



EUROPE

THE ARTS
CHILD POLICY
CIVIL JUSTICE
EDUCATION
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INTERNATIONAL AFFAIRS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
SUBSTANCE ABUSE
TERRORISM AND
HOMELAND SECURITY
TRANSPORTATION AND
INFRASTRUCTURE
WORKFORCE AND WORKPLACE

This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

[Jump down to document](#) ▼

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

[Browse Books & Publications](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore [RAND Europe](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

This product is part of the RAND Corporation technical report series. Reports may include research findings on a specific topic that is limited in scope; present discussions of the methodology employed in research; provide literature reviews, survey instruments, modeling exercises, guidelines for practitioners and research professionals, and supporting documentation; or deliver preliminary findings. All RAND reports undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

Health and wellbeing at work in the United Kingdom

Emmanuel Hassan, Christopher Austin, Claire Celia,
Emma Disley, Priscillia Hunt, Sonja Marjanovic,
Ala'a Shehabi, Lidia Villalba van Dijk,
Christian van Stolk

Prepared for the English Department of Health

The research described in this report was prepared for the English Department of Health. The opinions expressed in this study are those of the authors and do not necessarily reflect the views of the English Department of Health.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2009 The Work Foundation

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from The Work Foundation.

Published 2009 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665
Westbrook Centre, Milton Road, Cambridge CB4 1YG, United Kingdom
RAND URL: <http://www.rand.org>
RAND Europe URL: <http://www.rand.org/randeurope>
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

Preface

Dame Carol Black's Review – *Working for a Healthier Tomorrow* – recently recognised that there is strong and growing evidence that work, health and wellbeing are closely and powerfully linked and need to be addressed together.

The NHS, as Europe's largest employer, is committed to ensuring the best health and wellbeing for its staff. With over 450 different organisations employing staff in the NHS, there is a general recognition that while there are some organisations that support staff with excellent health and wellbeing initiatives there is also inconsistency across the NHS.

An independent NHS health and wellbeing review was announced by Secretary of State Alan Johnson MP on 25 November 2008 as part of the government's response to Dame Carol Black's report on the health of the UK's working age population. In January 2009, Dr Steve Boorman agreed to lead the review.

Against this background, The Work Foundation led a partnership with RAND Europe and Aston Business School undertaking the research and analysis to support the review. RAND Europe led the literature review on health and wellbeing in the UK.

The literature review is intended to provide evidence on whether health workplace interventions could be useful to mitigate health risk factors, and to reduce the costs associated with poor health and wellbeing in British workplaces and the NHS. In order to achieve this, the study: (1) examines the extent of poor health and wellbeing in British workplaces and the NHS; (2) reviews the scholarly literature on the effectiveness of health workplace interventions in terms of health and work-related outcomes; and (3) identifies some lessons that can be learnt from a small group of 'good practice' comparators identified by Dr Steve Boorman.

The main findings of this study are as follows:

- Health and wellbeing remain key issues in British workplaces and the NHS.
- Poor health and wellbeing at work lead to significant individual, organisational, economic and societal consequences due to sickness absence.
- Health and wellbeing in the workplace seems a particular challenge to the NHS in England.
- The cost of presenteeism should also not be under-estimated.
- Workplace health interventions can be effective to address poor health and wellbeing.

RAND Europe is an independent not-for-profit policy research organisation that aims to serve the public interest by improving policy-making and informing public debate. Its clients are European governments, institutions and firms with a need for rigorous, impartial, multidisciplinary analysis.

The Work Foundation is the leading independent authority on work and its future. It aims to improve the quality of working life and the effectiveness of organisations by equipping leaders, policymakers and opinion-formers with evidence, advice, new thinking and networks.

Aston is one of Europe's top business schools. Aston has an excellent reputation for innovative, ground breaking research.

For more information about this document, please contact:

Dr Christian van Stolk
or Dr Emmanuel Hassan
RAND Europe
Westbrook Centre
Milton Road
Cambridge CB4 1YG
Tel: +44 1223 353 329
Fax: +44 1223 358 845
Email: stolk@rand.org
Email: ehassan@rand.org

Dr Michelle Mahdon
The Work Foundation
21 Palmer Street
London SW1H 0AD
Tel: +44 1223 353 329
Fax: +44 207 976 3600
MMahdon@theworkfoundation.com

Acknowledgments

We are grateful for the support provided by Centrica, Royal Mail Group, BT and NHS Scotland. Without this support, this review would have been more limited in its findings. We are especially grateful for the help given by Dr Su Wang at Royal Mail Group. We also want to acknowledge the help from colleagues of the Work Foundation and the wider Boorman Review team in producing this document.

Table of contents

Preface	i
Acknowledgments	iii
Table of contents	v
Figures	vii
Tables	ix
Boxes	xi
Executive summary	xiii
CHAPTER 1 Introduction	1
1.1 The challenge of health and wellbeing at work.....	1
1.2 Objective of this study.....	2
1.3 Structure of the report.....	3
CHAPTER 2 Health, wellbeing and work	5
2.1 Introduction.....	5
2.2 Understanding health and wellbeing at work.....	5
2.3 Measuring health and wellbeing at work.....	18
2.4 Conclusion.....	28
CHAPTER 3 Effectiveness of workplace interventions	31
3.1 Introduction.....	31
3.2 Disease-specific interventions	31
3.3 Worksite health promotion	38
3.4 Conclusion.....	46
CHAPTER 4 Identifying good practice	49
4.1 Introduction.....	49
4.2 Case study overview.....	49
4.3 Conclusion.....	56

REFERENCES.....	59
Reference list.....	61

Figures

Figure 2-1: A model of employee wellbeing and its determinants	8
Figure 2-2: A conceptual framework of health and wellbeing at work.....	9
Figure 2-3: Estimated working days lost due to self-reported work-related illnesses in Great Britain, full-time equivalent	14
Figure 2-4: Estimated working days lost due to self-reported work-related injuries in Great Britain, full-time equivalent	15
Figure 2-5: Time off due to work-related illness for NHS workers and other workers in England, 2007-08.....	17
Figure 2-6: Time off due to work-related illness for NHS workers and other workers in England, 2004-08.....	17
Figure 2-7: Number of fatal injuries to workers in Great Britain, 2000/01–2007/08.....	19
Figure 2-8: Estimated annual incidence rates of reportable non-fatal injuries in Great Britain, 1999/00–2007/08	19
Figure 2-9: Estimated incidence of reportable non-fatal injuries to workers in Great Britain, by accident kind, 2007/08.....	20
Figure 2-10: Number of work-related fatal diseases in Great Britain, 1996–2006.....	20
Figure 2-11: Estimated incidence of self-reported illnesses caused or made worse by work in Great Britain, 1999/00–2007/08	21
Figure 2-12: Estimated incidence of self-reported illnesses caused or made worse by work in Great Britain, by illness kind, 2007/08	21
Figure 2-13: Distribution of work-related illnesses reported by NHS workers and other workers in England, 2007/08.....	22

Tables

Table 2-1: Effective OHS management systems	11
Table 2-2: The costs of workplace accidents and work-related ill-health in Great Britain, in £ billion, 2001/02	13
Table 2-3: Average working days lost per staff and total days lost in the civil service, FY 2006/07	16
Table 2-4: Specifications of the logistic regression analysis	23
Table 2-5: Odds of reporting a work-related illness or accident	24
Table 2-6: Change in odds of reporting a work-related illness	25
Table 2-7: Change in odds of reporting a work-related accident.....	27
Table 3-1: Summary of evidence on health and wellbeing interventions.....	48
Table 4-1: Some key components of occupational health strategy in case studies.....	54

Boxes

Box 2-1: Are NHS workers on sick leave more often than other workers?.....	16
Box 2-2: Are NHS workers more stressed than other workers?	22
Box 3-1: MSDs return-to-work programme at Centrica.....	34
Box 3-2: Changes in work environment and conditions.....	35
Box 3-3: Stress management and assistance at BT	36
Box 3-4: Reintegration into BT after mental-health-related sickness absence.....	38
Box 3-5: Alcohol and smoking cessation interventions at NHS Scotland.....	39
Box 3-6: Diet interventions at NHS Scotland	41
Box 3-7: Specific health promotion interventions at Royal Mail Group	42
Box 3-8: Is it worthwhile investing in workplace interventions?.....	46
Box 4-1: Effectiveness of health and wellbeing policies in Royal Mail Group	55
Box 4-2: Problems in evaluating effectiveness of health interventions in NHS Scotland.....	56

Executive summary

The Work Foundation led a partnership with RAND Europe and Aston Business School undertaking the research and analysis to support the Boorman review. RAND Europe led the study on whether health workplace interventions could be useful to mitigate health risk factors and to reduce the work-related costs associated with poor health and wellbeing in British workplaces and the NHS in England. This section highlights some of the main findings of the research.

Health and wellbeing remain key issues in British workplaces

Despite the downward trends in fatal and non-fatal injuries in Great Britain over past decades, evidence shows that health and wellbeing at work remain key issues. For instance, work-related illness due to stress, anxiety and depression are on the rise. In Great Britain, during 2007/08 an estimated 2.1 million people suffered from an illness that they believed was caused or made worse by their current or past work; 229 workers suffered fatal injuries at work; and 299,000 self-reported injuries occurred. Finally, 34 million working days were lost overall (1.4 days per worker), 28 million due to work-related ill-health and 6 million due to workplace injury.

Poor health and wellbeing at work lead to significant individual, organisational, economic and societal consequences due to sickness absence

Poor health and wellbeing issues at work can be damaging to both individuals and their immediate family, and eventually to the community and society they live in. The Health and Safety Executive estimates the costs to individuals of workplace accidents and work-related ill-health to be between £10.1 and £14.7 billion in Great Britain. These costs include loss of income, extra expenditure of dealing with injury or ill-health, and subjective costs of pain, grief and suffering.

The consequences of poor health and wellbeing at work are costly to employers. There is a lot of information on absenteeism, both in terms of the number of days lost and their associated cost to employers themselves. The Health and Safety Executive estimates the costs to employers of workplace accidents and work-related ill-health to be between £3.9 and £7.8 billion in Great Britain. These costs include sick pay, administrative costs, damage from injuries and non-injuries, recruitment costs, and compensation and insurance costs. There are estimates that work-related illness was responsible for 27.6 million working days lost in 2007/08 in Great Britain, representing 1.15 days lost on average per worker. Besides this, there are estimates that work-related injuries were responsible for 6.2 million days lost during the same year, representing 0.22 days lost on average by each worker.

In the financial year 2006/07 an average of 9.3 working days were lost per staff year to sickness absence across the whole civil service in the United Kingdom. There are nevertheless important differences across departments in term of sickness absence, ranging from 3.3 to 12.4 average working days lost per staff member.

In addition to the individual and organisational consequences of health and wellbeing issues at work, there are non-negligible consequences for society as a whole. The Health and Safety Executive estimates the costs to society of workplace accidents and work-related ill-health to be between £20.0 and £31.8 billion in Great Britain. These costs comprise loss of output, medical costs, costs to the Department for Work and Pensions of administering benefit payments, and Health and Safety Executive and local authority investigation costs.

Workplace health and wellbeing seems a particular challenge to the NHS in England

The proportion of workers reporting an illness or an injury varies across sectors, jobs and organisations. Although its results should be interpreted with caution, our logistic regression analysis has shown that working in human health activities (hospital, medical practice, dental practice and other human health activities) or in the NHS, as opposed to other activities and organisations, increases the odds of reporting a work-related illness or an injury. Moreover, NHS workers report more work-related illnesses due to stress, anxiety and depression than other workers in England.

The NHS in England shows a comparatively high average of working days lost per staff per year, i.e. 10.7 compared to the average of 9.3 in the public sector. Moreover, NHS workers seem to stay on sick leave longer than other workers.

The cost of presenteeism should also not be underestimated

There is less information available on the cost of presenteeism because it is more difficult to calculate than the cost of lost days. In addition, the cost of presenteeism is an indirect cost to employers that has remained largely invisible to them until recently. However there are estimates that presenteeism due to poor mental health leads to a loss of working time nearly 1.5 times that caused by sickness absence due to mental ill-health in the United Kingdom.

Workplace health interventions can be effective to address poor health and wellbeing

Workplace health interventions can mitigate health risk factors and reduce the work-related costs associated with poor health and wellbeing in British workplaces and the NHS. The concept of health and wellbeing at work goes beyond the mere absence of illness or disability. It should be understood as a “state of complete physical, mental and social wellbeing” (World Health Organization, 1948).

Various antecedent factors are related to the health and wellbeing of workers: work-related, lifestyle and socio-economic factors. Workplace health interventions aiming at improving health and wellbeing at work should therefore not focus only on work-related factors.

Evidence from the literature and the selected case studies show that many workplace health interventions targeting problems due to work-related antecedent factors such as low back pain, musculoskeletal disorders and mental health disorders can have positive health outcomes. The literature also suggests that interventions aimed at improving damaging lifestyle behaviours such as poor diet, smoking, alcohol abuse and lack of physical activity can be effective in terms of health outcomes. Nevertheless, few studies directly relate

workplace interventions to work-related outcomes, and the economic effectiveness of interventions varies greatly across sectors.

1.1 **The challenge of health and wellbeing at work**

Over the past three decades, growing public concern over the rise of unemployment in many industrialised countries has overshadowed the debate on the “quality” of jobs.¹ Increasing the quantity of jobs was seen as the main priority. It appears that in some cases little thought was given to the potential impact of policies devised to increase job numbers on the ability of such jobs to safeguard employees’ health and wellbeing.² In addition, it could be said that the transition of modern economies towards a post-Fordist productivity model characterised by automation and the rapid rise of services were perceived by many as the end of “tough jobs” (physical jobs that presented many health hazards and risks) (Askenazy, 2004). Statistics on work-related illnesses and injuries corroborate these perceptions. Between 1974 and 2008, the number of fatal injuries to employees fell by 75 percent in Great Britain. During the same period, the number of reported non-fatal injuries fell by 70 percent.³

Although downward trends in fatal and non-fatal injuries at work in many industrialised countries reinforce these perceptions that “tough jobs” are declining, job quality has increasingly gained the attention of policymakers and workers over recent years. This increasing interest in job quality can be explained by several factors such as increased job insecurity, worsening of working conditions, and reduced possibilities of combining work with other private and social responsibilities (European Commission, 2008). From 1990 to 2008, the rate of self-reported work-related illness – particularly due to stress and related conditions – doubled. It jumped from 820 per 100,000 employed in 1990 to 1,620 in 2008.⁴ Besides, several dimensions of job quality such as health and wellbeing at work have

¹ By “quality” of jobs, we mean the ability of jobs to uphold workers’ health and wellbeing.

² For example, Askenazy (2004) suggests that the reduction in length of the working week to 35 hours in France – which was aimed at the creation of some 300,000 jobs – also led to a worsening of working conditions according to many workers, as well as numerous changes to French labour laws including a shortening of the legal time employers have to give to their workers for changing shift hours.

³ Health and Safety Executive, 2008.

⁴ Prevalence per 100,000 employed in the last 12 months. Estimates of self-reported work-related illness are based on results from the Labour Force Survey and are available on the Health and Safety Executive website. They have been adjusted so that the coverage is approximately consistent (e.g. limited to people who worked in the last 12 months in England and Wales only), and even then are still affected by factors such as differences in survey design and level of information collected.

gained attention recently given the profound impacts which they have on individuals, organisations and societies.

This report focuses on a specific dimension of job quality: health and wellbeing at work. Health and wellbeing at work have become frequent topics in the media as well as in practitioner-oriented and scholarly research journals (Danna and Griffin, 1999). In addition, as mentioned previously, this particular dimension of job quality has gained the attention of many policymakers given the sizeable negative socio-economic consequences of low levels of health and wellbeing at work.⁵ Similarly, Dame Carol Black's Review – *Working for a Healthier Tomorrow* – recently recognised that there is strong and growing evidence that work, and health and wellbeing, are closely and powerfully linked and need to be addressed together.

