazards seek to detect the presence of radiation or asbestos, but do not aim to establish their capacity to cause harm). In this sense, theory guides assessment in a variety of ways (for example, identifying the hazards that ought to be investigated, and how they may be inter-related). However, theory is more than just a guiding framework, and can help the development of risk assessment in two important respects:

First, the combined knowledge provided by scientific theory and literature, by the familiarisation with the organisational context during the assessment phase, and by the expertise of the 'subject matter experts' (Steering Groups and employees in general), can provide considerable explanatory power, which may go some way towards offering plausibility, if not causality. For instance, the verisimilitude of a particular pattern of hazard/harm relationships identified during an assessment is strengthened if such a pattern has been previously identified in the scientific literature, or if it can be hypothesised on the basis of contextual knowledge[5]. This combined knowledge (represented

[5] The existence of a mechanism or 'effect pathway' is an essential prerequisite to establish causality –a point often made, for instance, in connection with the alleged predictive power of astrology: even if a strong association is found between birth sign and athletic prowess (the controversial "Mars effect", e.g. Ertel &

by the dotted-line box in Figure 1, page 21) represents a source of corroborating evidence or triangulation (Kristensen, 1996; Cox *et al.*, 2000b). In practice, the feedback from Steering Groups often goes beyond simple support for the face validity of the assessment results, and points towards underlying causal mechanisms and possible angles for intervention. Using the rich knowledge present in the organisation is one of the major advantages of a participative and grounded approach.

Second, risk assessments are, by their very nature, almost always 'time-urgent' and rely on cross-sectional data. One of the criticisms often levelled against such data is that they make it impossible to decide the direction of any postulated cause-effect relationships ("correlation does not imply causation"). It is also the case that most studies use self-report to identify both stressors (or 'exposure') and strain (or 'harm'). Although constraints in terms of time, resources or access often make this the easiest, or only, alternative, it is methodologically highly undesirable and has been described as the "triviality trap" (Frese & Zapf, 1988; Kasl, 1987). If additional, independent methods of measuring job strain cannot be found or used, one has to acknowledge the limitations of the study and guard against making claims about causal relationships. Longitudinal studies can be better suited to rule out third variable explanations and reverse causation but, in practice, this power is often not realised (see Zapf *et al.*, 1996, for a review).

As stated before, risk assessments (whether for physical or psychosocial hazards) do not aim to establish causal relationships. There are, however, a number of strategies to try to add plausibility to the existence of a substantive relationship between the two sets of measures. It is here where theory can also play an important role when trying to rule out 'reverse causation' (i.e., a variable conceptualised as the outcome being, in fact, the cause) in some instances. For example, there is currently no theory to explain how an outcome measure such as high alcohol consumption, or high scores on the General Health Questionnaire GHQ (Goldberg, 1972), could *selectively* influence scores on some –but not all– evaluations of the work environment. There are, however, well-developed theories to allow us to posit mechanisms by which some hazards and some measures of harm may be related –in fact,

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Irving, 1996), a cause-and-effect relationship is difficult to believe in the absence of a plausible ['rational'] mechanism.

failure to find such a relationship may therefore be seen as surprising and requiring further or alternative explanation, e.g. the lack of association between social support and mental health (Borg & Kristensen, 1999).

This is, of course, not sufficient definitely to assert that the effect runs in one direction: the *current* absence of such a theory does not mean that it will not be developed in the future. Additionally, there could still be alternative explanations –such as third variables (hidden or multiple causation), spurious effects, negative affectivity (Watson & Clarke, 1984) or dispositional optimism (Scheier & Carver, 1985)– which cannot be easily ruled out without further investigation. As Sorahan (1998) as indicated, "any epidemiological finding may have one or more of the following explanations: causal relationship, bias, confounding and chance". The potentially most fruitful strategy is –whenever possible– to look for, and discard, "plausible rival hypotheses" (Campbell, 1994) using converging and diverging evidence.

Nevertheless, risk assessment cannot be treated as a 'black box' exercise: it is worth remembering that the variables under study, if measured appropriately, are not unmeaning statistical entities, but possess meaning that should be considered when trying to determine a *logically* sound causal pathway: in other words, if an association is found between, say, ethnic origin and academic attainment, proving that the former *causes* the latter, or exploring whether they are both related via other variables, are empirical endeavours, but it would be difficult to justify logically how the latter could cause the former.

Moreover, building upon this 'appeal to meaning', psychosocial risk assessment can be developed in a variety of ways to help elucidate the relationships between hazards and harm. One such strategy is described in Chapter 6, which illustrates how the further analysis of assessment data to identify "likely risk groups" can strengthen the case for a causal relationship. For example, if the majority of doctors from a particular department or grade report lack of sleep or excessive alcohol consumption, it would seem unlikely that reverse causation can operate, so that excessive drinkers or poor sleepers somehow gravitate towards a given department or self-select into a particular occupation. (Although the "drift hypothesis" has been put forward (e.g., Creed, 1999) to suggest that people with poor health end up in "bad" or

stressful jobs –or worse positions within their organisation– because of their sickness absence record or unemployment. This would be a mechanism for a health→ stressor causal relationship. However, there is no empirical evidence to support it, and it would only be applicable if it could be proven that the job or position in question is a kind of *room 101* to which only those who have no other choice are consigned, rather than, for instance, the difference between a naturally busy and unpredictable "accident & emergency" department and a maternity ward with reasonably predictable patterns of work).

Semmer *et al.* (1996) have advanced a similar argument, and described a strategy to test it, with their concept of 'shared job strain':

> "This is a latent variable, with individual symptoms of strain of two workers holding the same job as indicators. Thus, it represents the strain that these two workers have in common, while truly individual variance is removed"
>
> Semmer *et al.* (1996), p. 293

The crucial words here are "the same job": as Kristensen (1996) suggests when discussing the "job method" (which treats all the individuals from a given occupation as experiencing the same level of stress), occupational classifications are often too broad to be able to consider those with the same job *title* as having the same job. This issue is discussed further in Chapter 6.

In summary, it is argued here that theory and research have an important role to play in the cyclical process of risk assessment and risk reduction. A recent newspaper item illustrates why, in Kurt Lewin's words, "there's nothing so practical as a good theory". The newspaper reported:

> "The Lancet carries a research letter in its new edition.' Elderly people with empty refrigerators are more likely to be readmitted to hospital', this reports, 'compared with patients with adequate refrigerator content.' Brilliant. Next month, news that homeless people are more prone to hypothermia."[6]

[6] The Guardian, Diary, 11 August 2000

Although perhaps an unfair representation of the research described in the Lancet's letter, the journalist's comments exemplify how over-reliance on the statistical analysis of the data without sound theoretical content and an awareness of the meaning of the variables under study can lead to findings which may be statistically significant, but are perceived as obvious, irrelevant or perplexing. This is not an unimportant issue when the assessment results are fed back to the organisation as the basis for the design of interventions: if the results were seen as useless or redundant it would become difficult to convince key stakeholders to act upon them.

2.5 Applying the risk management framework

The preceding sections have suggested that the risk management framework offers a useful strategy for the assessment and reduction of likely risk factors at work. However, it must be clear that risk management for physical hazards is used as an analogy ("analogy: resemblance in some particulars between things otherwise unlike", Merriam-Webster, 2000), and not as a recipe to be followed verbatim. This chapter has highlighted a number of issues that need to be considered, mainly [i] the operationalisation of definitions of hazard, [ii] the identification of adequate indices of harm that can also be reliably monitored, and [iii] a 'grounded approach' to understanding and explaining of relationships between hazard and harm, i.e., one that combines scientific knowledge with awareness of the organisational context.

The following chapter presents three case studies commissioned by the British Medical Association to illustrate how the second and third of the requirements indicated by Cox & Griffiths (1996: see Preface, page xi) can be met in practice: reliable and valid measuring instruments, and standard implementation procedures. Chapters 4, 5 and 6 use the data from the case studies to illustrate the fourth requirement, adequate data analysis. The final chapter discusses some of the difficulties common to all applied research in occupational health psychology (such as the measurement of the subjective work environment), and some of the challenges specific to the development of the risk management framework to deal with work-related stress.

3. BACKGROUND TO THE CASE STUDIES

This chapter introduces the background to the three case studies whose data are used in the remaining chapters of the thesis: three groups of medical staff working in two different National Health Service Trusts in the United Kingdom. The Chapter is divided in two main sections: the first section begins with a brief description of the Trusts, together with the rationale guiding the choice of Trusts, and of the samples within them. The assessment methodology and strategy are then described in some detail for each Trust in order to explain how the data were gathered. The second section contains a summary of the assessment data in terms of [1] demographic and job characteristics of the respondents, [2] individual health indices, and [3] organisational health indices.

3.1 The assessment samples

One of the key issues for the British Medical Association (BMA), who commissioned and funded the research project, was the generalisability of the findings to other Hospital Trusts within the National Health Service (NHS). Accordingly, a Steering Group –which included the BMA's senior management and the team at Nottingham– was set up in order to elaborate a shortlist of suitable Trusts, i.e., those that were 'not atypical' in terms of their size or mix of specialties. Two Trusts were approached initially to take part in the study. One of them agreed to participate, while the other candidate declined to be involved owing to issues of timing and internal re-organisation. The Occupational Health Physician of another Trust contacted the Nottingham team after hearing about the project. This Trust was also considered 'not atypical' by the Steering group and, after negotiations with the Trust's management, it was also included in the assessment. For confidentiality reasons, the participating Trusts are referred to as "Trust A" (first one) and "Trust B" (second one) throughout this thesis.

In line with the aims of the project (see page viii) it was decided that, within each Trust, the assessment groups would comprise:

1. All grades of medical staff within one specialty, i.e., a *vertical slice* (from Pre-Registration House Officers –who have just left Medical School– to Consultants, the most senior grade), and

2. All the doctors from one particular grade across a variety of specialties, i.e., a *horizontal slice* covering as many departments as possible within the Trust

During preliminary discussions with the BMA, it was agreed that the grade of Senior House Officer (SHO) needed specific attention, for two main reasons: First, much concern had been expressed publicly by professional associations, the government and the media about the plight of SHOs, who were perceived as a 'lost tribe' within the NHS, afflicted with a particularly difficult set of stressors due to their dual role (part employees, part trainees) together with the sheer workload, which led to very long working hours (Spurgeon & Harrington, 1989; Fielden & Peckar, 1999). It had been widely reported that excessive levels of stress amongst SHOs had resulted in dissatisfaction, lower morale and poorer work performance (e.g., Firth-Cozens, 1987; Dowling, 1990; Hale & Hudson, 1992; Lum *et al.*, 1995; Williams *et al.*, 1997). Second, they were the most numerous group, which – from the researchers point of view– is an especially important consideration when working with already limited numbers of participants. It was also felt by the Trusts' managers that any action taken should include a group that represented the largest section of their medical staff. It was therefore decided that SHOs would be the 'horizontal slice' in both Trusts.

In order to set the assessment data in context, the following two sections provide a brief description of the background to each Trust.

3.1.1 Trust A

Trust A was an acute District General NHS Trust Hospital with a bed complement of approximately 600. It was part of one of the largest non-teaching Health Districts in England, serving a population of approximately 500,000. The Eastern side is largely industrial while the Western boundary is mainly rural. Trust A incorporated a Continuing Care Unit and the Chest Clinic. The Accident and Emergency Unit and most outpatient facilities for the

city were also situated at this site. Other services included Medical, Trauma and Orthopaedics, Diagnostic, Surgical, Rehabilitation, Critical Care, and Clinical and Non-Clinical Support Services.

The latter phase of the project took place amidst a climate of change and uncertainty regarding the future of the Trust. New management arrangements at Trust A were put in place between late 1996 and early 1997. The Trust Board appointed a new Chief Executive on a fixed term contract in 1997. The new Chief Executive, a Consultant Surgeon at the Trust for over a decade, had also served as Medical Director for the previous three years. His predecessor took up a new post as Chief Executive of another hospital.

These changes came at a critical time for the Trust, as plans for a single acute Trust in the region were being explored. Both the Trust A and the other acute District General NHS Hospital Trust had announced their support for the single Trust, which was consistent with the recommendation of the Health Authority following an acute service review during the previous year. The decision was also said to reflect the overwhelming view of the clinicians at both hospitals, and had the support of the local Community Health Council. A Joint Project Board, made up of representatives from both hospitals, was undertaking a feasibility study on behalf of both Trusts. If the Project Board recommended a merger of Trust A and the other acute District General NHS Hospital Trust, the proposals would be put out to public consultation between in 1997, with a view to establishing a single Trust as soon as possible after that.

It was foreseen that the climate of uncertainty surrounding the future of the Trust would have an influence on the assessment samples, but it was decided to continue with the project because of the commitment shown by the participants and because many other Trusts across the United Kingdom faced a similar climate at the time, as illustrated by the background to Trust B below.

3.1.2 Trust B

Trust B was an acute Trust with a bed complement of approximately 930. The Trust was established in 1994 and was a large non-teaching provider of

acute care in the United Kingdom, serving a population of 500,000 people. The Trust managed three acute hospitals, Hospital 1 and Hospital 2 in the city and Hospital 3 in a nearby town, offering comprehensive, highly developed general hospital services for the local population, as well as a range of specialist acute services which attracted referrals from a wide catchment area.

Hospital 1 was founded in the 18th century and had approximately 780 beds. It offered a comprehensive range of surgical and medical services and had a busy accident and emergency department. It was recognised as a centre of excellence for many specialties, including Day Surgery and Orthopaedics. The 220-bed Hospital 2 was located 2 ½ miles from Hospital 1 and provided a range of services including Plastic Surgery, Ophthalmology, Diabetes, Oral Surgery and General Medicine. Some medical services had been moved from Hospital 2 to Hospital 1, resulting in bed losses for certain departments. Hospital 3 was situated 20 miles north of the city. It had 58 beds and an operating theatre, and was host to a range of outpatient, surgical and medical specialties.

At the time of assessment, work had begun on planning the complete development of Hospital 3, including the provision of a dedicated day-case surgical unit. More importantly, detailed plans had been drawn up for a new single, 'state-of-the-art' District General Hospital with 809 beds, which would be built on a 63 acre 'greenfield' site and would replace Hospitals 1 and 2. The new hospital was expected to be completed by the year 2000, and would be one of the first complete new-build major district hospitals to be developed under the controversial Private Finance Initiative (PFI), with an approximate project value of £170 million. Hospital 3 would be retained as an integral part of all the Trust's future plans. According to the Trust's Chief Executive, the design and build approach allowed for flexibility so that if, for example, future surgical or medical development meant that a particular department needed to expand or contract from its originally proposed size, this would be possible at any stage. Nevertheless, several staff had expressed their concern about the new building, especially given the expected reduction in capacity and the means of financing the project (perceived by some as expensive and a move towards privatisation of the NHS).

Throughout the assessment phase, plans for the new hospital continued to be developed, in consultation with the Trust's Consultant, nursing and clinical staff. By July 1997, the Bill clearing the way for Private Finance Initiative schemes was progressing through the UK Parliament. The rest of the negotiations with the private partners in the PFI and the banking consortium were reported to be 'on track'. At that time the Chief Executive stated that he believed there would be a successful conclusion once the Bill was passed.

It was reported in the media that 80% of the local residents were opposed to the move. The new site was three miles outside the city centre. This was especially problematic because 40% of the city's households and 25% of the households in the county did not own a car. There was also concern that those on low incomes living in the city centre would be the most disadvantaged by the move. Other significant worries raised by staff, patients and the media included: the environmental damage caused by the new site; the increased road use; the 33% reduction in the number of beds; and the damage to the city centre economy. Of most concern was the observation that the architect commissioned to improve services on the existing site found that "an equivalent provision would cost £100 million less, be cheaper to run, more accessible for patients and hospital employees and would support transport and planning policies". Trust B and the local health authorities claimed that such redevelopment plans were unworkable, but no public explanations or reassurances were offered. Furthermore, concern was expressed over the 'limited' public consultative process between 1992 and 1996. At a city meeting in April 1997, addressed by the Chief Executive, only 6 out of 200 voted in favour of the move. As the 'crunch time' for the decision approached, the situation became increasingly turbulent at the Trust. In addition to this, the Trust was involved in litigation with a former patient. That single case was expected to cost the Trust in excess of £1 million, and was part of an increasing trend that was causing much concern to both staff and managers.

3.2 Assessment methodology and strategy

The methodology and strategy followed during the assessment phase reflect the framework illustrated in Figure 1 (see p. 21) and the basic principles of

risk assessment described in Chapter 2. In order to provide an account of the process, as well as the outcomes, of the assessment, this section also includes a summary of the familiarisation process, which includes setting up the Steering Groups, selecting the target assessment groups and planning the schedule for the Work Analysis Interviews (designed to identify potential hazards) and for the Audit of Management Systems and Employee Support (AMSES). For the sake of clarity, each Trust is dealt with separately under each heading.

3.2.1 Exploratory Meetings, Familiarisation and Preparation

Trust A

Contact was established with Trust A during October 1995, when a meeting was held with the Director of Human Resources and the Medical Director. Some delay ensued before a follow-up meeting could be scheduled. This was due to the difficulty in co-ordinating doctors' schedules to arrange meetings –a fact that was symptomatic of the considerable time pressure under which doctors at the Trust worked. The Project Team eventually met with a larger group of Trust A representatives in January 1996 in order to establish the Trust A Steering Group and select the slices of medical staff to be studied. The Project Team suggested that the Trust A Steering Group should encompass those individuals best equipped to facilitate the process, who fell into three distinct groups:

1. The first group were representatives of the selected *slices*. The candidates selected were: the Junior Doctors' Representative, a Consultant from the Medical Directorate, and the Chairman of the Medical Advisory Committee.

2. The second group included those with a key interest in the feedback of results and the power to 'make things happen': the Director of Human Resources and the Medical Director

3. The third group included staff from the Occupational Health and Safety department: the Occupational Health Physician and a representative from Health and Safety

Some administrators were also selected to handle the practical issues (the Medical Education Manager and one Administration Officer from the Medical Directorate).

Medical staff considered it important to select a specialty of reasonable size in order to assess the impact of stress on more senior medical staff. The Medical Directorate (incorporating General Medicine, Medicine for the Elderly, Diabetes, Neurology and Dermatology) was selected. The Clinical Director had been approached and was willing to be included in the assessment. As indicated earlier, it was decided that the grade of Senior House Officer would represent the horizontal slice and act as the junction between the specialty and grade slices. In order to accommodate the impending "change of house"[7], it was agreed that familiarisation activities should begin immediately. The Risk Assessment phase would be completed during August 1996. The 'marketing' for the process included a memo to all medical staff, a presentation in the Doctors' Mess and a paragraph in the Trust's newsletter. In January, a visit was made to the hospital to begin familiarisation, which included a guided walk-through observation of the doctors' working areas. It was also possible to attend an SHO meeting, where the forthcoming integration of the Medical Directorate was discussed with senior medical staff. Discussions were held with representatives from Human Resources and the Medical Education Manager, focusing on policies, procedures and available hospital data. A list of key stakeholders for the Audit of Management Systems and Employee Support (AMSES) was also drawn up, with advice from the Steering Group.

Trust B

Following preliminary contacts with the Occupational Health Physician of Trust B in June 1996, a detailed proposal and information pack was prepared for discussion by the Trust Board at their meeting of July 1996. The Trust's commitment to the project was confirmed in August 1996, and an exploratory

[7] When SHOs change the specialty in which they are working or being trained. This generally takes place in February and/or August.

meeting between the author and hospital representatives was held during the same month. This group subsequently became the 'core' Trust B Steering Group, falling roughly into the membership categories listed above for Trust A.

Following discussions with the BMA, the Project Team suggested that the two slices selected at the first hospital –Senior House Officers (horizontal slice) and Medical Directorate (vertical slice)– should also be chosen at Trust B. It was further agreed that a second, more technical specialty (vertical slice) should be added. It was a reflection of the level of interest at Trust B that the design had already been discussed internally by medical staff at one of their liaison group meetings. Having considered the input from all the parties involved, Integrated Medicine (including Accident & Emergency), Obstetrics and Gynaecology, Paediatrics and Paediatric Surgery and the SHO grade were selected as 'sizeable' and 'representative' groups. A memo was distributed to all Trust Medical Staff to inform them of the aims and objectives of the research project. The memo was authorised and signed by the Chairman of the Medical Manpower Panel and the Occupational Health Physician.

An early meeting was held in September 1996 with representatives from Obstetrics and Gynaecology, Integrated Medicine and Junior Doctors. The author described the project to them and discussed the logistics of the interviews with specialty and grade slices. The rest of the day was devoted to a guided tour of the hospital, conducted by a Trust Administrator, with a particular focus on the two main specialties of interest. The following day, as part of the Audit of Management Systems and Employee Support (AMSES), the author reviewed the organisational statistics and information on relevant management controls that had been requested from the Occupational Health Physician in advance of the visit. The list of key stakeholders for the AMSES was confirmed and some further individuals were added.

To summarise, in both cases, the familiarisation phase allowed:

- Agreement on the terms and conditions for the assessment project
- The establishment of the Steering Group
- The planning of the preliminary interviews

- The planning of the Audit of Management Systems and Employee Support (AMSES).

It is worth noting that, even at this early stage of the process, there were significant differences between the Trusts. It was apparent that the levels of enthusiasm at management level were markedly different: The early delays at Trust A were subsequently to become a repeated pattern. Senior staff at the hospital were initially very enthusiastic, but it was remarkably difficult to translate this enthusiasm into action: Individuals joining the group were initially very committed, but less forthcoming with practical support. Commitments undertaken at meetings were often not fulfilled. Meetings were arranged at the convenience of medical staff and senior personnel, but they were often delayed to accommodate the schedule of staff who subsequently did not turn up. A total of five Steering Group meetings were required to 'get the process off the ground' and reach the stage of preliminary interviews. Membership of the Steering Group was subsequently altered in an attempt to speed up the process.

The fact that the Project Team had been approached by Trust B was certainly significant, as was the speed with which Trust-level commitment was secured. Another striking difference was the level of involvement of members of medical staff from the outset. This level of interest and knowledge at all grades of medical staff was in marked contrast to the seemingly negligible communications and activity within Trust A. The internal communication systems at Trust B –which, in this case, stemmed primarily from the Centre for Occupational Health– were found to be efficient, reliable and effective, which meant that geographical distance was no obstacle to establishing the project and arranging the necessary meetings.

It is also interesting that the Steering Groups in both Trusts suggested that the term "stress" should be avoided during the marketing of the project because of two main reasons: First, for most physicians "stress" has very individual –rather than organisational or systemic– connotations, and it was thought that the doctors in the assessment groups might misunderstand the purpose of the exercise, and be surprised at the nature of the process (especially the detailed analysis of their working conditions) once they became involved. Second, work-related "stress" is also a very sensitive issue

for doctors: there is a strong cultural expectation that they become 'men of steel' (an expression coined when most doctors were men), somehow impervious to stress and illness (e.g., Levin, 1988). The Steering Groups thought that doctors might feel more comfortable, and be more forthcoming during interviews, if the emphasis was on improving their work and their well-being. Therefore, in order to set clearer expectations and offer a more positive 'spin', it was agreed that the project would be entitled "Work and Well-being".

3.2.2 Audit of Management Systems and Employee Support

The Audit of Management Systems and Employee Support (AMSES) was designed to provide an account of the existing policies and arrangements, services and facilities, provided by each Trust which might contribute to the protection and promotion of staff well-being and the management of any problems that they face through work. It was carried out largely by interview, but also involved the collection of documented evidence and visits to support facilities. The interview schedule was derived from a traditional Health and Safety Audit but tailored to the context of a medical sample.

Twelve key stakeholders were interviewed at Trust A during February and March 1996. These staff were interviewed individually, and interviews lasted approximately 30 minutes. It was emphasised that the information that they provided would be reported anonymously in the reports to the Trust and the BMA, and that it would be confidential to the researchers. They were selected as staff-stakeholders who would have an interest or expertise with regard to staff well-being, with particular emphasis on medical staff. The stakeholders interviewed included:

- Health and Safety Advisor
- Representative from Human Resources
- Representative from Occupational Health
- Health Promotion Co-ordinator
- Medical Director
- Postgraduate Clinical Tutor

- Clinical Director of the Medical Directorate
- General Manager of Medical Directorate
- BMA Representative
- Junior Doctors' Representative
- Staff Counsellor
- Hospital Chaplain

The author also completed 20 AMSES interviews at Trust B. The Occupational Health Physician went to considerable trouble to ensure these interviews ran according to schedule and that all personnel had been briefed in advance. The following key stakeholders were interviewed:

- Head of Human Resources
- Human Resources - Medical Staffing
- Director of Administration
- Health and Safety Manager
- Occupational Health Physician
- Occupational Health Manager
- Senior Occupational Health Advisor
- Medical Director
- Post Graduate Clinical Tutor
- Clinical Director - Obstetrics and Gynaecology
- Service Manager - Obstetrics and Gynaecology
- Clinical Director - Medicine
- Service Manager - Medicine
- Clinical Director - Paediatrics
- Enhanced Practice Co-ordinator
- Clinical Audit Manager
- BMA Representative
- Junior Doctors' Representative

- Staff Counsellor
- Hospital Chaplain

Using the information obtained from the AMSES interviews, inspection of organisational records and external audits –and, where appropriate, from the Work and Well-being Audit interviews [see section 3.2.3 below]– audit reports were prepared covering the following six areas:

1. Policy
2. Organisation, arrangements and support systems
3. Communication systems and management
4. Culture and change management
5. Information, education and training
6. Monitoring

The AMSES reports were quite lengthy and will not be fully described here, but reference to their contents will be made when appropriate. The overall findings of the AMSES were that neither Trust had an organisational policy on work-related stress, and that their Health & Safety Policy statements did not make specific reference to the control of psychosocial and organisational hazards. Moreover, there was no policy, coherent organisational structure or monitoring system concerned with support for medical staff, over and above informal sources of advice accessible within the Trust. Consultants, in their various roles, would theoretically be responsible for the well-being of their junior staff. However, it was made clear during interviews that juniors rely on Consultants to provide good references for them and would, therefore, be very unwilling and unlikely to report any difficulties they may be experiencing. Furthermore, the rate of change of junior staff is so swift as to make this system difficult to monitor and sustain, meaning some individuals may "slip through the net" (junior doctors were sometimes referred to as 'transient migrant workers'). Consultants themselves had negligible support systems, particularly due to their seniority and professional association with medical colleagues (for example, an avenue open to most other workers is contact

with their General Practitioner, but Consultants are, perhaps understandably, very reluctant to confide in people with whom they will or may be having professional contact later on).

3.2.3 Work Analysis Interviews

The objective of the Work Analysis Interviews[8] is to explore the nature of potential psychosocial and organisational hazards associated with work. These are semi-structured interviews based on the generic Work Environment Survey, elaborated from classification of potential stressors suggested by Cox (1993) and shown in Table 1.

Category	Conditions defining hazard
Context to work	
Organisational culture and function	Poor communication, low levels of support for problem-solving and personal development, lack of definition of organisational objectives.
Role in organisation	Role ambiguity and role conflict, responsibility for people.
Career development	Career stagnation and uncertainty, underpromotion or overpromotion, poor pay, job insecurity, low social value to work.
Decision latitude / Control	Low participation in decision making, lack of control over work (control, particularly in the form of participation, is also a context and wider organisational issue)
Interpersonal relationships at work	Social or physical isolation, poor relationships with superiors, interpersonal conflict, lack of social support.
Home-work interface	Conflicting demands of work and home, low support at home, dual career problems.
Content of work	
Work environment and work equipment	Problems regarding the reliability, availability, suitability and maintenance or repair of both equipment and facilities.
Task design	Lack of variety or short work cycles, fragmented or meaningless work, underuse of skills, high uncertainty.
Workload / workpace	Work overload or underload, lack of control over pacing, high levels of time pressure.
Work schedule	Shift working, inflexible work schedules, unpredictable hours, long or unsocial hours.

Table 1: Potentially stressful characteristics of work (adapted from Cox, 1993)

[8] These interviews were re-titled "Work and Well-being Interviews" owing to the reasons outlined in section 3.2.1.

The strategy adopted to select interviewees tried to ensure that smaller departments were not under-represented or even missed out altogether through a purely random selection. Therefore, at least 1 doctor out of every 10 (the 1st, 11th, 21st, and so on, in alphabetical order) was picked from a departmental list. Departmental or Directorate lists were used, rather than an overall staff list, to ensure that there was some input from even the smallest departments selected for the risk assessment (with 3 medical staff).

Interviewees were asked to describe the general negative and positive aspects of their work, and then specific questions were asked about each of the categories in Table 1. The interviews were tailored where necessary to ensure that they were appropriate for the participant's grade and specialty. Interviewees were also asked about how they thought their work affected their health and well-being, and about any sources of advice or support of which they were aware. The interviews lasted approximately 45 minutes, and doctors were seen individually. The selection procedure was explained to each person to reassure them that they had not been 'nominated' by anyone. The interviewer also explained that the purpose of the interviews was to gather enough relevant information about the working environment to enable the tailoring of the assessment tools and procedures to the needs and context of the Trust and its medical staff. Interviewees were told that the quality of the assessment would depend on a high level of participation and candour, and they were asked to be as honest as they could in their responses. In general, staff responded positively to the aims of the project and were very forthcoming during the course of the interviews.

A list of interviewees had been prepared from staff lists provided by the Human Resources Department at Trust A. Junior medical staff were contacted using their 'bleeps' and interviews were arranged to fit in with their likely location in the hospital, provided a quiet and private room was available. Bleeps were the only method of contacting doctors whilst they were in the hospital. It took some time to arrange the appointments because this system was rather haphazard. Consultants were contacted via their secretaries. A total of 15 interviews were conducted with doctors from the selected groups: 8

interviews with Senior House Officers and a further 7 with representative grades from the Medical Directorate.

The Director of Human Resources at Trust B provided the author with a list of current medical staff. From this list, a random selection of 39 doctors was made, broadly representing the full range of specialties and grades. The selection was presented to the Occupational Health Physician who made arrangements for his secretary to set up the appointments. To protect the confidentiality of those involved, the list of interviewees was restricted to these two individuals. If a named individual could not be contacted after a number of attempts, the secretary contacted the back-up candidate. It proved impossible to arrange interviews with some medical staff, most notably SHOs in Accident and Emergency and in Anaesthetics. It was agreed that, for reasons of convenience, the author would be based in the Centre for Occupational Health. Two quiet rooms were made available during the interview period. At least half an hour was requested with each doctor to ensure quality of information. A total of 32 interviews were conducted with a representative sample of total medical staff.

Again, it is worth noting the disparity between both Trusts in terms of the logistics of organising the interviews and the inspection of organisational documentation. The support and efficiency of key members of staff within Trust B contributed decisively to the successful completion of such a large number of interviews with the doctors. This contrasted markedly with the apparent disorganisation and lack of effective communication channels at Trust A: here, contacting doctors using their bleeps was a time-consuming task and required much prior planning, particularly as the researcher had to visit each doctor's work area. This exercise was, however, unexpectedly useful, as it allowed the researcher to experience the working environment and understand more directly the working conditions within each department.