Health and wellbeing at work is indeed a key concern in many industrialised countries. In Great Britain, during 2007/08 an estimated 2.1 million people suffered from an illness that they believed was caused or made worse by their current or past work; 229 workers suffered fatal injuries at work; and 299, 000 self-reported injuries occurred in this period. Finally, 34 million working days were lost overall (1.4 days per worker): 28 million due to work-related ill-health and 6 million due to workplace injury.⁶

1.2 Objective of this study

The promotion and improvement of the health and wellbeing of NHS staff has been a long-term objective for the Department of Health and the NHS employing organisations. It is widely understood that the health and wellbeing of the workforce makes a major contribution to the delivery of high quality healthcare.

The NHS, as Europe's largest employer, is indeed committed to ensuring the best health and wellbeing for its staff. With over 450 different organisations employing staff in the NHS, there is a general recognition that while there are some organisations that support staff with excellent health and wellbeing initiatives there is also inconsistency across the NHS.

An independent NHS health and wellbeing review was announced by Secretary of State Alan Johnson MP on 25 November 2008 as part of the Government's response to Dame Carol Black's report on the health of the UK's working age population. In January 2009, Dr Steve Boorman agreed to lead the review.

Against this background, the study is intended to provide evidence on whether health workplace interventions could be useful to mitigate health risk factors and to reduce the costs associated with poor health and wellbeing in British workplaces and the NHS. More specifically, the study aims to:

⁵ See, for instance, the Secretaries of State for the Department for Work and Pensions and the Department of Health (2008); European Commission, *Improving Quality and Productivity at Work: Community Strategy 2007–2012 on Health and Safety at Work*, Communication from the Commission to the Council and the European Parliament, 2007.

⁶ Health and Safety Executive, based on the Labour Force Survey.

- examine the extent of poor health and wellbeing in British workplaces and the NHS
- review the scholarly literature on the effectiveness of health workplace interventions in terms of health and work-related outcomes
- identify some lessons that can be learnt from a small group of “good practice” comparators identified by Dr Steve Boorman.

1.3 **Structure of the report**

The report has three chapters. The first chapter discusses the definitions of health and wellbeing at work in use and analyses the extent of poor health and wellbeing in British workplaces and the NHS. The second chapter reviews the scholarly literature on the effectiveness of workplace health interventions. The final chapter presents the “good practice” identified in organisations selected by Dr Steve Boorman.

2.1 **Introduction**

In this chapter we introduce the concept of health and wellbeing at work, before assessing the extent of poor health and wellbeing in British workplaces and the NHS using publicly available statistics on work-related injuries and illness.

This chapter is structured as follows. First, we present a conceptual framework that helps us to understand the major elements of health and wellbeing in the workplace as a system.

We provide a brief overview of the literature that defines health and wellbeing at work. We then look at the antecedents (causal factors) that impact on health and wellbeing at work before looking at the consequences that health and wellbeing issues can have on individuals, the organisation they work for and society as a whole. Finally, we present statistics on work-related injuries and illness in workplaces in Great Britain to illustrate the extent of the problem caused by occupational health and wellbeing issues, and how health services compare to other sectors.

2.2 **Understanding health and wellbeing at work**

In this section, we present a conceptual framework that helps us understand the main elements of health and wellbeing in the workplace and their interrelationships. We first define health and wellbeing at work, the core elements of the framework. We then give an overview of the main antecedent factors related to health and wellbeing at work: work-related and lifestyle factors. After that, we examine the role of occupational health delivery services and health and safety management systems in the workplace. Finally, we discuss the consequences of poor health and wellbeing at work.

2.2.1 **Definitions of health and wellbeing at work**

Despite the recent increased interest in health and wellbeing at work, the scholarly literature on this topic is not consistent. Furthermore, there is little consensus among academics on the definitions of health and wellbeing at work (Danna and Griffin, 1999).

It is, however, possible to identify three broad approaches to health and wellbeing in the scholarly literature (Danna and Griffin, 1999). The first two approaches focus on the health and wellbeing of individual workers per se. The first of these approaches addresses health and wellbeing at work from a physical perspective, considering the physical health of workers such as their physical illnesses and diseases. However it is insufficient to address health and wellbeing at work from a uniquely physical perspective since work has also been

shown to impact on social and mental health. The second approach considers health and wellbeing at work from a mental, psychological and emotional perspective, looking at “emotional states and epidemiological rates of mental illnesses and diseases” (Danna and Griffin, 1999). Finally, a third approach addresses health and wellbeing through their potential societal consequences as is prevalent in cases where drug abuse and alcoholism are present.

Although these three approaches contribute to the understanding of health and wellbeing at work, it is inadequate to consider them separately since they are interrelated (Gollac and Volkoff, 2007). For instance, stress at work can affect the mental health of workers through depression, but it can also affect their physical health because it may for instance reduce their vigilance and lead to injuries. Even though health and wellbeing at work are examined through these interrelations, the definitions of “health” and “wellbeing” remain problematic in the literature. Each term should nevertheless be defined in its own right to facilitate the understanding of the issues they individually raise in the workplace.

Health at work

Emmet (1991) and Gollac and Volkoff (2007) find that health is not solely synonymous with the absence of illness or disability, although they recognise that both illness and disability damage health. The World Health Organization, for example, defines health as a broader encompassing concept, a “state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity” (World Health Organization, 1948). This broader definition of the concept of health from the World Health Organization is especially important in the work context as stress, tiredness and pain can have important negative effects on workers, organisations and society as a whole (Gollac and Volkoff, 2007). These “health problems” often need workplace interventions, although they do not necessarily lead to diagnosis of diseases and injuries or reveal pathological signs.

In an attempt to clarify the terminology used in the academic literature, Danna and Griffin (1999) suggest that the term “health” should “encompass both physiological and psychological symptomology within a more medical context”. Although this definition of health is more restrictive than that of the World Health Organization, it allows these authors to distinguish between wellbeing and intrinsic health. However, this definition does not provide information on the meaning of health in the work context.

Health at work cannot be understood only in terms of work-related antecedents. The relationships between health and work are not uni-factorial: the deterioration of workers’ health may be caused by work and non-work-related factors. Indeed, illnesses, diseases or injuries contracted outside work may have an impact not only on the individual but also on his or her working life by impeding their productivity or physical ability to carry out the job, for instance. An example of this would be sleep disorders that can be caused by combining shift work and family life (e.g. having young children) and can impact on both the individual’s private life and their working life.

In addition it is often difficult to establish a direct association between a given exposure related to the work environment and its impact on health, except in the cases of injuries or accidents where this association tends to be direct and instantaneous. However, more often than not, exposure to a work-related hazard exerts its impact only over several years, as for example asbestos-induced lung disease such as asbestosis or mesothelioma. A key issue for

employers and individuals alike is therefore to discover whether these pathologies have work-related antecedents or not. This issue will have far-reaching implications for compensation and insurance claims, as well as for policies, regulations and laws aimed at safeguarding workers' health in the workplace and establishing employers' duties in this respect.

Wellbeing at work

The concept of wellbeing has been subjected to various definitions in the academic literature. Warr (1999), in his seminal review of the literature, distinguishes between job-specific wellbeing – that is, people's feelings about themselves in their job – and more general feelings about one's life, namely context-free wellbeing. While wellbeing is often perceived through a single axis (i.e. feeling good or bad), Warr suggests that job-specific and context-free wellbeing may be viewed in terms of three axes: displeasure-to-pleasure, anxiety-to-comfort and depression-to-enthusiasm (Daniels and Guppy, 1994; Lucas, Diener and Suh, 1996) (Figure 2-1).

Danna and Griffin (1999) propose a similar definition of wellbeing where it is understood as a broader concept than health. This concept includes context-free measures of life experiences such as life satisfaction and happiness as well as work-related experiences such as job satisfaction.

Key job features such as physical security, valued social position and opportunity for skill use will all impact on a worker's level of wellbeing at work. However, job-specific wellbeing is not only influenced by these key job-features. Individual factors such as affective dispositions, socio-economic demographic factors (e.g. age and gender) and the level of context-free wellbeing play a role in determining people's wellbeing levels in the workplace (Warr, 1999) (Figure 2-1).

2.2.2 Antecedent factors related to health and wellbeing at work

The scholarly literature has identified several antecedent factors influencing the levels of health and wellbeing at work, encompassing work and non-work-related antecedent factors. In an attempt to synthesise the results of the literature review, we classify these antecedent factors into two broad groups: work-related and lifestyle antecedent factors (Figure 2-2). However, particular symptoms can be explained by several antecedent factors. For instance, family problems can have a negative impact on relationships at work, which in turn can affect workers' mental health. In other words, the two broad groups of antecedent factors are interrelated.

Work-related factors

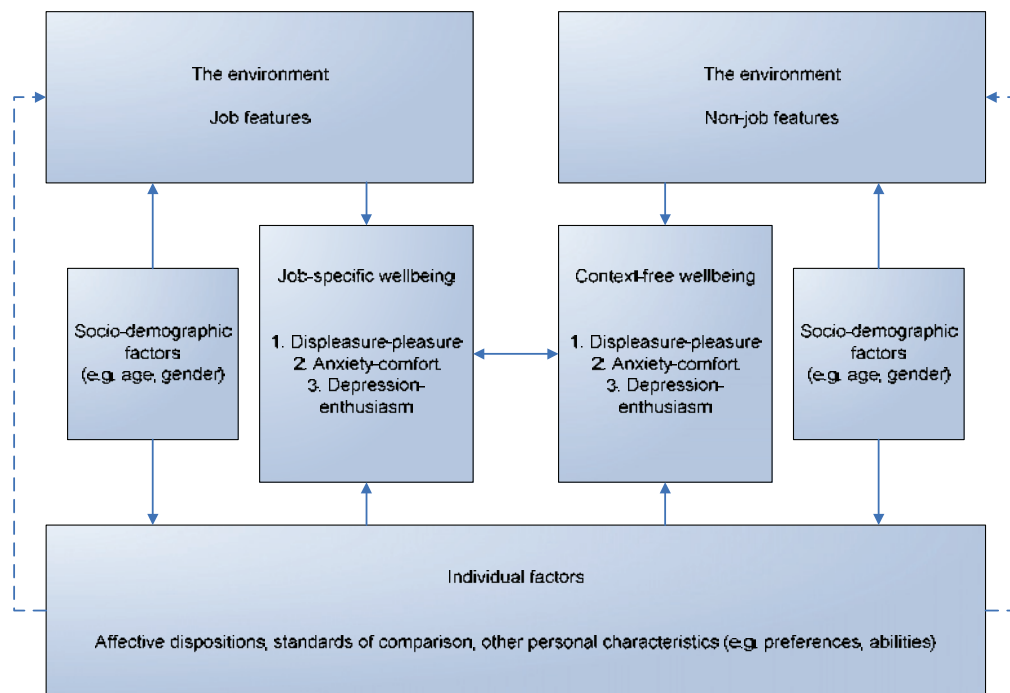
Many working conditions⁷ make the workplace hazardous to workers' health and wellbeing. These working conditions (e.g. lighting, temperature, noise factors, chemicals, working time, management practices) expose workers to different types of work-related health hazards: physical, chemical, biological and psychological (Gollac and Wolkoff, 2007). The exposure to these different work-related health hazards varies across occupations and industries.

⁷ By working conditions, we mean all the conditions under which employees have to work.

These working conditions can engender various physical and mental health illnesses. They can also provoke work-related injuries. Although these illnesses and injuries do not often cause long-term sickness absence, they nevertheless have sizeable consequences not only for individuals but also for organisations and society.

Moreover, work-related factors can induce serious illnesses and injuries and even lead to tragic outcomes. For instance, job insecurity can create chronic stress for workers, with symptoms including an elevated level of distress, depression and anxiety (Murphy, 2008). These symptoms increase with the length of exposure. A review of workplace closure studies found that nearly all of them reported both physical and psychological adverse effects on workers during both anticipation of redundancy and actual termination phases (Ferrie, 1999). Inappropriate work settings can also lead to chronic musculoskeletal disorders (MSDs) and subsequently to long-term sick leave (Briand et al., 2008; Bültman et al., 2009). Furthermore, thousands of workers are affected by work-related chronic diseases due to exposure to dangerous biological and chemical health hazards (Health and Safety Executive, 2008). These diseases include chronic obstructive pulmonary diseases, including bronchitis and emphysema, which occur due to occupational exposures to fumes, chemicals and dusts. They also include asbestosis and other types of pneumoconiosis, mainly due to exposure to asbestos, coal dust, and silica.

Figure 2-1: A model of employee wellbeing and its determinants



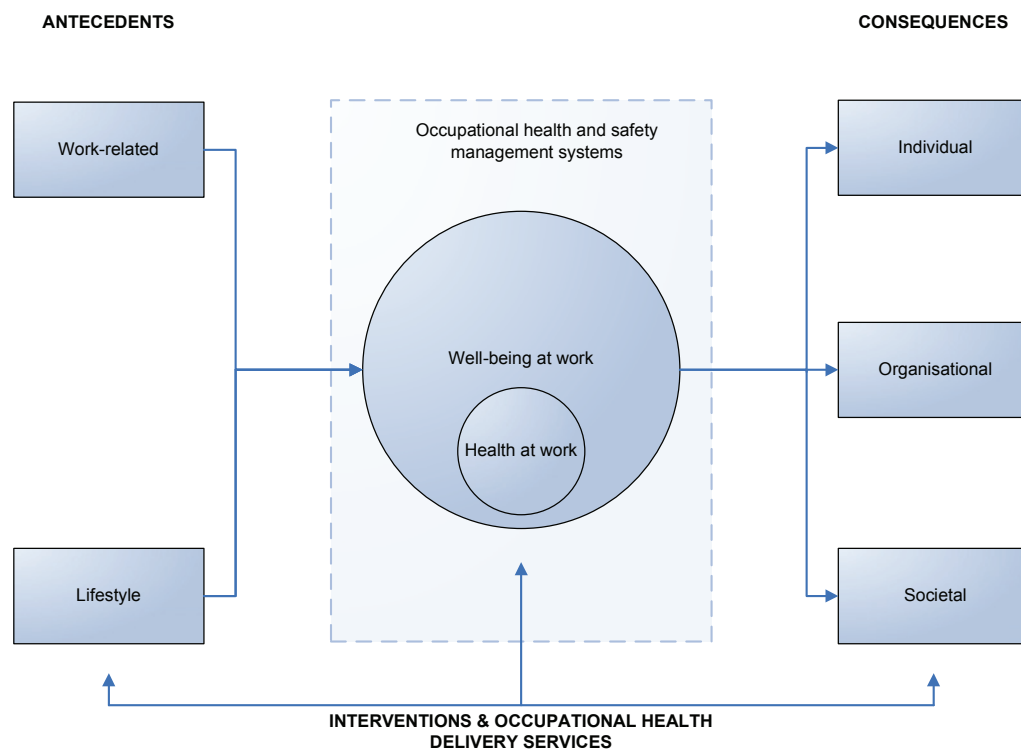
Source: Warr (1999).

Lifestyle factors

The choices that workers make about their behaviour, especially their choices about diet, tobacco and alcohol and more generally about the way their leisure is spent, have a direct effect on their health and wellbeing at work. Many chronic diseases such as cardiovascular diseases are caused by damaging lifestyle behaviours: poor diet, smoking, alcohol abuse and lack of physical activity (Vaughan-Jones and Barham, 2009).

Beyond these individual choices, lifestyle is also influenced by socio-economic factors (e.g. income, social environment, housing), which in turn influence workers' health and wellbeing (Blaxter, 1991).

Figure 2-2: A conceptual framework of health and wellbeing at work



Source: adapted from Danna and Griffin (1999).

2.2.3 Occupational health delivery services

In addition to work-related and lifestyle antecedent factors, other elements have an impact on the level of health and wellbeing at work. For instance, occupational health delivery services have a critical role in ensuring high levels of health and wellbeing among workers. Their mission is to promote and maintain “the highest degree of physical, mental and social wellbeing of workers in all occupations by preventing departures from health, controlling risks and the adaption of work to people and people to their jobs” (International Labour Organisation, 1985). Different models for provision of occupational health services can be distinguished, as outlined by Wales Audit Office⁸:

- The “full in-house service” model offers the advantage of dedicated specialists on-site who know the employer’s business and are “able to give authoritative input on any issue”. This model is often found in large organisations such as NHS hospitals where “internal occupational health needs generate enough demand to spread the cost of the service”.
- The “partial in-house service” model. This model generally means that a company does not employ a health specialist full-time but use regular part-time or contract

⁸ <http://www.wao.gov.uk/2082.asp>.

for medical opinion if required. This model is less expensive than employing full-time medical practitioners. It can thereby be suitable for small organisations.

- The “buy-in to someone else’s in-house service” model via a service level agreement (SLA) either for a fixed fee or by case. It is not uncommon to have a partial in-house service and to buy in specialist medical advice or interventions through an SLA. When this model works well, it can offer access to a larger and better-resourced set-up. However, there is a risk that the host organisation will give its own needs higher priority and the customer is always last in the queue. This risk can be reduced by managing and monitoring the SLA robustly.
- The “partnership (shared) service” model can be funded by charging pro rata pay bills of the organisations involved. By achieving size, the operation is then able to justify the engagement of occupational health consultants and adopt good practice for employee development. The risk is that the shared “ownership” generates suspicion within each organisation that preference is being given to another.
- The “external provider” model where occupational health is ensured by a local general practitioner or a specialist occupational health company.

2.2.4 Occupational health and safety management systems

Occupational health and safety (OHS) management systems also influence the level of health and wellbeing at work. Voluntary and mandatory OHS management systems have been developed in response to workplace-related health. An OHS management system can be defined as “the integrated set of organizational elements involved in the continuous cycle of planning, implementation, evaluation, and improvement, directed toward the abatement of occupational hazards in the workplace. Such elements include, but are not limited to, organizations’ OHS-relevant policies, goals and objectives, decision-making structures and practices, technical resources, accountability structures and practices, communication practices, hazard identification practices, training practices, hazard controls, quality assurance practices, evaluation practices, and organizational learning practices” (Robson et al., 2005).

OHS management systems are different from traditional occupational health and safety programmes because they are more proactive and better internally integrated. They also incorporate stronger elements of evaluation and continuous improvement than traditional OHS programmes (Robson et al., 2005). Gallagher, Underhill and Rimmer (2001) identified several successful factors for the effectiveness of OHS management systems (Table 2-1).

Table 2-1: Effective OHS management systems

Factors Contributing to Effective OHSMS	Barriers to Effective OHSMS
Type of system	
Customised to organisation's needs	Off-the-shelf system imposed without modification
Developed with support and involvement of all organisation stakeholders	Imposed by senior management without consultation
Safe place/innovative system	Safe person/traditional system
Internal Organisational Factors	
(i) Management Commitment	
Strong senior management involvement	Delegation of OHS responsibility to line and OHS management positions
OHSMS introduced to improve OHS	Introduced and supported for non-OHS reasons
Provision of adequate resources	Inadequate resources
OHS integral to management performance appraisals	Limited accountability mechanisms
Leading by example	Words unsupported by practice
(ii) Integration into Management Systems	
All organisational functions incorporate OHS	OHSMS activities marginalised
(iii) Employee Involvement	
All employees encouraged and capable of participation	OHS restricted to "technical" experts Inadequate training of employees in OHS and in consultation
Independent representation of employees encouraged and supported	Selective employee involvement at management's discretion
(iv) Workforce Characteristics	
Stable workforce	High labour turnover, extensive casual and part-time workforce Reliance on and exclusion of labour hire employees from OHSMS
Nature of Organisation	
Larger organisation familiar with systems and with adequate resources	Small business, with limited resources and unfamiliar with systems concept
Stable workplace	Labour hire company with employees working between multiple client sites Disorganisation of work associated with presence of labour hire employees and contractors
Contractor Relations	
Principal contractor works with subcontractor to develop compatible OHSMS	Principal contractor simply requires subcontractor to have OHSMS Principal contractor simply imposes their OHSMS on subcontractor Sub-contractor's OHSMS inconsistent with principal's OHSMS
Audits and Audit Tools	
Appropriately used audits can verify and validate OHSMS and facilitate continuous improvement	Inappropriately used audits encourage "paper systems" and an instrumentalist approach to OHSMS
Adequate audit tools are tailored to organisational needs and reflect key OHSMS success factors	Inadequate audit tools support mediocre OHSMS

Audit processes are robust and auditors are technically competent	Quality-style audit processes and inadequate auditor skills limit audit comprehensiveness
Audits are integrated within a comprehensive approach to measurement	Use of audits as the primary measurement tool

Source: Gallagher, Underhill and Rimmer (2001).

2.2.5 Consequences of low levels of health and wellbeing at work

Individual consequences

Poor health and wellbeing issues at work can be damaging to individuals and their immediate family, and eventually to the community and society they live in. The Health and Safety Executive estimates the costs to individuals of workplace accidents and work-related ill-health to be between £10.1 and £14.7 billion in Great Britain (Table 2-2). These costs include loss of income, extra expenditure of dealing with injury or ill-health, subjective costs of pain, grief and suffering (Pathak, 2008).

Some of the consequences of poor health and wellbeing at work on individuals specifically include (Secretaries of State of the Department for Work and Pensions and the Department of Health, 2008; European Network for Workplace Health Promotion, 2004; Black, 2008; PricewaterhouseCoopers, 2008):

- more frequent absences from work and increased risk of leaving employment altogether due to ill-health, which lead to further consequences (as described previously) not solely on an individual level but also on their immediate family
- loss of productivity as a result of both absenteeism and presenteeism⁹
- loss in motivation and satisfaction levels at work
- increased risk of injury.

⁹ The Sainsbury Centre for Mental Health (2007) defines presenteeism as “the loss in productivity that occurs when employees come to work but function at less than full capacity because of ill-health”.

Table 2-2: The costs of workplace accidents and work-related ill-health in Great Britain, in £ billion, 2001/02

Costs to individuals	
Ill-health	5.9 to 9.4
Injury	3.3 to 6.3
Sub-total	10.1 to 14.7
Costs to employers	
Ill-health	1.5
Injury	1.0 to 1.1
Non-injury	1.4 to 5.3
Sub-total	3.9 to 7.8
Costs to society	
Ill-health	11.3 to 17.3
Injury	5.9 to 10.7
Non-injury	1.4 to 5.3
Sub-total	20.0 to 31.8

This table presents the cost of damage to materials, machinery and property that occurs through non-injury accidents. Although no one is harmed in such events, Health and Safety Executive takes the view that (a) they have the potential to cause human harm; and (b) they are caused by the same management failures that lead to injury accidents.

Source: Health and Safety Executive (2004a).

Organisational consequences

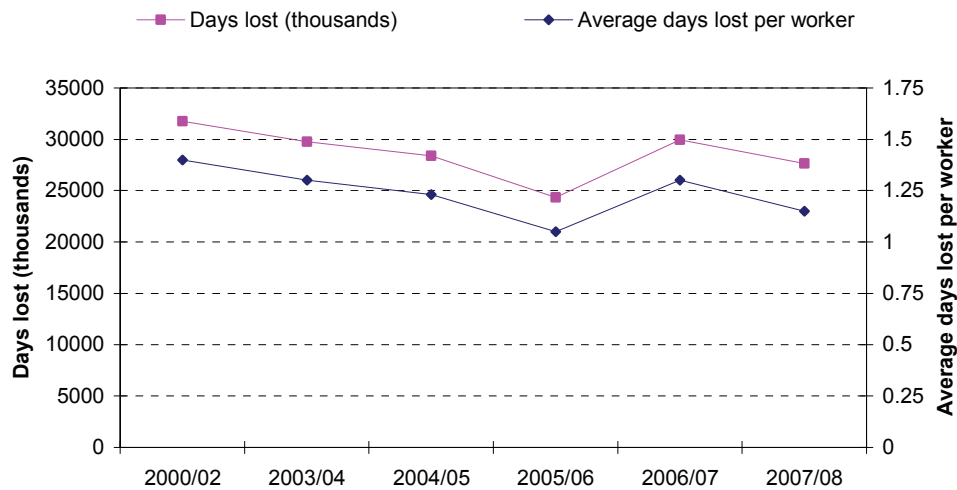
The consequences of poor health and wellbeing at work are costly to employers.

There is a wealth of information on the “business case” for employers’ investment in their workers’ health and wellbeing to reduce sickness absence of employees. To respond to the sickness absence of employees, employers may seek to maintain the level of output to hire temporary workers, to pay current workers to work overtime or to increase work load among current workers. Employers may also accept a decline in output equivalent to the foregone output of the absent worker (Pathak, 2008). These responses are costly to employers. Therefore, employers’ investment in their workers’ health and wellbeing to reduce sickness absences may save them money. Furthermore, this investment can also result in a more productive workforce by making employees feel greater loyalty to the company as a result of feeling valued and “cared for”. The Black review also stresses that a more productive workforce can spur on more positive consequences by enabling employers to invest more in training as a result of the money saved, which in turn has the potential to “yield higher returns” (Black, 2008).

There is a lot of information on the direct and indirect rates of absenteeism, both in terms of the number of days lost and their associated cost to employers themselves (PricewaterhouseCoopers, 2008). There are estimates that work-related illness was responsible for 27.6 million working days lost in 2007/08 in Great Britain, representing 1.15 days lost on average per worker (Figure 2-3). Also, there are estimates that work-related injuries were responsible for 6.2 million days lost during the same year, representing 0.22 days lost on average by each worker (Figure 2-4).

In financial year 2006/07 an average of 9.3 working days were lost per staff year to sickness absence across the whole civil service in the United Kingdom. There are nevertheless important differences across departments in terms of sickness absence, ranging from 3.3 to 12.4 average working days lost per staff. NHS in England shows a comparative high average working days lost per staff. Moreover, NHS workers seem to stay on sick leave longer than other workers (Box 2-1). The total cost of absences in the financial year 2006/07 in the whole civil service was calculated at around £393 million. The cost per staff year was estimated to be around £887.66 (RED Scientific Limited, 2007).

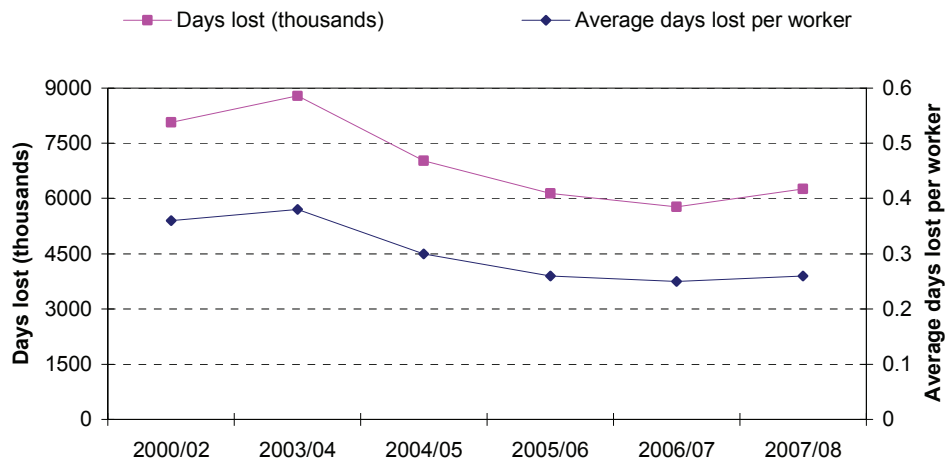
Figure 2-3: Estimated working days lost due to self-reported work-related illnesses in Great Britain, full-time equivalent



Source: Labour Force Survey.

In a recent survey, the Confederation of British Industry estimated the costs of sickness absence to employers at £12 billion. However, as noted by Pathak (2008), that survey does not estimate the costs of sickness absence due to work-related injuries and illnesses. The Health and Safety Executive estimates the costs to employers of workplace accidents and work-related ill-health to be between £3.9 and £7.8 billion in Great Britain (Table 2-2). These costs include sick pay, administrative costs, damage from injuries and non-injuries, recruitment costs and compensation and insurance costs (Pathak, 2008).

Figure 2-4: Estimated working days lost due to self-reported work-related injuries in Great Britain, full-time equivalent



Source: Health and Safety Executive based on Labour Force Survey.

There is much less information available on the cost of presenteeism because it is more difficult to calculate than the cost of lost days. In addition, the cost of presenteeism is an indirect cost to employers that has remained largely invisible to them until recently (Hemp, 2004). The difficulty to calculate these costs is easy to understand given that “you know when someone doesn’t show up for work, but you often can’t tell when – or how much – illness or a medical condition is hindering someone’s performance” (Hemp, 2004). In addition, calculating these indirect costs involves “determining the prevalence of illnesses and medical problems that undermine job performance in the workforce, calculating the related productivity loss, and combating that loss in cost-effective ways” (Hemp, 2004).

The impact of presenteeism on individual productivity has been estimated to cut productivity by one-third or more (Hemp, 2004). It has been estimated that depression costs US employers about \$35 billion a year in reduced performance at work and that painful conditions such as arthritis, headaches and back problems cost approximately \$47 billion. The total cost of presenteeism has been estimated at \$150 billion per year in the United States (Hemp, 2004). In addition, studies have calculated that presenteeism is a much costlier problem than absenteeism (Hemp, 2004; Childress and Lindsay, 2006; Sainsbury Centre for Mental Health, 2007). According to the Sainsbury Centre for Mental Health (2007), presenteeism due to poor mental health leads to a loss of working time nearly 1.5 times that caused by sickness absence due to mental ill-health.

Box 2-1: Are NHS workers on sick leave more often than other workers?

Table 2-3 presents the average working days lost per staff and total days lost in different departments within the public sector. The Department for Transport, the HM Land Registry, the Department for Work and Pensions, and the Home Office show the highest average working days lost per staff for the years 2006/07, amounting to more than 10 days per year. Although no direct comparable data exist for the NHS in England, it is estimated that the average working days lost per NHS is around 10.7 days, representing 10,228,163 total days lost.^{10,11}

Table 2-3: Average working days lost per staff and total days lost in the civil service, FY 2006/07

Summary Department	AWDL	Total Days Lost
Department for Transport	12.4	220,115
HM Land Registry	12.2	93,905
Department for Work and Pensions	11.1	1,361,196
Home Office	10.5	805,132
Scottish Executive	9.9	130,366
Department for Education and Skills	8.4	28,882
National Assembly for Wales	8.4	54,001
All Other Agencies	8.3	349,145
Department of Environment Food and Rural Affairs (DEFRA)	7.5	92,571
Ministry of Defence	7.3	504,083
Department for Constitutional Affairs	7.0	186,001
HM Revenue and Customs	7.0	180,590
Department of Communities and Local Government	6.5	19,878
Department of Health	6.4	22,692
Department of Trade and Industry (DTI)	6.3	39,618
HM Treasury	5.3	10,490
Department for International Development	5.0	9,001
Department for Culture, Media and Sport	4.8	3,158
Cabinet Office	3.3	7,151

Source: RED Scientific Limited (2007).

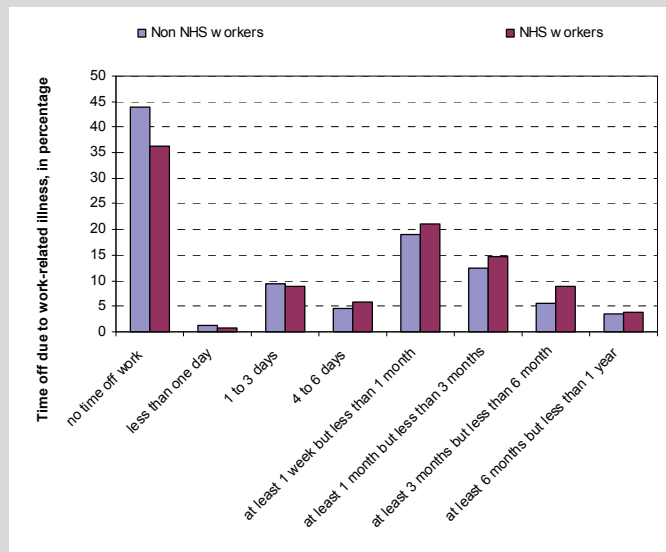
Also, the most recent data from the Labour Force Survey shows that NHS workers tend to have longer periods of sickness leave because of work-related illness than other workers in England (Figure 2-5). They also tend to take more time off due to work-related illness and stay at work when they are ill less long than other workers.