Summary

To summarise, the Work Analysis Interviews allowed:

- The tailoring of the assessment tools and procedures (such as the Work Environment Survey) to the needs and context of medical staff at the Trusts, and, in particular, the design of the questionnaire-based

survey instrument, involving the identification of potential psychosocial and organisational hazards

- The identification of their possible effects on medical staff well-being and health-related behaviour

3.2.4 The Assessment Instruments

The rationale for, and purpose of, the Work Analysis Interviews described in the previous section is well illustrated by the outcome of the process for Trust B: through the 4 days of interviews, it became increasingly clear that the working conditions of the senior doctors (mostly Consultants, together with a few Associate Specialists) were very different in nature from those experienced by the junior doctors (from Pre-Registration House Officers to Senior Registrars). Senior doctors were increasingly expected to perform three quite different, demanding and sometime conflicting roles: clinicians to their patients, supervisors and trainers for their juniors, and administrators or managers for the Trust. Because of this multiplicity or roles and because of their seniority, the Project Team decided that a single questionnaire could not adequately cover the relevant issues for both senior and junior doctors without [1] becoming too lengthy, and [2] including sections that would be largely irrelevant for each group. Therefore, a separate questionnaire was constructed for each group of staff at Trust B on the basis of the Work Analysis Interviews and AMSES, and each group (juniors vs. seniors: two *horizontal slices*) was thenceforth treated as a separate Case Study.

This development of the assessment exemplifies how a grounded approach, prepared to tailor its assessment tools to the target groups, can 'reach parts' of the organisational context that off-the-shelf measures would miss. Generic 'audit tools' lack granularity in their measurement of the work environment and conceptualise work at too broad a level, creating "an artificial world of data in which the demands on a seamstress can be compared with the demands on a movie star" (Kristensen, 1996, p. 255). In fact, during feedback sessions with senior doctors towards the end of the assessment phase, they suggested that the good response rate obtained among Consultants (particularly unusual given the time pressures on them) was partly due to the obvious relevance of the survey instrument to their job.

In order to pilot the suitability of the questionnaire in Trust A, the Project Team provided a hot lunch in the Doctors' Mess (it had soon become clear that the most effective strategy to ensure good attendance at meetings was to provide food!). Doctors were asked to complete the pilot questionnaire and encouraged to comment on all aspects of the questionnaire, including user-friendliness, content, layout and length. A number of doctors felt it was over-long and thought this would affect response rates. The questionnaire was subsequently modified and shortened: Most of the free response questions were changed to a fixed choice format. The Key Personnel section was reduced to one column to avoid confusion. In addition, what were considered to be the most critical issues (e.g. job design, career, national issues) were moved to the beginning of the questionnaire, to stimulate interest and demonstrate an awareness of the main problems facing doctors. The final version of the Assessment Instrument was approved by the Trust A Steering Group. The group also discussed several strategies for the effective distribution of the questionnaires. Throughout the design process, it was recognised that the staff taking part in the assessment should understand its nature and be assured that their participation and comments would be anonymous and 'protected'. The final instrument therefore included a covering letter designed to address any concerns the doctors might have harboured.

A similar piloting exercise was not feasible in the context of Trust B, owing to time constraints dictated by the 'change of house' in February 1997. The use of focus groups was also considered as a method of piloting the questionnaire, but it proved impossible to organise these groups in such a short period of time. Draft versions of the two Assessment Instruments were presented to the Trust B Steering Group for commentary. The versions were reviewed under the following headings: structure, coverage, content of specific areas, clarity of instructions, layout and length. All key members of the Steering Group attended this meeting and provided valuable comments. It was agreed that all departments and grades of medical staff were well-represented on the Trust B Steering Group and that this internal review process was sufficient to ensure user-friendliness. The final instruments at Trust B also included signed letters which re-iterated the team's commitment to confidentiality.

The three Assessment Instruments and their respective covering letters are included at the end of this thesis as Appendices I, II and III (certain names and references have been intentionally *blacked out* in these Appendices to protect the Trusts' confidentiality). Each of Survey Instruments included the following four sections:

Section 1: Work Environment Survey (WES)

As indicated earlier, this section is based on Cox's (1993) review of psychosocial hazards: it focuses on work characteristics and the particular conditions associated with them. The generic tool was tailored to address the needs and contexts of each of the three groups of doctors. This tailoring procedure incorporated feedback from all the activities listed above, namely (a) walk-through observations of the workplace, (b) Work Analysis Interviews, (c) interviews with key stakeholders and inspection of organisational documentation (AMSES), and (d) Steering Group consultation.

A number of additional questions were added to the Trust B questionnaires. Consultants and Associate Specialists were asked to indicate whether or not they undertook any management duties, in addition to clinical commitments. They were also asked if they were involved in teaching programmes and if they acted as an educational supervisor. Junior staff were asked if they supervised or managed the work of other doctors, if they were involved in teaching programmes or had other management duties.

Section 1 also included questions related to indices of organisational health and functioning. Reviews of the literature on absenteeism, job satisfaction and turnover were used to inform and guide this subsection. In addition to standard questions on absence behaviour, doctors at Trust B were asked whether they had experienced an episode of sickness absence which they felt was directly related to their work. They were asked if they received adequate support from work during this episode. A set of questions on current level of commitment to medicine and to the National Health Service was included for all doctors at Trust B. Consultants at both Trusts were asked about their commitment to the Trust and their intention to retire early. Junior staff at both Trusts were asked if they intended to practise as a doctor and whether or not they would return to the Trust if the opportunity arose.

Because of the input received during the preliminary phase at both Trusts, a number of additional items were included in all questionnaires on the subject of litigation. Doctors at both Trusts were asked to rate their level of concern regarding legal action –additionally, and following feedback from Trust A, respondents at Trust B were given the opportunity to suggest ways in which it might be avoided. Doctors at Trust B were also asked if anyone within their specialty had been the subject of legal action and if they were practising more 'defensive medicine'[9] than previously. All these issues had been raised during the course of the Work Analysis Interviews.

Section 2: Key Personnel

This section detailed those key individuals and services whom doctors could consult if they were experiencing personal work-related problems. These individuals and services had been identified during the Work Analysis Interviews and the AMSES. A comprehensive list was compiled which also included the national services available to doctors (e.g. National Counselling Service for Sick Doctors and the BMA Stress Counselling Service). Respondents were asked to indicate which of those sources of support they would consider using.

Section 3: General Well-Being Questionnaire

The assessment of employee well-being was based on their self-report of symptoms. These data were captured using the General Well-Being Questionnaire (GWBQ), which was developed in Nottingham for that specific purpose (Cox *et al.*, 1983). This instrument has 24 items and is divided into two scales of 12 items each: the first scale, labelled 'worn-out', relates to the report of symptoms of "feeling tired, confused, and emotional"; the second, 'tense', relates to "feelings of being tense, up-tight, jittery and nervous". These reports refer to a six-month time window, and higher scores represent more symptoms (i.e., poorer well-being). The full text of the GWBQ is available in Appendices I, II and III. The items shown in bold typeface in Appendix I are those associated with the 'worn-out' scale.

[9] "Defensive medicine" refers to the practice of carrying out medical tests or procedures which are not standard practice or necessary from a clinical point of view, but which are performed as protection against possible subsequent litigation.

The GWBQ has been used in studies on a wide variety of different occupational groups (e.g., Cox *et al.*, 2000b), and there are extensive normative data available for comparison purposes. The questionnaire has been shown to be a reliable and valid tool with a robust factor structure (Cox & Gotts, 1987; Cox *et al.*, 2000c).

Section 4: Health-related Behaviours

Data were also collected on the respondents' health-related behaviours. These data were obtained using a number of items relating to health-related behaviours such as smoking, consumption of alcohol, number of hours of quality sleep, exercise and dietary habits. These items were based on guidance from the Nottingham Health Education Authority and government bodies, and have been used in several projects concerning individuals' health-related behaviours. The measures of health-related behaviour were designed to be consistent with those used by UK's Office of Population Censuses and Surveys in the survey of the Health of the Nation (Office of Population Censuses and Surveys [OPCS], 1990).

3.3 Distribution and Response Rates

It was obvious that the doctors had very limited free time in which to complete the questionnaires. Additionally, those times when they might do so were unpredictable. Short of following them around the hospital, which was not feasible, it would be extremely difficult to ensure the questionnaires were received and returned. At Trust A, the Steering Group agreed a strategy whereby assigned SHOs agreed to distribute questionnaires to their colleagues within the specialty and return them –in sealed envelopes– in batches to the University of Nottingham. The assigned SHOs were aware of the aims of the project and the importance of a high return. Where it was impossible to establish or make contact with an SHO, administrators agreed to take part in the distribution. An administrator was selected specifically to co-ordinate the distribution within the Medical Directorate.

The response rate after the initial distribution was disappointing (33 questionnaires, 36.7% response rate). The Steering Group considered that the most sensible option to elevate the response rate was to create some form of motivation for doctors to gather in one area. Consequently, two

further free lunches were held in the Doctors' Mess during June. The researcher remained in the Mess for most of the day and explained the aims of the project to those doctors who had not heard about the assessment project due to poor internal communication. This was a useful exercise that raised the profile of the project and resulted in the return of fifteen more questionnaires, increasing the overall response rate to 53.3%.

The final versions of the Assessment Instruments for Trust B were distributed in January 1997 through the internal mailing system. Distribution to junior doctors took place first to ensure they had adequate opportunity to respond before the change of house on 6 February 1997. Assessment Instruments were distributed to Consultants via their secretaries. The initial response from both senior and junior medical staff to the first distribution at Trust B was excellent. However, for juniors, this enthusiastic response rapidly became a *trickle* of one or two questionnaires per day. Members of the Steering Group had cautioned that there were significant pressures in Medicine at the time of distribution –due to a national increase in acute medical admissions– but agreed that the assessment should be completed before the change of house to sustain the momentum of the process, and also to obtain a fair reflection of the increased workload faced by doctors almost every winter. By contrast, Obstetrics and Gynaecology had reached the end of the annual budget, meaning that all elective work had stopped. It was felt, therefore, that juniors would have plenty of time available to participate in the survey. Following discussions with the Occupational Health Physician, it was agreed that 94 Assessment Instruments should be re-distributed following the rotation, to those junior medical staff who had 'changed house' but were still within the Trust. A vigorously-worded letter from the Medical Director accompanied each Assessment Instruments. However, this only resulted in the return of a further 14 questionnaires. It was clear that those who had intended to, or had enough time to, complete the questionnaire had already done so.

The response rates for both Trusts are shown in Table 2 below. The numbers in brackets represent the number of questionnaires distributed for each slice. The bottom row indicates the overall response rate for each Trust. [N.B.: the response rates in each Trust's sub-cell do not add up to the total because the "cross-over group" (e.g., SHOs working in the Medical Directorate at Trust A) are represented twice, once in each cell).

Trust A		Trust B			
Horizontal slice	**Vertical slice**	**Horizontal slice 1**	**Horizontal slice 2**	**Vertical slice 1**	**Vertical slice 2**
Senior House Officers	Medical Directorate	Senior House Officers	Consultants & Associate Specialists	Integrated Medicine	Obs & Gynae / Paediatric
32 (64) 50.0%	27 (42) 64.3 %	40 (122) 32.8%	36 (61) 59.0%	47 (117) 40.2%	30 (48) 62.5%
Overall response rate 48 (90) = 53.3%		Overall response rate 92 (227) = 40.5%			

Table 2: Response rates by slice for each Trust

In general, the more senior the grade of doctor, the better the response rate, to the extent that at Trust B the rate for seniors was almost double that of juniors. There were some small differences in response rates between specialties, with Obstetrics and Gynaecology emerging with the highest response rate overall at 62.5%, compared to 40.2% for Integrated Medicine. This reflected the widespread impression at Trust B that "Obs & Gynae" was a less pressured department where most of the work could –by the very nature of the specialty– be planned. By comparison, all staff in Integrated Medicine were under considerable pressure, and the situation was particularly difficult for SHOs who were nearing the change of house.

Process issues

A variety of distribution strategies were employed to access this mobile workforce: using peer groups for juniors, secretaries for Consultants, administrators and a central distribution via the internal mailing system. In Trust A, it was apparent that personal contact, especially when combined with food, was the most successful distribution strategy for the various groups of medical staff. The timing of the distribution at Trust B was constrained by the 'change of house' which also coincided with a stressful period for physicians nationally.

Three issues must be noted from the experience of working with medical staff. First, there are obviously great demands placed on their time. Second, effective communication systems are an important factor in the success of any such operation. Third, and perhaps most crucially, the assessment

needs to be a priority for doctors in order to motivate them sufficiently to fill in a survey form.

This process might best be understood in terms of a cognitive model of the participants' priorities. It is possible to envisage the doctors' priorities in terms of a hierarchy: For all doctors, short-term goals appeared to be managing the daily workload and getting sustenance when the opportunity arose. The quality of training and supervision, passing examinations and securing the next training post were clearly the medium- to long-term priorities for junior medical staff. The Consultants' short-term priorities often focused on completion of administrative duties and providing the necessary training and supervision of juniors. Medium- and long-term priorities were meeting the deadlines imposed by the Patients' Charter[10], complying with the process of medical audit and managing the impact of NHS changes on their working practice. Consequently, the best opportunity to *catch* doctors was most often when the need for food had become the top priority. Offering them lunch removed one daily hassle –perhaps replacing it with another: the questionnaire. It was clear that if doctors delayed the process, the survey form became a much greater source of frustration as they struggled to set aside an opportunity to complete it. It would then intrude on their personal time, and the likelihood of completion decreased considerably. This was a lesson quickly learnt by the author, who tried to put it to good use.

3.4 Summary of the Assessment Data

Chapters 4, 5 and 6 will use the data collected during the process described above to explore how risk assessments can meet the "adequate data analysis" requirement put forward by Cox & Griffiths (1996). This second section of Chapter 3 seeks to set the analyses described in subsequent chapters within the framework of the overall results by offering a general description of the assessment samples. Accordingly, the following sections present a summary of the data in terms of [1] demographic and job

[10] The "Patient's Charter" was launched in 1991 by the Government as the NHS version of the Citizen's Charter. It specified certain targets that Health Authorities and NHS Trusts were expected to meet, such as time limits for patients' waiting lists for operations and appointments to see specialists.

characteristics of the respondents, [2] individual health indices, and [3] organisational health indices.

3.4.1 Demographic and job characteristics

Trust A

The Senior House Officer grade (horizontal slice) included staff from Accident & Emergency, Anaesthetics, Dermatology/Neurology, Ophthalmology, ENT, Medicine/Medicine for the Elderly, Oral & Maxillofacial Surgery, Orthopaedics, Surgery, Palliative Medicine and Rheumatology & Rehabilitation. The Medical Directorate included all existing staff grades, from Pre-Registration House Officers (PRHOs) to Consultant.

The assessment sample at Trust A consisted of 30 men and 18 women (62.5% and 37.5% respectively). The mean age was 27.3 years (range 25 - 33) for SHOs and 30.8 years (range 24 - 59) for the Medical Directorate. The mean length of service was 11.3 months for SHOs (range 1 - 34 months) and 35 months for the Medical Directorate (range 4 months - 32 years and 3 months). Neither Trust had readily available data to which the sample could be compared statistically, but the Steering Groups thought that the respondents were reasonably representative of the whole medical staff at each Trust.

Trust B

At Trust B, the study group comprised, on one hand, all medical staff within Integrated Medicine (as the 'generic' vertical slice) and within Obstetrics & Gynaecology, Paediatrics and Paediatric Surgery (as the 'technical' vertical slice) and, on the other hand, all Senior House Officers across all specialties and all senior staff (Consultants and Associate Specialists) across all specialties. As indicated earlier, senior and junior medical staff had received different questionnaires because of the fundamental differences in their working conditions, and therefore their data were analysed separately. The resulting sample of *senior medical staff* ("seniors") involved Consultants and Associate Specialists within Integrated Medicine, Obstetrics & Gynaecology, Paediatrics and Paediatric Surgery. The remaining medical staff in Integrated

Medicine, Obstetrics & Gynaecology, Paediatrics and Paediatric Surgery plus all SHOs were included in the *junior medical staff* sample ("juniors").

Senior medical staff

There were 34 Consultants and 2 Associate Specialists in the assessment sample of senior medical staff at Trust B. Analysed by specialty, 23 (63.9%) doctors were in Integrated Medicine and 12 (33.3%) were in Obstetrics & Gynaecology, Paediatrics and Paediatric Surgery (one respondent did not specify their specialty). This sample consisted of 28 men and 8 women (77.8% and 22.2% respectively). The mean age was 44.6 years (range 32 - 59). The mean length of service at Trust B was 9.2 years (range 1 - 28 years), with 14 Consultants serving over 10 years with the Trust.

Junior medical staff

In the assessment sample of junior medical staff, there were 4 (7.1%) Pre-Registration House Officers (PRHOs), 40 (71.4%) Senior House Officers (SHOs), 11 (19.6%) Specialist Registrars (SpR) and 1 (1.8%) Staff Grade (SG). Table 3 below shows a breakdown of these figures by specialty.

Trust B		
Specialty	**Junior Medical Staff**	
	Number of doctors	% of sample
Integrated Medicine	24	42.9
Obs & Gynae + Paeds	18	32.1
Accident and Emergency	5	8.9
Orthopaedics	3	5.4
General Surgery	2	3.6
Anaesthetics	1	1.8
ENT Surgery	1	1.8
Ophthalmology	1	1.8
Plastic Surgery	1	1.8

Table 3: Trust B Junior Medical Staff - breakdown by specialty

This sample consisted of 29 men and 27 women (51.8% and 48.2% respectively). The mean age was 29.9 years (range 24 - 40). The mean length of service at Trust B was 17.4 months (range 4 - 48 months).

The survey instrument asked the doctors to provide data on a number of job characteristics. The results are summarised here with regard to two major

issues, namely contractual arrangements for senior doctors and working hours for all staff groups.

The contractual arrangements for senior doctors reflect the agreements that the government had to reach with Consultants when the NHS was set up, and which have evolved and developed into a somewhat complex system. The Audit Commission's (1995) report, "The Doctors' Tale", outlined the nature of Consultants' contractual arrangements in England and Wales:

> "Both whole-time and maximum part-time Consultants are effectively employed for ten 'notional half days' (NHDs), or periods of 3.5 hours. The difference between the two types of contracts relates to the right to undertake private practice" (page 39, § 65).

The report further states that:

> "Consultants on whole-time NHS contracts must not receive payments from private work in excess of the equivalent of ten per cent of their gross NHS salary. Consultants on maximum part-time contracts forgo this restriction in exchange for a nine per cent reduction in their NHS salary" (page 44, § 72).

The mean number of contracted sessions for Consultants and Associate Specialists at Trust B was 10, which is the maximum number of sessions part-time. A total of 19 Consultants and Associate Specialists (52.8%) were on whole-time contracts (i.e. they were contracted for the full eleven sessions). 63.9% of Consultants reported undertaking private practice.

The assessment at Trust A revealed that Consultants' job plans were an important *bone of contention*, and three questions about them were included in the questionnaire for senior doctors at Trust B. Job plans are designed to spell out Consultants' commitments and represent a major part of contracts and job descriptions. They specify all the responsibilities and duties expected of a Consultant, in addition to clinical work. In 1991, rules for District Health Authorities (DHAs) stated that every Consultant should have an agreed job plan with the Trust's Chief Executive or other senior manager, stating his or her fixed commitments in detail. Only 73% of Consultants at Trust B reported that they had an agreed job plan. Of this proportion, 35.3% stated that their job plan was up-to-date. Furthermore, only 6.7% stated that they worked

strictly to this job plan. 70.6% reported that they did *not* have an up-to-date job description.

The issue of working hours was considered a 'hot topic' for all grades of doctor, but particularly for juniors: very long working hours had long been one of the most frequent complaints by junior doctors' representatives at local, regional and national level. A growing body of research evidence also suggests that long working hours may have a deleterious effect on health and performance (see, for example, the review by Sparks *et al.*, 1997).

The contractual arrangements for juniors' working hours are equally complex, partly as a result of efforts to reduce them: The impact of working hours on doctors' performance –and, therefore, patient care– had caused such concern that a *New Deal* for junior doctors had been agreed in 1995 (National Health Service Executive, 1995). Under the New Deal, Trusts had to ensure that no junior doctors were actually working for more than an average of 56 hours per week. The Personnel Handbook at Trust B stated that:

> "A. Practitioners in the grade of Specialist Registrar, Registrar, Senior House Officer and House Officer undertaking to work for a standard working week (which is defined as 40 standard hours per week) contract for:
>
> i. 40 standard hours per week;
>
> ii. such further hours (to be known as Additional Duty Hours, ADHs) as are agreed with the employing authority subject to controls set out in paragraph 20 below;
>
> iii. exceptionally, duty in occasional emergencies or unforeseen circumstances (see paragraph 110)
>
> B. Practitioners in these grades work on a full shift, a partial shift or an on-call rota. [...] Hours of duty include periods of formal and organised study (other than study leave), training, reasonable natural breaks and prospective cover, where applicable."

Many additional paragraphs –too extensive to be quoted here– were necessary further to define exactly what was meant by a full shift, a partial shift and an "on-call rota" (an arrangement under which practitioners work a normal day Monday to Friday and are "on-call" in rotation for the remainder of the 24 hour period and for weekends). Worse still, arrangements were often 'adapted' locally, and the Handbook merely advised on certain controls on hours of duty for each grade. Respondents were asked to state the total number of hours worked in an average week and the typical range of hours worked (minimum to maximum). The results for all groups are illustrated in Table 4 below.

		No. of working hours in average week (range in brackets)	Average minimum no. of hours (range in brackets)	Average maximum no. of hours (range in brackets)
Trust B	Seniors	48.7 (20-75)	41.3 (16-60)	68.0 (24-124)
	Juniors	61.3 (20-75)	47.8 (20-70)	86.2 (25-123)
Trust A	Medical Directorate	64.0 (26-80)	53.0 (40-100)	82.0 (45-112)
	SHOs	64.0 (26-80)	56.0 (40-100)	86.0 (56-120)

Table 4: Weekly Hours of Work for Medical Staff at the two Trusts

Although Consultants at Trust B are typically contracted for ten sessions of 3.5 hours each (a total of 35 hours), they reported working more hours than they were legally required to. A possible cause for concern would be the 6 Consultants (16.7%) who reported working a maximum exceeding 100 hours in a week.

Most junior doctors seem to have quoted the legal *maximum* limit as the *minimum* average hours under the New Deal, and the range of hours work shows that many of them reported working well over the agreed limit. Almost without exception, the key personnel interviewed for the Trusts' AMSES had already suggested that this was a major problem and that the targets were not being met. The author tried to obtain documentary evidence from the hospitals, but neither Trust kept accurate organisational records despite the onus on them to monitor juniors' working hours.

3.4.2 Individual Health Indices

The individual health of each group was assessed in terms of their report of their general well-being and their health-related behaviours, including drinking and smoking behaviour.

General Well-being

The general well-being of the participants was measured using the General Well-being Questionnaire (GWBQ: see page 57). The reliability of each scale –'worn-out' and 'tense'– was assessed by means of Cronbach's α. The results for each of the three assessment instruments (Trust A, Trust B junior medical staff and Trust B senior medical staff) are shown in Table 5 and Table 6 below. A reliability coefficient above .7 is generally considered to be acceptable (Nunnally, 1978), and the only scale with a value substantially below that is the 'tense' for senior medical staff at Trust B (α= .5847). Upon closer inspection, this low value seems to be related to the poor performance of two items (number 8, "Broken out in a rash when you have been upset or excited?", and number 22, "Been troubled by stammering?"). Respondents in this particular assessment group unanimously responded 'never' to both items. Nevertheless, these items were not removed because the coefficient would improve only marginally after deletion (α= .604). The reliability of both scales is good when the three samples are assessed together (α= .8364 for worn-out and α= .7899 for tense).

The scores for all the assessment samples on the two scales of the GWBQ are also presented in Table 5 and Table 6. They are compared to available UK normative data (standard normative group N= 711) and to data recently collected from a combined sample of professional, administrative and secretarial staff (N= 621).

Group	Mean	Cronbach's α	Sample size
SHOs (Trust A)	16.7	.8312	32
Medical Directorate (Trust A)	17.2		27
Senior Medical Staff (Trust B)	14.1	.6699	36
Junior Medical Staff (Trust B)	17.1	.8647	56
Standard Normative Group	15.9		711
Recent norms	17.5		621

Table 5: Worn-out mean scores, Cronbach's α and sample size (all assessment groups and comparison samples)

Group	Mean	Cronbach's α	Sample size
SHOs (Trust A)	5.8	.6981	32
Medical Directorate (Trust A)	5.8		27
Senior Medical Staff (Trust B)	3.8	.5847	36
Junior Medical Staff (Trust B)	6.9	.8386	56
Standard Normative Group	9.9		711
Recent norms	8.7		621

Table 6: Tense mean scores, Cronbach's α and sample size (all assessment groups and comparison samples)

Overall, the assessment samples of SHOs (Trust A), Medical Directorate (Trust A) and Junior Medical Staff (Trust B) reported feeling more worn-out and slightly less tense than the UK normative sample. However, they reported similar levels of feeling both worn-out and tense to those reported by the recent combined sample of professional, administrative and secretarial staff. The sample of Senior Medical Staff (Trust B) reported feeling less worn-out and considerably less tense than the UK normative sample. This could be due to an 'age effect', whereby worn-out scores are found to decrease with added years. A possible explanation for this would be that the expectation of 'aches and pains' as people mature means they are less likely to report symptoms they consider to be 'minor' or part of the ageing process.

The percentage of medical staff reporting poor well-being was calculated for all samples. No senior doctors at Trust B had scores of 25 and above (*often* and *always* reporting symptoms) for feeling either worn-out or tense. However, almost one fifth (19.6%) of Junior Medical Staff (Trust B), 9.3% of

SHOs (Trust A) and 7.4% of the Medical Directorate (Trust A) had scores of 25 and above for feeling worn-out. One junior doctor at Trust B had a score of 25 and above for feeling tense (*often* and *always* reporting symptoms). For comparison, 32 % of a sample of UK teachers –considered to be under a great deal of pressure– reported worn-out scores of 25 and above (Cox, Kuk and Leiter, 1994). The figures for some of the samples, particularly juniors at Trust B, do give some cause for concern.

Health-related Behaviours

The Health of the Nation (HON) White Paper published in 1992 set targets in five key areas against which to monitor improvements in the nation's health. The Department of Health's Central Monitoring Unit commissioned an epidemiological study of health-related behaviour through the Office of Population Censuses and Surveys (OPCS, 1996). The three survey instruments collected data on four of these key areas: smoking, alcohol consumption, physical activity and diet. Wherever possible, these data were measured in the same units as the OPCS study to allow comparisons to be made.

The Work Analysis Interviews also identified sleep as an important indicator of doctors' well-being: many of them reported that most days they did not feel they had slept enough hours (particularly after being on-call), and that this, unsurprisingly, affected their performance. Accordingly, doctors were asked to state how many hours of "good quality sleep" they managed each night. The data are summarised in Table 7 below.

Health-Related Behaviour	SHOs (Trust A)	Medical Directorate Staff (Trust A)	Senior Medical Staff (Trust B)	Junior Medical Staff (Trust B)
Percentage who **smoke** cigarettes	15.6	14.8	8.3	12.5
Percentage who smoke...				
only occasionally / 'social' smoking	9.4	7.4	-	-
1 - 10 cigarettes	6.3	3.7	5.6	12.5
11 - 20 cigarettes	0	0	0	0
21+ cigarettes	0	3.7	0	0
Percentage who drink **alcohol**	87.5	96.3	94.4	91.1
Percentage who drink ... units of alcohol per week:				
1-21 (Male) / 1-14 (Female)	59.4	59.3	80.6	91.1
22-28 (Male) / 15-21 (Female)	15.6	22.2	11.1	3.6
29-49 (Male) / 22-34 (Female)	9.4	11.1	5.6	5.4
50+ (Male) / 35+ (Female)	3.1	3.7	0	0
Percentage who, on average, get ...				
6.5 or more hours of **quality sleep**	28.1	40.7	37.2	56.6
5 - 6.5 hours of quality sleep	71.9	55.6	42.8	41.5
1 - 4 hours of quality sleep	0	3.7	20.1	1.9
Percentage who **exercise regularly** outside of work hours	75.0	63.0	50.0	46.4
Percentage who, at least once a week, engage in...				
leisurely activity	28.1	33.3	27.8	28.6
moderate aerobic activity	31.3	22.2	25.0	26.8
vigorous aerobic activity	59.4	48.1	22.2	26.8
Percentage of respondents who are **physically active** whilst doing their job	87.1	81.5	58.3	85.7
Percentage who consider themselves to have a **healthy diet at home**...				
all or most of the time	37.5	66.7	83.3	67.9
some of the time	50.0	25.9	13.9	25.0
rarely or never	12.5	7.4	2.8	7.2
Percentage who consider themselves to have a **healthy diet at work**...				
all or most of the time	-	-	38.9	26.8
some of the time	-	-	22.2	58.9
rarely or never	-	-	33.3	41.1

Note: "-" indicates that the group was not surveyed on this item

Table 7: Summary of Health-related Behaviours

Smoking

In the OPCS survey, men and women in the manual socio-economic groups were more likely to be smokers than those in the non-manual groups. The

prevalence of smoking in professional groups was 13% for men and 14% for women. In the assessment sample of Senior Medical Staff (Trust B) 8.3% of doctors smoked, compared to 12.5% of Junior Medical Staff (Trust B) and, in the SHOs sample (Trust A), 16% of doctors smoked compared to 15% of Medical Directorate staff (Trust A). These figures are somewhat higher than one might expect for physicians, who are particularly aware of the risks to health from smoking. However, all the smokers within the Trust B assessment samples smoke 10 or fewer cigarettes per day. Furthermore, 9% of SHOs and 7% of Medical Directorate staff (Trust A) reported that they smoked only occasionally ("social smoking").

Alcohol consumption

The Health of the Nation states that drinking less than 21 units of alcohol per week for men and 14 units per week for women is unlikely to damage health. Sustained alcohol consumption in excess of these levels is likely to lead to increasing health risks (OPCS, 1996). Consumption in excess of 50 units per week for men and 35 units for women is considered to be a dangerous level of drinking. The recommended levels have been revised by the Department of Health to endorse the philosophy of 'sensible drinking' on a daily basis and to provide men and women with daily benchmark guides. The questionnaires used the same response categories as the OPCS survey for ease of comparison with other samples.

In the UK, OPCS figures for 1992 revealed that 27% of men and 11% of women aged 18 and over drank above the recommended sensible levels of 21 and 14 units respectively. For the Senior Medical Staff (Trust B) sample, 16.7% drank above the sensible limits (all male), while the corresponding figure for Junior Medical Staff (Trust B) was 9.0% (3.6% male and 5.4% female). It would seem that for Junior Medical Staff almost twice as many women as men drank above the recommended levels. In the total sample at Trust A (SHOs and the Medical Directorate combined), 27% of male and 28% of female doctors drank above the sensible limits. The level for female doctors (2½ times that of the national average) would again give some cause for concern.

Quality sleep

According to Junior Doctors' Task Force Recommendations (Department of Health, 1993), six and a half hours' "quality sleep" is necessary for adequate functioning during the following day or night. In the Trust A sample, 28% of SHOs and 41% of Medical Directorate staff reported seven or more hours of quality sleep. Between five and six hours of quality sleep was recorded by the majority of doctors: 72% of SHOs and 56% of Medical Directorate staff. The majority of junior doctors in the Trust B sample (56.6%) reported having enough sleep to comply with the recommendations. However, 62.9% of Senior Medical Staff and 43.4% of Junior Medical Staff at Trust B reported sleeping for less than six and a half hours. One cause for concern would be the 20.1% of Senior Medical staff who reported having between one and four hours of quality sleep.

Exercise

The OPCS survey based its questions regarding physical exercise on scientific opinion stating that while it is vigorous activity that is associated with the maximum benefit for cardio-respiratory fitness, higher volumes of moderate activity should bring long term benefits (OPCS, 1996). In 1993, 10% of men and 4% of women were active at a vigorous intensity three or more times a week for at least 20 minutes per occasion. Three quarters of SHOs (Trust A) and nearly two thirds of Medical Directorate staff (Trust A) reported that they exercised regularly outside of work hours. 27% of the whole sample engaged in moderate activity at least once a week while 50% engaged in vigorous activity at least once a week. It should also be noted that 87% of SHOs and 82% of Medical Directorate staff considered that they were physically active whilst doing their job.

For the assessment samples at Trust B, 50.0% of Senior Medical Staff and 46.4% of Junior Medical Staff reported that they exercised regularly outside of work hours. 25.0% of Senior Medical Staff and 26.8% of Junior Medical Staff engaged in moderate activity at least once a week, while 22.2% of Senior Medical Staff and 26.8% of Junior Medical Staff engaged in vigorous activity at least once a week. The majority of staff (58.3% of Senior Medical Staff and 85.7% of Junior Medical Staff) considered that they were physically active whilst doing their job. During the interviews at both sites, many doctors stated

that time pressures prevented them from partaking in more physical activity outside of work.

Healthy diet at home and at work

The Project Team and the Steering Groups agreed that a detailed analysis of doctors' diets was beyond the scope of the assessment. However, there was interest from the Trusts in having some information about their staff's eating patterns, since concern had often been expressed about the food facilities at both Trusts and their impact on doctors' health. Accordingly, the following generic question was agreed for inclusion in Trust A's survey:

> "Do you consider yourself to have a healthy diet: (low fat, high fibre, plenty of fruit and vegetables)?"

At Trust A, 38% of SHOs and 67% of Medical Directorate staff considered that they had a healthy diet *most* or *all of the time*. The figures (corroborated by the interviews) would suggest that doctors engage in "snacking and grazing" at irregular times due to the nature of their work. Questions were also raised during interviews regarding the facilities available for catering 'out-of-hours'.

For Trust B, a further distinction was made between "healthy diet at home" and "healthy diet at work" following suggestions by members of the Steering Group. In total, 83.3% of Senior Medical Staff and 67.9% of Junior Medical Staff considered that they had a healthy diet at home *most* or *all of the time*. However, these figures reduced to 38.9% and 26.8% respectively when doctors were asked whether they had a healthy diet at work. A number of the senior doctors at Trust B reported that they did not eat at work. A larger number reported having lunch at their desk, while dealing with paperwork. During the course of the interviews, medical staff at all levels also expressed dissatisfaction with the catering facilities at Trust B, particularly 'out-of-hours'.

3.4.3 Organisational Health Indices

The organisational health of the Trusts (see page 26 for a definition) was examined via a number of indices. For the sake of brevity, only some are reported here (the full text of the questionnaires is available as Appendices I,

II and III). This section deals with the findings relating to leave, absence, job satisfaction, commitment to medicine and the NHS and future intentions.

Leave

Respondents at Trust B were asked whether they were able to take their full leave entitlement. Table 8 shows that 86.8% of Junior Medical Staff were able to take their full entitlement, compared to 75.0% of Senior Medical Staff.

Staff Group	Percentage of doctors responding 'yes' (%)
Senior Medical Staff (Trust B)	75.0
Junior Medical Staff (Trust B)	86.8

Table 8: Ability to take full leave entitlement (Trust B)

Absence

Respondents at both Trusts were asked about their absence behaviour and their reaction to their colleagues' absence. Table 9 presents the relevant data.

Staff Group	Days absent / last 12 months (mean)	Spells of absence / last 12 months (mean)	Percentage reporting colleagues' absence as a problem
SHOs (Trust A)	2.1	.7	37.5
Medical Directorate Staff (Trust A)	1.1	.5	44.4
Senior Medical Staff (Trust B)	1.1	.5	35.3
Junior Medical Staff (Trust B)	2.3	.9	69.8

Table 9: Absence Behaviour

SHOs and Medical Directorate staff at Trust A reported, having on average 1 spell of absence during the last 12 months. SHOs recorded an average of 2 days, while the average for Medical Directorate staff was 1 day. Senior Medical Staff at Trust B reported being absent on sick leave for an average 1

day during the last 12 months, while Junior Medical Staff reported an average of 2 days. The consensus of opinion is that medical staff generally tend not to be absent because of the strong cultural expectation to "work through illness". This notion is supported by the fact that 35.3% of Senior Medical Staff and 69.8% of Junior Medical Staff at Trust B considered colleagues' absence to be a problem, despite the relatively low levels of reported absence, compared to the average for the United Kingdom: 6.5 days per annum for non-manual workers, and 9.2 for manual workers (Confederation of British Industry, 2000). The corresponding figures at Trust A were 37.5% for SHOs and 44.4% for Medical Directorate staff.

Respondents at Trust B were asked whether they had ever had an episode of sickness absence when they were suffering from anxiety or depression, which they felt was directly related to their work. Table 10 presents the relevant data.

Staff Group	Number of doctors responding 'yes'
Senior Medical Staff (Trust B)	4
Junior Medical Staff (Trust B)	2

Table 10: Absence due to episode of anxiety or depression (Trust B)

Doctors who confirmed that they had experienced work-related anxiety or depression were also asked whether they had received adequate support from work during their absence. In the sample of Senior Medical Staff of Trust B, only one out of the four doctors reported having received adequate support from work. For Junior Medical Staff, one out of the two doctors reported having received adequate support from work.

During the course of the interviews, doctors at Trust B suggested that they would turn first to close family and friends if they were in difficulties. They unanimously considered that it would be detrimental to their careers to admit any form of "weakness" to those in authority at work. When asked to indicate which sources of support they would access to discuss personal work-related problems, such as coping with the demands of the job, 83.3% of senior

doctors and 73.2% of juniors confirmed that they would talk to members of their family. The same percentage of juniors would discuss problems with friends, while the figure drops by half for senior staff (to 38.9%). It would seem, therefore, that as doctors reach the higher echelons of hospital-based medicine, they become increasingly reliant on family members during times of personal crisis. From the interviews, issues of trust and professional pride would seem to be crucial factors in this choice.

Job satisfaction

Job satisfaction was measured on a single-item, five-point scale, from *very dissatisfied* to *very satisfied*. Only one item was used in order to keep the overall survey instrument as short as possible. The literature on job satisfaction suggests that a single-item measure is as acceptable as a multi-item scale and may be preferable in certain circumstances (e.g., Scarpello & Campbell, 1983; Wanous *et al.*, 1997).

Table 11 shows that 60% of SHOs at Trust A were *satisfied* or *very satisfied*, while 25% were *dissatisfied* or *very dissatisfied* (leaving 15% who felt *ambivalent*). Similarly, 52% of Medical Directorate staff were *satisfied* or *very satisfied*, while on third were *dissatisfied* or *very dissatisfied* (leaving 15% who were *ambivalent*). The majority (61.1%) of Senior Medical Staff at Trust B were also *satisfied* or *very satisfied*, while 38.9% were *dissatisfied* or *very dissatisfied*. 57.1% of Junior Medical Staff were *satisfied* or *very satisfied* and 28.6% were *dissatisfied* or *very dissatisfied* (14.3% were *ambivalent*).

Staff Group	Percentage satisfied or very satisfied (%)	Percentage dissatisfied or very dissatisfied (%)
SHOs (Trust A)	59.4	25.0
Medical Directorate (Trust A)	51.8	33.3
Senior Medical Staff (Trust B)	61.1	38.9
Junior Medical Staff (Trust B)	57.1	28.6

Table 11: Job satisfaction

Commitment to Medicine and the National Health Service

From the experience gained at Trust A and the results from Work Analysis Interviews at Trust B, the author decided to ask doctors at Trust B about the

level of their commitment both to medicine as a profession and to the National Health Service, compared with ten years earlier (for seniors) or with when they graduated (for juniors). This was measured on a five point scale, from *considerably more committed* to *considerably less committed.* Table 12 presents the relevant data.

An equal proportion of Senior Medical Staff at Trust B (13.9%) expressed that they were *more committed* or *considerably more committed* both to medicine and the NHS. Only 30.5% were *less committed* or *considerably less committed* to medicine, while a slightly larger proportion (36.1%) expressed reduced commitment to the NHS. Over one quarter of Junior Medical Staff (28.6%) reported that they were *more committed* or *considerably more committed* to medicine, though a larger number (41.1%) expressed reduced commitment. Only 10.7% stated that they were *more committed* or *considerably more committed* to the NHS, while almost half (46.4%) reported that their commitment had decreased. The Senior Medical Staff sample was a relatively homogeneous group, which may explain the relative stability of responses to the two questions. By contrast, the Junior Medical Staff sample included doctors at various stages of their medical careers (from PRHOs to Registrars), which may account for the wider fluctuation in their responses.

Staff Group		Commitment to	
		Medicine (%)	The NHS (%)
Senior Medical Staff (Trust B)	More committed or considerably more committed	13.9	13.9
	Unchanged	55.6	50.0
	Less committed or considerably less committed	30.5	36.1
Junior Medical Staff (Trust B)	More committed or considerably more committed	28.6	10.7
	Unchanged	30.4	42.9
	Less committed or considerably less committed	41.1	46.4

Table 12: Level of commitment to medicine and the NHS (Trust B only)

Future Intentions

Doctors were asked choose which one from a series of statements most accurately reflected their intentions about their career or employment. The figures are reported in Tables 11 to 14.

At Trust A, 80% of PRHOs stated that they were committed to completing their medical training and intended to practise as a doctor. However, when SHOs were asked the same question, this figure reduced to 69%. This may reflect a national level concern within the profession that a significant proportion of junior doctors leaves medicine at either PRHO or SHO level. Only 40% of PRHOs and 44% of SHOs would return to Trust A given the opportunity.

Intentions of PRHOs and SHOs (Trust A)	Percentage of PRHOs responding 'yes' (%)	Percentage of SHOs responding 'yes' (%)
Committed to Medical Training	80.0	68.8
Intention to practise as a doctor	80.0	68.8
Return to Trust A given opportunity	40.0	43.8

Table 13: Intentions of PRHOs and SHOs (Trust A)

Only one third of consultants reported that they would be working at Trust A in ten years' time. However, this result may be confounded by the fact that two thirds of this group intended to take early retirement (again reflecting a national trend which was a great cause for concern regarding doctors' recruitment and retention).

Intentions of Consultants (Trust A)	Percentage responding 'yes' (%)
Working at Trust A in ten years' time	33.3
Taking early retirement	66.7

Table 14: Intentions of Consultants (Trust A)

A large proportion (77.8%) of Senior Medical Staff stated that they were committed to remain at Trust B, whilst 16.7% reported that they were likely to seek employment in a different hospital during their career.

Intentions of Senior Medical Staff (Trust B)	Percentage responding 'yes' (%)
Committed to remaining at Trust B	77.8
Likely to seek employment in a different hospital during working life	16.7
Taking early retirement	27.8

Table 15: Intentions of Senior Medical Staff (Trust B)

It is worth noting the difference between the two Trusts with regard to senior doctors' intention to take early retirement: more than two thirds at Trust A, compared to just over a quarter at Trust B. This is not due to differences in age or tenure: for consultants at Trust A, the mean age was 45.0 years, and length of employment was 117 months. The respective figures for Trust B were 44.57 years and 110 months.

The majority of Junior Medical Staff (79.6%) reported that they intended to practise as a doctor. It has been estimated that up to 40% of women doctors and 10% of men leave medicine within five years of qualifying (Annual Consultants' Conference, 1995), so this figure was not surprising. Just under half (47.2%) stated that they would return to Trust B if the opportunity arose.

Intentions of Senior Medical Staff (Trust B)	Percentage responding 'yes' (%)
Practise as a doctor	79.6
Return to Trust B if the opportunity arose	47.2

Table 16: Intentions of Junior Medical Staff (Trust B)

3.5 Summary

This chapter has described the background to the three case studies whose data are used in the remaining chapters. The assessment methodology and strategy described here represent the concrete operationalisation of the second and third requirements outlined by Cox & Griffiths (1996), i.e., measuring instruments and standard implementation procedures. As suggested in the previous chapter, a sound risk assessment requires the

identification of outcome measures associated with, or diagnostic of, poor individual and organisational health.

As indicated in the relevant places in this chapter, and as a reflection of the 'grounded' approach of risk assessment, the elements of the assessments were tailored to doctors and the hospital context wherever possible. The choice of measures in these case studies was guided by a combination of [a] the scientific literature (particularly with regard to research on doctors), [b] the contextual knowledge obtained during the Work Analysis Interviews and AMSES about the organisations and their specific concerns, and –in the case of the two Trust B questionnaires– [c] the experience gained at Trust A. This chapter has also shown how some standardised measures can also be used (e.g., GWBQ, health-related behaviours) so that comparisons can be made with similar occupational groups or the general population. This allows the next step in the assessment strategy, namely to establish criteria for 'caseness' (i.e., guidelines according to which assessment data can be usefully and sensibly divided into harm / non-harm categories).

Finally, an account of some process factors has also been given where appropriate. This information is not only useful as "learning points" for future case studies, but provides valuable information in itself about the organisational context that is being assessed and should be borne in mind when designing interventions and evaluating their degree of success.

4. PSYCHOSOCIAL HAZARDS AND LIKELY RISK FACTORS

This chapter describes how, following the risk assessment framework, the psychosocial hazards and likely risk factors for the Trust B samples (junior and senior doctors) were identified. The rationale for the analyses is discussed, followed by a summary of the main findings and how they were reported to the Trust.

The assessment strategy described in section 2.2.5 was followed to analyse the data gathered from Trust B. Only these data are used here because the author did not have *sole* responsibility for the analyses carried out to identify hazards and likely risk factors for Trust A.

The process –as summarised in Figure 1– begins with the identification of psychosocial hazards. Chapter 3 described how the generic Work Environment Survey (WES) was tailored to the context of each group of doctors, producing two separate questionnaires. For brevity's sake, the section of the questionnaires dealing with work characteristics will be referred to here as the "WES" or "the WES items".

4.1 Psychosocial Hazards

Two methods were used to decide which items from the WES should be considered as psychosocial hazards. The basic rationale for the process is the search for consensus amongst the respondents, and prioritising those issues which seem to affect most staff, or to affect them most strongly. The requirement for a high degree of consensus should be seen in the context of the search for a better measurement of the work environment, away from 'individual differences' and what is sometimes dismissed as 'subjective perceptions'. This is discussed in more detail in section 7.2.

From a tabulation of the WES items, two measures were calculated:

- **Hazard Index**: the percentage of staff who reported that a work characteristic was *unsatisfactory* or *very unsatisfactory*. In order to preserve a high degree of consensus, only indices over 60% were considered.

- **Hazard Ratio**: the relative strength of the hazard. Calculated as the ratio of the number of doctors reporting that a work characteristic was *unsatisfactory* or *very unsatisfactory* to those reporting that is was *satisfactory* or *very satisfactory* (the midpoint *ambivalent* was ignored for the calculation). Only hazard ratios above 2.0 were considered, indicating that at least twice as many doctors reported that an aspect was unsatisfactory as reported than it was satisfactory.

The resulting hazards indices and ratios are presented below[11]. Table 17 overleaf shows the hazards data for senior doctors. It can be seen that the main psychosocial hazards identified for Senior Medical Staff overwhelming relate to organisational and work design issues.

[11] To preserve the Trusts' anonymity, some references within the WES items have been *blacked out* intentionally. When necessary, an explanation has been added [in brackets]

WES item	Hazard Index	Hazard ratio[12]
Pressure on beds resulting in patients being placed in inappropriate wards	93.8	*
Cancellation of routine work to cope with acute referrals	88.5	*
Difficulty in finding a parking space	77.8	4.66
Continuity of care since introduction of new patterns of work for junior staff	77.4	7.98
Impact the reduction in junior doctors' hours has had on your workload	75.0	7.98
Amount of time available for research projects	72.7	4.78
Resourcing within your specialty ("money following patients")	72.7	6.01
How fair pay is compared with those in other professions (e.g. lawyers)	72.2	6.50
Opportunity to use income generated by your specialty to improve service (e.g. purchase equipment for your specialty)	69.7	5.76
National shortage of qualified nurses in your specialty	68.8	22.19
Future "Calman" consultants requiring formal senior supervision	67.6	7.68
Opportunities to take work breaks (e.g. coffee breaks, lunch)	66.7	3.00
New "business" ethos within the NHS	65.7	3.29
Lack of separate restaurant facilities for hospital staff	65.6	10.41
Funding opportunities for [redacted] (as a non-teaching hospital) when compared to [redacted] [a nearby teaching hospital]	65.6	6.98
Volume of paperwork	64.7	2.44
Possible national fixed term appointments for consultants	64.5	5.00
Demands placed upon you / your specialty by purchasers	62.5	5.00
Amount of time available for "hands-on" teaching of junior staff	60.0	2.62
Impact of your work on home life	60.0	4.20

Table 17: Hazard Indices and Ratios for Senior Medical Staff (Trust B)

The two main psychosocial hazards, reported by over 85% of Senior Medical Staff were:

- Pressure on beds resulting in patients being placed in inappropriate wards
- Cancellation of routine work to cope with acute referrals

Over three quarters of the sample reported the following further hazards:

- Difficulty in finding a parking space

[12] The asterisk indicates that no respondents considered the relevant aspect of work to be adequate and it was therefore impossible to calculate the hazard ratio.

- Continuity of care since introduction of new patterns of work for junior staff
- Impact the reduction in junior doctors' hours has had on your workload

Table 18 below shows the main psychosocial hazards identified for Junior Medical Staff. They relate mainly to organisational and national issues.

Psychosocial Hazard	Hazard Index	Hazard ratio
Pressure on beds resulting in patients being placed in inappropriate wards (and "lost" or forgotten)	85.7	14.05
Increase in acute medical admissions and its impact on service provision	80.0	20.00
Impact of the moves on morale within [redacted] [Trust B]	79.2	20.84
Management of moves from nearby hospitals (resulting in fewer available beds and more patients)	78.4	13.29
How fair pay is compared with those in other professions (e.g. lawyers)	76.8	10.82
National shortage of qualified nurses in your specialty	76.8	8.63
Recognition of your efforts by the Trust	72.5	12.29
Cancellation of routine work to cope with acute referrals	71.1	7.99
Lack of separate restaurant facilities for hospital staff	70.9	5.58
Amount of time available for research projects	70.8	3.77
Reduced funding for course travel and accommodation expenses	67.4	6.18
Out of hours facilities for food	65.4	3.41
Rising patient expectations	64.3	5.14

Table 18: Hazard Indices and Ratios for Junior Medical Staff (Trust B)

The two main psychosocial hazards, reported by over 80% of Junior Medical Staff were:

- Pressure on beds resulting in patients being placed in inappropriate wards (and "lost" or forgotten)
- Increase in acute medical admissions and its impact on service provision

Over three quarters of the sample reported the following further psychosocial hazards:

- Impact of the moves on morale within [the Trust]
- Management of moves from nearby hospitals (resulting in fewer available beds and more patients)

- How fair pay is compared with those in other professions (e.g. lawyers)
- National shortage of qualified nurses in your specialty

4.2 Likely Risk Factors

The logic underpinning the identification of likely risk factors has been described in previous chapters. Essentially, the health-related data are used to identify which psychosocial hazards are associated with negative outcomes, and are thus *likely* to represent risks to individual or organisational health. It is important to reiterate that only a statistical association is sought and established: it is not possible to tease out and draw conclusions about 'cause and effect' in these analyses. To summarise, there are three steps:

1. The identification of psychosocial hazards
2. The measurement of staff well-being, health-related behaviours and organisational outcomes
3. The establishment of statistical links between 1 and 2

It should be noted that not all the psychosocial hazards necessarily become likely risk factors: In other words, not all the work characteristics rated as unsatisfactory are expected to be linked to poor well-being or health-related behaviours. These aspects of work, however, should be properly considered and addressed by the organisation as part of "good management practice", since they are clearly linked to staff dissatisfaction. Conversely, not all the likely risk factors identified necessarily have to be major psychosocial hazards as identified above. Accordingly, all the WES items (not just the psychosocial hazards) were included in the analyses leading to the identification of likely risk factors.

4.2.1 Criteria for 'caseness'

In order to carry out the planned statistical analyses (details in the following section), the individual and organisational health data needed to be dichotomised into "diseased" and "non-diseased" categories. The 'cut-off points' selected for categorising an individual's score for each of the individual and organisational health indices are described below:

Individual health

- *Quality Sleep*: 6.5 hours of quality sleep was selected as the cut-off point, reflecting the recommendation from the Junior Doctors' Task Force (Department of Health, 1993) as a level below which performance is likely to be impaired

- *Amount of alcohol*: a score higher than 14 units for women and 21 units for men (OPCS, 1996)

- '*Worn-out (25)*': a score equal to or greater than 25.

- '*Tense (25)*': a score equal to or greater than 25

A score of 24-25 represents the mid-point in the entire possible range of scores for the worn-out and tense scales (each scale has 12 items that are scored between 0 and 4). This is a very conservative cut-off point, since scores above 24 are well above the mean of the available norms. Accordingly, two additional data recodes were performed:

- *Worn-out mean*: a score higher than the mean for the assessment sample (i.e., junior or senior medical staff)

- *Tense mean*: a score higher than the mean for the assessment sample (i.e., junior or senior medical staff)

Organisational health

- *Absence*: As indicated earlier, absence rate amongst doctors is known to be very low. In Trust B the rate was between 1 and 2 days. Accordingly, the mean score for each sample –rather than the average for the UK population, or professional workers– was used as the 'cut-off' point in order better to discriminate within the samples.

- *Reduced commitment to medicine*: The categories "considerably less committed" and "less committed" were collapsed into one, and the same process was followed with "considerably more committed" and "more committed". The mid-point ("unchanged") was ignored.

- *Reduced commitment to the NHS*: The same process was followed as for "*Reduced commitment to medicine*"

- *Reduced intention to remain at Trust B*: The sample was split between those who agreed with the statement "I am committed to remaining at [Trust B]" and those who did not.

- *Intention to move to a different hospital* (seniors only): The sample was split between those who agreed with the statement "I am likely to seek employment in a different hospital during my lifetime as a consultant / associate specialist"" and those who did not.

- *Intention to take early retirement* (senior only): The sample was split between those who agreed with the statement "I intend to take early retirement" and those who did not.

- *Intention to return to Trust B (juniors only)*: The sample was split between those who agreed with the statement "I would return to [Trust B] if the opportunity arose" and those who did not.

4.2.2 Measuring risk: likely risk factors

As indicated in section 2.4.1, experimental designs that aim to investigate causal relationships are beyond the scope of case studies such as those presented here. The purpose of risk assessments is to provide 'good enough'

evidence that workers exposed to certain aspects of the work environment are statistically 'at risk' of experiencing negative health outcomes. In general terms, risk is best assessed by means of cohort studies: researchers assemble a 'cohort', this is, a defined population at risk who do not present the disease or outcome of interest, classify them according to whether they are exposed or not to those characteristics which are thought to be related to the outcome, and then assess them over time to see which of those individuals experience the outcome. However, cohort studies involve large numbers of participants (especially when the disease or outcome under investigation is rare), require considerable investment in time and resources, and may not provide anything but provisional results for many years. Consequently, case control studies are much more frequently used. Such studies are still observational –not experimental– in nature, and begin with the identification of a group of *already* 'diseased' individuals and one of controls. Researchers then proceed retrospectively to assess their exposure to the hypothesised risk factors.

Cohort studies are the only ones that allow researchers to measure relative risk directly. Relative risk (RR) is generally defined as the ratio of the rate of the disease among those exposed to the rate among those not exposed. RR should be considered in relation to absolute risk, this is, the actual number of persons in each group, exposed and unexposed, who acquired the disease. Risk measures can be best understood with reference to a 2×2 cross-classification table such as:

		Negative health outcome		
		Yes ('case')	No ('control')	
Inadequate work characteristic	yes	a	b	a + b
	no	c	d	c + d
		a + c	b + d	a + b +c + d

Using this classification table, relative risk can be defined as,

$$RR = \frac{\text{Incidence of disease in those exposed}}{\text{Incidence of disease in those not exposed}} = \frac{A/A+B}{C/C+D} \quad (1)$$

Case control studies offer no means of ascertaining disease rates because the study groups are not determined by nature, but selected by researchers according to their criteria. Consequently, it is not possible to calculate RR by using formula (1) above. However, odds ratios are often used as an alternative measure of risk that is conceptually and mathematically analogous to relative risk (Fletcher *et al.*, 1988). Odds ratios (OR) are widely used in epidemiology and health studies (Wang *et al.*, 1995), although rarely in clinical settings. An odds ratio describes how much more likely it is for the outcome to be present among those exposed to a risk ('exposed group'), than among those not exposed to that risk ('control group') –in other words, the odds that a case is exposed divided by the odds that a control is exposed. Because of their conceptual similarity, OR are often reported as "estimated relative risks". However, it is worth noting that OR are approximately equal to the relative risk only when the incidence of the disease is low. How low the risk needs to be for the mathematical assumptions to hold has been a matter for debate, but it is suggested that the mathematical equivalence between RR and OR begins to be questionable when disease rates in unexposed participants are higher than 1 in 100 (Feinstein, 1986).

This poses a problem for risk management case studies, which need to focus on well-defined work groups for theoretical and practical reasons (see page 142). Unfortunately, "well-defined" generally means *small* groups. Therefore, if researchers adopt highly stringent criteria for 'caseness' in order to ensure that the incidence of disease is very low, the consequence will be that many of the analyses will produce empty cells in the cross-classification tables, and fail to meet the heuristic for minimum expected frequencies (Tabachnick & Fidell (1996) recommend that "all expected frequencies are greater than one, and that no more than 20% are less than five", p. 579).

On the other hand, OR have certain optimal statistical properties that make it the fundamental measure of association in many types of studies, particularly in case control studies (Laird & Mosteller, 1990). These statistical advantages may be particularly important when data from several studies are combined, as they are in a meta-analysis. The assessments presented here bear a closer resemblance to case control studies than to cohort studies. Although odds ratios may in some cases be an imperfect estimate of relative risk, they were used to explore the hazard-harm relationship in the case studies because they present two main advantages over alternative analytical techniques:

First, both OR and logistic regression (see Chapter 5) have the advantage of not being subject to statistical assumptions (such as normality), and of not being based on a linear model, which implies that there is a linear relationship between variables, i.e., that a change in one variable corresponds to a directly proportional change in the other (represented in a scatterplot as a straight line). This is unlikely to be the case for a variety of reasons (see, for example, Zapf et al., 1996), and performing linear analyses on non-linear data can lead to the failure to detect 'real' effects in the data.

Second, OR also have the advantage of being reasonably intuitive and easy to understand. As Wang *et al.* (1995) put it, odds ratios "yield more useful and meaningful results". This is an important consideration when results are to be fed back to participants who may not be statistically minded. For example, a chi-square test may tell us that the relationship between two variables is statistically significant, with a chi-square of 20.5 at $p \leq .01$. OR, however, would tell us that an exposed group is *n* times more likely to present a given outcome than the non-exposed group. This is more easily interpreted, and more meaningful, than merely reporting a significance level (which, with sufficiently large samples, can be misleadingly easy to achieve).

By definition, the odds ratio is

$$OR = \frac{[a/(a+b)] \ / \ [b/(a+b)]}{[c/(c+d)] \ / \ [d/(c+d)]}, \qquad (2)$$

which reduces to

$$OR = \frac{a/b}{c/d}, \qquad (3)$$

and is usually calculated as

$$OR = \frac{ad}{bc}. \qquad (4)$$

[4] is the simplest formula for odds ratio, and is used as an estimator of the population relative risk. In principle, the OR can have any value between zero and infinity (although very large values, or those close to zero, should be treated with caution).

The most common method used to determine the statistical significance of any associations identified by the odds ratio technique is the chi-square test (Howell, 1997; Hosmer & Lemeshow, 1989). The p value associated with the chi-square represents its statistical significance, but it should be taken into consideration that it depends on the magnitude of the difference between the two groups, the strength of the association between them and the size of the sample. Because of these caveats, it is also advisable to calculate a 95% confidence interval for each OR. The Confidence Interval (CI) for an OR represents the range within which the 'true magnitude' of the effect lies within a certain degree of certainty (Hennekens & Buring, 1987), and can serve as a measure of statistical significance at $p \leq .05$ (this is, if the study was repeated 100 times, having a 95% CI suggests that 95 out of the 100 times the OR value would fall within the parameters of the CI). The CI can be calculated using the formula:

$$CI = (ad/bc) \exp [\pm Z \sqrt{(1/a+1/b+1/c+1/d)}] \qquad (5)$$

(for 95% confidence i.e. $p \leq .05$, $Z=1.96$)

The 'null value' is represented by an OR = 1 (both groups are equally likely to report the negative outcome), therefore, if the 95% CI does *not* include an OR

=1, then the corresponding p value is $\leq$ .05 and the OR is considered significant.

The likelihood ratio chi-square statistic is generally accepted as the most appropriate test for the significance of odds ratios (Howell, 1997; Hosmer & Lemeshow, 1989). This is the value reported in the following sections with each OR.

Odds ratios were used to assess the likelihood of the group who were 'exposed' to the psychosocial hazard having a particular (poor) health outcome relative to those who were not 'exposed' to the psychosocial hazard. Exposure was assigned on the basis of the respondents' scores on the WES items: the group who reported a WES item to be *unsatisfactory* or *very unsatisfactory* was coded as the "exposed" group, and those who reported a WES item to be *satisfactory* or *very satisfactory* were coded as the "not exposed" group. The midpoint ("ambivalent") was not included in the analysis.

Dichotomising variables that may be better conceptualised as continuous (or that may be truly interval data, such as days and hours in the case of the sleep and absence variables) implies some loss of information (variance) within the data, and therefore, the loss of some statistical power. However, this has to be balanced against the advantages of OR described earlier, especially in the case of health-related data such as the GWBQ, which tends to depart markedly from the normal distribution and would require transformation techniques. Moreover, it is thought that "linear data analysis methods would usually underestimate the true strength of stressor-strain association" (Zapf *et al.*, 1996).

The Trust B datasets were analysed using SPSS for Windows releases 7.5 and 9.0. The results are reported below in the following order:

- Likely risk factors for senior medical staff, in relation to:
    a) individual health (GWBQ and health-related behaviours) and,
    b) organisational health

- Likely risk factors for junior medical staff, in relation to
    a) individual health (GWBQ and health-related behaviours) and,
    b) organisational health

Within each individual health subsection (a), likely risk factors are shown by each of the domains of the WES (adapted from Cox, 1993: see Table 1). Within the organisational health subsections (b), the organisational outcome has been listed in the first column with its likely risk factor(s) in the last. This facilitates the consideration of work characteristics are associated with each individual or organisational outcome.

In each table, the likely risk factor has been listed with its hazard index (some of which were illustrated in section 4.1) to provide an impression of how widespread the problem appears to be. The outcome(s) with which the psychosocial hazard has been associated, the value of the odds ratio (indicative of the strength of the relationship) and its level of significance (likelihood ratio chi-square statistic) are also shown. The more interesting findings from each table are noted briefly.

4.3 Likely risk factors for senior medical staff

4.3.1 Individual health indices

Work design

Table 19 shows the items in this domain significantly linked to the health indices of Senior Medical Staff. For instance, the 55.6% who reported a high volume of work were six times more likely to report fewer hours of quality sleep than those who did not. It is worth noting that a cluster of risk factors in this domain related to interactions with junior medical staff. Other risk factors were the focus of medical audit and lack of support within the specialty for dealing with patients' death.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Volume of work (overall workload)	55.6	6.00 (p=.03)	Sleep
Adequacy of hand-over procedure for junior staff (i.e. satisfactory completion of duties and clear transfer of responsibility)	57.6	9.37 (p=.02)	Sleep
Support from junior staff during Outpatient clinics	36.7	10.12 (p=.01)	Sleep
Arrangements for the completion of discharge summaries	37.1	5.33 (p=.04)	Worn-out mean
		10.28 (p=.02)	Tense mean
		7.70 (p=.02)	Sleep
Opportunities to establish rapport with junior staff and give informal feedback	48.6	7.86 (p=.01)	Worn-out mean
Amount of time available for appraisal of junior staff (even if you are not an educational supervisor)	52.9	5.69 (p=.04)	Sleep
Focus of medical audit (on clinical / research vs. "practical" issues such as continuity of care)	25.7	8.00 (p=.04)	Worn-out mean
Support within specialty for dealing with death	25.8	11.00 (p=.03)	Tense mean

Table 19: Likely Risk Factors for Senior Medical Staff (Work Design)

Career, Job Status and Pay

The 32.4% who reported unsatisfactory prospects for career development and those who lacked opportunities to maintain and update their skills (38.9%) were significantly more likely to be more worn-out and to have a poor quality of sleep than the not exposed group (see Table 20).