¹⁰ Estimates from Aston Business School.

¹¹ Days lost translate into significant costs to organisations. The National Audit Office undertook studies on the Probation Service (2006) and Department of Transport (2007) and concluded that:

- Sick leave in the National Probation Service is running at an average of 12.3 days a year for each member of staff, directly costing £31.6 million.
- Staff sickness absence in the Department for Transport and its agencies averaged 10.4 days in 2005, costing the taxpayer around £24 million.

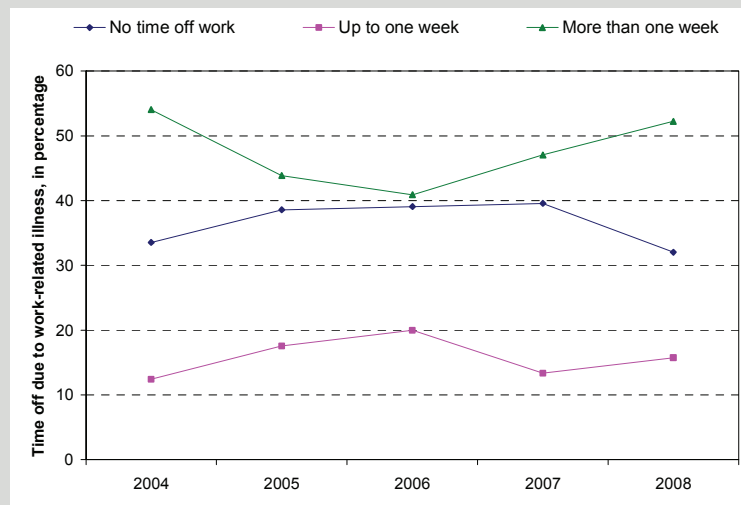
Figure 2-5: Time off due to work-related illness for NHS workers and other workers in England, 2007-08



Source: authors' calculations based on the Labour Force Survey.

Moreover, a look at the data over recent years reveals that NHS workers have increasingly stayed longer on sick leave (Figure 2-6).

Figure 2-6: Time off due to work-related illness for NHS workers and other workers in England, 2004-08



Source: authors' calculations based on the Labour Force Survey.

This is so because illnesses associated with presenteeism (e.g. back pain, seasonal allergies, headaches, depression, gastrointestinal disorders) are more prevalent than many of the illnesses associated with absenteeism (e.g. heart disease, cancer), often go untreated and “typically occur during peak working years” (Hemp, 2004). The type of ailments and illnesses associated with presenteeism affects both the quantity of work that people are able to carry out and the quality of their work (Hemp, 2004).

Societal consequences

In addition to individual and organisational consequences of health and wellbeing issues at work, there are non-negligible consequences for society as a whole. According to the Black review (2008), the society-wide consequences that can result from health and wellbeing issues at work are wide-ranging. In particular, the review highlights the societal consequences of worklessness on society, which include social exclusion, lower output and reduced tax revenues as well as higher costs borne by taxpayers in terms of healthcare and social security benefits (Black, 2008).

The Black review estimated that the costs of sickness absence and worklessness due to ill-health to UK taxpayers totalled over £60 billion including benefit costs, additional health costs and foregone taxes (Black, 2008). The Health and Safety Executive estimates the costs to society of workplace accidents and work-related ill-health to be between £20.0 and 31.8 billion in Great Britain (Table 2-2). These costs comprise loss of output, medical costs, costs to the Department for Work and Pensions of administering benefit payments and Health and Safety Executive and local authority investigation costs (Pathak, 2008).

2.3 Measuring health and wellbeing at work

To better understand the issue of work-related illness and injuries in workplaces in Great Britain, we review data collected in the framework of the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) and the UK Labour Force Survey. These data sources have important differences in terms of coverage of reporting mechanism. RIDDOR places a legal duty on employers and other specified duty holders to report certain workplace incidents to the relevant enforcing authority, namely the Health and Safety Executive, local authorities (LAs) and the Office of Rail Regulation (ORR). The UK Labour Survey includes two specific survey modules commissioned by the Health and Safety Executive – “The Workplace Injury survey” module and the “Self-reported Work-related Illness (SWI) survey” module – to gain a view of work-related illness and workplace injury based on individual’s perceptions.

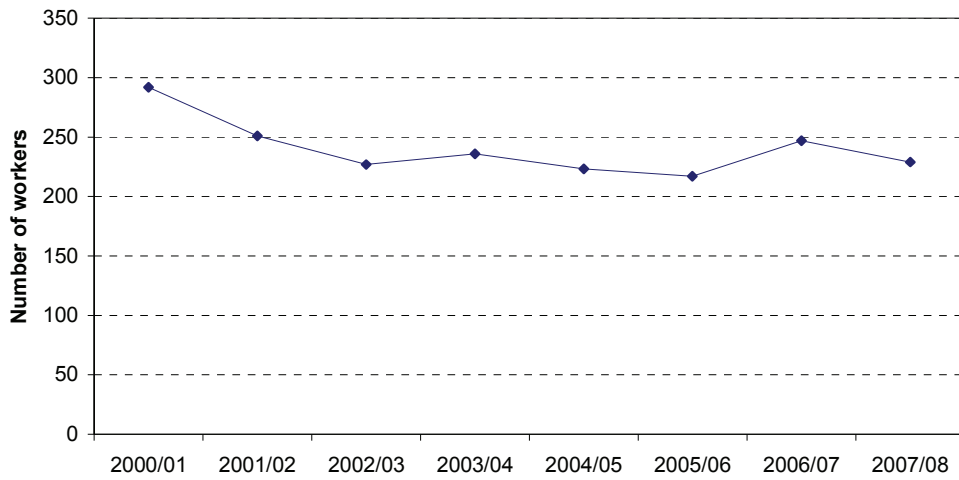
2.3.1 Work-related injuries and illness in Great Britain

Injuries

Despite the long-term downward trend in fatal injuries to workers, there has been only a slight decline over recent years; 229 workers were still fatally injured in 2007/08 (Figure 2-7).

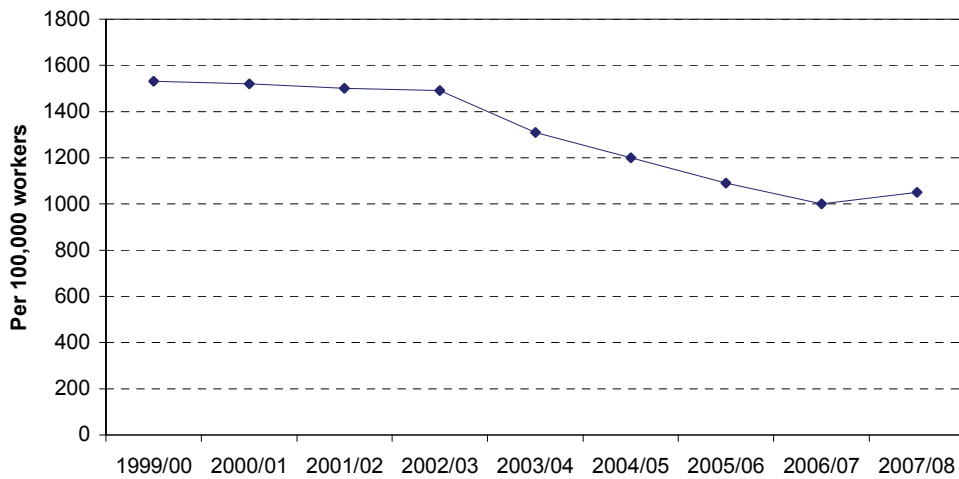
More pronounced has been the fall in non-fatal injuries since 1999/00 (Figure 2-8). From 1999/00 to 2002/03, the incidence rate of non-fatal injuries was fairly constant. However, there has been a steady decrease in the incidence rate from 1,490 incidences per 100,000 workers (2002/03) to 1,000 per 100,000 workers (2006/07), with a slight increase in 2007/08 to 1,050 incidences per 100,000 workers.

Figure 2-7: Number of fatal injuries to workers in Great Britain, 2000/01–2007/08



Source: Health and Safety Executive based on RIDDOR.

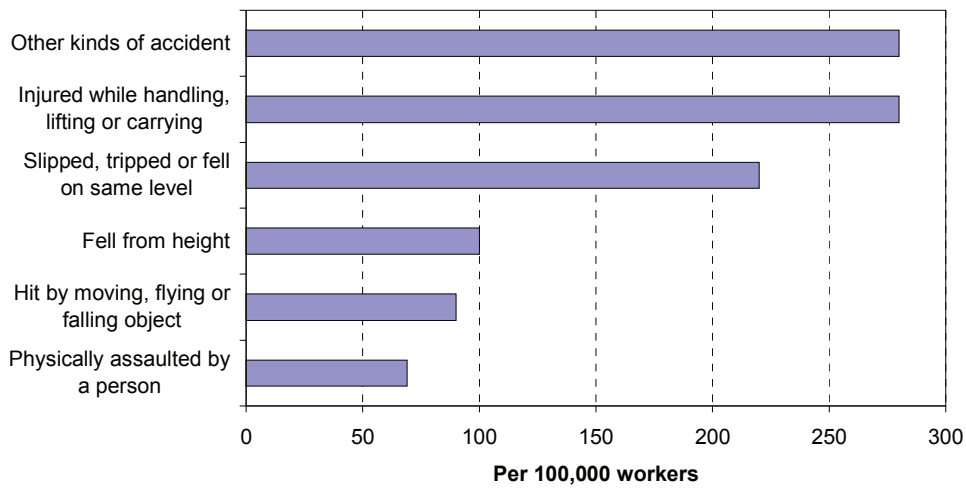
Figure 2-8: Estimated annual incidence rates of reportable non-fatal injuries in Great Britain, 1999/00–2007/08



Source: Health and Safety Executive based on Labour Force Survey.

The two most commonly reported non-fatal injuries are “injuries while handling, lifting or carrying” and “slipped, tripped or fell on same level” (Figure 2-9).

Figure 2-9: Estimated incidence of reportable non-fatal injuries to workers in Great Britain, by accident kind, 2007/08

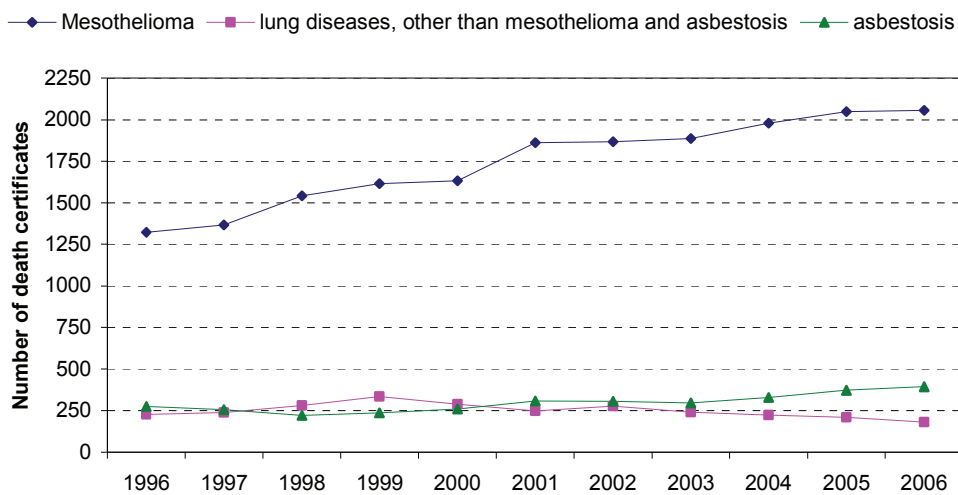


Source: Health and Safety Executive based Labour Force Survey.

Illnesses

Each year, thousands of workers die of work-related diseases in Great Britain (Health and Safety Executive, 2008). In many circumstances, these diseases have been developed recently but are the consequences of exposure to occupational hazards many years ago. In 2006, an estimated 2,056 death certificates mentioned mesothelioma in Great Britain. Other major work-related fatal diseases are asbestosis diseases and lung diseases other than mesothelioma and asbestosis (Figure 2-10).

Figure 2-10: Number of work-related fatal diseases in Great Britain, 1996–2006



Source: Health and Safety Executive.

While deaths due to work-related diseases such as mesothelioma have followed an upward trend over the years, reflecting poor working conditions from the past, the rate of self-reported non-fatal work-related illness is declining. From 2003 onwards, the incidence rate

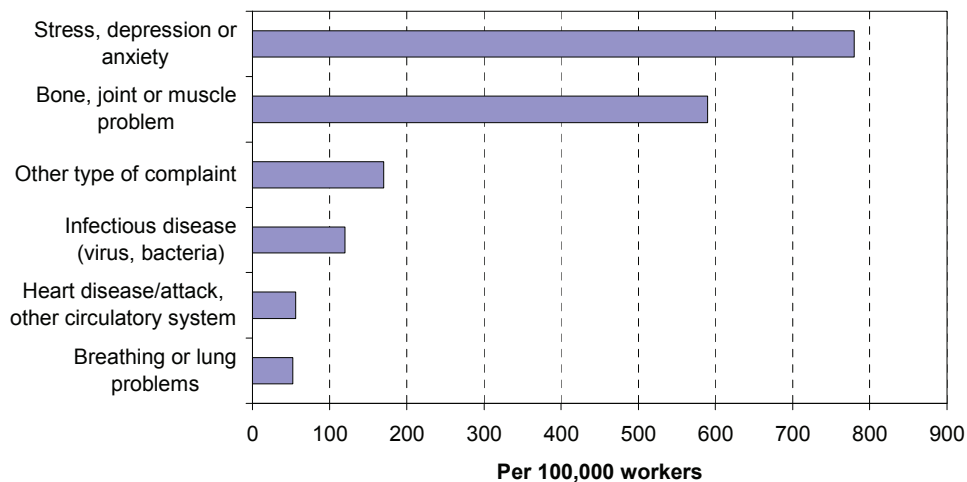
for reported work-related illness or illness made worse by work has been slightly falling in Great Britain (Figure 2-11). Despite a sharp increase in 2006/07, the incidence rate was down to 1,860 cases of workplace illness per 100,000 workers in 2007/08.

Figure 2-11: Estimated incidence of self-reported illnesses caused or made worse by work in Great Britain, 1999/00–2007/08



Source: Health and Safety Executive based on Labour Force Survey.

Figure 2-12: Estimated incidence of self-reported illnesses caused or made worse by work in Great Britain, by illness kind, 2007/08



Source: Health and Safety Executive based on Labour Force Survey.

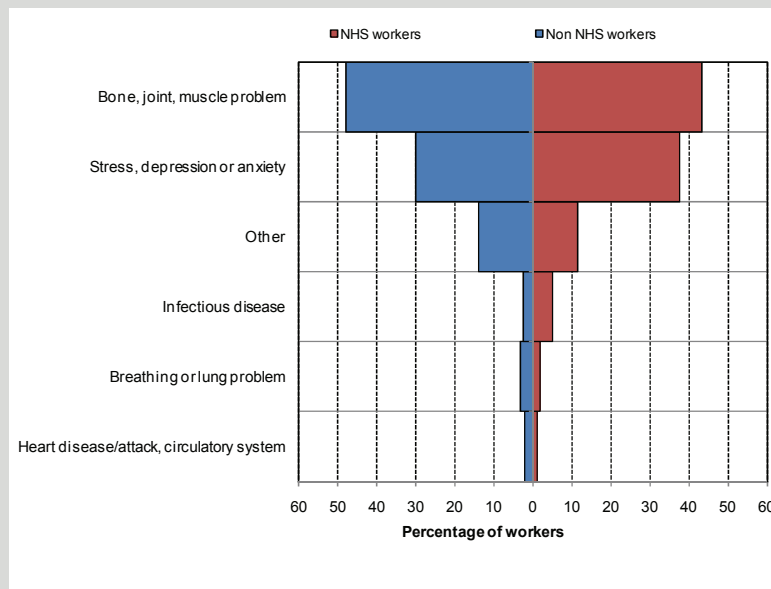
As Figure 2-12 shows, the two most common types of illness reported are “stress, depression, or anxiety”, and “bone, joint or muscle problem”. The other diseases include “infectious disease”, “heart disease/attack or other circulatory system problem”, “breathing or lung problems”, and other illness. Obviously, the incidence rate per illness depends on the nature of working conditions, which vary across industries, occupations and organisations. For instance, NHS workers report work-related illnesses caused by stress,

anxiety and depression more frequently than other workers in England. They also report more infectious diseases than other workers in relative terms (Box 2-2).