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Career development (e.g. prospects for furthering management or clinical roles)	32.4	14.60 (p=.01)	Worn-out mean
		9.00 (p=.02)	Sleep
Opportunities to maintain and update your skills	38.9	44.00 (p=.01)	Worn-out mean
		20.80 (p=.01)	Sleep

Table 20: Likely Risk Factors for Senior Medical Staff (Career, Job Status and Pay)

National Issues

The hazard indices for items in the National Issues domain were considerably higher than for those in other domains. This is indicative of a higher degree of consensus. The 50% who rated the morale of fellow consultants as unsatisfactory were nearly nineteen times more likely to have a poor quality of sleep than the control or non-exposed group. In addition, those who found the new "business" ethos within the NHS to be unsatisfactory (65.7%) were nearly seven times more likely to report a poor quality of sleep than those who found it to be satisfactory. These and other likely risk factors are shown in Table 21.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Morale of fellow consultants	50.0	18.75 (p=.01)	Sleep
New "business" ethos within the NHS	65.7	6.67 (p=.04)	Sleep
Prospects for the development of your own specialty	55.6	6.00 (p=.03)	Worn-out mean
The impact of the Patient's Charter on your work (e.g. waiting lists, waiting times)	47.1	24.00 (p=.01)	Sleep

Table 21: Likely Risk Factors for Senior Medical Staff (National Issues)

Social Climate and Interpersonal Relations

Those who rated the support from their fellow consultants (either within the specialty or across Trust B) as unsatisfactory were significantly more likely to be more worn-out and more tense than those who rated it as satisfactory. It should be noted that the majority of Senior Medical Staff considered that support within the specialty and across Trust B was satisfactory (72.2% and 63.9% respectively). Therefore, although only around one fifth of Senior Medical Staff reported dissatisfaction with the level of support from their colleagues, this was significantly associated with poor well-being. Table 22 shows that nursing staff morale and support from administrative staff within the specialty also emerged as likely risk factors within this domain.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Support from fellow consultants (within the specialty)	22.2	8.14 (p=.01)	Worn-out mean
		10.22 (p=.01)	Tense mean
Support from fellow consultants (across [redacted]) [the Trust]	19.4	14.00 (p=.01)	Tense mean
		10.50 (p=.03)	Amount of alcohol
Nursing staff morale and its effect on your work	50.0	10.00 (p=.02)	Worn-out mean
Support from administrative staff within the specialty	27.8	10.00 (p=.01)	Worn-out mean

Table 22: Likely Risk Factors for Senior Medical Staff (Social Climate)

Organisational Issues

The risk factors identified for this domain closely relate to the concepts of demands, support and control. As shown in Table 23, those Senior Medical Staff who considered that purchasers placed unreasonable demands upon them, or their specialty, were over eleven times more likely to report a poor quality of sleep. Furthermore, negative health outcomes were significantly more likely to be experienced by those who did not receive support at either Directorate or Trust management level. This support was defined, generally, in terms of actual support and recognition of efforts and, more specifically, in terms of support for the development of the service. Senior Medical Staff who reported a lack of participation in decisions which affected their job and a lack of encouragement for sharing work problems and problem solving were, again, at likely risk in terms of their health and well-being. Finally, those Senior Medical Staff who reported poor communications with the Trust management were nearly eight times more likely to be above the overall group's worn-out mean than the non-exposed group.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Demands placed upon you / your specialty by purchasers	62.5	11.42 (p=.04)	Sleep
Trust support for development of the service (e.g. towards sub-specialisation, Centres of Excellence)	42.9	7.43 (p=.02)	Sleep
Participation in decisions which affect the job you do (adequate consultant representation on management committees)	22.2	8.40 (p=.02)	Worn-out mean
Encouragement for sharing work problems and problem solving	38.2	9.43 (p=.03)	Tense mean
		11.00 (p=.02)	Sleep
Actual support from Directorate management	22.9	22.40 (p=.01)	Worn-out mean
Communications with Trust management	17.6	8.00 (p=.03)	Worn-out mean
Recognition of your efforts by the Directorate	22.9	10.50 (p=.01)	Worn-out mean
Recognition of your efforts by the Trust	44.4	5.56 (p=.03)	Worn-out mean

Table 23: Likely Risk Factors for Senior Medical Staff (Organisational Issues)

Role at Work

Those Senior Medical Staff (12.1%) who reported being overburdened by the responsibility for managing the team of junior staff were fourteen times more likely to exceed the overall group's mean tense score than those did not consider it to be a problem (see Table 24).

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Responsibility for managing team of junior staff	12.1	14.00 (p=.03)	Tense mean

Table 24: Likely Risk Factors for Senior Medical Staff (Role at Work)

4.3.2 Organisational health indices

Absence

Likely risk factors for days of absence were poor prospects for career development and, interestingly, inflexible working hours (see Table 25).

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Days absent	32.4	14.40 (p=.01)	Career development (e.g. prospects for furthering management or clinical roles)
	8.3	13.33 (p=.05)	Flexibility of working hours

Table 25 Likely Risk Factors for Absence Behaviour in Senior Medical Staff

Reduced Commitment to Medicine

Table 26 shows that likely risk factors for reduced commitment to medicine were insufficient numbers of junior doctors in the specialty and dissatisfaction with the decision to build the new hospital.

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Reduced Commitment to Medicine	31.4	7.20 (p=.02)	Junior medical staffing levels in your specialty
	14.7	9.00 (p=.04)	Decision to build "[redacted]" (the new hospital)

Table 26: Likely Risk Factors for Reduced Commitment to Medicine (Senior Medical Staff)

Reduced Commitment to the National Health Service

The likely risk factors for reduced commitment to the NHS can also be structured around the concepts of demands, control and support. In terms of the demands placed on Senior Medical Staff, likely risk factors were the rapid rate of change within the Trust; the excessive demands from patients, colleagues and others; and the lack of opportunities to maintain and update their skills. Lack of support from colleagues when negotiating study leave and from administrative staff within the specialty were also likely risk factors for reduced commitment to the NHS. There may be issues of control regarding the lack of satisfaction with the terms and conditions of the employment contract (see Table 27).

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Reduced Commitment to the NHS	24.2	6.67 (p=.04)	Equal opportunities for each consultant to become a clinical director
	19.4	6.67 (p=.05)	Terms and conditions of employment contract
	38.9	9.90 (p=.01)	Opportunities to maintain and update your skills
	16.7	6.67 (p=.04)	Support from colleagues when negotiating study leave
	27.8	6.37 (p=.02)	Support from administrative staff within the specialty
	41.7	11.43 (p=.01)	Rate of change within the Trust
	28.6	11.00 (p=.01)	Demands from patients / colleagues / others

Table 27 Likely Risk Factors for Reduced Commitment to the NHS in Senior Medical Staff

Reduced Intention to Remain at Trust B

Support emerged as a significant risk factor for reduced intention to remain at Trust B. Senior Medical Staff were significantly more likely to report their intention to leave the Trust when they stated that they did not receive support in the following areas: (i) within the specialty for dealing with death; (ii) from colleagues when negotiating both annual and study leave; and (iii) support and recognition of their efforts from the Directorate management. Table 28 shows that communications with Directorate and Trust management were also significant risk factors.

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Reduced Intention to Remain at Trust B	25.8	11.00 (p=.03)	Support within specialty for dealing with death
	32.4	10.00 (p=.03)	Career development (e.g. prospects for furthering management or clinical roles)
	38.9	9.00 (p=.03)	Opportunities to maintain and update your skills
	16.7	15.33 (p=.01)	Support from colleagues when negotiating study leave
	30.6	5.56 (p=.04)	Consultant staffing levels in your specialty
	17.1	14.67 (p=.01)	Support from colleagues when negotiating annual leave
	22.2	12.00 (p=.01)	Support from fellow consultants (within the specialty)
	22.2	54.00 (p=.01)	Participation in decisions which affect the job you do (adequate consultant representation on management committees)
	15.2	9.50 (p=.04)	Communications with Directorate management
	22.9	9.50 (p=.02)	Actual support from Directorate management
	17.6	19.00 (p=.01)	Communications with Trust management
	22.9	28.33 (p=.01)	Recognition of your efforts by the Directorate

Table 28: Likely Risk Factors for Reduced Intention to Remain at Trust B (Senior Medical Staff)

Intention to Move to a Different Hospital

Again, lack of support emerged as a significant likely risk factor associated with reported to move to a different hospital. A general lack of support from other colleagues (both within the specialty and across the Trust) and, more particularly, difficulties with colleagues when negotiating annual and study leave, were associated with the doctors' report.

For those senior doctors who expressed their intention to move to a different hospital, the lack of support in these crucial areas may be seen as a factor specific to Trust B and perhaps not expected to be found at another institution. Other factors that were associated with intention to leave Trust B

but not with reduced commitment to medicine or the NHS were the organization of the emergency call rota, poor communications with Trust management and unsatisfactory recognition of efforts at Directorate level (see Table 29).

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Intention to Move to a Different hospital	30.3	19.00 (p=.01)	Organization of emergency call rota
	16.7	25.00 (p=.01)	Support from colleagues when negotiating study leave
	17.1	11.50 (p=.02)	Support from colleagues when negotiating annual leave
	22.2	7.20 (p=.05)	Support from fellow consultants (within the specialty)
	19.4	7.87 (p=.05)	Support from fellow consultants (across [redacted]) [the Trust]
	17.6	9.00 (p=.04)	Communications with Trust management
	22.9	8.00 (p=.03)	Recognition of your efforts by the Directorate

Table 29: Likely Risk Factors for Intention to Move to a Different Hospital in Senior Medical Staff

Intention to take Early Retirement

Poor career development prospects and lack of recognition of efforts by the Trust were, interestingly, the likely risk factors linked to senior doctors' reported intention to retire early (see Table 30). Furthermore, those rated the support from administrative staff as unsatisfactory (just over a quarter of the sample) were more likely to consider early retirement than the not exposed group. This reflects concerns expressed during Work Analysis Interviews by some consultants, who found that the inefficiency of the staff in charge of the daily management of their schedules resulted in many unwanted and unwarranted "daily hassles".

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Early retirement	32.4	10.00 (p=.03)	Career development (e.g. prospects for furthering management or clinical roles)
	27.8	6.37 (p=.02)	Support from administrative staff within the specialty
	44.4	5.50 (p=.04)	Recognition of your efforts by the Trust

Table 30 Likely Risk Factors for Intention to take Early Retirement (Senior Medical Staff)

4.4 Likely Risk Factors for Junior Medical Staff

Following the same pattern as the previous section, in the individual health subsection likely risk factors are organised by each of the domains of the WES.

4.4.1 Individual health indices

Work design

Table 31 below shows which items in this domain were significantly associated with the health of Junior Medical Staff, specifically in terms of their general well-being, drinking alcohol and quality of sleep. Those who reported a high volume of work (30.4%) and, specifically paperwork (41.2%), were around four times more likely to exceed the overall groups' worn-out score than those who were in the not exposed category. Poor organization of the emergency call rota, dissatisfaction with the appropriateness of tasks and support within the specialty for dealing with death were also associated with significantly poorer worn-out scores. Other risk factors were lack of control over workload, irregular appraisal sessions with the educational supervisor and lack of time available for research projects.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Volume of work (overall workload)	30.4	4.15 (p=.02)	Worn-out mean
Control over workload (opportunity to plan your work)	52.8	5.67 (p=.02)	Worn-out mean
		12.00 (p=.02)	Alcohol yes/no
Organization of emergency call rota	25.0	7.65 (p=.01)	Worn-out mean
		7.14 (p=.03)	Worn-out 25
How appropriate the tasks are (e.g. being called at night to take bloods)	31.9	14.86 (p=.01)	Worn-out mean
		19.25 (p=.01)	Worn-out 25
Volume of paperwork (e.g. in terms of the clerking of patients)	41.2	3.67 (p=.05)	Worn-out mean
Regularity of appraisal sessions with educational supervisor	36.0	6.23 (p=.01)	Sleep
Amount of time available for research projects	70.8	5.38 (p=.04)	Worn-out mean
		9.60 (p=.01)	Tense mean
Support within specialty for dealing with death	34.6	4.33 (p=.03)	Worn-out mean
		9.00 (p=.02)	Worn-out 25

Table 31: Likely Risk Factors for Junior Medical Staff (Work Design)

Career, Job Status and Pay

The 43.6% of Junior Medical Staff who found the provision of careers guidance to be inadequate were four times more likely to exceed the overall junior doctors' worn-out and tense scores than those who did not find it a problem (see Table 32). Likely risk factors for feeling tense and reporting a poor quality of sleep included lack of opportunities to maintain and update skills (in current rotation) and lack of immediate job prospects.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Provision of careers guidance	43.6	4.05 (p=.04)	Worn-out mean
		4.14 (p=.03)	Tense mean
Opportunities to maintain and update your skills (in your current rotation)	13.5	24.00 (p=.01)	Tense mean
Immediate job prospects	17.3	7.67 (p=.01)	Tense mean
		6.65 (p=.02)	Sleep
Trust-determined classification for Additional Duty Hours (ADH)	36.7	5.20 (p=.02)	Worn-out mean

Table 32: Likely Risk Factors for Junior Medical Staff (Career, Job Status & Pay)

National Issues

Poor morale of peers and insufficient remuneration (both reported by over half the sample) were significant likely risk factors for high worn-out and tense scores in Junior Medical Staff (see Table 33).

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Morale of peers	50.9	6.00 (p=.01)	Worn-out mean
		10.40 (p=.01)	Tense mean
National level of basic pay	56.4	7.00 (p=.02)	Worn-out mean

Table 33: Likely Risk Factors for Junior Medical Staff (National Issues)

Work Organisation

The number of consecutive hours on-call and time spent working outside contracted working hours, in conjunction with the inflexibility of those working hours, were all significantly related to scores above the mean amongst 'exposed' staff. Additionally, Table 34 shows that lack of opportunities to take work breaks and poor facilities for food out of hours were significant likely risk factors for general well-being. Lack of support from the Directorate to cover annual leave and the negative impact of work on home life were further factors.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Number of consecutive hours on-call	21.6	4.36 (p=.05)	Worn-out mean
		4.81 (p=.03)	Tense mean
		11.25 (p=.03)	Smoke yes/no
Flexibility of working hours	40.4	4.12 (p=.05)	Worn-out mean
Amount of time spent working outside contracted working hours	42.6	5.71 (p=.01)	Worn-out mean
		6.50 (p=.01)	Tense mean
Opportunities to take work breaks (e.g. coffee breaks, lunch)	32.1	13.60 (p=.02)	Worn-out 25
Out of hours facilities for food	65.4	8.47 (p=.02)	Tense mean
Support from Directorate to cover annual leave	27.8	5.50 (p=.01)	Worn-out mean
Impact of your work on home life (e.g. arriving home at a reasonable time)	45.5	7.09 (p=.01)	Tense mean

Table 34: Likely Risk Factors for Junior Medical Staff (Work Organization)

Social Climate & Interpersonal Relations

Table 35 shows that a very small proportion of junior doctors (around 7%) reported support from non-medical colleagues within the specialty and contact with patients' relatives to be unsatisfactory. However, this group were significantly more likely to exceed the overall group's mean tense score, and to report unhealthy levels of alcohol consumption, compared to the rest of the sample. This appears to be an at risk group, and is a clear instance where reverse causation or a common third variable may constitute alternative explanations.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Support from non-medical colleagues (e.g. nurses, midwives, physiotherapists) within specialty	7.1	12.43 (p=.02)	Tense mean
Pleasantness of contact with patients' relatives	7.3	37.00 (p=.01)	Amount of alcohol

Table 35: Likely Risk Factors for Junior Medical Staff (Social Climate & Interpersonal Relations)

Organisational Issues

The quality of the induction programmes to the Trust and the specialty emerged as likely risk factors for a number of individual health outcomes (see Table 36). Further analysis indicated that an overwhelming 93.8% of juniors in Obstetrics and Gynaecology were satisfied or very satisfied with their specialty induction programme, while the corresponding figure for juniors in Integrated Medicine was only 47.8%. Interactions with Directorate management proved to be a contentious issue for junior doctors, in terms of communications, support and recognition of efforts.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Lack of adequate funding to boost consultant numbers	39.1	7.20 (p=.03)	Worn-out mean
Induction to Trust upon arrival	19.6	5.75 (p=.03)	Worn-out 25
Induction to Specialty upon arrival	17.3	13.33 (p=.01)	Worn-out mean
		10.94 (p=.01)	Tense mean
Communications with Directorate management	41.2	8.12 (p=.01)	Worn-out mean
Actual support from Directorate management	50.0	10.12 (p=.01)	Worn-out mean
Recognition of your efforts by the Directorate	54.9	4.93 (p=.04)	Worn-out mean

Table 36: Likely Risk Factors for Junior Medical Staff (Organisational Issues)

Role At Work

Those junior doctors who reported excessive demands from patients, colleagues and others (around a quarter of the sample) were five times more likely to report being more worn-out and more tense than the average for the assessment sample, and over seven times more likely to exceed the 25 mid-point of the worn-out score than the rest of the sample.

Likely Risk Factor	Hazard Index (%)	Odds Ratio	Outcome
Demands from patients/colleagues/others	23.6	5.06 (p=.02)	Worn-out mean
		7.50 (p=.02)	Worn-out 25
		5.33 (p=.02)	Tense mean

Table 37: Likely Risk Factors for Junior Medical Staff (Role At Work)

4.4.2 Organisational health indices

Within this subsection, the organisational outcome has again been listed in the first column with its likely risk factor(s) in the last.

Reduced Commitment to Medicine

Table 38 shows that support (from colleagues both within the specialty and across Trust B) and demands (from patients, colleagues and others) played an important role in the reporting of reduced commitment to Medicine. Lack of opportunities to pursue a specialist interest (rated as unsatisfactory by around 40% of the sample) was also a likely risk factor. It is interesting to note the difference between this set of factors and that of senior doctors (see Table 26 on page 98)

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Reduced Commitment to Medicine	14.5	5.14 (p=.05)	Support from colleagues (within the specialty)
	18.9	5.18 (p=.03)	Support from colleagues (across [redacted]) [the Trust]
	39.5	24.00 (p=.01)	Opportunities to pursue a specialist interest
	23.6	3.80 (p=.05)	Demands from patients/colleagues/others

Table 38: Likely Risk Factors for Reduced Commitment to Medicine (Junior Medical Staff)

Reduced Commitment to the National Health Service

As shown in Table 39, the likely risk factors associated with reduced commitment to the NHS in Junior Medical Staff centre around the volume of work and paperwork, demands and support from the Medical Staffing department. Again, these fairly low-level or 'task' factors contrast with the risk factors for senior doctors' reduced commitment to the NHS (see Table 27 on page 99).

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Reduced Commitment to the NHS	30.4	6.50 (p=.04)	Volume of work (overall workload)
	41.2	4.22 (p=.03)	Volume of paperwork (e.g. in terms of the clerking of patients)
	39.5	6.40 (p=.02)	Opportunities to pursue a specialist interest
	24.1	4.50 (p=.04)	Actual support from Medical Staffing
	23.6	4.50 (p=.03)	Demands from patients/colleagues/others

Table 39: Likely Risk Factors for Reduced Commitment to the NHS (Junior Medical Staff)

Intention to Return to Trust B

Several themes emerged when considering likely risk factors for junior doctors' reported decision not to return to Trust B (see Table 40). The first one encompasses education, training and careers guidance (including: insufficient time utilized for "hands-on" teaching by senior staff; the lack of opportunities to establish rapport with senior staff, to receive informal feedback and to attend teaching sessions; the inadequacy of formal educational objectives set for post; and the poor quality of careers guidance). All these factors represent core components within any rotation (time spent in a given specialty or Directorate) and are crucial to the development of junior doctors. The second theme reflects the unsatisfactory nature of psychological or managerial support also appeared to play a role in doctors'

reluctance to return to Trust B (absence of debriefing sessions after distressing events and inadequate support within specialty for dealing with death).

The third theme relates to work design and scheduling issues: workload and the negative impact which the reduction in hours has had on workload; insufficient time to discuss diagnosis and treatment with patients (maintain quality of care); inflexible working hours; and lack of opportunities to take work breaks. Finally, a number of organisational issues were associated with a reported decision not to return to the Trust: communications with, and support from, Directorate management, poor support from Medical Staffing, a lack of participation in job-relevant decisions and the rapid rate of change within Trust B.

Outcome	Hazard Index (%)	Odds Ratio	Likely Risk Factor
Decision not to return to Trust B	30.4	4.60 (p=.02)	Volume of work (overall workload)
	47.5	5.20 (p=.03)	Impact the reduction in hours has had on your workload
	30.9	6.09 (p=.01)	Time to discuss diagnosis and treatment with patients (maintain quality of care)
	52.9	4.00 (p=.05)	Amount of time utilized for "hands-on" teaching by senior staff
	27.3	5.67 (p=.02)	Opportunities to establish rapport with senior staff and receive informal feedback
	40.0	9.71 (p=.01)	Opportunities to attend teaching sessions
	52.1	5.40 (p=.02)	Availability of debriefing sessions after distressing events
	34.6	4.06 (p=.05)	Support within specialty for dealing with death
	28.3	4.77 (p=.03)	Formal educational objectives set for post
	43.6	4.89 (p=.02)	Provision of careers guidance
	40.4	11.00 (p=.01)	Flexibility of working hours
	32.1	8.56 (p=.01)	Opportunities to take work breaks (e.g. coffee breaks, lunch)
	27.8	4.11 (p=.04)	Support from Directorate to cover annual leave
	46.4	4.16 (p=.03)	Nursing staff morale and its effect on your work
	37.3	10.29 (p=.02)	Rate of change within the Trust
	46.2	6.60 (p=.01)	Participation in decisions which affect the job you do (e.g. decisions regarding rota organization or training)
	41.2	6.00 (p=.02)	Communications with Directorate management
	50.0	5.14 (p=.02)	Actual support from Directorate management
	24.1	4.33 (p=.05)	Actual support from Medical Staffing
	23.6	4.24 (p=.05)	Demands from patients/colleagues/others

Table 40: Likely Risk Factors for Decision not to Return to Trust B (Junior Medical Staff)

4.5 Summary Of Hazards and Likely Risk Factors

This section offers a brief summary of the assessment data in terms of hazards and likely risk factors, and tries to identify overall themes within the data.

4.5.1 Psychosocial and Organisational Hazards

The main psychosocial hazards identified for *Senior Medical Staff* relate to organisational and work design or 'local' issues:

- Pressure on beds resulting in patients being placed in inappropriate wards (and "lost" or forgotten)
- Cancellation of routine work to cope with acute referrals
- Difficulty in finding a parking space
- Continuity of care since introduction of new patterns of work for junior staff
- Impact the reduction in junior doctors' hours has had on your workload

The main psychosocial hazards for *Junior Medical Staff* relate primarily to organisational and national issues.

- Pressure on beds resulting in patients being placed in inappropriate wards (and "lost" or forgotten)
- Increase in acute medical admissions and its impact on service provision
- Impact of the moves on morale within Trust B
- Management of moves from nearby hospitals (resulting in fewer available beds and more patients)
- How fair pay is compared with those in other professions (e.g. lawyers)
- National shortage of qualified nurses in your specialty

4.5.2 Likely Risk Factors

The volume of work, relationships with colleagues and interactions with junior medical staff emerged as the main likely risk factors for *Senior Medical Staff*. Particularly at the time of assessment, nationwide healthcare policy decisions

were forcing the Trust to implement major changes at a very fast rate. It was variously reported during AMSES and Work Analysis Interviews that a disproportionate amount of the workload caused by these reforms was shouldered by a small group of highly committed senior doctors, who were struggling to balance managerial and clinical commitments. It is not possible to identify individuals from the anonymous survey, but it is tempting to conclude that this group of core staff are represented by the relatively small but recurrent percentage of senior doctors in several of the relevant tables.

The main likely risk factors for *Junior Medical Staff* appear to be the intense workload (especially the amount of paperwork), combined with long and inflexible working hours. The overall impression is of junior doctors facing excessive demands from patients and perceiving little support and recognition of their efforts from the Directorate management. Difficulties relating to career development, education and training were apparent in most rotations, reflecting a national situation as the stretched National Health Service struggled to meet training targets whilst providing the necessary patient care. The strained relationship with management is tested over issues such as emergency call rota, organization of annual leave and general communication difficulties.

4.6 Conclusions: From Assessment to Translation

This chapter has described the results of a risk assessment for two samples of staff –junior and senior doctors– at Trust B. The results were fed back to the Steering Group and, in a summarised format, to all doctors in the target assessment samples.

A common request from organisations is for some kind of *benchmark*: an indication of "how we are doing" with regard to other, similar organisations. Therefore, the author decided to present Trust B with some benchmark information in a way that could also start the process of identifying patterns and underlying pathologies –the 'translation' of assessment results into a coherent basis for designing interventions (see page 16). Although the risk

assessment methodology presented here is a grounded and tailored approach that, by necessity, results in different assessment instruments for each organisation, it is possible to summarised the data, for example, at the level of the categories or domains identified by Cox (1993) and around which the generic Work Environment Survey is constructed.

As a result, two tables were prepared to illustrate how the psychosocial hazards and likely risk factors were distributed by domain across both Trust A and B (see Table 41 and Table 42 below). To make comparisons easier, each cell is shaded according to the magnitude of the percentage within it: the higher the figure, the darker the cell. Although the figures are obviously related to the size of the WES sections in each questionnaire, the proportion of items by WES category was a function of their salience during the Work Analysis Interviews: in other words, if there is a larger proportion of job design items in a questionnaire, this is because such issues emerged as worthy of inclusion during the preliminary phases of the risk assessment.

Domain	Trust A		Trust B	
	Junior Staff	Medical Directorate	Junior Staff	Senior Staff
Physical environment & facilities	25.0%		9.0%	8.4%
Job design	12.5%	67.0%	9.0%	16.6%
Social climate & relationships				
Organisational issues	50.0%	16.5%	64.0%	33.3%
Career, job status & pay	12.5%	16.5%	9.0%	8.4%
National & "external" issues			9.0%	33.3%

Table 41: Distribution of psychosocial hazards by domain (both Trusts)

Domain	Trust A		Trust B	
	Junior Staff	Medical Directorate	Junior Staff	Senior Staff
Physical environment & facilities	20.0%	33.3%		
Job design	20.0%	11.1%	28.6%	
Social climate & relationships			14.3%	40.0%
Organisational issues	60.0%	22.2%	57.1%	20.0%
Career, job status & pay		33.3%		
National & "external" issues				40.0%

Table 42: Distribution of likely risk factors by domain (both Trusts)

In each table, the domains are ordered along a local–national axis, from the very local, *nitty-gritty* issues of equipment and physical environment, through team and organisational issues, to nationwide matters such as career, pay

and health policy initiatives. Although based on a rough, unsophisticated measure, these tables do illustrate the broad similarities and differences between samples within a Trust, between Trusts overall, and between some equivalent samples (e.g., seniors) across Trusts. The aggregated data also show some interesting differences between psychosocial hazards and likely risk factors: for example, in Trust B no items from the "social climate and interpersonal relationships" domain emerged as hazards for either juniors or seniors. However, they do appear as likely risk factors –and, in the case of senior doctors, quite prominently.

Two main themes emerge most clearly from the summary tables: First, the *hot spots* for junior doctors centre around "organisational issues": this is remarkably consistent across, on one hand, Trusts and, on the other hand, hazards and likely risk factors: organisational problems account for around 60% of the total number of items. This reflects the importance of good organisational function for junior doctors in terms of their ability to manage both their daily work as 'service providers' and their training and educational programme, which has a decisive influence on their acquisition of further skills and their career progression.

Second, there appears to be an inverted reward matrix between the Trusts along the local–national axis: low-level, local matters at Trust A figure highly for all staff: the first two domains add up to around 40% of the total for both hazards and likely risk factors, and for both junior and senior doctors. However, these issues have a minor role at Trust B, where –by contrast– the last two categories ("career, job status and pay" and "national and eternal issues") account for around 40% of the items for senior doctors in terms of both hazards and likely risk factors. It was suggested, tentatively, to the Trusts that there might be a hierarchy of problems operating across the two cases, from lower-order, local issues, through social and organisational issues to higher-order, national issues. Lower-order problems may take precedence over higher-order matters, so that when doctors face a preponderance of local problems that interfere with ability to operate effectively on a day-to-day, they may be understandably *distracted* from concern for national issues.

As suggested earlier, part of the 'translation process' –from assessment to intervention design– involves encouraging Steering Groups to think about the issues underlying the assessment results, rather than treating each likely risk factor as a separate entity unrelated to the others. A medical analogy (see Appendix IV) was used by the author when reporting the results to each Trust to illustrate this approach.

The use of odds ratios described in this chapter may unintentionally but partially contribute to this 'disjointed' perception of the problems identified by the risk assessment: likely risk factors for each assessment group are identified individually, which places the onus on Steering Group members to identify patterns and relationships. However, two further statistical strategies can be deployed to help organisations in terms of encouraging a more 'holistic' consideration of the assessment results and of improving the design and, hopefully, effectiveness of interventions.

First, logistic regression can be used to build up models in order better to target resources to a specific outcome of interest to the organisation. This extends the analysis 'upwards and outwards', to explore relationships across any number of appropriate assessment samples within the organisation (e.g., "what factors seem to be related to absence behaviour in our organisation?"). Second, further analyses can be performed to identify groups of staff that report particularly poor levels of individual or organisational health (but see observations about confidentiality on page 133). This strategy extends the analysis 'downwards and inwards', to the level of smaller work groups (e.g., "what groups amongst our staff seem to be particularly at risk?"). Thus, likely risk groups within the sample may be identified for the organisation to consider specific or priority actions. These two strategies are described in the following two chapters.

5. BUILDING MODELS

This chapter describes the use of logistic regression to explore the combination of work characteristics that may predict specific individual or organisational health outcomes. The appropriateness of logistic regression for the analysis of risk assessment data is discussed, and the combined data from the three case studies is used to illustrate the analytical procedure. This strategy may be useful when organisations are particularly concerned about certain negative outcomes and would like to target their efforts to the factors that appear to be associated with those outcomes.

As suggested in the previous chapter, one of the ways in which the analysis of risk assessment data may be extended beyond the overall reporting of likely risk factors is the investigation of the predictors of specific outcomes. Occupational psychology researchers often use multiple linear regression to build models of how certain variables predict a given outcome.

However, logistic regression may be a better technique to analyse data collected for the purpose of risk assessment: Following the logic outlined in previous sections, the analyses aim to identify what factors are associated with negative outcomes, and data are dichotomised to establish 'diseased' and 'non diseased' groups. Multivariate analysis of variance (MANOVA) could be used to determine, for example, whether belonging to a group with insufficient hours of sleep (e.g., fewer than 6.5 hours) is associated with reliable mean differences on a combination of variables (e.g., job characteristics or demographic data). Alternatively, the 'reverse' of MANOVA, discriminant function analysis (DFA), could be used to test whether a combination of variables can accurately predict membership of the 'diseased' or sleep-deprived group and, furthermore, successfully classify individuals' scores into the correct category.

However, these techniques are quite demanding in terms of their requirements (Tabachnick & Fidell, 1996). Compared to them, logistic regression is considerably more flexible, making no assumptions about the

normal distribution of predictors (unlike multiple regression) or equal variance within each membership group (unlike DFA). Predictors in logistic regression do not have to be discrete variables (unlike multiway frequency analysis), which allows a wide variety of potential predictors to be included in the equation. More importantly (see section 4.2.2), logistic regression does not assume that a linear relationship exists between the outcome and the predictor variables (Zapf *et al.*, 1996).

In summary, logistic regression appears to be a particularly suitable technique for analysing risk assessment data: it deals well with non-normal, non-linear data, and it allows predictors to be a combination of continuous, discrete or dichotomous variables (Goodman, 1978). As with odds ratios, there is the necessary consideration that some statistical power is likely to be lost, especially when working with small samples (but this loss may be compensated by logistic regression's non-reliance on normally distributed variables: Menard, 1995). It is also important to ensure that the expected frequencies for the selected variables are adequate (Tabachnick & Fidell, 1996).

With these caveats in mind, the analyses described in this chapter were performed on a dataset which combined variables from all three case studies to increase the number of valid cases. In two cases, two variables were computed into a single one to bring them in line with the other questionnaires:

- At Trust B, all doctors were asked about "Consultant staffing levels in your specialty", and also about "Junior medical staffing levels in your specialty", whereas at Trust A there was a single question for everyone about "Medical staffing levels in your main work area (e.g. wards, outpatients)". This was thought to be too important a variable to lose in the combined dataset, and, therefore, the scores for the two items from Trust B were combined into a single item by calculating their mean (arithmetic average). The resulting 'shared' variable across the three samples was labelled "Medical staffing levels in your specialty" (see Table 43).

- Similarly, the questions regarding "Opportunities to establish rapport with junior staff and give informal feedback" (for seniors) and "Opportunities to establish rapport with senior staff and receive

informal feedback" (for juniors) were computed into a single question and labelled "Opportunity to establish rapport between junior and senior staff and to give or receive feedback".

All the demographic and job characteristics, WES items, and individual and organisational health indices that were common to all three samples were combined into a single dataset. This dataset included data for 140 participants on 30 WES items. Some context-specific information relevant to each Trust may be lost by collapsing the three survey instruments into a single dataset, but this is acceptable for the purposes of this chapter and in the search for more *universal* information, i.e., factors that may predict certain outcomes *across* all grades doctors and two different organisational settings. The following section describe the application of logistic regression to these data using worn-out scores as the outcome of interest.

5.1 Factors associated with worn-out scores

In common with multiple regression and DFA, there are three options when carrying out a logistic regression analysis: First, *stepwise* (or "statistical") logistic regression is especially recommended for exploratory studies because no pre-existing theoretical models are required: inclusion and exclusion of predictors from the regression equation are based purely on certain statistical criteria. However, this option can lead to the results over-fitting the data and reducing the likelihood that the results would be replicated in other contexts, as the technique is too sensitive to random variation in the data (Agresti & Finlay, 1986). As a remedy, it is possible to split the dataset into two halves and use the second half of the data as a separate set of scores on which to test the emerging model, but choosing this strategy with the reduced size of the available dataset (N= 140) would result in an even smaller sample. Second, *sequential* logistic regression requires the researcher to have an a priori theoretical model that suggest the order of entry of predictors. This is not yet available for worn-out scores. Finally, in *direct* logistic regression no assumptions are made as to which predictors are more important or logically prior to any others. Therefore, all the predictors are entered into the regression equation simultaneously, so that the contribution that each variable makes in addition to all the others is assessed.

Some authors suggest that this is the most appropriate method, unless very well-established theoretical models exist and are to be tested by the analysis (Studenmund & Cassidy, 1987).

Direct logistic regression was selected to identify what variables were significantly associated with the reporting of poor well-being. Worn-out was dichotomised as described in section 4.2.1, so that the 'diseased' group contained those whose worn-out score was higher than the mean for the overall sample.

In the absence of strong theoretical reasons to select predictors, it is possible to start the process of selection by carrying out univariate tests with each possible predictor. However, logistic regression is similar to ordinary least-squares (OLS) regression in that If relevant variables are omitted, the common variance they share with included variables may be wrongly attributed to those variables, or the error term may be inflated (Menard, 1995). Therefore, a first, exploratory regression analysis was run using all the available WES items (i.e., those that were present in all three survey instruments, listed in Table 43 below) as possible predictors. Additionally, age and gender were included as predictors to investigate if they had any relationship with the reporting of well-being. No interactions between predictors were included in the analysis because they can add complexity to a model without significantly improving its reliability as a predictor of the outcome (Tabachnick & Fidell, 1996). This is particularly pertinent when carrying out an exploratory analysis such as this.

Work Environment Survey items used for logistic regression analyses
Volume of work (overall workload)
Control over workload (opportunity to plan your work)
Volume of paperwork
Quality of "protected" teaching sessions
Amount of time utilized for "hands-on" teaching by senior staff
Opportunity to establish rapport between junior and senior staff and to give or receive feedback
Recognition of your efforts by the Directorate
Recognition of your efforts by the Trust
Terms and conditions of employment contract
Career development and prospects
Opportunities to maintain and update your skills
National level of basic pay
How fair pay is compared with those in other professions (e.g. lawyers)
Medical staffing levels in your specialty
Nursing staff levels in your specialty
Flexibility of working hours
How predictable hours of work are
Amount of time spent working outside contracted working hours
Opportunities to take work breaks (e.g. coffee breaks, lunch)
Facilities for work breaks away from usual work area
Impact of your work on home life
Support from colleagues (across the Trust)
Support from colleagues (within the Directorate)
Support from administrative staff within the Directorate
Quality of colleagues' work
Participation in decisions which affect the job you do
Actual support from Directorate management
Actual support from Trust management
Encouragement for sharing work problems and problem solving
Demands from patients/colleagues/others

Table 43: WES items used for logistic regression analyses

5.1.1 Exploratory logistic regression analysis

Following Tabachnick & Fidell (1996), the data were examined for adequacy of expected frequencies, of cases-to-variables ratio, outliers and multicollinearity.

Exposure was decided on the basis of the respondents' scores on the WES items, initially following the same recoding scheme as for odds ratios (see

chapter 5): the group who reported a WES item to be *unsatisfactory* or *very unsatisfactory* was coded as the "exposed" group, and those who reported a WES item to be *satisfactory* or *very satisfactory* were coded as the "not exposed" group. The midpoint ("ambivalent") was not included in the analysis. However, this resulted in an unacceptable number of 'empty cells', which cause problems when calculating logistic regression because goodness-of-fit tests depend on expected frequencies (Tabachnick & Fidell (1996) recommend that "all expected frequencies are greater than one, and that no more than 20% are less than five", p. 579). Therefore, the midpoint was also recoded as 'not exposed' (the 'reference' response: Hosmer & Lemeshow, 1989; Goodman, 1971). This is a more conservative approach than the alternative recoding according to a mean split for each item.

The cases-to-variables ratio was 140:32, which is acceptable as it produced no inordinately large parameter estimates or standard errors (Tabachnick & Fidell, 1996). The fact that estimation terminated after only 5 iterations (see below) also suggests that the ratio was acceptable. The "collinearity diagnostics" facility within the SPSS multiple linear regression menu was used to test for multicollinearity (excluding cases pairwise). The results of the analysis (see Table 44 below) show that no variables exceeded the recommended values for tolerance (< 0.1) or variance inflation factor (VIF: >10) (Menard, 1995; Myers, 1990).

Work Environment Survey items [*]	Tolerance	VIF
Volume of work (overall workload)	.634	1.577
Control over workload (opportunity to plan your work)	.718	1.393
Volume of paperwork	.622	1.607
Quality of "protected" teaching sessions	.642	1.557
Amount of time utilized for "hands-on" teaching by senior staff	.588	1.701
Opportunity to establish rapport between junior and senior staff and to give or receive feedback	.605	1.654
Recognition of your efforts by the Directorate	.376	2.662
Recognition of your efforts by the Trust	.419	2.386
Terms and conditions of employment contract	.641	1.559
Career development and prospects	.687	1.455
Opportunities to maintain and update your skills	.585	1.708
National level of basic pay	.523	1.910
How fair pay is compared with those in other professions (e.g. lawyers)	.567	1.762
Medical staffing levels in your specialty	.579	1.726
Nursing staff levels in your specialty	.571	1.751
Flexibility of working hours	.555	1.802
How predictable hours of work are	.633	1.580
Amount of time spent working outside contracted working hours	.546	1.830
Opportunities to take work breaks (e.g. coffee breaks, lunch)	.504	1.986
Facilities for work breaks away from usual work area	.662	1.511
Impact of your work on home life	.551	1.814
Support from colleagues (across the Trust)	.681	1.468
Support from colleagues (within the Directorate)	.591	1.691
Support from administrative staff within the Directorate	.478	2.093
Quality of colleagues' work	.685	1.460
Participation in decisions which affect the job you do	.453	2.208
Actual support from Directorate management	.334	2.997
Actual support from Trust management	.591	1.692
Encouragement for sharing work problems and problem solving	.591	1.692
Demands from patients/colleagues/others	.486	2.058

[*] Dependent Variable: Worn-out scores dichotomised by mean split

Table 44: Test for multicollinearity amongst WES predictor variables

The analysis was performed using SPSS release 9.0. Six cases were deleted from the sample due to missing data, leaving 134 cases available for

analysis. When inspected through cross-tabulation, missing data appeared to be randomly distributed across the predictor and outcome variables.

The initial chi-square for the model, which reflects the error associated with the model when *only* the intercept is included, was X^2= 185.4947 (reported by SPSS as "–2 Log Likelihood" because the log-likelihood value is multiplied by –2). The log likelihood is a statistic similar to the error sum of squares in multiple regression, this is, an indicator of how much *unexplained* variance there exists in the model. As an index of poor model fit, the value of log likelihood is therefore expected to decrease after the predictors are entered into the equation and model fit improves.

Indeed, the full model with all 32 variables produced a –2 Log Likelihood of 112.150. This means that the full model was found to be statistically reliable against a constant-only model: X^2 (df= 32, N= 136)= 73.34, p= .0001. The test's significance implies that the null hypothesis (that none of the predictors are linearly related to the log odds of the outcome) can be rejected. (N.B.: this is an overall model test which does not assure that *every* predictor is significant: see Table 48 later).

Two statistics are available from SPSS that attempt to provide a logistic analogy to the R^2 coefficient in OLS regression: Cox & Snell's R^2 and Nagelkerke's R^2. The 'maximum' or upper limit of the Cox & Snell's coefficient can be (and usually is) less than 1.0, making it difficult to interpret. Nagelkerke's (1991) modification divides Cox and Snell's R^2 by its maximum in order to achieve a measure whose range is always between 0 and 1. These 'pseudo-R' try to measure the degree of variance explained by the model, and provide a gauge of the substantive significance of the model (Hosmer & Lemeshow, 1989). The results for the current regression are shown in Table 45.

Test	Value
Cox & Snell's R^2	.422
Nagelkerke's R^2	.562

Table 45: Outcome variance accounted for by the regression equation

Cox & Snell's and Nagelkerke's R^2 coefficients suggest that the regression equation accounts for between 42.2% and 56.2% of the variance in the dependent variable. There is, however, some controversy as to what measure is preferable as an analogue to the linear R^2 value, and Hosmer & Lemeshow (1989) offer a more conservative version of R^2 for logistic regression. Their coefficient (R_L^2) is not available on SPSS 9.0, but can be easily calculated by hand: it is obtained by diving the model chi-square by the original –2 Log Likelihood. In this case:

$$R_L^2 = \frac{73.344}{185.494} = .395$$

R_L^2 indicates the proportional reduction in the absolute value of the log-likelihood measure –in other words, it measures how much the *badness* of fit improves as a result of the inclusion of the predictor variables. Hosmer & Lemeshow's R_L^2 also ranges between 0 (= independent variables are not reliable predictors of the outcome) and 1 (the model predicts the outcome perfectly). An estimated 39.5% of the variance explained, although lower than the other coefficients, is still an acceptable figure.

An indication of model fit is provided by the Hosmer and Lemeshow Goodness-of-Fit Test: this test divides subjects into deciles based on predicted probabilities, and then computes a chi-square test statistic from observed and expected frequencies. A probability value (p) is computed from the chi-square distribution with 8 degrees of freedom to test the fit of the logistic model. If the Hosmer and Lemeshow goodness-of-fit test statistic is $p \leq .05$, the null hypothesis (that there is no difference between the observed and predicted values of the dependent variable) is rejected.

Table 46 below shows the results of the Hosmer and Lemeshow Goodness-of-Fit Test for the logistic regression on worn-out. The test results in X^2 (df= 8, N= 134)= 7.10, p= .526., which means that the null hypothesis of no difference is not rejected and that model fit is acceptable. This result does not, however, indicate that the model necessarily explains much of the

variance in the outcome variable, and, therefore, reference still needs to be made to the coefficients shown earlier in Table 45.

	Not diseased		diseased		
Group	Observed	Expected	Observed	Expected	Total
1	13.000	12.885	.000	.115	13.000
2	11.000	12.048	2.000	.952	13.000
3	11.000	10.037	2.000	2.963	13.000
4	8.000	8.483	5.000	4.517	13.000
5	9.000	7.089	4.000	5.911	13.000
6	3.000	5.743	10.000	7.257	13.000
7	6.000	4.068	7.000	8.932	13.000
8	2.000	2.370	11.000	10.630	13.000
9	1.000	.925	12.000	12.075	13.000
10	.000	.353	17.000	16.647	17.000

Table 46: Results of Hosmer and Lemeshow Goodness-of-fit Test

A 2x2 classification table can be calculated in order to establish how successful the equation is at correctly classifying cases. In a perfect model, all cases would be on the left-to-right, descending diagonal, the other two cells would be empty, and the overall percent correct would be 100%. If the logistic model has homoscedasticity (although not a logistic regression assumption: see section 5.1), the percent correct will be approximately the same for both rows. Table 47 shows that the equation correctly assigns 82.84% of the cases to their category. More importantly, it appears to be equally successful at classifying both the diseased and non-diseased cases.

		Predicted		% correctly classified
		Not diseased	Diseased	
Observed	Not diseased	52	12	81.25%
	Diseased	11	59	84.29%
				82.84%

Table 47: Classification table for regression equation

Having examined the results in terms of [1] the variance accounted for, [2] the goodness-of-fit of the model, and [3] the ability of the equation correctly to classify cases, the individual contribution of each predictor variable can be scrutinised. Table 48 overleaf shows the regression coefficients and Wald statistics (with relevant significance levels) for each predictor. The Wald statistic (similar to the t-test in multiple linear regression) has a chi-square distribution and indicates whether the B coefficient for a variable is significantly different from zero. If so, the predictor is believed to contribute significantly to the prediction of the outcome.

Table 48 indicates that only eleven variables are reliable predictors within the equation. Surprisingly, four of these appear to show the reverse associated with the worn-out variable:

- Amount of time utilized for "hands-on" teaching by senior staff
- Impact of your work on home life
- Participation in decisions which affect the job you do
- Encouragement for sharing work problems and problem solving

The coefficient for each predictor is related to the log odds in favour of being in the 'diseased' group. Therefore, to obtain the odds ratio the B coefficient has to be multiplied by the natural logarithm *e*. This value (OR) is shown in together with its 95% confidence interval. It appears that the predictors with largest effect size, as estimated by OR, were:

- Actual support from Directorate management
- Opportunities to maintain and update your skills
- Opportunity to establish rapport between junior and senior staff and to give or receive feedback

Variable	B	Wald	OR	95% CI for OR	
				Lower	Upper
Age	-.0656	2.2726			
Sex	.4149	.4643			
Volume of work (overall workload)	.7047	1.1097			
Control over workload (opportunity to plan your work)	1.6796	5.0334*	5.3635	1.2365	23.2649
Volume of paperwork	1.5229	4.3727*	4.5857	1.1002	19.1131
Quality of "protected" teaching sessions	1.5505	4.7842*	4.7136	1.1748	18.9115
Amount of time utilized for "hands-on" teaching by senior staff	-3.5322	10.2309**	.0292	.0034	.2547
Opportunity to establish rapport between junior and senior staff and to give or receive feedback	2.0772	6.7345**	7.9824	1.6626	38.3243
Recognition of your efforts by the Directorate	2.0121	3.4060			
Recognition of your efforts by the Trust	.0887	.0052			
Terms and conditions of employment contract	-.5324	.6805			
Career development and prospects	.5104	.7336			
Opportunities to maintain and update your skills	2.2865	7.7155**	9.8405	1.9604	49.3973
National level of basic pay	1.6414	3.4434			
How fair pay is compared with those in other professions	-1.8331	2.1647			
Medical staffing levels in your specialty	-.5532	.5832			
Nursing staff levels in your specialty	1.1997	2.1479			
Flexibility of working hours	.6866	.8549			
How predictable hours of work are	-.2063	.1107			
Amount of time spent working outside contracted working hours	.6575	.5754			
Opportunities to take work breaks (e.g. coffee breaks, lunch)	-1.1695	1.6907			
Facilities for work breaks away from usual work area	.3010	.1687			
Impact of your work on home life	-1.7468	3.9883*	.1743	.0314	.9681
Support from colleagues (across the Trust)	-1.0518	2.6366			
Support from colleagues (within the Directorate)	-1.1835	2.6225			
Support from administrative staff within the Directorate	.2855	.1821			
Quality of colleagues' work	.2127	.1022			
Participation in decisions which affect the job you do	-2.3854	5.5237*	.0921	.0126	.6729
Actual support from Directorate management	2.2698	4.8609*	9.6777	1.2866	72.7950
Actual support from Trust management	.0380	.0025			
Encouragement for sharing work problems and problem solving	-1.7011	3.8459*	.1825	.0333	.9990
Demands from patients/colleagues/others	1.6259	4.2338*	5.0830	1.0802	23.9183
Constant	-1.2780	.3624			

*p< .05; **p< .01 (two-tailed test)

Table 48: Logistic regression model for worn-out scores as dependent variable and selected WES items as independent variables (32 predictors). Regression coefficients, Wald statistics, odds ratios (OR) and 95% confidence interval for odds ratios

5.1.2 Targeted logistic regression analysis

Once an exploratory analysis has been carried out to establish which variables appear to be reliable predictors, the analysis can be re-run entering only those variables (Tabachnick & Fidell, 1996).

The eleven variables identified were used to repeat the regression analysis following the procedure described in the previous section. There were no missing data for the selected variables, and the analysis therefore included all 140 cases. The initial chi-square for the model on this occasion was X^2= 193.6238, slightly higher than for the previous analysis. The full model with the 11 variables produced a –2 Log Likelihood of 147.788 (compared to 112.150 earlier). Although with a somewhat poorer fit than the 32-variable model, it was found to be statistically reliable against the constant-only model: X^2 (df= 11, N= 140)= 45.836, p= .0001.

The values for Cox & Snell's R^2, Nagelkerke's R^2 and Hosmer & Lemeshow's R_L^2 are shown in Table 49 below. None of them improves upon the performance of the previous model.

Test	Value
Cox & Snell's R^2	.279
Nagelkerke's R^2	.373
Hosmer & Lemeshow's R_L^2	.2367

Table 49: Outcome variance accounted for by the regression equation (11 predictors)

The Hosmer and Lemeshow Goodness-of-Fit Test for the logistic regression was then calculated. The test resulted in X^2 (df= 8, N= 140)= 4.26, p= .833, which means that the null hypothesis of no difference is not rejected and that model fit is acceptable, although, again, exhibiting poorer fit than the 32-variable model.

Table 50 shows that this model is also less successful in trying correctly to classify cases (72.86% overall, against 82.84% for the 32-predictor model), with particularly poorer performance when dealing with 'not diseased' cases.

		Predicted		% correctly classified
		Not diseased	Diseased	
Observed	Not diseased	45	21	68.18%
	Diseased	17	57	77.03%
				72.86%

Table 50: Classification table for regression equation (11 predictors)

Finally, Table 51 overleaf shows the regression coefficients and Wald statistics (with relevant significance levels) for each predictor. The Wald statistic (similar to the t-test in multiple linear regression) has a chi-square distribution and indicates whether the B coefficient for a variable is significantly different from zero. If so, the predictor is believed to contribute significantly to the prediction of the outcome.

Table 51 below indicates that only seven variables remain as reliable predictors within the equation. The two predictors with the largest effect size in the previous model as estimated by OR ("Actual support from Directorate management" and "Opportunities to maintain and update your skills") are joined by "Volume of paperwork" and "Control over workload (opportunity to plan your work)".

Variable	B	Wald	OR	95% CI for OR	
				Lower	Upper
Control over workload (opportunity to plan your work)	1.3460	7.0812**	3.8213	1.4236	10.2574
Volume of paperwork	1.3180	6.2496**	3.7360	1.3293	10.4999
Quality of "protected" teaching sessions	.6191	1.6527			
Amount of time utilized for "hands-on" teaching by senior staff	-1.8257	7.5535**	.1611	.0438	.5923
Opportunity to establish rapport between junior and senior staff and to give or receive feedback	.9999	4.2451*	2.7181	1.0499	7.0367
Opportunities to maintain and update your skills	1.3473	7.9477**	3.8469	1.5077	9.8149
Impact of your work on home life	-.8770	2.3250			
Participation in decisions which affect the job you do	-1.1210	3.4815			
Actual support from Directorate management	2.2874	12.5981**	9.8491	2.7851	34.8298
Encouragement for sharing work problems and problem solving	-1.2015	4.5138*	.3008	.0993	.9111
Demands from patients/colleagues/others	.8685	3.4036			
Constant	-20788	8.1783			

*p< .05; **p< .01 (two-tailed test)

Table 51: Logistic regression model for worn-out scores as dependent variable and selected WES items as independent variables (11 predictors). Regression coefficients, Wald statistics, odds ratios (OR) and 95% confidence interval for odds ratios

5.2 Conclusions

The purpose of this chapter was to illustrate how the initial analyses described in Chapter 4 can be extended 'upwards and outwards' to examine likely risk factors that may be common to a number of different samples. As suggested earlier, this strategy may be useful for organisations that are particularly concerned about certain negative outcomes and would like to target their efforts to the factors that appear to be associated with those outcomes. This rationale is still firmly anchored within the general aims of risk assessment and is an integral part of the search for data to guide the design of interventions within a given organisation: for example, the two NHS Trusts that took part in this project could focus their resources on the four major issues that would appear to affect doctors' report of poor well-being across grades and across hospitals: [a] support from Directorate management, [b]

opportunities to maintain and update skills, [c] volume of paperwork, and [d] control over workload.

A related purpose would be –from the researcher's point of view– the description and testing of models that may predict individual or organisational health indices in similar, or different, occupational contexts. In this respect, caution needs to be exercised to avoid building models that over-fit existing data to the detriment of their generalisability. The results described in this chapter would need to be replicated first with both senior and junior doctors in other contexts, and the contribution of each variable evaluated further (particularly those which seem to operate in the direction opposite to that which was expected). One could then test the model with increasingly dissimilar occupational groups (nursing staff, then hospital support staff or primary care medical staff, for instance). Which direction to take, and when to stop, is partly an empirical question and partly a theoretical one: a balance needs to be struck between achieving a parsimonious and general model that explains little variance across many different occupations, and a cumbersome model with many variables that is only applicable to a fairly limited number of occupations. It depends on what emerges from the data and on the purpose of the research.

To take the examples used in this chapter, the researcher is left with two options: to explore the 32-variable model further and test whether certain variables act as reliable predictors with other samples, or to persevere with a reduced set of 11 variables –accepting a somewhat inferior model fit and poorer classification of cases. Practical considerations would be important here: for example, response rates would probably be better with an 11-item scale than with a 32-item one. Added caution can also be exercised by judicious and conservative use of statistical techniques: this is why stepwise regression was not selected in these examples, despite their suitability for exploratory studies.

Furthermore, as more data are gathered, hypotheses could be generated from the tentative model, and interventions could be targeted to test them. As suggested earlier, a Trust could direct most of its available resources for intervention to the 'big four' identified in this chapter. A study could be carried out including one Trust that had already been through the assessment, and

one that had not, in order to compare the relevance of the model in each case. The evaluation of the targeted interventions could provide some data to test whether such focused action had a positive effect on indices of well-being, and whether the interventions had a *differential* effect on well-being compared to other outcome measures, or merely an undifferentiated, non-specific effect on various outcomes.

To summarise, as the body of risk assessments grows, more evidence is collected, and hypotheses are tested, it may be possible to provide organisations with a coherent model to address certain outcomes that are particularly undesirable for them. In the present case, poor well-being or excessive alcohol consumption, with their implications for impaired health and job performance, would be primary candidates.

Section 4.6 presented an example of how the data analysis can move towards the more generic level of the domains of psychosocial hazards (Cox, 1993) that are more easily generalisable to various occupations (see Tables 41 and 42). This chapter has described an additional 'upwards' route to investigate factors contributing to poor organisational and individual health across various assessment groups. The next chapter follows the opposite direction, seeking to identify likely risk groups within risk assessment samples.

6. LIKELY RISK GROUPS

This chapter describes how risk assessment data analysis can be extended from the reporting of 'likely risk factors' to 'likely risk groups' by determining whether group criteria exist that are associated with the report of particularly poor levels of individual or organisational health. These criteria could be bio-demographic data (such as age, gender or tenure), or work- and job-related factors (for example, working in a particular ward or directorate). The identification of groups that may be particularly 'at risk' can be used by the organisation to prioritise resources in their direction.

The odds ratio (OR) analyses reported in Chapter 4 were carried out treating all participants within each case study as a single sample. However, further analyses can be performed upon specific groups of staff that appear to report particularly poor levels of individual or organisational health. In this sense, the analysis is taken 'downwards and inwards' to the level of smaller work groups, so that 'likely risk groups' within the sample may be identified for the organisation to consider group-specific or priority actions. This needs to be carried out giving due consideration to the protection of participants' confidentiality (cf. British Psychological Society, 2000, section 4). The size of the staff groups under study needs to be sufficiently large to avoid the identification of any individuals. This is also in keeping with the framework's principles: conceptualising stress as generated by working practices and the work environment, rather than related to individuals' *weakness*.

Three main strategies can be followed when exploring the data for specific patterns of poor health:

- First, an exhaustive, systematic series of OR analyses could be run with every well-defined group within the sample (for example, by grade of doctor), making no assumptions about underlying patterns.

- Second, the overall OR analyses could be used as the starting point for focused analysis: for each OR analysis of interest, it is possible to identify who is in the 'response' category of each variable (i.e., who is

both 'exposed' and 'diseased'). One can then run a breakdown of that group's bio-demographic and job information and look for patterns amongst these individuals.

- Third, some groups may be chosen *a priori* because of either theoretical or contextual reasons (especially given the large amount of group-specific information that is collected during risk assessments). It is then possible to recode the data to create two groups, so that membership of a given group is classed as 'exposed', and non-membership (everyone else in the sample) as 'not exposed'.

These three rationales are not dissimilar from those used for different types of regression analysis (see section 5.1). Each also has its own limitations. The first, 'blind' analysis relies too heavily on statistical chance, and is not far from plain 'data snooping' –which may be justifiable to 'get a feel' for the data, but not as the basis for suggesting interventions within a workplace. The difficulty with the second strategy is to find reliable and justifiable criteria for deciding what is a recognisable pattern amongst the 'exposed and diseased' group, and what is just a slightly higher than average incidence of a particular characteristic. The third option requires a good knowledge of both the organisation and any peculiar characteristics of the occupational group, lest some important defining characteristics are missed out from the analysis.

A problem for all three analyses is that, as the scrutiny narrows down to particular groups, so the sample size decreases to levels where it may become more difficult to meet the requirements for analysis (such as the proportion of non-empty cells, for example) and where statistical power is drastically reduced. This is often an unavoidable consequence of the risk assessment methodology, because assessment samples need to be quite homogeneous and, therefore, tend to be fairly small groups. Therefore, an optimum level of analysis has to be strived for, so that the usefulness of the information for the organisation is maximised without compromising the statistical power and quality of the analyses.

This chapter will use the third of the strategies outlined above to establish whether specific groups of staff at Trust B could indeed be considered to be particularly 'at risk'. The third option was chosen because two groups

emerged as giving cause for concern throughout the process the assessments at Trust B.

First, it was repeatedly suggested that one department was under particular pressure: both the King's Fund[13] report on Trust B and an audit conducted by a private organisation (part of the documentation examined for the Audit of Management Systems and Employee Support [AMSES]), noted that the Integrated Medicine Directorate was working under "barely tolerable conditions", especially compared to other specialties with lighter workloads and better facilities (see section 3.3). The Work Analysis Interviews and the conclusions of the AMSES corroborated this suggestion.

Second, junior doctors as a whole were often said to be working at 'maximum capacity' and under a great deal of strain caused by sheer workload. The junior staff themselves reported being overworked, sleeping few hours and having very little time to prepare for their crucial exams. As indicated in Chapter 3, there was also widespread concern at a national level for the well-being of junior staff, and specifically Senior House Officers (e.g., Spurgeon & Harrington, 1989). The serious implications of poor SHO morale on recruitment and retention were, indeed, the main reasons for the BMA to commission the project.

The following two sections examine whether Integrated Medicine staff, on one hand, and Junior Medical Staff, on the other, appear to be 'likely risk groups'.

6.1 Integrated Medicine staff as a Likely Risk Group

The combined dataset used for Chapter 5 was also used for the identification of likely risk groups. The respondents from Trust A were deleted from the dataset, leaving 92 cases for analysis. A breakdown of the respondents by grade and specialty is shown in Table 52. (N.B.: One individual did not specify his/her specialty and was therefore omitted from this analysis).

[13] The King's Fund is an independent health charity that seeks to promote health policy and good practice across the UK and internationally. It regularly audits NHS Trusts and reports on the strengths and weaknesses of their managerial and clinical practice.

SPECIALTY	Grade		Total
	Junior	Senior	
Accident and Emergency	5		5
Anaesthetics	1		1
ENT surgery	1		1
Integrated Medicine	24	23	47
General Surgery	2		2
Obstetrics, Gynaecology & Paediatrics	18	12	30
Ophthalmology	1		1
Orthopaedics	3		3
Plastic Surgery	1		1
Unspecified		1	1
Total	**56**	**36**	**92**

Table 52: Breakdown of respondents by grade and specialty

The data were recoded so that Integrated Medicine and Accident & Emergency (part of the same directorate) were classified as the 'exposed' group, while the remaining cases were coded as 'not exposed'. This resulted in a 52:39 ratio of exposed : not exposed, which is a good split (Goodman, 1978). The coding scheme for the individual and organisational health data was as described in section 4.2.1, with two exceptions: the mid-point responses to *Reduced commitment to medicine* and *Reduced commitment to the NHS* were not ignored as in previous analyses, as this would reduce the cell counts beyond acceptable levels. The "unchanged" responses to both questions (40.2% and 45.7% respectively) were coded as the reference category [= 'not diseased'], the more cautious option (Tabachnick & Fidell, 1996). Other alternative strategies for dealing with empty cells were considered but rejected: adding 0.5 to the count in each cell and recalculating the OR (Hosmer & Lemeshow, 1989; Goodman, 1971) is not advisable in cases where the scale midpoint is a popular score. A mean split was rejected for the same (conservative) reasons, as it may overestimate the 'diseased' category.

Some outcome measures that were designed for juniors- or seniors-only were not used in the analysis (e.g., intention to take early retirement and intention to return to Trust B).