Box 2-2: Are NHS workers more stressed than other workers?

Figure 2-13 shows the distribution of self-reported illnesses caused or made worse by work. The figure distinguishes between NHS workers and other workers in England. In 2007/08, NHS workers reported more work-related illnesses due to stress, depression and anxiety than other workers. They also declared more infectious diseases than other workers in relative terms (Figure 2-13).

Figure 2-13: Distribution of work-related illnesses reported by NHS workers and other workers in England, 2007/08



Source: authors' calculations based on the Labour Force Survey.

2.3.2 Determinants of poor health at work

In this section, we use logistic regression analysis to examine the determinants of poor health at work.¹² More precisely, logistic regression is used to predict the odds of reporting a work-related illness or accident given certain other information.

The dependent variables in our analysis are dichotomous, measuring whether a worker reported a work-related illness or accident. These variables correspond to the following questions extracted from the UK Labour Force Survey:

- “(Apart from the accident you have told me about,) within the last twelve months have you suffered from any illness, disability or other physical or mental problem that was caused or made worse by your job or work done in the past?”
- “Thinking of the 12 months since [full date] have you had any accident resulting in injury at work or in the course of your work?”

¹² Logistic regression is commonly used to examine the determinants of health at work (for instance, Melamed et al., 1999; Shaw, Pransky and Fitzgerald, 2001; Curtis Breslin and Smith, 2005).

The independent variables are categorical variables. They categorise workers (by gender, age and educational qualification), their establishments (by industry, number of employees, public/private sector and geographic location) and jobs (by employment occupation, permanency of employment contract, and full-time/part-time employment contract).¹³

Table 2-4: Specifications of the logistic regression analysis

Variables	Model (1)	Model (2)	Model (3)
Industry	X		
Number of employees	X		
Public-private sector	X	X	
Permanency of contract	X	X	X
Fulltime/part-time	X	X	X
Employment occupation	X	X	X
Gender	X	X	X
Age	X	X	X
Marital status	X	X	X
Educational qualification	X	X	X
Geographic area (region)	X	X	X
Worker in human health activities		X	
NHS worker			X
<hr/>			
Number of observations: work-related illness	43,430	183,739	144,917
Number of observations: work-related accident	108,734	282,843	223,449

The study population considered in the logistic regression is all the employed persons in England interviewed in the framework of the UK Labour Force Survey over the period 1999–2008 for illnesses and 2000–2008 for accidents. The number of observations nevertheless depends on the variables included in each model. We indeed use three models to predict the odds of reporting a work-related illness or accident. Each of the three models provides a different level of investigation (Table 2-4):

- Model (1) shows how worker attributes, establishment attributes and job-related characteristics affect the odds of reporting a work-related illness or accident.
- Model (2) narrows the scope to identify how working in human health activities (hospital, medical practice, dental practice and other human health activities) affects the odds of reporting a work-related illness or accident.
- Model (3) identifies how the odds of reporting a work-related illness or accident changes if one were an NHS trust worker versus a non-NHS trust worker.

¹³ Quite similar variables are used in Melamed et al. (1999), Shaw, Pransky and Fitzgerald (2001) and Curtis Breslin and Smith (2005).

In Table 2-5, we summarise these odds ratios for reporting an illness and the odds ratio for reporting a work-related illness or accident. An odds ratio of 1.0 means the independent variable has no effect on the dependent variable. An odds ratio above 1 indicates that the independent variable increases the likelihood of reporting a work-related illness or accident. An odds ratio below 1 indicates that the independent variable decreases the likelihood of reporting a work-related illness or accident.

The results from Table 2-5 show that working in public administration (including education and health) as opposed to other industries increases the odds of reporting a work-related illness by 1.37 times and an accident by 1.78 times, controlling for other variables in the models. Similarly, working in health activities, as opposed to other activities, increases the odds of reporting a work-related illness by 1.17 times and an accident by 1.15 times. Finally, being a NHS worker increases the odds of declaring a work-related illness by 1.50 times and an injury by 1.75 times.

Table 2-5: Odds of reporting a work-related illness or accident

Category of worker	Illness	Accident
Public administration, education and health (reference group: manufacturing)	1.375***	1.178**
Human health activities (reference group: other activities)	1.173***	1.147***
NHS (reference group: non-NHS)	1.491***	1.731***

"Human health workers" refers to people working in the "human health activities" industry sector (SIC 85.1). This sector includes hospital, medical practice, dental practice, and other human health activities.

*, **, ***, statistically significant at 10 percent, 5 percent and 1 percent, respectively.

Source: authors' calculations based on the Labour Force Survey.

In each of the subsections below, we go into further detail as to how worker attributes, establishment and job-related characteristics change the odds of reporting a work-related illness or accident compared to the reference group. It is nevertheless necessary to mention that the logistic regression analysis does not control for all variables that may determine the likelihood of reporting a work-related illness or accident due to the lack of data. For instance, our analysis does not include independent variables on lifestyle factors while the latter are important antecedent factors of health and wellbeing at work. Therefore, the results of our analysis should be interpreted with caution.

Work-related illnesses

Table 2-6 illustrates the findings for all variables in each model applied to self-reported work-related illnesses.

The results from the three models show that female, divorced and older workers are more likely than married workers living with husband/wife to report work-related illnesses. The odds of reporting a work-related illness increase in services such as "distribution, hotels and restaurants" and "public administration, education and health". Working in the public sector, as opposed to the private sector, increases the odds of reporting a work-related illness.

Table 2-6: Change in odds of reporting a work-related illness

Variables	(1)	(2)	(3)
Industry (reference group: manufacturing)			
Agriculture and fishing	1.230		
Energy and water	1.049		
Construction	1.137		
Distribution, hotels and restaurants	1.224**		
Transport and communication	1.287**		
Banking, finance and insurance	1.107		
Public administration, education and health	1.375***		
Other services	1.366**		
Number of employees (reference group: 49–250 employees)			
Less than 10	0.796***		
11–49	1.004		
Public/private sector (reference group: private sector)			
Public sector	1.184**	1.296***	
Permanency of contract (reference group: permanent contract)			
Having anything other than permanent contract	0.873	0.954	1.009
Full-time/part-time (reference group: full-time contract)			
Full-time	0.539***	0.646***	0.638***
Main occupation (reference group: associate professional and technical)			
Managers and senior officials	0.825**	0.731***	0.683***
Professional occupations	0.876	0.807***	0.665***
Administrative and secretarial occupations	0.818**	0.731***	0.703***
Skilled trades occupations	1.009	1.007	0.954
Personal service occupations	0.859	0.873***	0.924
Sales and customer service occupations	1.063	1.009	0.954
Process, plant and machine operatives	1.108	1.056	0.996
Elementary occupations	0.969	0.888**	0.882**
Gender (reference group: male)			
Female	1.184***	1.172***	1.163***
Age bracket (reference group: 25-39 years old)			
Less than 24	0.528***	0.484***	0.467***
40–54	1.253***	1.332***	1.291***
55+	1.212**	1.402***	1.375***
Marital status (reference group: married, living with husband/wife)			
Single, never married	1.036	1.097***	1.080**

Married, separated from husband/wife	1.111	1.185***	1.093
Divorced	1.394***	1.336***	1.286***
Widowed	0.912	1.069	1.135
Workers in human health activities/other activities (reference group: other activities)			
Workers in human health activities		1.173***	
NHS workers			
			1.491***
NHS/non-NHS (reference group: non-NHS)			
Constant	0.0422***	0.0426***	0.0460***
Observations			
	43,430	183,739	144,917

"Human health activities" to an industry sector (SIC 85.1). This sector includes hospital, medical practice, dental practice and other human health activities.

*, **, ***, statistically significant at 10 percent, 5 percent and 1 percent respectively.

Blank cells indicate the variable is not estimated in the model.

The type of qualification and the geographic are not reported in the table.

Source: authors' calculations based on the Labour Force Survey.

Nevertheless, the odds of reporting a work-related illness is lower in managerial and senior occupations as well as in administrative and secretarial occupations than in associate professional and technical jobs. Also, workers in small establishments, the young employed and workers with part-time employment contracts are less likely to declare a work-related illness.

Work-related accidents

Table 2-7 illustrates the findings of the three preceding models applied to self-reported work-related accidents.

Workers in sectors such as "distribution, hotels and restaurants", "construction" and "public administration, health and education" are more likely than their counterparts in manufacturing to report work-related accidents. The odds of reporting an accident in the public sector are also higher than in the private sector. Working in manual occupations such as skilled trade and elementary occupations, as opposed to associate professional and technical occupations, increases the odds of declaring an accident. Divorced and separated workers are also more likely to report a work-related injury than married workers living with a husband or wife.

Workers employed in the banking, finance and insurance sectors are also less likely to report work-related accidents compared with those employed in manufacturing. The odds of reporting work-related accidents also decrease in small establishments compared with medium-size establishments. In addition, working in managerial, senior, professional, administrative and secretarial occupations, as opposed to associate professional and technical occupations, decrease the odds of reporting a work-related accident.

Table 2-7: Change in odds of reporting a work-related accident

Variables	(1)	(2)	(3)
Industry (reference group: manufacturing)			
Agriculture and fishing	1.126		
Energy and water	0.962		
Construction	1.134*		
Distribution, hotels and restaurants	1.222***		
Transport and communication	1.088		
Banking, finance and insurance	0.750***		
Public administration, education and health	1.178**		
Other services	1.135		
Number of employees (reference group: 49–250 employees)			
Less than 10	0.818***		
11–49	0.917**		
500+	0.944		
Public/private sector (reference: private sector)			
Public sector	1.265***	1.410***	
Permanency of contract (reference group: permanent contract)			
Having anything other than permanent contract	0.905	0.872***	0.915
Full-time/part-time (reference group: full-time contract)			
Full-time	0.534***	0.566***	0.577***
Main occupation (reference group: associate professional and technical)			
Managers and senior officials	0.628***	0.644***	0.773***
Professional occupations	0.707***	0.700***	0.756***
Administrative and secretarial occupations	0.538***	0.480***	0.599***
Skilled trades occupations	1.877***	1.970***	2.396***
Personal service occupations	1.368***	1.355***	1.629***
Sales and customer service occupations	0.952	1.096*	1.315***
Process, plant and machine operatives	1.976***	1.978***	2.401***
Elementary occupations	1.794***	1.742***	2.164***
Gender (reference group: male)			
Female	0.791***	0.841***	0.842***
Age bracket (reference group: 25–39 years old)			
Less than 24	0.976	0.969	0.974
40–54	0.874***	0.919***	0.934**
55+	0.851***	0.881***	0.891***
Marital status (reference group: married, living with husband/wife)			

Single, never married	1.058	1.064**	1.066**
Married, separated from husband/wife	1.319***	1.179***	1.217***
Divorced	1.360***	1.331***	1.325***
Widowed	0.973	1.030	0.943
Workers in human health activities/other activities (reference group: other activities)			
Workers in human health activities		1.147***	
NHS/non-NHS (reference group: non-NHS)			
NHS workers			1.731***
Constant			
Constant	0.0471***	0.0371***	0.0312***
Observations			
Observations	108,734	282,843	223,449

"Human health activities" to an industry sector (SIC 85.1). This sector includes hospital, medical practice, dental practice, and other human health activities.

*, **, ***, statistically significant at 10 percent, 5 percent and 1 percent respectively.

Blank cells indicate the variable is not estimated in the model.

The type of qualification and the geographic area are not reported in the table.

Source: authors' calculations based on the Labour Force Survey.

2.4 Conclusion

There are several findings from this chapter:

- Despite the decline in the rates of fatal and non-fatal work-related injuries in Great Britain over the past decades, health and wellbeing remain key issues in British workplaces. For instance, although work-related illnesses due to stress, anxiety and depression are on the rise it is probable that awareness of and attitudes to work-related stress changed during the 1990s, and this may have increased reporting.
- The proportion of workers reporting an illness or an injury greatly varies across industries, occupations and organisations. Although its results should be interpreted with caution, our logistic regression analysis has shown that working in human health activities (i.e. hospital, medical practice, dental practice and other human health activities) or in the NHS, as opposed to other activities and organisations, increases the odds of reporting a work-related illness or injury. Moreover, NHS workers report more work-related illnesses due to stress, anxiety and depression than other workers in England.
- The problem of low levels of health and wellbeing at work leads to significant individual, economic, and organisational and societal consequences. The costs of poor health and wellbeing comprise not only direct and indirect costs due to sickness absence but also costs due to presenteeism. NHS workers tend to have

longer sickness leave due to work-related illness than other workers in England. They also stay at work less when ill.

- Workplace health and safety interventions can mitigate these costs to individuals, employers and society. However, they should not address only illness or disability problems. The concept of health and wellbeing at work indeed goes beyond the absence of illness or disability. It should be understood as a “state of complete physical, mental and social wellbeing” (World Health Organization, 1948).
- Various antecedent factors are associated with the health and wellbeing of workers: work-related and lifestyle factors. Therefore, interventions aiming at improving health and wellbeing at work should not focus only on work-related factors.

3.1 **Introduction**

In this chapter we review the international peer review literature on the effectiveness of workplace interventions in terms of health and work outcomes. The review summarises evidence mainly from systematic and other quality evidence reviews.

Workplace interventions can be preventive, supportive or rehabilitative. Preventive interventions aim to protect healthy workers from developing a disease or experiencing an injury. Supportive interventions aim to address the early stages of disease and/or disease risk factors, such as hypertension; the intention is to stop or slow the progress of disease in its earliest stages. For injury, the goals of supportive interventions include limiting long-term disability and preventing re-injury. Finally, rehabilitative interventions focus on helping workers manage complicated, long-term health problems. The goals include preventing further physical deterioration and increasing the wellbeing of workers. For many health disorders a combination of preventive, supportive and rehabilitative interventions is required to achieve a meaningful degree of prevention and protection.

We classify workplace interventions according to two broad groups: interventions targeted at specific diseases, including the three stages of interventions, and worksite health promotion activities, which address more general risk-factors for illness. When possible, we break down further the latter into three groups: preventive, supportive and rehabilitative interventions. Because given health disorders often have multiple antecedent factors, several workplace interventions may be required to mitigate them. Similarly, a given workplace intervention may be used to address different but interrelated health and wellbeing disorders at work.

3.2 **Disease-specific interventions**

3.2.1 **Back pain and musculoskeletal disorders**

There are many types of work-based interventions for preventing low back pain (LBP) and musculoskeletal disorders (MSDs), ranging from preventive, to supportive to rehabilitative interventions (Frank et al., 1998; Bevan, Passmore and Mahdon, 2007).

Preventive interventions

Many workplace interventions have been used to prevent the development of LBP and MSDs. They include the use of back belts or lumbar supports, education and “back school” exercise, and ergonomic interventions (Hill et al., 2007).

In their systematic review, Linton and van Tulder (2001) found little empirical evidence for preventive workplace interventions such as back schools, lumbar supports and ergonomics. Gatty et al. (2003) also reviewed the effectiveness of back pain and injury prevention programmes in the workplace. These prevention programmes include the use of back belts, education and task modification, and education and task modification with workstation redesign. Concerning health outcomes, the use of back belts to prevent back pain and injury was found to be inconclusive but more positive results were reported from education and training interventions. The findings on work outcomes, principally sick leave, were mixed, with small or no effects reported. In a systematic review of workplace interventions to prevent LBP, Maher (2000) assessed the effectiveness of four types of interventions: the use of braces, education, exercise and workplace adjustment and education. The author found no positive effects of these interventions except exercise on leave due to LBP.

Regarding ergonomic interventions, which have dominated the scene of preventive interventions, Verhagen et al. (2006) found, in a systematic review, moderate evidence that changing keyboard design had an impact on arm, neck and shoulder complaints. Along the same lines, Brewer et al. (2006) found that using an alternative pointing device (i.e. mouse) had a positive effect on MSDs. In a systematic review, Rivilis, et al. (2008) found partial to moderate evidence that “participatory ergonomic interventions”¹⁴ had a positive impact on musculoskeletal symptoms, reducing injuries and workers’ compensation claims, and a reduction in lost days from work or sickness absence. However, the size of the effect requires a precise definition.

Supportive interventions

Several scholars have reviewed the effectiveness of supportive interventions to prevent the recurrence of LBP and MSDs or the deterioration of workers’ health. Many of these supportive interventions intend to reduce psychological and social barriers to recovery (Waddell and Burton, 2000; Hill et al., 2007).

Frank et al. (1998) argued that interventions addressing back pain are not effective in diminishing subsequent disability unless they are targeted at workers who are still disabled and on sick leave after the acute stage (3–4 to 12 weeks after the onset of the pain). Indeed, in many circumstances, workers get back to work in the first weeks after the onset of pain. Furthermore, the authors showed evidence suggesting that employers who quickly offer suitably modified duties can reduce significantly time lost per episode of back pain. These results are corroborated by Waddell and Burton (2000). In their systematic review, Schonstein et al. (2003) compared the effectiveness of physical conditioning programmes

¹⁴ “Participatory ergonomic interventions” involve participation by employees and management in identifying and implementing change. They can be regarded as complex, multiple component interventions as they have the ability to address both physical and organisational risk factors for MSDs simultaneously.

with management strategies that do not include physical conditioning programmes for workers with back and neck pain, in reducing sick leave and increasing functional status. The authors found that some programmes are better than usual care in reducing sick days for some workers with chronic back pain. These programmes include a cognitive-behavioural approach addressing attitudes and behaviours such as fear of movement. They are carried out at work or in cooperation with employers and are supervised by a physiotherapist or multidisciplinary team. However, the authors found no evidence of the effectiveness of these programmes for acute back pain.

Rehabilitative and return-to-work interventions

Finally, the effectiveness of rehabilitation and return-to-work interventions after long-term sickness absence due to MSDs seems positive. In their systematic review, Elders, van der Beek and Burdof (2000) showed that back school type interventions seem more effective after a long period of sickness absence than other non-back school type interventions. Karjalanian et al. (2003) examined the effectiveness of multidisciplinary rehabilitation – including a workplace visit or a more comprehensive occupational healthcare intervention for subacute (i.e. between four and twelve weeks) LBP. Their systematic review showed only moderate evidence that such intervention helps ill workers to return to work faster. In their study, Bultmann et al. (2009) found that the development of a new “coordinated and tailored work rehabilitation” approach led to a reduced number of sickness absence hours for the time intervals 0–6 months and 6–12 months. This new approach combines a work disability screening by an interdisciplinary team followed by a collaborative development of return-to-work plan. In their systematic review, Franche et al. (2005) found strong evidence that workplace-based return to work interventions contribute to reduce the duration of work disability when they combine work accommodation and contact between the healthcare provider and workplace.

There was some anecdotal evidence from the case studies. In Royal Mail Group, MSDs are the largest cause of sickness. Therefore, they have implemented the so-called rehabilitation psychosocial model. An interview respondent during the study reported that the intervention resulted in 70 percent of people coming back to their normal duty (or part-time). Royal Mail Group also reported a return on investment of £2.50 saved to every £1 invested. Centrica reports that their MSD rehabilitation programme and use of company-funded interventions has proved successful in reducing sickness absence and keeping employees at work (Box 3-1). Following the introduction of the programme in 1998, sickness absence in British Gas engineers was reduced by 39 percent in the first three years.

These findings are also confirmed in a study by the Health and Safety Executive (2004b) on managing sickness absence in the public sector. In a case study on Rolls-Royce, the NAO reported that the use of action plans including physiotherapy services (for both work and non-workplace injuries) had led to a reduction in staff absence from 2.9 percent (1999) to 2.4 percent (2002) of the workforce, saving around £11 million.

Box 3-1: MSDs return-to-work programme at Centrica

The nature of the work and the risks involved mean that Centrica's workforce is potentially vulnerable to MSD problems and their specialist skills are difficult to replace in the event of sickness absence.

British Gas (part of Centrica) decided to extend its normal Occupational Health case management within company-funded medical interventions for its gas engineers where appropriate. The rationale was to reduce the time required for access to diagnosis and treatments in the NHS, which negatively impacted on the company to meet customers' needs. In more recent years, the access to company-funded medical interventions has been extended to the whole of the Centrica workforce to mitigate sickness absence.

Centrica Occupational Health provides a full range of advisory services and although individuals may contact Occupational Health directly, it is normally an employee's line manager who makes the initial referral. If it is considered that a medical intervention would increase the likelihood of the employee remaining at work or would hasten their return to work, Centrica will consider funding the intervention from an extensive portfolio of providers covering both physical and mental ill-health including consultations, treatment and rehabilitation. For example:

- orthopaedic consultation and investigations followed by surgery, physiotherapy and six weeks of gym-based exercises to enable full rehabilitation
- musculoskeletal functional capacity assessment for an individual with shoulder problems, followed by physiotherapy
- physiotherapy for neck pain because of poor workplace posture
- a one-day back-care workshop followed by six weeks' gym membership and back exercise regime for an individual with a chronic history of well-documented and fully investigated back pain.

Centrica has agreed benefit in kind tax exemption with the Inland Revenue for musculoskeletal and mental health conditions for many employees, provided of course that the condition fulfils the criteria laid down by the Inland Revenue for tax exemption.

The rehabilitation programme and use of company-funded interventions has proved successful in reducing sickness absence and keeping employees at work. Following the introduction of the programme in 1998, sickness absence in British Gas engineers was reduced by 39 percent in the first three years. Although expenditure varies across the Centrica Group, the company continues to spend an average of £1 million yearly on funded interventions for British Gas engineers. About 13 percent of the engineers use the programme each year at an average cost of £588 each.

Source: Health and Safety Executive case study on Centrica; interview with Centrica.

3.2.2 Common mental health problems

Many types of workplace interventions address common health problems. These interventions can be preventive, supportive or rehabilitative.

Preventive interventions

Preventive interventions mainly refer to stress management interventions. These interventions help those employees who are not necessarily at risk of common mental health problems cope with stress and improve their ability to recognise potentially stressful situations early on, to prevent the building up of stress and its related ailments (anxiety and mild depression). Stress management interventions comprise several approaches aiming at “acquiring problem-solving skills, reducing negative coping styles, identifying potential stressors at work and developing strategies to minimise their impact and developing self-awareness in relation to stressors” (Seymour and Grove, 2005). Stress management interventions can be classified into three main types of stress approaches: individual versus global approaches, multimodal approaches and organisational development approaches. Individual approaches include individual training in the skills necessary to deal with perceived stress while global approaches are characterised by the provision of information alone or general group discussions. Multi-modal approaches combine a variety of methods that can include education, physical exercise, role-play and the acquisition of skills such as improved communication skills and muscle relaxation techniques. Organisational development approaches include interventions such as changes to the work environment (e.g. work practices, skills training to improve relations at work) (Box 3-2).

Box 3-2: Changes in work environment and conditions

Changes in work environment and work conditions can have positive health, wellbeing and work outcomes.

The Whitehall II study showed that UK civil servants in the lower grades perceived to have less control over their work than those in the more senior grades. Those working in the lower grades report higher rates of sickness absence, mental illness, heart disease and lower back pain. Egan et al. (2007) found evidence of health benefits when employee control improved, demands decreased or support increased. These findings are compatible with Karasek’s Demand Control (Support) model (Karasek, 2004) and current Department of Health policy directives. In their systematic review, Bambra et al. (2007) found that task structure interventions do not alter levels of employee control. However, where job control decreased and psychosocial demands increased, self-reported mental health worsened.

Brown et al. (2006) showed that interventions that include employer–employee partnership and/or consultation (e.g. health circles) demonstrated improved results compared with those that did not. Partnership and consultation are shown to improve communication, give employees a greater sense of control over their working environment and increase social support. The Whitehall II study supports Brown’s conclusion, showing that good levels of social support at work had a positive effect on mental health and reduced sickness absence. A lack of social support was associated with an increased risk of poor mental health. A poor work environment is one of the main factors explaining higher prevalence of depression among the lower grades. A review of participatory employee committees (Egan et al., 2007) synthesised 18 studies. Participatory employee committees that increased employee control were found to have a consistent and positive impact on self-reported employee health. The effects of health circles are inconclusive according to a review of five studies by Aust and Ducki (2004).

Sickness absence increased in the one controlled study, but decreased in the four uncontrolled studies.

There is strong evidence in the literature to suggest that changes to shift work patterns can have a positive effect on employee health. Bambra et al. (2008) synthesised 40 studies and found the health effects of changing to a compressed working week (four 12-hour shifts instead of five eight-hour shifts) were inconclusive, but seldom detrimental. In another study published the same year, Bambra et al. found beneficial effects on health and work–life balance from switching from a slow to fast shift pattern, switching from a backward to forward shift rotation and self-scheduling of shifts.

According to Seymour and Grove (2005), there is moderate evidence that stress management interventions have small or short-term impacts. The authors found that stress management interventions were overall effective in reducing stress levels, improving coping skills and psychological wellbeing of employees who were not considered at risk of developing common mental health problems. Murphy (1996), in his review of stress management interventions in work settings, found that a combination of interventions was more effective than a single intervention in helping employees appraise stressful situations and/or handle stress and its symptoms in a more effective way. In particular, this review found that a combination of muscle relaxation and cognitive behavioural therapy (CBT) seemed to be more effective and produce overall positive effects on both physiological outcomes and stress-related psychological symptoms. Edwards and Burnard (2003), in their review of stress management interventions for nurses in the mental health sector, found that such interventions contribute to reduce psychological distress and burnout and improve ability to cope and sickness absence.

Supportive and selective interventions

Supportive or selective interventions are aimed at employees identified as being at risk of mental health problems (Seymour and Grove, 2005). This assessment can be made either through the nature of their job role or through a range of assessment tools (see, for instance, Box 3-3); the objective of these interventions is to enable these individuals to remain at work (Seymour and Grove, 2005). These interventions can be divided into individual-level and organisational-level interventions. Individual-level interventions include CBT, other cognitive or educational interventions, supervisory training, multimodal interventions, selective case management, and computer-aided CBT. Organisational-level interventions encompass job reorganisation, other cognitive or educational interventions, supervisory training and multimodal interventions.

Box 3-3: Stress management and assistance at BT

The aim of BT's Mental Health Framework is to focus effort on actively promoting good mental health and preventing any adverse effects of work on mental health, as well as early identification and management of people at risk. STREAM (based on the Health and Safety Executive management standards for stress), BT's online stress risk assessment tool, was developed with human resources, union and line management involvement and has been rolled out across the company in the United Kingdom and different countries, in their own

language, like the Netherlands, Belgium, Spain, Germany, Italy and the United States.

Following completion of 30 simple questions, individuals and their nominated first or second line manager receive a tailored report with either a RED, AMBER or GREEN rating and a series of recommendations to follow to address the top four identified work-related stressors. Following a RED or AMBER report, the line manager must meet for a one-to-one meeting with the individual within 7 or 28 days respectively to draw up an action plan. Senior managers can also receive anonymous reports showing the qualitative and quantitative profiles of stress within their departments; results are compared with other groupings in the organisation. In addition, across the BT group different divisions can be contrasted to identify hot spots in terms of the scale and nature of stress. The use of externally produced stress management categories (i.e. the Health and Safety Executive's management standards) allows BT to benchmark results with any organisation using a similar approach.

Source: interview with BT and www.csreurope.org.

Seymour and Grove (2005) found that interventions focusing on individuals were most effective in producing positive health outcomes. The most effective ones included programmes focused on personal support, and training in individual and coping skills. Similarly, Milne et al. (1986) found that individual interventions such as behavioural assessment and learning or behavioural therapy produced positive effects such as “reduced absenteeism, reduced strain, improved work satisfaction, increased confidence and work skills”. Marine et al. (2006) found some evidence that certain organisational-level interventions which include communication or changes in work organisations for example can have a positive effect on stress levels as well as reduce the possibility of burnout and general symptoms. This review also estimates that the sustainability of the positive impacts of these interventions is similar to that of individual-level interventions with positive effects lasting on average from six months to two years.

Rehabilitative and return-to-work interventions

Rehabilitative interventions are aimed at those employees who have had “periods of mental ill-health related sickness”; their objective is to support these individuals’ rehabilitation and return to work (Seymour and Grove, 2005). Rehabilitative interventions employ the same programmes used for supportive or selective interventions (see, for instance, Box 3-4).

A review carried out by Seymour and Grove (2005) found conclusive evidence that brief forms of individual therapy, such as cognitive behavioural therapy, that lasted less than two months were the most successful form of intervention. In particular, the review found that CBT was effective whether delivered face-to-face or through computer-aided software; it also found “a stronger effect associated with employees in high control jobs”. Hill et al. (2007) concluded that CBT was effective in reducing not only psychological ill-health but also absenteeism. Bamberg and Busch (1996) also observed positive effects from interventions such as CBT at individual and organisational level. However, they found that positive effects at the individual level (e.g. improvements in somatic and mental symptoms) were much more pronounced than at the organisational level (e.g. on absenteeism rates). Van der Klink et al. (2001) found a similar result when they carried out a meta-analysis of individual and organisational-level interventions aimed at employees

with high and low levels of baseline stress. In fact, they found individual interventions successful in reducing psychological ill-health, improving coping skills and improving the work–life quality of employees, but the impact of these interventions on levels of absenteeism was found to be non-significant.

Box 3-4: Reintegration into BT after mental-health-related sickness absence

As part of their long-term structured approach to mental wellbeing, BT ensures that line managers frequently keep in touch with individuals on sick leave. A rehabilitation plan aims to help people return to work, initially working reduced hours. It looks at aspects of jobs that are particularly pressured and rearranges responsibilities. Jobs may be adjusted to reduce workload and there may be time off allocated to attend therapeutic sessions. Shift patterns also may be changed, allowing a later or earlier start to avoid rush-hour travel. The company also provides a quiet place to rest if individuals feel anxious or stressed.

In the first five years of this comprehensive, integrated approach, mental-health-related sickness absence and premature retirement decreased by 30 percent and 80 percent respectively. Almost 80 percent of people off work for more than six months with mental ill-health get back to their own jobs, compared with 20 percent nationally.

Source: www.csreurope.org.

There appears to be limited evidence on the work outcomes of mental health interventions. Hill et al. (2007), whose review explicitly focused on such outcomes, found that information related to absenteeism, employee turnover and return to work was scarce and that most of the literature on mental health interventions in the workplace focuses on “measures of stress, burnout or health-related outcomes such as measures of anxiety, depression or general health”. They offered an explanation for this by saying that “it may be that positive changes in the above measures may eventually lead to positive work outcomes but little firm evidence exists to support this so far”, and that “appropriately considering the efficacy of interventions in relation to such outcome measures could necessitate longer follow-up periods over which to detect meaningful change, presenting a significant challenge to evaluators”.

3.3 Worksite health promotion

Worksite health promotion (WHP) programmes are employer initiatives aimed at improving the health and wellbeing of workers. They include a wide range of initiatives designed to prevent the incidence of disease (Goetzel and Ozminkowski, 2008).

The scholarly literature has examined the evidence of the effectiveness of work-site health programmes to prevent cardio-respiratory health disorders induced by the lifestyle of workers (Hich et al., 2007) such as the consumption of alcohol, tobacco and poor diet.

3.3.1 Alcohol

Roman and Blum (1996) summarised 24 studies related to worksite interventions linked to alcohol-related problems. They concluded that investments directed at reducing alcohol-related problems overall result in positive outcomes. These outcomes were measured in

different ways, including changes in attitude around drinking and alcohol, decrease in consumption of alcohol, and alcohol-related effects on physical health.