6.1.1 Results

Odds ratios were calculated for each of the following individual and organisational health measures: worn-out, tense, alcohol consumption, sleep, average days of absence, commitment to the NHS and commitment to medicine. The analyses were carried out using SPSS release 9.0. The results are reported in Table 53 below.

Variable	OR value	Likelihood ratio	df	95% Confidence Interval	
				Lower	Upper
Worn-out	*ns*				
Tense	*ns*				
Alcohol consumption	9.27	7.056**	1	1.132	75.874
Sleep	*ns*				
Absence	*ns*				
Reduced commitment to the NHS	3.66	8.493**	1	1.482	9.024
Reduced commitment to medicine	3.38	7.487**	1	1.373	8.340

**p< .01 (two-tailed test); ns = non significant

Table 53: Results of OR analyses (Integrated Medicine as likely risk group)

As indicated in Chapter 4, the likelihood ratio chi-square statistic is currently accepted as the most appropriate test for the significance of odds ratios. Its value and the associate significance level for the OR are also shown in Table 53.

A significant association was found between membership of the Integrated Medicine Directorate and [a] reduced commitment to the NHS, [b] reduced commitment to medicine, and [c] increased alcohol consumption (above the recommended *safe* limits (OPCS, 1996): more than 14 units for women and 21 units for men). No significant associations were found with the other indices.

Because of the reduced sample size, Table 53 also reports the 95% confidence intervals for the significant odds ratios. The confidence intervals

(CI) for alcohol consumption reflect rather large parameters (CI=1.1321–75.874). This odds ratio calculation also had a percentage of cells with an expected count below 5 that exceeded the recommended limit of 20% (Tabachnick & Fidell, 1996): 1 cell, representing 25% of the table. Taken together, these statistics suggest that this result should be treated with caution. The values for the other two significant OR are reasonable.

It would appear that staff working within Integrated Medicine are over 3 times more likely than the rest of the Trust B respondents to report reduced commitment both to medicine as a profession and to the National Health Service. They may also be more likely to drink over the recommended limits of alcohol. The implications of these results are discussed in section 6.3 below.

6.2 Junior Medical Staff as a Likely Risk Group

The same dataset as in the previous section was used to test whether Junior Medical Staff should be considered a 'likely risk group'. The breakdown of staff by specialty and grade was shown in Table 52. The data were recoded so that junior doctors were classified as the 'exposed' group, while senior doctors were coded as 'not exposed'. This resulted in a 56:36 ratio of exposed : not exposed, which –although unequal groups– represents an acceptable overall split (Goodman, 1978). The coding scheme for the individual and organisational health data was as described in section 6.1. The same seven individual and organisational health indices were used in the odds ratio analyses: worn-out, tense, alcohol consumption, sleep, average days of absence, commitment to the NHS and commitment to medicine. The analyses were carried out using SPSS release 9.0.

6.2.1 Results

Table 54 below shows the results of the odds ratios analyses to determine whether junior medical staff represent an 'at risk' group within the context of the overall Trust B sample. The likelihood ratio chi-square statistic, its associated significance level for the OR, and the 95% CI are also shown.

Variable	OR value	Likelihood ratio	df	95% Confidence Interval	
				Lower	Upper
Worn-out	2.36	3.918*	1	.996	5.584
Tense	4.65	9.173**	1	1.575	13.730
Alcohol consumption	*ns*				
Sleep	*ns*				
Absence	3.34	6.425**	1	1.255	8.895
Reduced commitment to the NHS	*ns*				
Reduced commitment to medicine	3.22	6.693**	1	1.286	8.074

*p< .05; **p< .01 (two-tailed test); ns = non significant

Table 54: Results of OR analyses (Junior Medical Staff as likely risk group)

The valid number of cases, because of pairwise deletion of missing values, ranged between 88 and 92. Only one odds ratio calculation (alcohol consumption) had a percentage of cells with an expected count below 5 that exceeded the recommended limit of 20% (Tabachnick & Fidell, 1996): 1 cell, representing 25% of the table. In any case, the OR for alcohol consumption was not significant.

The pattern of results emerging from these analyses is particularly interesting when compared to those of the previous section. Whereas the significant indices for Integrated Medicine staff were mostly related to organisational health (reduced commitment to the NHS and to medicine as a profession, with a cautious link also to alcohol consumption), the outcomes associated with junior staff as a specific 'likely risk group' appear to include those of a more individual nature: worn-out and tense. Worn-out has been included in Table 54 because it is a borderline case: the OR value (2.36) is, in fact, statistically significant according to the likelihood ratio test (LR=3.918, df=1, p= .048), although its lower 95% confidence interval (.996) narrowly includes the null value (OR=1). Moreover, another index of individual health, quality sleep, reached significance levels that would qualify as a "trend" (LR=3.222, df=1, p= .073) with an odds ratio of 2.21 and 95% confidence intervals that, again, are very close to significance levels (95% CI= .920–5.294).

The results for absence are worth noting because the baseline for absence in doctors is generally quite low, but, for the same reason, the finding that juniors are over 3 times more likely to have an average absence over the mean for the whole sample should be treated with caution.

6.3 Conclusions

This chapter has sought to illustrate how the risk assessment data analysis can be extended 'downwards' to investigate work teams or groups of individuals linked by some common feature. Specifically, it explored whether two particular groups of staff that were giving cause for concern at Trust B could be considered as 'likely risk groups'.

The results from the two sets of analyses would support the notion that, at least in some respects, each of the groups is at significantly more risk than the rest of the assessment sample: On one hand, staff working at Trust B's Integrated Medicine Directory are over 3 times more likely than the rest of the sample to report reduced commitment both to medicine as a profession and to the National Health Service, and there are some indications that they may also be more likely to drink over the recommended limits of alcohol than the rest of the staff. On the other hand, junior medical staff are between 2 and 4 times more likely than the Trust's seniors in the sample to score above the overall sample's mean in terms of worn-out, tense, absence and reduced commitment to medicine. It should be noted that the results for worn-out (and also the tentative indication that sleep may be a significant factor for this group) could be related to a third variable, age, given that worn-out scores are known to decrease with age, and so are the reported hours of sleep. Nevertheless, the differences between the two groups may be more related to the respondents' seniority than to their age: the "junior" sample included grades up to Specialist Registrar (giving a range of ages between 24 and 40, mean= 29.86, SD= 4.35), while the "senior" sample contained a number of the fairly young consultants at Trust B (range 32–59, mean= 44.57, SD= 6.91).

The slightly different pattern of significant results (individual vs. organisational health indices) suggests indicate that different forces may be operating, or

that the relevant work characteristics may be associated with different outcomes depending on whether they relate to doctors' workplace or to their seniority. In other words, it could be hypothesised that the conditions that affect *everyone* working in the Integrated Medicine Directory and to which staff working in other Directorates are *not* exposed (high and unpredictable workload; poor organisation; patients 'over-spilling' onto other, inappropriate wards; inadequate equipment and unpleasant working environment) have the effect of causing doctors' disillusion and disaffection towards the Health Service that tolerates such conditions and even towards their own profession, which appears to be increasingly unappealing or unrewarding.

By contrast, the pressures to which *all* junior doctors are exposed –and that senior doctors experience to a lesser degree or not at all, such as the difficulties to combine the service provision with their own training and educational needs– lead to a more complex pattern of poorer well-being (more worn-out and tense) and reduced commitment to the profession. Of course, there is an obvious overlap across the two groups: junior doctors working in the Integrated Medicine Directory. It would be interesting what health indices are relevant at the intersection of both 'likely risk groups': however, although some preliminary analyses were carried out with this collective as a potential 'likely risk group', there are only 29 cases, resulting in expected frequencies that are too low to reach any valid conclusions.

Regardless of the interpretation of the results, it is clear that these two groups of staff are reporting significantly higher levels of poor individual and organisational health than the other doctors in the sample. The case for action targeted to these groups is strengthened by the fact that the recoding strategies selected were intentionally conservative, and that the tests were carried out on a limited number of variables, thus reducing the likelihood of finding significant results purely by chance.

Returning to the discussion in section 2.4.1, the identification of likely risk groups also adds weight to the plausibility argument. It would be difficult to see how the individual and organisational indices used in this chapter could *cause* membership of either a particular Directorate or a grade of doctor (what would drive significantly more uncommitted staff to work in the Integrated Medicine Directorate?). If reverse causation seems unlikely, the possibility of

a third, unseen or unmeasured variable *causing* both the differential reporting of outcomes and the group membership seems equally doubtful (what could drive doctors to work in the Integrated Medicine Directorate and to be more likely to report reduced levels of commitment to the NHS and the profession? Moreover, junior doctors tend to be working in a Directorate because of the Trust's staffing needs, rather than their own choice). A Directorate-wide delusion or conspiracy is improbable. It is argued here that –although by no means certain– the more likely explanation is that the working conditions particular to each likely risk group are causing the reports of poorer individual and organisational health.

As suggested in Chapter 2, the identification of likely risk groups has a similar rationale and purpose to the search for 'shared job variance' described by Semmer *et al.* (1996). The process also constitutes a more focused approach to the 'job method' described by Kristensen (1996) as the procedure "according to which all respondents in a given occupation are classified as being exposed to the same degree of job strain" (p. 251). The criticisms rightly levelled against research based on the job method is that the 'jobs' used are too heterogeneous to be treated as being "the same job", which, as suggested earlier, are the crucial words. The extension to the risk assessment data analysis presented here focuses on samples small enough and context-bound enough to be highly homogeneous. Of course, the respondents may differ in many ways not assessed by the survey instruments, from personality to family or medical history. However, with regard to the characteristics of their *job* and their *work*, they are sufficiently homogeneous to be treated as "the same job" –in fact, it could be argued that they are equivalent not just in terms of "being exposed to the same degree of job strain", but also with regard to the broad nature of the stressors.

Finally, the samples used here do not profess to be 'representative' of a larger population, nor do the results claim to be directly generalisable to other doctors: at most, they are assumed to be applicable also to those staff within the targeted slices at Trust B who did not respond to the questionnaire. This would be a grievous failure indeed if the aims of the assessment were epidemiological in nature, but the purpose of the analyses in this chapter is different and twofold: first –very pragmatic and assessment-based– to identify 'at risk' groups to which resources can be targeted; second, to provide some

further evidence of the plausibility of a causal link between working conditions and health outcomes (a purpose closer to the realm of an aetiological study, which Kristensen (1996) contrasts with epidemiological research). In either case, representativeness beyond the confines of Trust B is not essential.

The main limitation of these case studies is the small size of their samples, which precludes more powerful analyses from being carried out. Again, this is a characteristic inherent to risk assessments: a balance has to be struck between achieving *workable*, reasonably large sample sizes, and limiting the assessment to groups that are homogeneous enough to be treated as a working unit. Nevertheless, the 'ideal case study' to aim for would have assessment groups that are larger rather than smaller; homogeneous rather than heterogeneous, and yet as different as possible in some of their characteristics (e.g., with enough variance within sub-samples in terms of exposure to strain, for example, to allow significant comparisons to be made between high- and low-strain jobs); independent and self-reported measures of both harm and hazards; similar groups available to serve as controls; and staff eager to participate, led by committed managers keen to intervene and evaluate!

While we wait for that elusive gold-standard, perfect assessment, the accumulation of evidence from multiple small-scale case studies is one possible way forward. This is one of the topics discussed in the final section of this thesis: conclusions and future directions.

7. CONCLUSIONS AND FUTURE DIRECTIONS

This final section seeks to bring together the results and conclusions from the preceding chapters, which are examined in the light of the wider debates taking place within stress research and occupational health psychology. The strengths and weaknesses of the risk assessment methodology are discussed, together with some directions for future research that may help to build on the strengths of the methodology and address its weaknesses.

The main aim of this thesis has been twofold. First, to describe the theoretical and research background from which the risk management framework for dealing with work-related stress emerged, and the relationship between this approach and the more traditional research in this field. Second, to explore how the guiding principles of the framework can be usefully implemented through standardised procedures and adequate data analysis.

The thesis has been structured around the requirements that Cox & Griffiths (1996) suggest risk assessments should possess in order to represent "a sound assessment methodology", namely:

1. An adequate theoretical framework
2. Reliable and valid measuring instruments
3. Standard implementation procedures
4. Adequate data analysis

The first two chapters have set the problem of work-related stress and the risk management framework in their wider contexts. Chapter 3 focused on the risk assessment phase and introduced three case studies commissioned by the British Medical Association, and the instruments and procedures used for data collection. Chapters 4 to 6 then used the data from the three case

studies to explore what may constitute 'adequate data analysis' for risk assessments.

This final chapter considers the findings and conclusions of previous chapters, and examines the strengths and weaknesses of risk assessment in the context of two major methodological and theoretical debates within stress research.

7.1 The work environment: conceptualisation and measurement

The main purpose of carrying out a risk assessment is to identify which characteristics within the work environment are associated with negative outcomes in terms of individual and/or organisational health. Therefore, the first and fundamental question in risk assessment relates to the conceptualisation and measurement of the work environment: in other words, *what* to measure (and why) and *how* to measure it.

A distinction between the 'objective' and the 'subjective' work environment is often made (although these terms are often misused in this debate, I shall stay with them for the sake of discussion). In short, the former would be constituted by the 'real' characteristics of the workplace (workload, communication, demands, support, and so on), whereas the latter is constructed by each individual from his or her perceptions and evaluation of those 'objective' characteristics. Because it is constructed, mediated by the worker's perceptions and appraisal, the latter is generally considered to be at best an imperfect and biased measure of the work environment, and at worst a hopelessly flawed misrepresentation of the *real* world. Indeed, workers' reports on their jobs are seen in some quarters as a modern-day equivalent of the Cartesian devil, willingly prejudiced and distorted assessments of their working conditions.

So: what should we measure? The standard conceptualisation of the 'objective' work environment implies that we should not trust the job incumbents' report, and that working conditions are best measured by an independent person (i.e., someone other than the job incumbent: a manager,

a subordinate, a colleague, a researcher, etc.) or by the 'job method' (see section 2.4.1). Two factors make this a weaker argument than it appears to be:

First, in conceptual terms, if we take stress as the mediating pathway from psychosocial hazards to physical and psychological harm (Cox, 1993), what counts is the interaction between the person and their environment, and their evaluation of that interaction. In fact, the transactional model of stress (see Chapter 1) makes individuals' appraisal a central part of the stress process (Cox, 1978). Cox & Griffiths (1996) suggest that by simply trying to relate 'objective events' to health outcomes –instead of examining the relationship between *appraisals* of those events and the health outcomes– "important cognitive-emotional mediating processes" may be ignored (Dewe, 1989; Peeters, 1992).

It follows that 'objective' working conditions may not be the best predictor of individual and organisational health, and of health-related behaviours (Spector, 1987; Jex & Spector, 1996). There is some evidence that this may be the case: For example, French *et al.* (1982) carried out on a large survey of work stress and health in 23 different occupations in the United States, with a sample of 2010 working men. Their data showed that there was a good correspondence between the objective and subjective measures and that the effects of those objective measures on self-reported health could be very largely accounted for by the subjective measures: objective occupation only accounted for between 2%–6% of the variance in self-reported health beyond that accounted for by the subjective measures. Stansfeld *et al.* (1995) examined the association between self-reported and externally-assessed work characteristics and psychiatric disorders, and found that "objective indices of work" were generally not associated with the psychological indices, whereas "subjective work characteristics" were associated with psychiatric disorder even after controlling for negative affectivity. Stansfeld and colleagues conclude that "subjective perception of work characteristics may be a mediating step between objective working conditions and psychological outcomes" (p. 52), although reverse causation may account for a real deterioration in both the subjective and objective work environment (via, for example, reduced social support at work). Also within the ongoing Whitehall II study, Bosma *et al.* (1997) found that the associations of self-reported and

independently-assessed job control with coronary heart disease were about equally strong. Both Whitehall II studies suggest that self- and other-assessment measure different areas of "the same underlying constructs", which would explain why they are not highly correlated (r = .41 in Bosma *et al.*, 1997).

Second, in practical terms, it is difficult to find someone who actually knows the job intimately enough –or who can spend enough time with the job incumbent over a sufficiently extended and representative period of time– to provide a fair and accurate assessment of the objective conditions of work. This certainly applies to the two Whitehall studies referred to above, where personnel managers provided the external assessments of work characteristics for 8,838 employees in terms of control, work pace and conflicting demands. It is difficult to judge how accurate the assessments for such vast numbers were, how well the personnel managers knew each job, and how homogeneous the actual jobs within each category were (see section 6.3). Additionally, it is not impossible that the 'independent' rater may also have a biased view (positive or negative) of the job or the work environment. In fact, if the rater really knows the job well (for example, a line manager who works closely with the job incumbent) it is likely that both incumbent and rater will share, and be *contaminated* by, some of the same values, group or team perceptions and the wider organisational culture that the 'objective' measurement seeks to avoid.

Self-report data, however, also present some problems: Although they often represent the most readily available information for applied researchers, it is reasonable not to accept workers' report as a true reflection of 'real' working conditions (however real they may be for them). Workers' own assessment of working conditions are particularly problematic when their health has also been measured by self-report. Without having to resort to the explanation of *politically* motivated bias, a number of reasons exist to treat such data with caution: negative affectivity, reverse causation and common method variance, to mention but three (Cox *et al.*, 2000b).

Nevertheless, it is important to understand that referring to *perceived* problems in the working environment does not automatically imply a value or ontological judgement. Perceptions do not have to be biased, mendacious or

wrong; they can be accurate as well as inaccurate, or moderated by other factors (Cox & Rial-Gonzalez, 2000). Furthermore, self-report data are not necessarily intangible, inaccessible perceptions and feelings: there are at least two kinds of self-report data, namely those that can be verified (e.g., "how many hours do you work per week?") and those that are 'private' and difficult, or impossible, to measure ("are your efforts recognised by your boss?"). In other words, although self-report data should not be accepted at face value, their reliability, validity and accuracy are empirical questions, and, therefore, can themselves be the subject of investigation. For example, social desirability effects (a common source of bias) can be tested for and screened out at several stages in the development of the assessment (Ferguson & Cox, 1993). Recent evidence also suggests that self-reports of absence can provide valid and accurate measures (Thomson, 2000). It would be interesting to put some apparently 'objective' measures used in stress research under the same degree of scrutiny: "What, for example, is the reliability of a measure of blood pressure taken with an electronic sphygmometer? What are its accuracy and its validity as a measure of heart disease?" (Cox & Rial-Gonzalez, 2000).

There is no clear answer to the question of "what to measure", and why: On one hand, it seems clear that we should measure the 'objective' work environment because it is something 'real', unmediated by the worker's appraisal. On the other hand, if the subjective work environment is thought to be a better predictor of stress and poor health outcomes, surely we should be measuring the product of workers' appraisals? The problem with this argument is that we could be accused of recommending changes to the *real* work environment on the basis of *mere*, possibly inaccurate, perceptions. Furthermore, if an imperfect relationship between the subjective and objective environment is postulated, and if the subjective work environment is the prime influence on health (see above), then acting upon the objective environment may bring about little or no positive health benefits.

If neither measurement should be rejected, the most sensible approach appears to be to obtain measurements of *both* the 'subjective' and 'objective' environments that are as accurate as possible. Moreover, measuring both allows comparisons to be made between them, resulting in the three different measures of the work environment described by Cox & Ferguson (1994):

- The objective (*actual reality*)
- The subjective (*perceived reality*), and
- The discrepancy between the objective and the subjective (*contact with reality*).

In fact, back in 1994 Cox & Ferguson noted the growing importance of social cognition, and suggested a fourth measure, based on "shared reality". This relates to the concept of "shared job strain" suggested by Semmer *et al.* in 1996 (see section 2.4.1) and the 'job method' of analysis.

This relates to the second question, "how to measure". The methodology described in this thesis attempts to use this measure of *shared reality* or *shared job strain*, operationalised by means of [1] highly homogeneous samples and [2] the requirement for a high degree of consensus (above 60%) before work characteristics are conceptualised as psychosocial hazards. Additionally, the risk assessment methodology seeks corroborating evidence in a variety of ways, via questionnaires, interviews with key stakeholders, workplace observation and organisational records (internal and external, as in the case studies presented here) and focus groups. Qualitative data are used occasionally as supporting evidence, but the analysis and use of such data ought to be a more frequent feature of risk assessments.

To summarise, much can be done to improve the measurement of the work environment in stress research. Ideally both self- and other-report should be used (for both stressors and strain). Better still, the concept of triangulation could be applied fully to avoid the negative consequences of what Bailey & Bhagat (1987) described as the "single-method trap". This could take the form of, for instance, their very own multi-method approach (Bailey & Bhagat, 1987) or Kristensen's (1995) 3-S matrix for stressors, strain and sickness.

As discussed in the Preface, risk assessments are constrained by many factors and generally have to settle for science that is 'good enough' to justify and design workplace interventions. The methodological ideals should be used as goals to aim towards, but can rarely be fully implemented. Nevertheless, in the context of the search for a better measurement of the

work environment –moving away from the debate surrounding 'individual differences' and the wholesale dismissal of all self-report data as 'subjective perceptions'– the use of homogeneous groups, the requirement for a high degree of consensus and the strategy of triangulation should be seen as one of the strengths of the risk assessment approach.

7.2 Post-normal Science

A theme running through this thesis has been the balance that the risk management approach has to strike between the assessment and research agendas, and the need to act on the basis of 'good enough science'. The differences between the two agendas may be exemplified by a story sometimes told by mathematicians, who pride themselves in exercising more scientific rigour than physicists, and much more so than astronomers:

> A mathematician, a physicist and an astronomer are travelling from England to Scotland. They cross the border and observe a black sheep in the middle of a field. "Look," exclaims the astronomer, "all Scottish sheep are black!" The physicist responds: "No, no! *Some* Scottish sheep are black!" The mathematician shakes her head, sighs to express her disapproval and proclaims, "Colleagues, all we can truly say is that in Scotland there exists at least *one* field, containing at least *one* sheep, at least *one* side of which is black."

This is perhaps not terribly successful as a joke, but it serves to illustrate that [1] even the *hard sciences* exhibit different degrees of 'hardness', and [2] these degrees are probably related to the extent to which each discipline is directly relevant to the 'real world': the larger the impact of a decision is on the real world, the more likely that decision is to be made as soon as sufficient evidence becomes available. Mathematicians may have spent centuries trying to solve Fermat's last theorem. Astronomers are unlikely to wait to ascertain the exact mass, speed and composition of a large asteroid hurtling towards Earth: knowing its trajectory with sufficient certainty would be enough to prompt some action.

Chapter 2 suggested that applied researchers have to be realistic and accept that the aim of a risk assessment is not to be perfect, establish causal links and test hypotheses, but to be 'good enough' to warrant interventions that seek to improve the working conditions of the assessment group (Cox *et al.*, 2000b). This should not be seen as *carte blanche* to dispense with science and evidence, but as a reminder properly to focus on the purpose of assessment and to ensure that the available resources are used to their best effect. Hurst (1998), writing about the use of the term 'risk' in medical research, offers a good description of 'good enough science':

> "Of course, the statistics will be uncertain because they relate to averages not individuals and, furthermore, medical knowledge is not absolute but represents the best available at that particular time. Most people, however, faced with a medical problem will accept that the current state of medical knowledge and evidence is the best basis on which to make a decision on their need for treatment. This is difficult decision making in the face of great uncertainty."
>
> (Hurst, 1998, p. 87)

There is, undoubtedly, the need to accumulate more knowledge in the field of work-related stress. There is, however, a more pressing need –both scientifically and morally– to *apply* existing knowledge. In some contemporary studies, it is not always clear whether the intellectual or practical gain justifies the cost (in all senses) of the research undertaken: is it really necessary to seek a complete specification of a problem, to know its mechanisms, its mediators and moderators, to the very last and intimate detail, before taking action to tackle it? As Hernberg eloquently puts it:

> "Scientists unfortunately all too often lose perspective when digging (too) deep into their own specialty. We can, for example, ask (...) is it really worthwhile, once again, to carry out a scientific study showing that asbestos causes mesothelioma also in the republic of Backwardia, when we know that it happens in all other countries and when the real issue is prevention? (...) Or should we once again

determine that mental stress causes stress-related symptoms? My answer is 'no'."

(Hernberg, 1994, p. 5).

The approach against which Hernberg argues might be defensible in an ideal world of infinite resources and opportunities for research, but in this, the real world, time and effort spent on *Backwardian* research is all too often to the detriment of intervention and prevention. Relentlessly pursuing the holy grail of the definitive proof of causation can lead researchers down some very frustrating avenues. As Griffiths (1999) contends, the experimental paradigm that currently dominates stress research may be suitable for the natural sciences, but it generally fails to 'deliver the goods' for the social sciences:

> "Clearly, carrying out experiments in organizations is probably impossible. In many situations even quasi-experiments may be too much to ask for. (...) Really, it is unrealistic to expect the natural science paradigm to explain highly complex, constantly changing systems such as organizations and to predict the specific effects on individual behaviour and health"
>
> (Griffiths, 1999, p. 592)

Stress research is actually a field for which the term 'post normal science' could have been invented. Kuhn (1970) referred to the classical science paradigm and conventional problem-solving techniques as "normal science". Later, research into complex systems (such as ecosystems) and their behaviour suggested that normal science could not deal adequately with such systems. Funtowicz and Ravetz (1993, 1994) proposed the concept of "Post-Normal Science" to deal with problems outside normal science, in the realm of human activities in which prediction and control are very difficult or impossible; scientific evidence and experience are important but facts are uncertain or disputed; and where society and politics play an important role because cultural values come into play, stakes are high and decisions are urgent and momentous: again, "difficult decision making in the face of great uncertainty". This will, or should, sound familiar to most stress researchers.

Those "highly complex, constantly changing systems" described by Griffiths (1999) are, therefore, natural candidates for post normal science. One of the more fundamental difficulties relates to the multi-aetiological nature of work-related stress. Many authors refer to it, but just as many express disappointment when expected stressor→strain effects fail to materialise empirically, or when highly sophisticated methods and measures with large samples manage to find only small effects. Zapf *et al.* (1996) persuasively explained why only a small correlation between stressors and strain should be expected: so many factors have an effect –positive or negative– on health and well-being that any one of them, including 'work', can only account for a small proportion of the variance. Assuming just 15 major factors (e.g., physical constitution, health behaviours, social class, etc.) of equal effect strength, work stressors could account for, at most, 7% of the variance (a correlation of .26). If measurement error is taken into account, and the reliability with which stressors and strain are measured is assumed to be only .80 (not a pessimistic estimate), the correlation is further reduced to .21

To make matters worse, the variance that is available to be accounted for is probably reduced by the *healthy worker effect*: those workers who are 'at the end of their tether' will either leave work, be more likely to be absent from work, or –if still at work– less likely to participate in a research project that reminds them of just how dreadful their health or their work are. This, therefore, leads to the restriction of range in the indices used to measure health, thus reducing further the likelihood of detecting the effects of work. If the complex ways in which those 15, or more, factors should be expected to interact are added to the equation, it is all the more remarkable than *any* health effects are found for work characteristics. It is the complexity and unpredictability of the workplace as a system overlapping with many other systems that represent the biggest challenge to stress research.

The problem is often exacerbated by those who argue that the demonstration of causality may be more easily achievable by concentrating on some specific relationships (e.g., between job demands and control, and cardiovascular disease). The number of factors in the model is reduced even further, from all the stressful work characteristics to just issues of demand and control. Johnson & Hall (1996) refer to this use of an excessively parsimonious model as the "underspecification error", and conclude that:

"Any two-dimensional representation of the world of work will necessarily represent a simplified view. (...) If the essential elements within the social and work environments are not examined, then researchers' causal interpretations of observed associations may be incorrect and attempting to understand and reform the work environment cannot be done".

(Johnson & Hall, 1996, p. 366)

Particularly after such *doom and gloom*, this may be the most apposite place to discuss one of the main strengths of the risk management framework, and of its risk assessment phase in particular, which also lies at the heart of Johnson & Hall's plea for complexity (even at the expense of parsimony). As it should have become clear from the (summarised) account of the three case studies given in Chapter 3, risk assessment is a very information-rich and participative methodology. This 'grounded' approach is certainly more time-consuming and possibly more threatening for the organisation –and often more fraught with difficulties and challenges and frustrations for the researchers– than a standardised 'stress audit' of the kind that tries to squeeze the seamstress and the actress into the same pigeonhole (Kristensen, 1996). However, by the end of a risk management project the assessment team have achieved a very detailed understanding of the organisation and the context within which the assessment groups work. Equally important is the fact that, more often than not, Steering Groups also develop a more complete, or more accurate, 'cognitive map' of their organisation as a result of the process. (This is an added benefit of a grounded methodology, and, with sufficient commitment, it may encourage the organisation to become a 'learning organisation' [Cox *et al.*, 2000b]: see Figure 2).

The wealth of information available from a risk assessment and the active participation of the workforce are also relevant to the earlier discussion in this section about the possibly futile search for proof of stressor→strain causality within the strictures of the existing experimental paradigm. As argued in Chapter 2 (and illustrated by the dotted-line box in Figure 1), the combined knowledge of the assessment team, the Steering Group and all the members

of the organisation that participate in the assessment phase represent an invaluable resource to *understand and explain* the relationships uncovered in the data. It can identify and explain underlying patterns, suggest plausible mechanisms and offer strategies for suitable interventions. The translation phase is, indeed, designed to encourage precisely this kind of active, thoughtful participation (see, for example, Appendix IV).

This utilization of the combined knowledge base available during risk assessments may also be seen as a pathway towards more research oriented activities. Section 2.4.1 outlined how research and assessment need not be mutually exclusive. This thesis has tried to illustrate how risk assessment can, to some extent, serve both masters, partly by adopting methods and statistical techniques closer to those used by occupational medicine than is currently the case in stress research. Indeed, there is an understandable desire amongst most applied researchers not just to describe relationships between variables, but also to add to the body of scientific knowledge by *explaining and understanding*, and to make a contribution by *intervening in and improving* the workplace. In this regard, section 5.2 has suggested how the data from risk assessments may be used to build models and put forward hypothesis that test them. In this sense, risk management, through its risk reduction phase, also encompasses the activities of 'research' in its more traditional sense: interventions not only fulfil the purpose of the risk assessment + risk reduction framework, but provide an opportunity to test and refine hypothesis relating to causes and mechanisms. Section 6.3 also illustrated how the concept of shared job strain can be taken further to identify likely risk groups. Again, with all the necessary caveats, this process approximates the traditional activities of research and can sometimes offer evidence to rule out alternative hypothesis such as reverse causation and third variables. Thus, risk assessment data can both contribute to the total sum of scientific knowledge and provide a firmer basis for designing and implementing intervention programmes.

It is not argued here that stress research should abandon the natural science paradigm altogether, but that it should see many of the paradigm's requirements as the gold standard to bear in mind and aim for (not as the minimum requirement for acceptance of evidence), and that it should adjust

its expectations and methods to the multi-aetiological nature of the phenomenon under study.

In this vein, the current developments within the ongoing programme of risk management projects at the Institute of Work, Health & Organisations (I-WHO) capitalise on these strengths and aim to make best use of *all* the data that become available during risk assessment and reduction, heeding Griffiths' (1999) advice to avoid concentrating on "outcomes at the expense of process". The next and final section suggests some future directions for risk assessment.

7.3 Future Directions

At the heart of risk assessment lies the process of identifying 'likely risk factors'. The first suggested area for future work focuses on the three elements of the equation: hazard, harm and risk. The second deals with the need to use a multiplicity or research methods and corroborating evidence to improve the quality of risk assessments.

7.3.1 Hazard, harm and risk

Better conceptualisation and measurement of both psychosocial hazards and harm are needed (Cox *et al.*, 2000a). The current problems with the measurement of hazards have been discussed, and some ways forward identified, in this chapter. In addition to the previous discussion on the measurement of the work environment, it is argued here that a better understanding of the appraisal mechanisms underlying stress is required, and that the attendant feelings, emotions and thoughts are under-researched (Dewe *et al.*, 2000). This is understandable in a climate that emphasises *hard factors* and perceives the less tangible psychological processes as too *soft* to be worthy of, or amenable to, 'proper' study. This is one of the areas in which stress research could make much better use of qualitative methods.

Three main areas in need of development can be identified with regard to the assessment of harm:

First, at a general level, it is necessary to ascertain what measures constitute the most useful indicators or both individual and organisational health. For example, 'intention to quit' is likely to be a more sensitive index of poor organisational health than actual turnover: people may be very unhappy or unhealthy in their job, but they may be reluctant to leave for a variety of reasons.

Second, at a specific level, it would be beneficial for research and assessment to develop indices of individual and organisational health that are more sensitive to the occupational context, group or culture. For example, absence is not very useful in medical contexts: it is probably all the more meaningful for being so rare, but its restriction of range presents some serious problems for measurement. Other indicators, such as alcohol consumption and drug misuse, would be more useful in this case. If the context-specificity of some measures is not properly considered, risk assessment can easily miss good indicators of harm and, therefore, significant relationships between work and health.

Third, the validity of the measures used must be tested, and their reliability confirmed over time. For instance, further research into the external validity of the General Well-being Questionnaire (GWBQ) and the validity and reliability of self-reported absence is currently being carried out (Cox *et al.*, 2000c; Thomson, 2000). This is an equally important issue for individual and organisational health: with self-reported health measures that are reliable and valid indicators of health and/or well-being, research and assessment can be much less intrusive (e.g., filling out a questionnaire, compared to having a blood test). Similarly, given that so many organisations are quite poor in terms of their record-keeping, the finding that self-reported absence can be – in the right circumstances– an adequate substitute for organisational records makes assessments more practicable without making them less reliable or valid.

With regard to investigating the relationship between hazard and harm, Cox & Griffiths' (1996) fourth requirement has been cited frequently here: "adequate data analysis". What is meant by "adequate" in this context? This thesis has interpreted this term in two different but related ways:

- First, it must be psychometrically sound, so that the choice of statistical techniques fits and reflects the nature of the data (see Chapter 5). Also, "adequate" means that, when in doubt, analytical techniques should err on the side of caution. This has been the case in the various analyses reported here, in relation to criteria for 'caseness', choice of statistical test or cut-off points.

- Second, data analysis must be 'fit for purpose', that is, it must provide an appropriate basis for the design of interventions. In one sense this relates to the first interpretation (i.e., psychometrically sound, not open to dispute), but it also refers to the fact that "researchers are guests, not autocrats" (Griffiths, 1999) in the participating organisations. They must explain and occasionally persuade, and need to seek to maximise the participation and understanding of staff and managers at all stages, including feedback. To the average lay person, the result of an odds ratio is more intuitive than the reporting of t and F values. This consideration must not compromise the scientific credentials of the assessment (i.e., 'dumb it down'), but adequate data analysis and adequate feedback to the organisation are crucial for the success of the next stage of the process: translation and risk reduction.

As a general remark applicable to all three elements of the risk equation, the emphasis during assessment should be on gathering verifiable data –whether it be 'objective', documentary or self-report– and on trying to minimise bias by encouraging respondents to 'objectify' their responses. One of the, as yet untested, hypotheses in this context is that the phrasing of the assessment questions in either *situational reasoning* ("Is this an inadequate aspect of work?") or *psychological reasoning* ("Are you dissatisfied with this aspect of work?") may lead to a different pattern of answers.

7.3.2 Multiplicity of methods

The need to use a multiplicity of methods has been mentioned earlier in relation to two issues: the search for corroborating evidence and the multi-factorial determination of health.

More frequent and skilled use of multiple methods of assessment will not only provide better measurement of hazards and improve the degree and quality of 'triangulation', but it will also tap into a source of information that is not fully used at present. This would apply in two ways, and be best achieved by means of an increased use of qualitative data: first, at the level of microprocesses (Griffiths, 1999), a much better understanding of some of the concepts used in stress research can be gained by using qualitative methods, which are generally much more information-rich and open to revealing unexplored areas and psychological mechanisms than the majority of questionnaires that are currently employed in assessment, full of items to be rated but with little room for qualitative data.

Second, at the level of macroprocesses, the evaluation of interventions needs to widen its focus of attention to cover not just *if* interventions work, but *how* they work, or *why* they work –or do not. Again, a combination of quantitative and qualitative methods would be most appropriate to 'mine' the available sources of information that would permit the identification of both success factors and learning points. For example, Cox and his colleagues (Cox *et al.*, 2000b) evaluated the success of interventions in a number of UK organisations and developed the concept of "organisational penetration and impact" to obtain more information about how interventions actually worked (or not) within the organisations: comparisons were made according to the organisational penetration of the interventions, i.e., how many employees had been *aware* of the interventions, how many were *involved* in the interventions, and how many reported that their jobs had *changed* as a result. They also reported on various organisational and process factors that help or hinder interventions.

Returning to the issue of the multi-factorial determination of health, back in 1994 Hernberg suggested that "risk assessment must also rely on other disciplines, such as epidemiology, statistics, toxicology, occupational hygiene, ergonomics, and psychology". A single discipline clearly cannot possess enough knowledge to gain a complete understanding of an issue as complex as work-related stress. Stress research *should* be ideally placed within the emergent and "interface" discipline of occupational health psychology (Cox *et al.*, 2000d) to follow Hernberg's suggestion. Unfortunately, all too often occupational (health) psychologists fail to communicate and work together

with even their social psychologists *brethren*, who would have much to add to the understanding of the social context within organisations and, therefore, to understanding "how" and "why" interventions succeed or fail.

In summary, future work in risk assessment should improve the conceptualisation and measurement of the basic elements of the risk equation; use a variety of methods to explore micro- and macro-processes; and seek improved co-operation with allied disciplines in order to develop better models of the aetiology of work-related stress and health.

This thesis aimed to explore how risk assessment can be implemented within the guiding principles of the risk management framework to provide organisations with useful data to continue the process towards risk reduction and evaluation. This final chapter has set the framework in its wider theoretical and methodological context.

Although some areas have been identified where the methodology can be improved, these are not insurmountable problems, but challenges to the ingenuity and tenacity of applied researchers. The overall conclusion of this thesis is that risk assessment constitutes a valuable addition to the efforts of the scientific community to address the problem of work-related stress, particularly by providing a sound basis for intervention and prevention.

The value and usefulness of the overall risk management framework will be best assessed over time, more likely and appropriately through the tradition of the multiple case study (Kompier *et al.*, 2000), which is particularly appropriate,

> "when how and why questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context"
>
> (Yin, 1994, p. 1)

In this tradition, multiple case studies are treated cumulatively, and their findings are generalisable not to populations or to other samples, but to theoretical propositions. This seems an appropriate tradition for an eminently practice-oriented framework such as risk management, and for applied researchers who are often presented with the question: "That's all very well in practice, but –will it work in theory?" Additionally, if the focus of the case studies is on process as well as outcomes, the results are also generalisable in terms of 'success factors' and 'learning points'.

The conclusions from a recent paper (Cox & Rial-Gonzalez, 2000) would appear to be a fitting note on which to finish.

> "The complex aetiology of work stress represents a major challenge for science, and its mechanisms and causes may never be completely understood in their finest detail. However, there is a moral, as well as scientific and legal, imperative to act to reduce the harm caused by stress in the workplace. Risk management provides a framework for positive action –focused on prevention and on the organisation as the generator of risk– and has already proven successful in a number of varied occupational settings. There is now an opportunity further to refine and improve the assessment methodology and the design of relevant and effective stress reduction interventions. An exciting future lies ahead."

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9. APPENDICES

I – Survey Instrument for Trust A

II – Survey Instrument for Trust B – junior doctors

III – Survey Instrument for Trust B – senior doctors

IV – The 'medical analogy' slide used at Steering Group meetings

Appendix I

Survey Instrument for Trust A

Centre for Organizational Health & Development
Department of Psychology, University of Nottingham
Nottingham. NG7 2RD UK
A World Health Organization Collaborating Centre in Occupational Health

April 1996

To: Medical Staff (the Medical Directorate and all Senior House Officers)
[redacted] NHS Trust

GENERAL WORK ENVIRONMENT SURVEY

The British Medical Association (BMA) has been under increasing pressure to address the problems currently facing doctors in the UK. The Association has commissioned us, as researchers in occupational health psychology, to develop the means to assess, protect and enhance the health and well-being of hospital-based doctors. [redacted] has agreed to collaborate with us and become a pilot hospital for this pioneering work.

We would emphasise that this is more than just another piece of research. The Assessment Report will be considered by the "Organization and Doctor Well-Being Group", on which both management and medical staff (Mr [redacted], Dr [redacted], Dr [redacted] and Dr [redacted]) sit, in July/August. Reasonable and practicable action will be taken by the Trust on the basis of the results. We will then conduct an evaluation to establish whether interventions are in fact effective. An open presentation and summary of findings will be made available to all medical staff.

We are conducting a survey of Senior House Officers (as a horizontal slice of medical staff) and the Medical Directorate (as a vertical slice). The aim of the survey is to explore your views about the design and organization of your work, the problems you face, and whether you think that those problems affect your health. It is very important that we obtain information from those who *have* experienced problems as well as from those who *have not*. The more honest and accurate your replies to our questions, the more useful the information will be. **This is your opportunity to provide information relevant to your health and welfare, and an opportunity for the Trust and the BMA to listen and take action.**

We are an independent team. Anything you write on this survey form will *only* be read by our team at the University of Nottingham. None of your questionnaires will be read by members of [redacted] or the BMA. Do not write your name on the form. The questionnaires are anonymous and we will take great care not to identify indirectly any individual in the Final Report.

In order that we might determine response rates, key individuals have been asked to distribute the questionnaires, collect them when completed, and post them on your behalf. Each questionnaire should be placed in a pre-paid reply envelope and handed to the appointed person **within 3 days**.

SHOs should return their form to the appointed SHO representative in their Specialty. Those in the Medical Directorate (excluding consultants and SHOs) should return their form to Mrs [redacted] (or [redacted]). If you do not manage to make contact with these people, please post the questionnaire directly to the University of Nottingham **within 4 days.** Further supplies of pre-paid reply envelopes will be available from Mrs [redacted] and Mrs [redacted].

Please find the time to complete this questionnaire. We know you are very busy but we hope you will appreciate the importance of this project.

Thank you for your help.

Professor Tom Cox
Dr Amanda Griffiths

Miss Margy Macafee
Mr Eusebio Rial-Gonzalez

General Work Environment Survey:

[redacted]

The Medical Directorate and Senior House Officers

SECTION 1: YOU and YOUR JOB

1. Job title: .....

2. Specialty .....

3. Length of time working at [redacted].
   (to the nearest month): ..... months

4. Gender: [ ] Male [ ] Female

5. Age *(to the nearest year):* ..... years

6. Total number of hours worked per week

   -in an average week: ..... hrs

   -range: minimum number of hrs per week..... hrs

   maximum number of hrs per week..... hrs

7. Do you spend the majority of your time in:
   (tick two or more if your spend equal amounts in each)

   [ ] Wards
   [ ] Theatre
   [ ] Accident & Emergency
   [ ] Outpatients
   [ ] Day Case Unit
   [ ] Other, please specify

   .....

   .....

8. Do you have a written *current* contract? [ ] Yes [ ] No

9. If YES, do you work strictly to your contract? [ ] Yes [ ] No

10. Do you have a job plan? [ ] Yes [ ] No

11. Do you have a job description? [ ] Yes [ ] No

12. Are your role and responsibilities in the Trust clearly defined? [ ] Yes [ ] No

13. If YES, does the definition of your role accurately reflect the job you actually do? [ ] Yes [ ] No

The next section is about your views on your job. For each of the items below, please place a tick in the column which most accurately reflects your level of satisfaction with your work.

KEY:

[0] Very unsatisfactory **[1]** Unsatisfactory **[2]** Neither unsatisfactory/satisfactory **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Regular pattern of shift working - *you do not work shifts*)

WORK CHARACTERISTICS	**Particular conditions**	NA	**[0]**	**[1]**	**[2]**	**[3]**	**[4]**
How satisfied are you with ...?							
Work design *(the nature of your work and the way you do it)*	Volume of work (workload)						
	Control over workload						
	Emergency call rota						
	New rota system in Medicine with geographically-based house officers						
	System of cross-covering for colleagues						
	Deadlines (e.g. for discharge summaries, Patient's Charter)						
	Difficulty of tasks						
	Variety of different tasks						
	How appropriate the tasks are (e.g. taking bloods at weekends)						
	Amount of paperwork (e.g. on wards)						
	System of protected training time						
	Amount of time available for research						
	Amount of time allocated for teaching and appraisal of junior staff						
	How performance is monitored						
	Quality of "regional" appraisal system (**Registrars only**)						
	Regularity of "regional" appraisals (**Registrars only**)						
	Quality of six month placement (career) "counselling" sessions (**PRHOs and SHOs only**)						
	Regularity of six month placement (career) "counselling" sessions (**PRHOs and SHOs only**)						
	Amount of informal feedback on performance from senior medical colleagues						
	Quality of informal feedback on performance from senior medical colleagues						
	Recognition of your efforts by the Directorate						
	Recognition of your efforts by the Trust						

KEY:

[0] Very unsatisfactory **[1]** Unsatisfactory **[2]** Neither unsatisfactory/satisfactory **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Regular pattern of shift working - *you do not work shifts*)

WORK CHARACTERISTICS	**Particular conditions**	NA	**[0]**	**[1]**	**[2]**	**[3]**	**[4]**

How satisfied are you with....?

Career, Job Status & Pay	Terms of employment contract						
	Formal educational objectives set for post						
	Job description/roles and responsibilities						
	Provision of careers guidance						
	Career development and prospects						
	Encouragement by Trust to take further examinations						
	Opportunity to use all your skills and knowledge (in your current placement)						
	Job security						
	Status or 'value' associated with your work at [redacted]						
	Trust-determined classification for Additional Duty Hours (ADH)						
	Reimbursement for travel/relocation expenses						
	System of funding for courses						
	Amount of study leave						
	Timing of study leave						

WORK CHARACTERISTICS	**Particular conditions**	NA	**[0]**	**[1]**	**[2]**	**[3]**	**[4]**

How satisfied are you with....?

National Issues	Effect of "Calmanization" on your work - present and future/the implementation of "Calmanization"						
	The level of mobility required during training years of the job						
	National level of basic pay						
	How fair pay is compared with those in other professions/groups						

KEY:

[0] Very unsatisfactory **[1]** Unsatisfactory **[2]** Neither unsatisfactory/satisfactory **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Regular pattern of shift working - you do not work shifts)

WORK CHARACTERISTICS	**Particular conditions**	NA	**[0]**	**[1]**	**[2]**	**[3]**	**[4]**

How satisfied are you with ...?

Work Organisation	Medical staffing levels in your main work area (e.g. wards, outpatients)						
	Nursing staff levels in your main work area (e.g. wards, Outpatients)						
	Length of working hours						
	Flexibility of working hours						
	How predictable hours of work are						
	Amount of time spent working outside of salaried working hours						
	Opportunities to take work breaks						
	Facilities for work breaks away from usual work area						
	Out of hours facilities for food						
	Impact of your work on home life						

WORK CHARACTERISTICS	**Particular conditions**	NA	**[0]**	**[1]**	**[2]**	**[3]**	**[4]**

How satisfied are you with....?

Social climate & Interpersonal relations	Support from colleagues (across the Trust)						
	Support from colleagues (within the Directorate)						
	Support from team when studying for examinations (e.g. Membership)						
	Support from non-medical colleagues (e.g. nurses, physiotherapists) across the Trust						
	Support from administrative staff within the Directorate						
	Quality of colleagues' work						
	Availability of advice from senior medical colleagues						
	Interactions with Junior Doctor's representative						
	Interactions with the BMA itself or the Trust BMA representative						
	Pleasantness of contact with patients						

KEY:

[0] Very unsatisfactory **[1]** Unsatisfactory **[2]** Neither unsatisfactory/satisfactory **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Regular pattern of shift working - you do not work shifts)

WORK CHARACTERISTICS	**Particular conditions**	NA	**[0]**	**[1]**	**[2]**	**[3]**	**[4]**

How satisfied are you with....?

Organizational issues	Clarity of the Trust's "vision and values"						
	Induction to the Trust upon arrival						
	Induction to the Specialty upon arrival						
	Participation in decisions which affect the job you do						
	Opportunities for clinical training and professional development						
	Quality of clinical training and supervision at Trust						
	Quality of educational programme at Trust						
	Opportunities to pursue a specialist interest						
	Opportunities to pursue a research interest						
	Communications with Directorate management						
	Actual support from Directorate management						
	Communications with Trust management						
	Actual support from Trust management						
	Encouragement for sharing work problems and problem solving						

WORK CHARACTERISTICS	**Particular conditions**	NA	**[0]**	**[1]**	**[2]**	**[3]**	**[4]**

How satisfied are you with....?

Role at Work: Position in Organization	Other employees' knowledge of what your job involves (e.g. nurses)						
	Patients' knowledge of what your job involves						
	Balance of priorities demanded of you by the Directorate (e.g. ward duties conflicting with A&E)						
	Balance of priorities demanded of you by Trust (e.g. supervised operating vs. pressure to reduce waiting lists)						
	Responsibility for managing others						
	Continual demands from patients/colleagues/others						

KEY:

[0] Very unsatisfactory **[1]** Unsatisfactory **[2]** Neither unsatisfactory/satisfactory **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Regular pattern of shift working - you do not work shifts)

WORK CHARACTERISTICS	**Particular conditions**	NA	**[0]**	**[1]**	**[2]**	**[3]**	**[4]**

How satisfied are you with ...?

Work equipment and environment (1) *Wards*	Adequacy of work equipment						
	Provision of white coats						
	Standard of Doctors' room (e.g. provision of desk)						
Work equipment and environment (2) *Theatre*	Adequacy of work equipment						
Work equipment and environment (3) *Accident and Emergency*	Adequacy of work equipment						
	Standard of Doctors' area						
Work equipment and environment (4) *Outpatients*	Adequacy of work equipment						
	Standard of Doctors' Room(s)						
Work equipment and environment (5) *Day Case Unit*	Adequacy of work equipment						
	Standard of Doctors' Room(s)						
Work equipment and environment (6) *On-Call Environment*	Standard of accommodation for doctors resident on-call						
	Upkeep and maintenance of on-call rooms						
	Comfort and noise of on-call rooms						

How many **days** have you been absent **on sick leave** from work in the last 12 months?

.....days

How many different **spells** of **sickness absence** have you had over the last 12 months?

.....spells

Is absence among your colleagues a problem for you? (due to sickness and/or study leave)

[ ] YES [ ] NO

Please indicate (in the box provided) your level of satisfaction with your job at the present time.

[ ] Very dissatisfied
[ ] Dissatisfied
[ ] Neither satisfied/dissatisfied
[ ] Satisfied
[ ] Very satisfied

On an average day, at what level of efficiency do you perform? (on a scale of 0 - 100%)

..... %

Which of the following statements most accurately reflects your views? (please tick the most appropriate boxes)

PRHOs, SHOs and Registrars

[ ] I am committed to completing my medical training

[ ] I intend to practice as a doctor

[ ] I would return to [redacted] if the opportunity arose

Staff Grades, Senior Registrars and Consultants

[ ] I can see myself working at [redacted] in 10 years time

[ ] I intend to take early retirement

How concerned are you about the threat of litigation? (Please tick the most appropriate box)

[ ] Very concerned
[ ] Moderately concerned
[ ] No view
[ ] Only slightly concerned
[ ] Not concerned at all

SECTION 2: KEY PERSONNEL

Please indicate which **five** sources of support you would feel happy using and the **order** in which you would use them (where 1 = first choice) to discuss **personal work-related problems** (e.g. coping with the demands of job).

SOURCE OF HELP	ORDER OF USE
Peer Colleagues	
Retired Colleagues	
Consultant	
Postgraduate Clinical Tutor	
College Tutor	
Clinical Director	
Medical Director	
Chief Executive	
Human Resources	
Occupational Health	
BMA representative	
Junior Doctors representative	
Hospital counsellor (part of District-wide "[redacted]" Service)	
External bodies (e.g. BMA Stress Counselling Service for Doctors, District-wide "Doctors in Distress Service)	
GP	
Minister of Religion	
Family	
Friends	
Other, please specify	

SECTION 3: YOUR HEALTH: THE GENERAL WELL-BEING QUESTIONNAIRE

This section is to do with your general health. It is directly relevant to measuring the effects of work. Please read each of the questions carefully and decide how often, **over the last six months,** you have experienced the various symptoms that are listed. Please circle just **one** point on each response scale (from **All the time** to **Never**). We would like you to answer all the questions so that we can score the questionnaire fully.

Over the last six months, how often have you...	**All the time**	**Often**	**Some times**	**Rarely**	**Never**
1. Been bothered by your heart thumping?	4	3	2	1	0
2. **Become easily bored?**	4	3	2	1	0
3. Experienced loss of sexual interest or pleasure?	4	3	2	1	0
4. **Become easily annoyed or irritated?**	4	3	2	1	0
5. **Had to clear your throat for no apparent reason?**	4	3	2	1	0
6. Been scared when alone?	4	3	2	1	0
7. **Got mixed up in your thinking when you have had to do things quickly?**	4	3	2	1	0
8. Broken out in a rash when you have been upset or excited?	4	3	2	1	0
9. Shaken or trembled for no apparent reason?	4	3	2	1	0
10. **Done things rashly or on impulse?**	4	3	2	1	0
11. Thought people considered you a nervous person?	4	3	2	1	0
12. **Been forgetful?**	4	3	2	1	0
13. **Found things getting on your nerves and wearing you out?**	4	3	2	1	0
14. Become afraid of unfamiliar places or people?	4	3	2	1	0
15. **Become easily tired?**	4	3	2	1	0
16. **Become flushed / hot in the face for no apparent reason?**	4	3	2	1	0
17. Experienced numbness or tingling in your arms or legs?	4	3	2	1	0
18. **Had difficulty in falling or staying asleep?**	4	3	2	1	0
19. Been tense or jittery?	4	3	2	1	0
20. **Found your feelings easily hurt?**	4	3	2	1	0
21. Had any pains in the heart or chest?	4	3	2	1	0
22. Been troubled by stammering?	4	3	2	1	0
23. **Found it hard to make up your mind?**	4	3	2	1	0
24. Worn yourself out worrying about your health?	4	3	2	1	0

Are there particular, well defined work situations, which make you very anxious or agitated? If YES, please specify:

.....

.....

SECTION 4: HEALTH-RELATED BEHAVIOURS

Please remember that your responses are anonymous and confidential. Individual answers will not be seen by any member of [redacted] or the BMA. If you really do not want to answer some of these questions, then leave them blank. However, the data would be useful for our analyses.

1. How tall are you? ..... ft .....ins

2. How much do you weigh? .....stone.....lbs

3. Do you **smoke cigarettes**? [ ] Yes [ ] No

   If YES, how many cigarettes do you smoke a day? *(Please tick the appropriate box)*

Occasional social smoking	
1 - 10	
11 - 20	
21+	

4. Do you **drink alcohol?** [ ] Yes [ ] No

   If YES, how many units do you consume in an average week?
   (Please tick the appropriate box)

   (1 unit = half a bitter, 1 glass of wine or spirits).

Male respondents use this box

1 - 21 units	
22 - 28 units	
29 - 49 units	
50+ units	

Female respondents use this box

1 - 14 units	
15 - 21 units	
22 - 34 units	
35+ units	

5. Do you use **medically or self prescribed drugs** [ ] Yes [ ] No

   If YES, do you use them for treatment or relief of *physical* pain or illness? [ ] Yes [ ] No

   If YES, do you use them for treatment or relief of *psychological* distress or illness?
   (e.g. sleep problems, anxiety, depression) [ ] Yes [ ] No

6. On average, how many hours of **quality sleep** do you get each night?
   (Please tick the appropriate box)

1 - 4 hours	
5 - 6 hours	
7 hours or more	

7. Do you **exercise regularly** outside of work hours [ ] Yes [ ] No

   If YES, how would you describe your exercise habits?. Include continuous periods of activity of 20 minutes or more

   Leisurely activity (walking, golf) ..... times a week.
   Moderate aerobic activity (swimming, gentle cycling) ..... times a week.
   Vigorous aerobic activity (jogging, squash, work-outs) ..... times a week.

8. Generally are you physically active while doing your job? [ ] Yes [ ] No

9. Do you consider yourself to have a **healthy diet**:
   (low fat, high fibre, plenty of fruit and vegetables)

   [ ] All the time
   [ ] Most of the time
   [ ] Some of the time
   [ ] Rarely
   [ ] Never

SECTION 5 : MISCELLANEOUS

Overall, what do you consider to be the ***main*** **problem** you face at work?

Can you suggest any reasonable and practical ways of reducing the problems you face at work?

Thank you very much for your help. Please return your completed form *within 3 days* either to your SHO representative or to Mrs [redacted] in the Medical Directorate, as appropriate. If you do not manage to make contact with these people, please post the questionnaire directly to the University of Nottingham *within 4 days*.

Appendix II

Survey Instrument for Trust B - junior doctors

Centre for Organizational Health & Development
Department of Psychology, University of Nottingham
Nottingham. NG7 2RD UK
A World Health Organization Collaborating Centre in Occupational Health

16 January 1997

Junior Medical Staff (Integrated Medicine, Obstetrics & Gynaecology, Paediatrics)
All Senior House Officers
[redacted] NHS Trust

Dear Colleague

GENERAL WORK ENVIRONMENT SURVEY
Further to the memo of 4 November 1996, we are now conducting the survey of medical staff across the Trust, which will conclude the assessment phase. The aim of the survey is to explore your views about the design and organization of your work, the problems you face, and whether you think that those problems affect your health. It is very important that we obtain information from those who *have* experienced problems as well as from those who *have not*. The more honest and accurate your replies to our questions, the more useful the information will be.

- **This is your opportunity to provide information relevant to your health and welfare, and an opportunity for the Trust and the BMA to listen and take action.**

The results of the audit and their implications will be brought forward for discussion with the Steering Group. Reasonable and practicable action will be taken by the Trust on the basis of the results. We will conduct an evaluation to establish whether interventions are in fact effective. A summary will be made available to all medical staff.

- **We are an independent team.**
- **Anything you write on this survey form will only be read by our team at the University of Nottingham.**
- **None of your questionnaires will be read by members of [redacted] or the BMA.**
- **Do not write your name on the form.**
- **The questionnaires are anonymous and we will take great care not to identify indirectly any individual in the Final Report.**

Please find the time to complete this questionnaire. We know you are very busy but we hope you will appreciate the importance of this project. Thank you for your help.

Professor Tom Cox
Dr Amanda Griffiths
Miss Margaret Macafee
Mr Eusebio Rial-Gonzalez

SECTION 1: YOU and YOUR JOB

1. Job title: .....

2. Specialty: .....

3. Gender: [ ] Male [ ] Female

4. Age *(to the nearest year)*: ..... years

5. Length of time working at [redacted]: .....

6. Total number of hours worked per week for [redacted]

   -in an average week: ..... hrs

   -range: *minimum* number of hrs per week ..... hrs

   maximum number of hrs per week ..... hrs

7. Do you work at more than one hospital site? [ ] Yes [ ] No

   (if YES, please list them, e.g. [redacted]) .....

   .....

8. Where do you spend the majority of your time?
   (please tick all that apply)

   [ ] Wards
   [ ] Theatre
   [ ] Accident & Emergency
   [ ] Intensive Care Unit
   [ ] High Dependency Unit
   [ ] Medical Assessment Unit
   [ ] Outpatients/Consulting Room
   [ ] Day Procedures Unit
   [ ] Special Care Baby Unit
   [ ] Delivery Floor
   [ ] Other, please specify

   .....

   .....

9. Do you have a written contract? [ ] Yes [ ] No

10. If YES, is your contract up-to-date ? [ ] Yes [ ] No

11. If you have a contract, is it? [ ] Fixed term [ ] Permanent

12. If you have a contract do you work strictly to it? [ ] Yes [ ] No

13. Do you have an *up-to-date* job description? [ ] Yes [ ] No

14. Have your hours reduced since the New Deal? [ ] Yes [ ] No

15. If YES, is your workload *more stressful* now with the reduction in hours? [ ] Yes [ ] No

16. Do you have *management* duties, in addition to your clinical commitments? [ ] Yes [ ] No

17. If YES, please specify those duties (e.g. responsibility for design of rotas, etc.)

.....

18. Do you manage or supervise the work of other junior staff? [ ] Yes [ ] No

19. If yes, how many juniors do you manage or supervise? .....

20. Are you involved in teaching programmes for junior staff at [redacted]? [ ] Yes [ ] No

The next section is about your views on your job. Please mark any items (in the NA column) which are not applicable or relevant to your work situation. For items which are applicable, please indicate how satisfactory or adequate that aspect of your work is by placing a tick in the appropriate column.