Although clear guidelines and policies exist in the context of health and safety, this does not necessarily ensure that alcohol does not cause accidents at the workplace. Education, awareness and other types of interventions need to be equally recognised. In this field, Roman and Blum (1996) emphasised Employee Assistance Programmes (EAPs) as the most effective interventions for rehabilitating employees with alcohol problems or employees with alcohol-related problems. However, it is not clear which elements of EAPs are the key components for an effective intervention. In general, the literature suggests that effective intervention programmes need to be complemented with an adequate environment that recognises the employee's problems and offers adequate support. This support also includes training and educating supervisors (Health Development Agency, 2004).

3.3.2 Smoking

Cahill, Moher and Lancaster (2008) assessed the evidence of work-related interventions for smoking cessation in a Cochrane review covering 51 studies. Most of the evidence concerns the effectiveness of workplace interventions in terms of health outcomes rather than work outcomes.

The authors demonstrate that material and financial incentives to reduce smoking (through for example contests, raffles or promotional items) are not always effective. Nevertheless, both reviews show that material and financial incentives often result in higher participation/recruitment rates in smoking cessation programmes.

The authors distinguished between two types of interventions: those aimed at individual workers (i.e. group therapy, individual counselling, self-help materials, nicotine replacement therapy and social support) and those aimed at the workplace overall (i.e. comprehensive programmes). The authors found strong evidence that interventions such as individual and group counselling and pharmacological treatment to overcome nicotine addiction increase the likelihood of individual smokers quitting smoking. Self-help interventions and social support are less effective. The authors also showed limited evidence that participation in programmes can be increased by competitions and incentives organised by the employer. Finally, they failed to detect an effect of comprehensive programmes in reducing the prevalence of smoking. However, the authors looked at actual interventions only. There is evidence that smoking bans tend to be effective in reducing smoking prevalence. Such type of intervention is such, for instance, at NHS Scotland (Box 3-5).

Box 3-5: Alcohol and smoking cessation interventions at NHS Scotland

NHS Scotland is a non-smoking environment (other than in a few areas where long-term mental care is being undertaken) – this is a policy level intervention.

Staff have access to free smoking cessation support services, and information and advice on nicotine replacement therapy.

NHS organisations try to make sure that no staff member is under the influence of alcohol or drugs while at work (through observation and monitoring, and reporting by a staff member). They also provide information and advisory

services for staff who want to change their lifestyles, and have a clear disciplinary procedure for staff whose work is affected.

Failure to comply with health and safety regulations is a criminal offence, but employers do not have a right to conduct alcohol or drug testing without the informed consent of the staff member. Consent to testing is essential in all cases except for pre-employment screening.

Source: interview with NHS Scotland.

3.3.3 Diet

The reviews of nutrition and/or cholesterol intervention programmes discussed here indicate that these can improve health risk factors. Glanz, Sorenson and Farmer (1996) and Hennrikus and Jeffery (1996) together covered 70 studies. The review performed by Glanz, Sorenson and Farmer (1996) focused on worksite nutrition education programmes (group education, group education plus individual counselling/instruction, cafeteria-based programmes, and group education plus cafeteria-based programmes). Such interventions are used, for instance, at NHS Scotland (Box 3-6).

Glanz, Sorenson and Farmer (1996) showed that workplace nutrition and cholesterol intervention programmes are possible and that participants benefit in the short-term. Hennrikus and Jeffery (1996) concluded that programmes aimed at improving diet to decrease weight are effective. However, the findings from these reviews need to be interpreted with caution due to methodological limitations. For instance, the conclusions of the review carried out by Glanz, Sorenson and Farmer (1996) are limited by the design of studies under consideration (lack of control groups, use of non-randomised designs).

Glanz, Sorenson and Farmer (1996) reported positive outcomes on diet from nutrition and cholesterol intervention programmes. Similarly, Hennrikus and Jeffery (1996) reported outcomes in terms of positive participation rates and short-term weight loss. However, they expressed reservations about the existing evidence on weight loss and productivity gains for the long-term. Although interventions in the two reviews varied, interventions typically included group education, individual counselling and coaching, cafeteria-based programmes, audio-visual, telephone, self-help kits and a combination of these.

Box 3-6: Diet interventions at NHS Scotland

Shift work and long or unpredictable hours can create challenges to an optimal diet for NHS Scotland staff. There are several actions that are promoted to encourage a healthy diet by NHS Scotland staff.

All caterers in NHS Scotland need to try to achieve the standard of the Scottish Healthy Choices award. This is one way by which NHS Scotland encourages healthy eating at work.

NHS Scotland is trying to improve diet and get messages across about the importance of eating five portions of fruit and vegetables a day to staff (and the general public as well), for example with information leaflets.

NHS Scotland has also sponsored demonstrations about how to cook healthily for people who are recovering from heart attacks. These are not specifically for staff, but are open to staff in some areas. Often there is a better cost–benefit entailed in offering interventions to patients and to staff at the same time.¹⁵

Other actions are encouraged and including efforts to:

- encourage caterers to provide a wide choice of foods, ingredients, preparation and cooking methods, based on sound nutritional guidelines
- encourage managers to sell healthier alternatives in vending machines (e.g. fruit juices, wholemeal bread and sandwiches, fresh fruit, cereal bars)
- encourage NHS organisations to have a fridge and eating area if there is no dining room in the organisation, so staff can bring their own healthy foods
- organise special events (e.g. healthy eating weeks, taste-and-try days), so that staff are introduced to healthier food options in canteens.

Source: interview with NHS Scotland.

3.3.4 Physical activity

There is evidence that physical activity is beneficial for both mental and physical health. Several studies have shown that WHP programmes designed to increase workers' physical activity are effective in raising levels of physical activity among workers (Proper et al., 2003; Kallestal et al. 2004).

However, there is less compelling evidence about the effectiveness of worksite interventions on work outcomes and health risk indicators. Dishman et al. (1998), Proper et al. (2002) and Hagberg and Lindholm (2006) covered a total of 60 primary studies (26, 8 and 26, respectively) evaluating the effectiveness of these interventions. The types of interventions evaluated in the mentioned reviews covered two broad categories: “exercise”, which mainly includes participation in exercise groups and other physical activities such as walking; and “advice” interventions, which cover mainly advice, education, awareness and support for changing physical activity habits.

Dishman et al. (1998) analysed the effect of the interventions on health indicators such as changes in muscular strength, endurance or flexibility. Proper et al. (2003) found only

¹⁵ Source: interview with NHS Scotland.

limited evidence for a positive effect on health risk indicators such as physical fitness and general health. Proper et al. (2002) analysed the impact on absenteeism, job satisfaction and stress, as well as employees' turnover and productivity. Neither review reported a statistically significant impact of the intervention. Hagberg and Lindholm (2006) similarly concluded there was limited evidence on the cost-effectiveness of interventions aimed at improving physical activity. Although the reviews found overall limited evidence of interventions on people following a sedentary lifestyle, there seems to be some (although limited) evidence on the effectiveness of interventions aimed at high-risk groups (e.g. those with diabetes or cardio-vascular diseases) to promote physical activity and older people with heart failure. In contrast, another study commissioned by the Health and Safety Executive found evidence that work-site fitness programmes reduce absenteeism from work (Shepard, 1992; Lock and Colford, 2005).

Box 3-7: Specific health promotion interventions at Royal Mail Group

Health fairs

Health fairs have been set up to engage with primary care trusts (PCTs), charities and other bodies to promote health checks and healthy behaviours to staff. Royal Mail Group also uses their OHS supplier to carry out some of these health interventions (e.g. blood pressure checks). The fairs aim to strengthen and support the overall health promotion strategy of Royal Mail Group by extending their coverage and making programmes more interesting.

In-house newspapers

In-house newspaper, the *Courier*, includes basic health and wellbeing messages. It includes an A5 insert in each monthly issue. These inserts are like a programme approach so that in 26 months, people will have 26 inserts of basic health information that they can store away in a folder and bring home to share with family and friends.

Health trainers

So far, Royal Mail Group has trained 32 managers and they are also training first aiders to be more engaged and qualified in a wider range of issues than the traditional first aid remit. Health trainers and first aiders are employees trained to support the delivery of Royal Mail Group's health and wellbeing strategy. This initiative aims to build up a structure within Royal Mail Group so that in the regions people can meet and link up with their PCT, so they can help in delivering events such as the health weeks and also point themselves and colleagues to where they can get health help and support.

In-house canteen food

Different strategies have been followed in this area, including interventions to reduce salt and fat intake in the food provided by the caterers at Royal Mail Group's canteens; this was done in collaboration with the Food Standards Agency (FSA). First, the head of health asked kitchen chefs to reduce the amounts of salt. Second, different education and awareness activities were carried out at lunchtime to inform and show staff how to cook healthy food for themselves and their family. For example, staff were showed how to cook with low salt and low fat, while people from the local PCT often came to talk about eating behaviours. These interventions also included "Table Talks" where Royal Mail Group employees could talk to PCT staff about health issues and

ask questions, similarly to an intervention carried out in South London. These interventions have led to a high level of staff engagement.

Physical activity

Different alternatives are offered to employees to increase physical activity, although the average fitness level of Royal Mail Group's employees is good because they have physical jobs (e.g. postmen cycling or walking and carrying heavy mail bags). However, some sections of the staff have fitness levels that are a challenge: middle management, which is the less active section of staff, and women because many of them are overweight and leave the company three years before retirement age.

Source: interview with Royal Mail Group.

3.3.5 Multiple programme interventions

In this section we examine the evidence of multi-factorial and comprehensive workplace health programmes. The definition of these as well as the elements covered under these programmes varies in terms of the comprehensiveness, intensity and duration of the intervention activities (see, for instance, Heaney and Goetzel, 1997). As we discuss next, the literature overall concludes that the outcomes of workplace health programmes show positive effects on health risk factors, reduced sick days and absenteeism, and on returns on investment.

The systematic reviews by Heaney and Goetzel (1997), Pelletier (1997, 2001), and Engbers et al. (2005) all reported on the outcomes of the workplace health programmes measured in terms of the health risk factors of those in the intervention group. Heaney and Goetzel (1997) mostly reported a decrease in the health risk factors as a result of workplace health programmes providing health education to employees. The results of the review by Pelletier (2001) also revealed a positive impact of workplace health programmes on clinical outcomes. Pelletier included disease management programmes as part of the general workplace health programmes and emphasised the importance of targeting people with the highest risk factors. Engbers et al. (2005) evaluated 13 studies. In contrast to Heaney and Goetzel (1997) and Pelletier (2001), Engbers et al. (2005) focused on assessing the effectiveness of WHP programmes with an emphasis on environmental modifications, physical activity behaviour, dietary intake and health risk indicators. The programme proved to have positive outcomes on dietary intake. However, the evaluation found inconclusive evidence on physical activity behaviour and other health risk factors.

Heaney and Goetzel (1997) reported not only on the impact on health risk factors, but also on outcomes on levels of absenteeism, which also decreased as a result of the intervention. Furthermore, they argued, employee health is not the only factor affecting absenteeism. Morale, teamwork, supervisor–subordinate relations and organisational policies might also influence behaviour and consequently the levels of absenteeism in an organisation. Similarly, Aldana (2001) showed a positive correlation between workplace health programmes and lower levels of absenteeism. Although the review examined 72 studies, only 14 specifically evaluated absenteeism as an outcome measure of workplace health programmes. All 14 reported a reduction on absenteeism. Three studies reporting on absenteeism included a calculation of the cost savings directly linked to reduced absenteeism. The ratio of dollars invested to dollars saved as a result of less absenteeism ranged from 1:2.5 to 1:10.1. Chapman (2005) carried out a meta-evaluation of 56 studies. Sick leave and health costs were studied in almost 70 percent of the cases, which shows the significance of these outcomes for organisations that regard these figures as indicators of productivity and cost-effectiveness. Actual rates of absenteeism and sick leave were analysed in 25 studies. These studies showed that workplace health programmes decreased absenteeism and sick leave on average by 26.8 percent. Nevertheless, results varied across studies.

Aldana (2001) associates financial outcomes mainly to employee-related expenditure related to absenteeism and health care costs, where the latter includes the worker's compensation and disability costs. In the 29 studies reviewed by Aldana (2001), workplace

health programmes varied significantly in their definition and scope as well as in their research design. Hence, it is important to bear in mind that these methodological issues limit the generalisability of the results. Nevertheless, evidence showed overall that the programmes decreased the health risk scores, as well as the treatment costs, medical visits, hospital days, emergency care and other medical care costs.

In a few studies, the evaluators calculated the rate of return, which ranged from 1:4 to 1:6, meaning that for every dollar invested in health promotion programmes between four and six dollars were saved. Two of the studies included in the review highlighted the higher rates of return of programmes targeting high-risk populations. The 15 studies included in the review by Pelletier (2001) also provided cautious optimism about the cost-effectiveness of these worksite programmes. Offering only low intensity, short duration programmes aimed at raising awareness of health issues for all employees may not be satisfactory to achieve desired outcomes. Chapman (2005) reported average cost savings of 26.1 percent over a total of 28 studies reviewed.

More anecdotal evidence in case studies also shows the significant impact of a more comprehensive strategy. In Royal Mail Group, health and wellbeing policies have since 2004 led to improvements in absenteeism rates, achieving a reduction from 7 percent to 5 percent between January 2004 and May 2004 (equivalent to an extra 3,600 employees in work). Parcellforce Worldwide reduced absences from 7 percent to 4.5 percent in the same period (equivalent to an extra 104 employees at work). These significant reductions in absences have enabled Royal Mail Group to achieve significant cost savings of about £227 million in direct costs.

Box 3-8: Is it worthwhile investing in workplace interventions?

When employers invest in workplace interventions to improve the levels of health and wellbeing of their employees, they expect a financial return on their interventions.

Although many systematic reviews have examined the effectiveness of workplace interventions in terms of health outcomes, only a few are intended to evaluate their economic returns.

In an attempt to assess the economic effectiveness of workplace interventions, Tompa et al. (2007) recently published a systematic review of health and safety interventions with economic evaluations. This systematic review covers different sectors and interventions. The latter include ergonomic and other musculoskeletal disorder prevention programmes; occupational disease prevention programmes; disability management programmes; multi-faceted programmes, with two or more types of interventions; health promotion programmes; and programmes to reduce violence in the workplace.

The results of this review by sector are described below.

Healthcare and social services

There is moderate evidence that ergonomic and other MSD prevention programmes are worth undertaking for economic reasons.

There is moderate to limited evidence that occupational disease prevention interventions have positive financial implications.

Administrative and support services

There is moderate evidence that ergonomic and other MSD prevention programmes are worth undertaking for economic reasons.

Manufacturing and warehousing

There is strong evidence that ergonomic and other MSD prevention programmes are worth implementing.

There is, however, limited or mixed evidence of negative economic returns for multi-faceted programmes.

Transportation

There is moderate evidence that ergonomic and other MSD prevention programmes have economic impact.

For all other interventions, there is limited or no evidence on their economic effectiveness.

3.4 Conclusion

This chapter has reviewed the evidence on the effectiveness of workplace health interventions in terms of health and wellbeing outcomes. Before presenting the main findings, it is worth mentioning that few studies relate interventions directly to work outcomes, and the economic effectiveness of interventions varies across sectors (Box 3-8).

Finally, studies categorise interventions in slightly different ways, making direct comparisons between them difficult.

In Table 3-1 we summarise the evidence on health and wellbeing interventions.