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **[4]** Very satisfactory
[NA] Not applicable (for example: Rota system following the integration of Medicine - *you are in O& G)*

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Work design *(the nature of your work and the way you do it)*	Volume of work (overall workload)						
	Impact the reduction in hours has had on your workload						
	Impact the reduction in hours has had on your "quality of life"						
	Control over workload (opportunity to plan your work)						
	Organization of emergency call rota						
	System of internal cover (cross-cover) for colleagues						
	Amount of unnecessary "bleeps" throughout the working day						
	Time to discuss diagnosis and treatment with patients (maintain quality of care)						
	Patients presenting complaints additional to those for which they were originally referred by GP						
	Night-time GP referrals being handled by PRHOs						
	Continuity of care since introduction of new patterns of work for junior staff						
	Impact of the reduction in hours on your "exposure" to cases and the disease process						
	Adequacy of hand-over procedure for junior staff (i.e. satisfactory completion of duties and clear transfer of responsibility)						
	PRHOs' and SHOs' inexperience resulting in additional clinical tasks for more senior members of the team						
	Effects of shortened training period on your personal competence and confidence						
	Arrangements for the completion of discharge summaries						
	How appropriate the tasks are (e.g. being called at night to take bloods)						
	Volume of paperwork (e.g. in terms of the clerking of patients)						
	Amount of time utilized for "hands-on" teaching by senior staff						
	Opportunities to establish rapport with senior staff and receive informal feedback						
	Quality of appraisal sessions with educational supervisor						
	Regularity of appraisal sessions with educational supervisor						
	Quality of "protected" teaching sessions						
	Amount of teaching sessions						
	Opportunities to attend teaching sessions						
	Amount of time available for research projects						
	Availability of debriefing sessions after distressing events						
	Support within specialty for dealing with death						

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **[4]** Very satisfactory
[NA] Not applicable (for example: Rota system following the integration of Medicine - *you are in O& G)*

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Career, Job Status & Pay	Terms and conditions of employment contract						
	Formal educational objectives set for post						
	Provision of careers guidance						
	Encouragement by Directorate to take further examinations						
	Opportunities to maintain and update your skills (in your current rotation)						
	Immediate job prospects at end of rotation						
	Long term job prospects						
	Application system for Calman posts						
	Availability of Calman posts in your specialty						
	Information of rotation locality						
	Lack of opportunity to change within rotation						
	Support from Directorate to cover study leave						
	System of funding for training courses						
	Reduced funding for course travel and accommodation expenses						
	Trust-determined classification for Additional Duty Hours (ADH)						

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
National Issues	Morale of peers						
	Level of mobility required during training years of the job						
	The future availability of consultant posts						
	National level of basic pay						
	How fair pay is compared with those in other professions (e.g. lawyers)						
	The impact of the Patient's Charter on your work (e.g. waiting lists, waiting times)						
	Rising patient expectations						
	New patient complaints procedure						
	Increase in acute medical admissions and its impact on service provision						
	National shortage of qualified nurses in your specialty						

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **[4]** Very satisfactory
[NA] Not applicable (for example: Rota system following the integration of Medicine - *you are in O& G)*

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Work Organisation	Consultant staffing levels in your specialty						
	Junior medical staffing levels in your specialty						
	Nursing staff levels in your specialty						
	Support from porters in your specialty						
	Patients upsetting schedule by arriving either too early or too late						
	Amount of consecutive hours on-call						
	Flexibility of working hours						
	How predictable hours of work are						
	Amount of time spent working outside contracted working hours						
	Opportunities to take work breaks (e.g. coffee breaks, lunch)						
	Restaurant facilities (e.g. standard of food, opening hours during day)						
	Lack of separate restaurant facilities for hospital staff						
	Out of hours facilities for food						
	Support from colleagues when negotiating annual leave						
	Support from Directorate to cover annual leave						
	Impact of your work on home life (e.g. arriving home at a reasonable time)						

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Social climate & Interpersonal relations	Support from colleagues (within the specialty)						
	Support from colleagues (across [redacted])						
	Availability of advice from senior medical colleagues						
	Quality of peers' work						
	Quality of senior colleagues' work						
	Support from team when studying for examinations (e.g. membership)						
	Support from non-medical colleagues (e.g. nurses, midwives, physiotherapists) within specialty						
	Nursing staff morale and its effect on your work						
	Support from administrative staff within the specialty						
	Pleasantness of contact with patients in clinics						
	Pleasantness of contact with patients on wards						
	Pleasantness of contact with patients' relatives						
	Interactions with the Junior Doctors' Representative						
	Interactions with the BMA itself or the Trust BMA representative						

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **[4]** Very satisfactory
[NA] Not applicable (for example: Rota system following the integration of Medicine - *you are in O& G)*

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Organizational issues	Rate of change within the Trust						
	Management of moves from nearby hospitals (resulting in fewer available beds and more patients)						
	Impact of the moves on morale within [redacted]						
	Pressure on beds resulting in patients being placed in inappropriate wards (and "lost" or forgotten)						
	Cancellation of routine work to cope with acute referrals						
	Night time access to the hospital (e.g. time taken to gain access via security staff)						
	Lack of adequate funding to boost consultant numbers						
	Funding and resources for research projects						
	Opportunities to pursue a specialist interest						
	Participation in decisions which affect the job you do (e.g. decisions regarding rota organization or training)						
	Encouragement for sharing work problems and problem solving						
	Induction to Trust upon arrival						
	Induction to Specialty upon arrival						
	Communications with Directorate management						
	Actual support from Directorate management						
	Communications with Trust management						
	Actual support from Medical Staffing						
	Recognition of your efforts by the Directorate						
	Recognition of your efforts by the Trust						

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory
[4] Very satisfactory
[NA] Not applicable (for example: Rota system following the integration of Medicine - *you are in O& G)*

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Role at Work: Position in Organization	Responsibility for managing other junior staff						
	Balance of priorities demanded of you by the specialty (e.g. ward duties conflicting with A &E))						
	Demands from patients/colleagues/others						

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Work equipment and environment	Standard of Doctors' room/ area (e.g. provision of a desk)						
	Provision of basic emergency equipment during the night						
	IT support (computer networks for results, records etc.)						
	Standard of accommodation for doctors resident on-call						
	Upkeep and maintenance of on-call rooms						
	Comfort and noise of on-call rooms						

Are you able to take your full leave entitlement? [ ] YES [ ] NO

How many **days** have you been absent **on sick leave** from work in the last 12 months? .....days

How many different **spells** of **sickness absence** have you had over the last 12 months? .....spells

Have you ever had an episode of sickness absence when you were suffering from anxiety or depression, which you feel was directly related to your work? [ ] YES [ ] NO

Did you receive adequate support from work during this episode? [ ] YES [ ] NO

Is absence among your colleagues a problem for you? (due to sickness and/or study leave) [ ] YES [ ] NO

Please indicate (in the box provided) your level of satisfaction with your job at the present time:

[ ] Very dissatisfied
[ ] Dissatisfied
[ ] Neither satisfied/dissatisfied
[ ] Satisfied
[ ] Very satisfied

Please rate your commitment to medicine *now* compared with when you graduated:

[ ] Considerably less committed
[ ] Less committed
[ ] Unchanged
[ ] More committed
[ ] Considerably more committed

Please rate your commitment to the National Health Service *now* compared with when you graduated:

[ ] Considerably less committed
[ ] Less committed
[ ] Unchanged
[ ] More committed
[ ] Considerably more committed

Which of the following statements most accurately reflects your views? (please tick the most appropriate boxes)

[ ] I intend to practise as a doctor

[ ] I would return to [redacted] Hospital if the opportunity arose

On an average day, at what level of *capacity* do you perform? (on a scale of 0 - 100% ..... %

On an average day, at what level of *efficiency* do you perform? (on a scale of 0 - 100%) ..... %

Have you any suggestions (one or two) as to what might improve your efficiency?

.....

.....

How concerned are you about the threat of litigation? (Please tick the most appropriate box)

[ ] Very concerned
[ ] Moderately concerned
[ ] Ambivalent
[ ] Only slightly concerned
[ ] Not concerned at all

Has anyone in your specialty been the subject of a legal action? [ ] YES [ ] NO

Are you practising more "defensive medicine" than you used to? [ ] YES [ ] NO

Can you suggest any ways in which litigation might be avoided?

.....

.....

SECTION 2: KEY PERSONNEL

Please indicate (with a tick in the box provided) which sources of support you would consider using to discuss **personal work-related problems** (e.g. coping with the demands of job).

SOURCE OF HELP	USE (√)
Peer Colleagues	
More experienced junior staff (e.g. Senior Registrar)	
Educational Supervisor	
Postgraduate Clinical Tutor	
College Tutor	
Other Consultant	
Clinical Director	
Medical Director	
Chief Executive	
Human Resources	
Occupational Health	
BMA representative	
Hospital counsellor	
External bodies (e.g. BMA Stress Counselling Service for Doctors, Counselling Service for Sick Doctors)	
GP	
Minister of Religion	
Family	
Friends	
Other, please specify	

Comments: .....

SECTION 3: YOUR HEALTH: THE GENERAL WELL-BEING QUESTIONNAIRE

Please remember that your responses are anonymous and confidential. Individual answers will not be seen by any member of [redacted] or the BMA. If you really do not want to answer some of these questions, then leave them blank. However, the data would be useful for our analyses.

This section is to do with your general health. It is directly relevant to measuring the effects of work. Please read each of the questions carefully and decide how often, **over the last six months,** you have experienced the various symptoms that are listed. Please circle just **one** point on each response scale (from **All the time** to **Never**). We would like you to answer all the questions so that we can score the questionnaire fully.

Over the last six months, how often have you...	**All the time**	**Often**	**Some times**	**Rarely**	**Never**
1. Been bothered by your heart thumping?	4	3	2	1	0
2. Become easily bored?	4	3	2	1	0
3. Experienced loss of sexual interest or pleasure?	4	3	2	1	0
4. Become easily annoyed or irritated?	4	3	2	1	0
5. Had to clear your throat for no apparent reason?	4	3	2	1	0
6. Been scared when alone?	4	3	2	1	0
7. Got mixed up in your thinking when you have had to do things quickly?	4	3	2	1	0
8. Broken out in a rash when you have been upset or excited?	4	3	2	1	0
9. Shaken or trembled for no apparent reason?	4	3	2	1	0
10. Done things rashly or on impulse?	4	3	2	1	0
11. Thought people considered you a nervous person?	4	3	2	1	0
12. Been forgetful?	4	3	2	1	0
13. Found things getting on your nerves and wearing you out?	4	3	2	1	0
14. Become afraid of unfamiliar places or people?	4	3	2	1	0
15. Become easily tired?	4	3	2	1	0
16. Become flushed / hot in the face for no apparent reason?	4	3	2	1	0
17. Experienced numbness or tingling in your arms or legs?	4	3	2	1	0
18. Had difficulty in falling or staying asleep?	4	3	2	1	0
19. Been tense or jittery?	4	3	2	1	0
20. Found your feelings easily hurt?	4	3	2	1	0
21. Had any pains in the heart or chest?	4	3	2	1	0
22. Been troubled by stammering?	4	3	2	1	0
23. Found it hard to make up your mind?	4	3	2	1	0
24. Worn yourself out worrying about your health?	4	3	2	1	0

Are there particular, well defined work situations, which make you very anxious or agitated? If YES, please specify:

.....

.....

SECTION 4: HEALTH-RELATED BEHAVIOURS

Please remember that your responses are anonymous and confidential. Individual answers will not be seen by any member of [redacted] *or the BMA. If you really do not want to answer some of these questions, then leave them blank. However, the data would be useful for our analyses.*

1. Do you **smoke cigarettes**? [ ] Yes [ ] No

   If YES, how many cigarettes do you smoke a day? ..... per day

2. Do you **drink alcohol?** [ ] Yes [ ] No

   If YES, how many units do you consume in an average week? ..... per week
   (1 unit = half a bitter, 1 glass of wine or spirits).

3. Do you use any **drugs** other than alcohol as a coping strategy or for recreational purposes?
   [ ] Yes [ ] No

4. On average, how many hours of **quality sleep** do you get each night? ..... hours

5. Do you **exercise regularly** outside of work hours? [ ] Yes [ ] No

   If YES, how would you describe your exercise habits?
   (include continuous periods of activity of 20 minutes or more)

   Leisurely activity (walking, golf) ..... times a week

   Moderate aerobic activity (swimming, gentle cycling) ..... times a week

   Vigorous aerobic activity (jogging, squash, work-outs) ..... times a week

6. Generally are you physically active while doing your job? [ ] Yes [ ] No

7. Do you consider yourself to have a **healthy diet at *home***:
   (low fat, high fibre, plenty of fruit and vegetables)
   [ ] All the time
   [ ] Most of the time
   [ ] Some of the time
   [ ] Rarely
   [ ] Never

8. Do you consider yourself to have a **healthy diet at *work***:
   (low fat, high fibre, plenty of fruit and vegetables)
   [ ] All the time
   [ ] Most of the time
   [ ] Some of the time
   [ ] Rarely
   [ ] Never

SECTION 5 : MISCELLANEOUS

Overall, what do you consider to be the ***main* problem** you face at work?

Can you suggest any reasonable and practical ways of reducing the problems you face at work?

Thank you very much for your help.

Please post the questionnaire directly in the pre-paid reply envelopes to the Centre for Organizational Health & Development (at the University of Nottingham) ***within 7 days*** **.**

Appendix III

Survey Instrument for Trust B – senior doctors

Centre for Organizational Health & Development
Department of Psychology, University of Nottingham
Nottingham. NG7 2RD UK
A World Health Organization Collaborating Centre in Occupational Health

16 January 1997

Consultants & Associate Specialists (Integrated Medicine, Obstetrics & Gynaecology, Paediatrics)
[redacted] NHS Trust

Dear Colleague

GENERAL WORK ENVIRONMENT SURVEY
Further to the memo of 4 November 1996, we are now conducting the survey of medical staff across the Trust, which will conclude the assessment phase. The aim of the survey is to explore your views about the design and organization of your work, the problems you face, and whether you think that those problems affect your health. It is very important that we obtain information from those who *have* experienced problems as well as from those who *have not.* The more honest and accurate your replies to our questions, the more useful the information will be.

- **This is your opportunity to provide information relevant to your health and welfare, and an opportunity for the Trust and the BMA to listen and take action.**

The results of the audit and their implications will be brought forward for discussion with the Steering Group. Reasonable and practicable action will be taken by the Trust on the basis of the results. We will conduct an evaluation to establish whether interventions are in fact effective. A summary will be made available to all medical staff.

- **We are an independent team.**
- **Anything you write on this survey form will only be read by our team at the University of Nottingham.**
- **None of your questionnaires will be read by members of [redacted] or the BMA.**
- **Do not write your name on the form.**
- **The questionnaires are anonymous and we will take great care not to identify indirectly any individual in the Final Report.**

Please find the time to complete this questionnaire. We know you are very busy but we hope you will appreciate the importance of this project. Thank you for your help.

Professor Tom Cox
Dr Amanda Griffiths

Miss Margaret Macafee
Mr Eusebio Rial-Gonzalez

SECTION 1: YOU and YOUR JOB

1. Job title: .....

2. Specialty: .....

3. Gender: [ ] Male [ ] Female

4. Age *(to the nearest year)*: ..... years

5. Length of time working at [redacted]: .....

6. How many NHS sessions per week are you contracted for? ..... sessions

7. How many of those sessions are fixed? ..... fixed sessions

8. Total number of hours worked per week for [redacted]:

   -in an average week: ..... hrs

   -range: *minimum* number of hrs per week ..... hrs

   maximum number of hrs per week ..... hrs

9. Do you work at more than one hospital site? [ ] Yes [ ] No

   (if YES, please list them, e.g. [redacted])

   .....

   .....

10. Where do you spend the majority of your time?
    (please tick all that apply)

    [ ] Wards
    [ ] Theatre
    [ ] Accident & Emergency
    [ ] Intensive Care Unit
    [ ] High Dependency Unit
    [ ] Medical Assessment Unit
    [ ] Outpatients/Consulting Room
    [ ] Day Procedures Unit
    [ ] Special Care Baby Unit
    [ ] Delivery Floor
    [ ] Other, please specify

    .....

11. Do you have an agreed job plan with the Trust? [ ] Yes [ ] No

12. If YES, is it up-to-date? [ ] Yes [ ] No

13. If YES, do you work strictly to this job plan? [ ] Yes [ ] No

14. Do you have an up-to-date job description? [ ] Yes [ ] No

15. Do your management duties encroach significantly on your *personal* time? [ ] Yes [ ] No

16. If YES, please specify which particular duties:.....

.....

17. Do your management duties encroach significantly on your *teaching* time? [ ] Yes [ ] No

18. If YES, please specify which particular duties:.....

.....

19. Are you involved in teaching programmes for junior staff at [redacted]? [ ] Yes [ ] No

20. Are you an educational supervisor? [ ] Yes [ ] No

21. How many juniors do you supervise? .....

22. Do you undertake private practice? [ ] Yes [ ] No

The next section is about your views on your job. Please mark any items (in the NA column) which are not applicable or relevant to your work situation. For items which are applicable, please indicate how satisfactory or adequate that aspect of your work is by placing a tick in the appropriate column.

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **4]** Very satisfactory

[NA] Not applicable (for example: Time taken by domicilaries - *you do not undertake domicilaries*)

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Work design *(the nature of your work and the way you do it)*	Volume of work (overall workload)						
	Impact the reduction in junior doctors' hours has had on your workload						
	Control over workload (opportunity to plan your work)						
	Organization of emergency call rota						
	Amount of "bleeps" throughout the working day						
	Time to discuss diagnosis and treatment with patients (maintain quality of care)						
	Patients presenting complaints additional to those for which they were referred by GP						
	Continuity of care since introduction of new patterns of work for junior staff						
	Adequacy of hand-over procedure for junior staff (i.e. satisfactory completion of duties and clear transfer of responsibility)						
	Juniors' lack of expertise resulting in additional clinical tasks for seniors						
	Support from junior staff during Outpatient clinics						
	Arrangements for the completion of discharge summaries						
	How appropriate the tasks are (e.g. certain administrative tasks)						
	Volume of paperwork						
	Amount of time available for "hands-on" teaching of junior staff						
	Opportunities to establish rapport with junior staff and give informal feedback						
	Amount of time available for appraisal of junior staff (even if you are not an educational supervisor)						
	Quality of "protected" teaching sessions						
	Amount of time available for research projects						
	Focus of medical audit (on clinical / research vs. "practical" issues such as continuity of care)						
	Absence of a formal system of peer group performance appraisal						
	Delegation of responsibility for elderly patients (to a specialist physician or an MFE consultant)						
	Rota system following the integration of Medicine						
	Availability of debriefing sessions after distressing events						
	Support within specialty for dealing with death						
	Time taken by domicilaries						
	Equal opportunities for each consultant to become a clinical director						

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Time taken by domicilaries - *you do not undertake domicilaries*)

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Career, Job Status & Pay	Terms and conditions of employment contract						
	Possible national fixed term appointments for consultants						
	Job security						
	Career development (e.g. prospects for furthering management or clinical roles)						
	Opportunities to maintain and update your skills						
	Current organization of Continuing Medical Education (CME)						
	Philosophy behind CME						
	Opportunities to take study leave for CME						
	Support from colleagues when negotiating study leave						
	System of funding for study leave						

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
National Issues	Morale of fellow consultants						
	New "business" ethos within the NHS						
	Prospects for the development of your own specialty						
	The future availability of consultant posts						
	Future "Calman" consultants requiring formal senior supervision						
	New patient complaints procedure						
	The impact of the Patient's Charter on your work (e.g. waiting lists, waiting times)						
	Rising patient expectations						
	New GMC guidelines for dealing with a sick colleague						
	Support from fellow consultants when dealing with sick colleagues						
	National level of basic pay						
	How fair pay is compared with those in other professions (e.g. lawyers)						
	National shortage of qualified nurses in your specialty						

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Time taken by domicilaries - *you do not undertake domicilaries*)

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Work Organisation	Consultant staffing levels in your specialty						
	Junior medical staffing levels in your specialty						
	Nursing staff levels in your specialty						
	Patients upsetting schedule by arriving either too early or too late						
	Flexibility of working hours						
	How predictable hours of work are						
	Amount of time spent working outside salaried working hours						
	Opportunities to take work breaks (e.g. coffee breaks, lunch)						
	Restaurant facilities (e.g. standard of food, opening hours during day)						
	Lack of separate restaurant facilities for hospital staff						
	Out of hours facilities for food						
	Support from colleagues when negotiating annual leave						
	Impact of your work on home life						

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Social climate & Interpersonal relations	Support from fellow consultants (within the specialty)						
	Support from fellow consultants (across [redacted])						
	Quality of fellow consultants' work						
	Support from junior medical staff in team						
	Support from non-medical colleagues (e.g. nurses, midwives, physiotherapists) within specialty						
	Nursing staff morale and its effect on your work						
	Support from administrative staff within the specialty						
	Pleasantness of contact with patients in clinics						
	Pleasantness of contact with patients on wards						
	Pleasantness of contact with patients' relatives						
	Interactions with the BMA itself or the Trust BMA representative						

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Time taken by domicilaries - *you do not undertake domicilaries*)

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Organizational issues	Rate of change within the Trust						
	Decision to build "[redacted]"						
	Management of moves from nearby hospitals (resulting in fewer available beds and more patients)						
	Impact of the moves on morale within [redacted]						
	Pressure on beds resulting in patients being placed in inappropriate wards						
	Cancellation of routine work to cope with acute referrals						
	Lack of adequate funding to boost consultant numbers						
	Demands placed upon you / your specialty by purchasers						
	Resourcing within your specialty ("money following patients")						
	Opportunity to use income generated by your specialty to improve service (e.g. purchase equipment for your specialty)						
	Trust support for development of the service (e.g. towards sub-specialisation, Centres of Excellence)						
	Funding opportunities for [redacted] (as a non-teaching hospital) when compared to [redacted]						
	Funding and resources for research projects						
	Participation in decisions which affect the job you do (adequate consultant representation on management committees)						
	Encouragement for sharing work problems and problem solving						
	Induction programme for new consultants						
	Communications with Directorate management						
	Actual support from Directorate management						
	Communications with Trust management						
	Actual support from Trust management						
	Recognition of your efforts by the Directorate						
	Recognition of your efforts by the Trust						
	Trust system for deciding who receives discretionary points						
	Philosophy behind the national merit award system for services to the NHS						
	Current national system for deciding who receives a merit award						

KEY: **[0]** Very unsatisfactory **[1]** Unsatisfactory **[2]** Ambivalent **[3]** Satisfactory **[4]** Very satisfactory

[NA] Not applicable (for example: Time taken by domicilaries - *you do not undertake domicilaries*)

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Role at Work: Position in Organization	Conflicts between management and teaching commitments						
	Responsibility for managing team of junior staff						
	Balance of priorities demanded of you by the specialty (e.g. colleagues requiring managerial or clinical commitment from you)						
	Balance of priorities demanded of you by Trust (e.g. controlling waiting lists vs. exceeding budgets/contracts and having to stop operations						
	Demands from patients / colleagues / others						

WORK CHARACTERISTICS	PARTICULAR CONDITIONS	NA	[0] VU	[1] U	[2] A	[3] S	[4] VS
Work equipment and environment	Personal office where confidentiality is protected						
	IT support (computer networks for results, records etc.)						
	Difficulty in finding a parking space						
	Payment for use of parking facilities						

Are you able to take your full leave entitlement? [ ] YES [ ] NO

How many **days** have you been absent **on sick leave** from work in the last 12 months? .....days

How many different **spells** of **sickness absence** have you had over the last 12 months? .....spells

Have you ever had an episode of sickness absence when you were suffering from anxiety or depression, which you feel was directly related to your work? [ ] YES [ ] NO

If YES, did you receive adequate support from work during this episode? [ ] YES [ ] NO

Is absence among your colleagues a problem for you? (due to sickness and/or study leave) [ ] YES [ ] NO

Please indicate (in the box provided) your level of satisfaction with your job at the present time:

[ ] Very dissatisfied
[ ] Dissatisfied
[ ] Neither satisfied/dissatisfied
[ ] Satisfied
[ ] Very satisfied

Please rate your commitment to medicine *now* compared with when ten years ago:

[ ] Considerably less committed
[ ] Less committed
[ ] Unchanged
[ ] More committed
[ ] Considerably more committed

Please rate your commitment to the National Health Service *now* compared with ten years ago:

[ ] Considerably less committed
[ ] Less committed
[ ] Unchanged
[ ] More committed
[ ] Considerably more committed

Which of the following statements most accurately reflect(s) your views? (*please tick the most appropriate boxes)*

[ ] I am committed to remaining at [redacted] NHS Trust

[ ] I am likely to seek employment in a different hospital during my lifetime as a consultant / associate specialist

[ ] I intend to take early retirement

On an average day, at what level of *capacity* do you perform? (on a scale of 0 - 100%)

..... %

On an average day, at what level of *efficiency* do you perform? (on a scale of 0 - 100%)

..... %

Have you any suggestions (one or two) as to what might improve your efficiency?

.....

How concerned are you about the threat of litigation? (*Please tick the most appropriate box*)

[ ] Very concerned
[ ] Moderately concerned
[ ] Ambivalent
[ ] Only slightly concerned
[ ] Not concerned at all

Has anyone in your specialty been the subject of a legal action? [ ] YES [ ] NO

Are you practising more "defensive medicine" than you used to? [ ] YES [ ] NO

Can you suggest any ways in which litigation might be avoided?

.....

.....

SECTION 2: KEY PERSONNEL

Please indicate (with a tick in the box provided) which sources of support you would consider using to discuss **personal work-related problems** (e.g. coping with the demands of job).

SOURCE OF HELP	USE (√)
Peer Colleagues	
Retired Colleagues	
Clinical Director	
Medical Director	
Chief Executive	
Human Resources	
Occupational Health	
BMA representative	
Hospital counsellor	
External bodies (e.g. BMA Stress Counselling Service for Doctors, Counselling Service for Sick Doctors)	
GP	
Minister of Religion	
Family	
Friends	
Other, please specify	

Comments: .....

.....

.....

SECTION 3: YOUR HEALTH: THE GENERAL WELL-BEING QUESTIONNAIRE

Please remember that your responses are anonymous and confidential. Individual answers will not be seen by any member of [redacted] or the BMA. If you really do not want to answer some of these questions, then leave them blank. However, the data would be useful for our analyses.

This section is to do with your general health. It is directly relevant to measuring the effects of work. Please read each of the questions carefully and decide how often, **over the last six months,** you have experienced the various symptoms that are listed. Please circle just **one** point on each response scale (from **All the time** to **Never**). We would like you to answer all the questions so that we can score the questionnaire fully.

Over the last six months, how often have you...	**All the time**	**Often**	**Some times**	**Rarely**	**Never**
1. Been bothered by your heart thumping?	4	3	2	1	0
2. Become easily bored?	4	3	2	1	0
3. Experienced loss of sexual interest or pleasure?	4	3	2	1	0
4. Become easily annoyed or irritated?	4	3	2	1	0
5. Had to clear your throat for no apparent reason?	4	3	2	1	0
6. Been scared when alone?	4	3	2	1	0
7. Got mixed up in your thinking when you have had to do things quickly?	4	3	2	1	0
8. Broken out in a rash when you have been upset or excited?	4	3	2	1	0
9. Shaken or trembled for no apparent reason?	4	3	2	1	0
10. Done things rashly or on impulse?	4	3	2	1	0
11. Thought people considered you a nervous person?	4	3	2	1	0
12. Been forgetful?	4	3	2	1	0
13. Found things getting on your nerves and wearing you out?	4	3	2	1	0
14. Become afraid of unfamiliar places or people?	4	3	2	1	0
15. Become easily tired?	4	3	2	1	0
16. Become flushed / hot in the face for no apparent reason?	4	3	2	1	0
17. Experienced numbness or tingling in your arms or legs?	4	3	2	1	0
18. Had difficulty in falling or staying asleep?	4	3	2	1	0
19. Been tense or jittery?	4	3	2	1	0
20. Found your feelings easily hurt?	4	3	2	1	0
21. Had any pains in the heart or chest?	4	3	2	1	0
22. Been troubled by stammering?	4	3	2	1	0
23. Found it hard to make up your mind?	4	3	2	1	0
24. Worn yourself out worrying about your health?	4	3	2	1	0

Are there particular, well defined work situations, which make you very anxious or agitated? If YES, please specify:

.....

.....

SECTION 4: HEALTH-RELATED BEHAVIOURS

Please remember that your responses are anonymous and confidential. Individual answers will not be seen by any member of [redacted] *or the BMA. If you really do not want to answer some of these questions, then leave them blank. However, the data would be useful for our analyses.*

1. Do you **smoke cigarettes**? [ ] Yes [ ] No

   If YES, how many cigarettes do you smoke a day? ..... per day

2. Do you **drink alcohol?** [ ] Yes [ ] No

   If YES, how many units do you consume in an average week? ..... per week
   (1 unit = half a bitter, 1 glass of wine or spirits).

3. Do you use any **drugs** other than alcohol as a coping strategy or for recreational purposes?
   [ ] Yes [ ] No

4. On average, how many hours of **quality sleep** do you get each night? ..... hours

5. Do you **exercise regularly** outside of work hours? [ ] Yes [ ] No

   If YES, how would you describe your exercise habits?
   (include continuous periods of activity of 20 minutes or more)

   Leisurely activity (walking, golf) ..... times a week

   Moderate aerobic activity (swimming, gentle cycling) ..... times a week

   Vigorous aerobic activity (jogging, squash, work-outs) ..... times a week

6. Generally are you physically active while doing your job? [ ] Yes [ ] No

7. Do you consider yourself to have a **healthy diet at *home***:
   (low fat, high fibre, plenty of fruit and vegetables)
   [ ] All the time
   [ ] Most of the time
   [ ] Some of the time
   [ ] Rarely
   [ ] Never

8. Do you consider yourself to have a **healthy diet at *work***:
   (low fat, high fibre, plenty of fruit and vegetables)
   [ ] All the time
   [ ] Most of the time
   [ ] Some of the time
   [ ] Rarely
   [ ] Never

SECTION 5 : MISCELLANEOUS

Overall, what do you consider to be the ***main* problem** you face at work?

Can you suggest any reasonable and practical ways of reducing the problems you face at work?

Thank you very much for your help.

Please post the questionnaire directly in the pre-paid reply envelopes to the Centre for Organizational Health & Development (at the University of Nottingham) ***within 7 days*** **.**

Appendix IV

'Medical analogy' slide used at Steering Group meetings

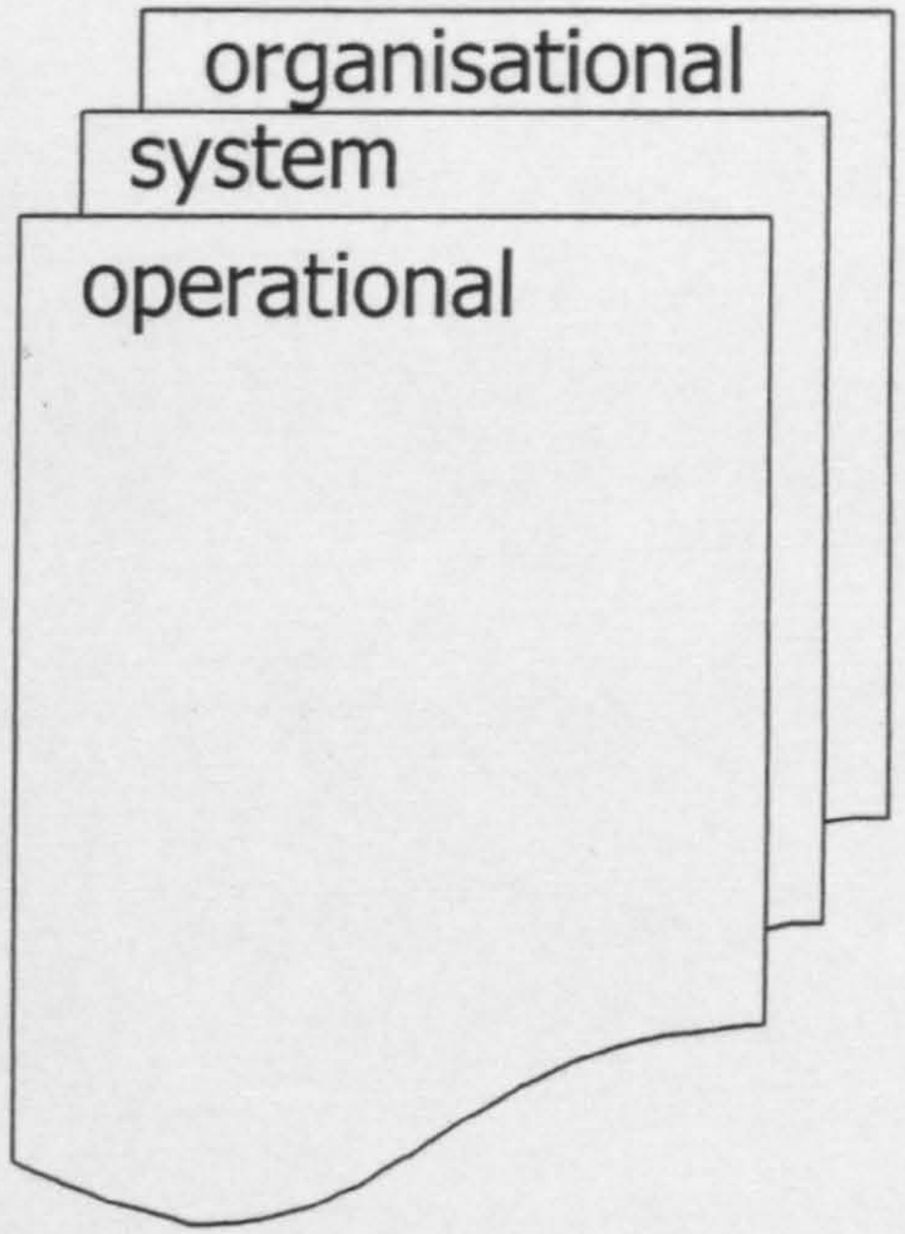
The medical analogy

symptoms

- Food availability
- Rota system
- Workload
- Interpersonal problems
- Career progression
- Recognition of efforts
- Lack of equipment
- .....
- .....

Facilitated Steering Group discussions

Diagnosis & design of interventions



Addressing as many *symptoms* as possible with only a few interventions