Table 3-1: Summary of evidence on health and wellbeing interventions

Antecedent factors	Targets	Evidence on effectiveness in literature
Work-related	MSDs and LBP	<ul style="list-style-type: none"> - little evidence for preventive interventions such as back belt and lumbar supports - evidence of positive effects of education and training interventions - evidence that preventive exercise interventions have positive effects on leave due to LBP - evidence that preventive ergonomic interventions have positive impact on health and work outcomes - evidence of positive effects of supportive interventions targeted towards individuals still disabled and on sick leave after the acute stage - evidence of positive effects of physical conditioning programmes on work-related and health outcomes - evidence of positive effects of rehabilitation and return-to-work interventions after long-term absence due to MSDs
	Mental health	<ul style="list-style-type: none"> - evidence of positive effects of alterations to shift work patterns on health outcomes - evidence that preventive stress management interventions have positive effects on health outcomes - evidence of positive effects of supportive interventions focusing on personal support, training in individual coping skills on health and work outcomes - evidence that rehabilitative and return-to-work interventions such as cognitive behavioural training and cognitive behavioural therapy have positive effects on health outcomes - limited evidence on work outcomes
Lifestyle	Alcohol	<ul style="list-style-type: none"> - evidence of positive effects of interventions linked to alcohol-related problems on health outcomes - evidence that employee assistance programmes are the most effective interventions for achieving positive results on health outcomes - limited evidence on work outcomes
	Smoking	<ul style="list-style-type: none"> - evidence that material and financial incentives to reduce smoking do not always affect health outcomes - evidence of positive effects of interventions aimed at individual workers such as individual counselling on health outcomes - limited evidence on work outcomes
	Diet	<ul style="list-style-type: none"> - evidence that programmes aimed at improving nutrition behaviour to decrease weight are effective in promoting behaviour change - limited evidence on work outcomes
	Physical	<ul style="list-style-type: none"> - sufficient literature suggesting that physical activity is good for mental and physical health - limited evidence on work outcomes
	Multiple programme	<ul style="list-style-type: none"> - definition as well as the elements covered under these programmes varies tremendously - evidence that the outcomes of whp programmes show positive effects on health risk factors, reduced sick days and absenteeism

4.1 **Introduction**

In this chapter, we present the results of case studies. Dr Boorman identified four organisations that could provide some “good practice” in the design and implementation of workplace health practices, which might be informative for the NHS in England. These organisations were:

- Centrica – a large multinational utility company, based in the United Kingdom with operations in North America and Europe; it has almost 35,000 employees
- Royal Mail Group – the parent company of Royal Mail, Post Office and Parcelforce Worldwide; it employs more than 190,000 people in the United Kingdom
- BT – one of the world’s leading communications companies, operating in over 170 countries around the world; it employs over 100,000 employees
- NHS Scotland – the publicly funded healthcare system and biggest employer of Scotland.

We conducted telephone semi-structured interviews to better understand the objectives of workplace practices and interventions in each organisation; transferability to the NHS in England; and their effectiveness in terms of health and work outcomes. We interviewed one person in charge of health and wellbeing issues in each organisation. The case studies were then complemented by a documentary review of publicly available information on workplace health interventions in each of these organisations.

4.2 **Case study overview**

The case studies presented us with a wide range of interventions covering many of the antecedents influencing health and wellbeing at work such as work-related and lifestyle antecedent factors.¹⁶ The main observation has been that the organisations selected choose a comprehensive approach with a wide range of interventions that target both what they can control only indirectly, such as lifestyle issues, and what they can control more directly, such as work-related health disorders, i.e. mental ill-health and MSDs.

¹⁶ This section is mostly based on summaries of interviews with respondents in the respective organisations and in the unpublished documents of cases provided in the course of these interviews.

Though the characteristics of the workplace interventions might vary across these organisations, the “good practice” appears focused on designing more holistic strategies (e.g. NHS Scotland) that can influence both the generic antecedents driving poor health and wellbeing at work such as physical activity and smoking and also specific risk factors in each organisation.

To learn more about risks, most strategies allow management to monitor the overall problem of health and wellbeing in the organisation. This management information can assist in the targeting of interventions in the strategy and also give an indication of the strategy’s effectiveness.

Strategies increasingly try to target specific conditions and populations of the workforce as well as attempt to empower managers and employees to take responsibility for health and wellbeing in the workplace. Disease-specific interventions such as stress management and rehabilitation from MSDs feature prominently in the strategies of the case studies selected. There is more variance in the use of general information campaigns.

The justification in all organisations for their comprehensive strategies is that the health and wellbeing of staff is of key importance to achieving the objectives of the organisation.

Transferability

Few of the respondents noted specific concerns about the transferability of their initiatives to organisations such as the NHS. There seems to be an impression that these issues are common across large organisations and that interventions should therefore be broadly transferable. However, one respondent at BT stressed some possible barriers to the transferability of good practice. The emphasis BT puts on the capitalisation of technologies in its health and wellbeing programmes and initiatives might not be directly transferable to other contexts or to the NHS. This is very much influenced by the fact that BT employees are rather technology-oriented so this part of their programmes and initiatives will not necessarily be the most effective in a context where staff are not as knowledgeable about computers.

Branding and engagement

Branding and engagement were seen as important factors in generating awareness of the initiatives inside and outside the organisation. Most organisations (e.g. Royal Mail and BT brand their strategies to encapsulate various initiatives as well as gain visibility for the strategy). Royal Mail brings a number of initiatives together and ensures that they are more joined up; BT starts marketing the strategy to the end user, the employee. There are differences in how organisations market their strategies. Most target their initiatives at individuals and groups at risk, while some take more universal approaches applicable to the workforce, or use a mixture of the two.

Engagement with staff was seen as a key component in Royal Mail’s strategy. The Royal Mail respondent indicated that they had a clear message from their staff to “talk to us, and not to give out leaflets”. Engagement allows Royal Mail to conduct specific targeted interventions such as blood pressure clinics and urine checks as well as to collect some baseline data about their staff. For instance, through health checks in selected locations, Royal Mail learnt that approximately 10 percent of its staff did not eat even one portion of

fruit or vegetable per day. This type of information then feeds back into the general strategy.

The respondent for this study from Centrica reported that whereas many organisations use campaigns and posters to promote health and wellbeing, such campaigns do not work at Centrica because its workforce is spread across the whole of the United Kingdom and is predominantly field based. Therefore, Centrica has to use tailored communication channels to disseminate information on health and wellbeing.

BT also mentioned engagement and outreach as a critical factor in the success of health campaigns. The challenge is to achieve high levels of participation and engagement among their staff. This is a particular challenge given that over 75 percent of their staff are male, aged 42–44, and many, for example those who work in the “Openreach” line of business, are out and about constantly. BT therefore needs to sell its initiatives as something that makes sense to these employees. In practice, each line of business uses multiple communications channels to get maximum penetration – it's about segmenting the market and pitching messages appropriately. BT also co-brands much of its health and wellbeing material with the unions to give it added legitimacy as well as tailor the content and delivery methods of the messages. They also make use of incentives to engage staff. For instance, if staff register for a particular event, the organisation enters them in a draw for health-related prizes to get them involved.

Such incentives are also evident in NHS Scotland. The Healthy Working Lives Award Programme, which integrates the Scotland's Health at Work programme, includes thinking about how health and wellbeing can be actively promoted in the workplace, such as by supporting smoking cessation or healthy eating. Such a programme encourages NHS organisations to pay attention to the health and wellbeing of the staff. For example, it provides employers and employees with the opportunity to have one-to-one discussions about their lifestyle and to identify changes they could make to improve their health. This process is a criterion for being awarded a Silver Healthy Working Lives Award.

Other companies such as BT use more universal information campaigns to raise awareness about illnesses (e.g. diabetes, heart disease). Their unified underlying message is to “reduce health risks through exercise, diet and nutrition”. At the very least, each campaign uses a communication site with information posted on the intranet, through web newsletters and in hard copy. BT also organises some campaigns using road show programmes and organises health fairs in order to reach different categories of workers.

Finally, Centrica focuses more on training and workshops (e.g. training on how to deal with specific clinical conditions and lifestyle workshops) than wider information campaigns, though it has universal programmes such as discounted gym membership. This direct approach might empower individuals to take more responsibility for their health and wellbeing.

Empowering employees and line managers

Many organisations have started using toolkits to assist management and staff to identify problems of health and wellbeing and correct those if possible. These interventions target the individual and lines of accountability in the workplace. For instance, BT has an “Achieving the Balance” online programme, which helps people and managers to address

issues around the work–life balance of employees. Centrica has taken an approach of training line managers, so that they are comfortable dealing with and managing underlying health conditions and needs of employees in the workplace, for instance their mental health, flu and back problems. Its “Building Confidence” programme was launched in early 2009 to increase management capability in dealing with health issues in the workplace. It aims to train managers how to have a conversation when people call in sick, how to manage somebody on day one of absence versus day 50 of absence, how to understand what is stopping somebody from coming into work and to identify what support measures can be provided to aid someone who is returning to work after sickness. Organisations not only empower managers and employees in the occupational health area by providing information on health and wellbeing; they also use direct counselling and problem management. For instance, BT trains line managers through a computer-based programme called STRIDE. Such a programme informs them about the responsibilities they have towards their employees and also tells them about other training programmes related to stress management.

Treating those who are chronically ill

All strategies encapsulate forms of tertiary treatment for physical and mental health problems. BT’s rehabilitative interventions for mental health include a Mental Health First Aid training course for line managers inspired by work done in Australia and Scotland. This is delivered by a third party Employee Assistance Management (EAM) team, part of a service which also provides telephone and face-to-face counselling and a helpline. The EAM consultant team also provides advice and support to managers who are managing difficult people situations. This is an entirely confidential service.

The strategies in the case studies selected all have similar interventions to manage the return to work process of longer-term absentees. They also have strategies to address MSDs. At Royal Mail, MSDs are the largest cause of sickness. Therefore, they have implemented a rehabilitation psycho-social model. The intervention resulted in 70 percent of people coming back to their normal duty (sometimes part-time). Royal Mail also reported a return on investment of £2.50 saved for every £1 invested. The psycho-social model has several elements to it. One is assessment of how much a person can do (their levels of stress, how much they can lift, how much strength they have, etc.). In other words, it is like a “glorified physio” who helps someone assess what they need for their job. Instead of focusing on physical activity exercises only, the programme provides training and education.

Evaluation of effectiveness

An important area of variance in case studies seems to be the evaluation of effectiveness of the strategy.

Royal Mail has undertaken some evaluation work on the effectiveness of its strategy. Royal Mail also has a virtual company model, which represents the total number of absent sick workers (about 10,000). This allows Royal Mail management to collect statistics on the absent sick as well as calculate the cost of the absent sick to the organisation. Marsden and Moriconi (2008) recently reviewed the effectiveness of Royal Mail’s health and wellbeing strategy. In their publicly available report *The Value of Rude Health*, the authors showed the positive effects of the strategy in terms of work outcome (Box 4-1). Royal Mail Group

has considerably reduced absenteeism, allowing business units to make significant cost savings.

Centrica has started reporting publicly on the effectiveness of its strategy in key areas, and BT reports internally to management on key performance areas. These include sickness absence by cause, injury rates, work-related illness, Occupational Health Services referral rates and uptake of its Employee Assistance Programme. Centrica goes as far as to benchmark its performance against other more similar organisations on the basis of Health and Safety Executive standards. A respondent for NHS Scotland pointed out that such measurement and evaluation was more problematic in NHS Scotland (Box 4-2), but they did set a target to reduce sickness absence below 4 percent. Though we only looked at a small number of cases, this might be indicative of some issues around performance assessment and health surveillance in occupational health services of large public sector organisations compared with private sector providers. This observation seems especially relevant in more decentralised public sector organisations. This in turn could have some consequences for the targeting of strategy in public sector organisations.

Table 4-1: Some key components of occupational health strategy in case studies

Organisation	Strategy	Lifestyle	Clinical	Work-related	Health Surveillance
Royal Mail Group	- Feeling First Class	- A range of health interventions including in-house canteens, information provision, and physical health promotion	- Rehabilitative MSD programme	- Standard and common return to work approach	- Evaluation and virtual company approach for line managers
BT	- Work Fit Programme	- Six information campaigns covering main risks to organisation - Online stress assessment tool (STREAM)	- Employee Assistance Service, which includes counselling	- MSD information provision - Return to work procedures - "Achieving the balance" – online tool for employees and managers to target work-life balance	- Internal reporting on main occupational health indicators
Centrica	- No overall example, but "Building Confidence" programme to train managers	- Targeted health promotion not including campaigns on physical activity and less emphasis on smoking and alcohol programmes	- MSD rehabilitation - Education and training on certain conditions	- Return to work procedures	- Reporting on main occupational health indicators
NHS Scotland	- Comprehensive recent strategy	- The Healthy Working Lives Award system	- Pre-employment health checks - MSD rehabilitation	- Return to work	- Lack of evaluation on outcomes - Staff survey

Source: RAND Europe compilation.

Box 4-1: Effectiveness of health and wellbeing policies in Royal Mail Group

Health and wellbeing policies at Royal Mail Group have had several significant effects since 2004:

- Improvements in absenteeism rates with Royal Mail achieving a reduction from 7 percent to 5 percent between January 2004 and May 2004 (equivalent to an extra 3,600 employees in work) and Parcelforce Worldwide reducing absences from 7 percent to 4.5 percent in the same period (equivalent to having an extra 104 employees at work).
- These significant reductions in absences have enabled Royal Mail Group to achieve important cost savings: the achieved reduction in absences since 2004 could have contributed to a total saving of about £227 million in terms of direct costs.
- Controlling absence has enabled managers at Parcelforce Worldwide to hit their targets more easily because it “removes unpredictability in meeting profitability targets that managers set, enabling them to keep unit costs down as well as hit targets for items delivered per day and grow depot net income more easily”. Reducing absences by 1 percent across all depots is worth “£1,317,000 to Parcelforce Worldwide annually in terms of meeting net income targets”.
- Tackling absenteeism reduces Royal Mail Group’s dependency on replacement labour, including agency staff. Evidence from Parcelforce Worldwide shows that such a reduction in dependence on these staff “safeguards indicators such as Quality of Service (QoS) and improves net income through bringing costs down”.
- Improvements in QoS enable Parcelforce Worldwide to “capture additional business and improve net income”.

Source: headline findings of the Value of Rude Health (Marsden and Moriconi, 2008).

Box 4-2: Problems in evaluating effectiveness of health interventions in NHS Scotland

Trying to tease out the effectiveness of various interventions is very hard when one considers a population of 160,000 people working in NHS Scotland.

Statistics on staff satisfaction, retention and sickness absence are difficult to attribute clearly to the health and safety interventions. They have a target to reduce sickness absence below 4 percent.

An evaluation of interventions is required under the Healthy Working Lives Award scheme, but the respondent does not think they are able to show a cause and effect relationship, for example between the health and safety interventions specifically and sickness absence results within a health board – at least not in general.

Some things can be correlated, such as reducing MSDs in staff and the interventions adopted to do so. The interventions do result in a reduction in musculoskeletal injuries.

In terms of specific sickness absence, one can look at the cause of absence and at trends reducing over time as a result of interventions.

4.3 Conclusion

There are a number of wider themes that we can draw out of the case studies. We present them below:

- The case studies selected take a holistic approach to the health and wellbeing of employees. The organisations selected choose a comprehensive approach with a wide range of interventions that target both what they can control only indirectly such as lifestyle and clinical issues as well as what they can control more directly such as work-related issues including job design and return to work programmes.
- The case studies try to target specific risk groups and problems in health and wellbeing. To learn more about risks, most strategies allow management to monitor the overall problem of health and wellbeing in the organisation. This management information can assist in the targeting of interventions in the strategy and also give an indication about the effectiveness of the strategy.
- Strategies focus on branding of the strategy and tailoring messages to the likely end users of health and wellbeing interventions. Branding strategies bring a number of initiatives together and ensure that they are more joined up; tailoring messages start marketing the strategy to end users – employees. Strategies tend to be increasingly targeted and risk based, rather than containing universal campaigns.
- The case studies selected aim to empower line managers to identify problems, and staff to take responsibility for their health and wellbeing. Many organisations have started using toolkits to assist management and staff to identify problems of health

and wealth-being and correct them if possible. These interventions target individuals and lines of accountability in the workplace.

- The case studies selected use a similar range of interventions to treat the long-term absent. The strategies in the case studies selected have more similar procedures to manage the return to work process management of longer-term absentees.
- Organisations are increasingly measuring and benchmarking the effectiveness of interventions. The case studies selected often collect information from the interventions to monitor the overall problem and target interventions more effectively in the future. They increasingly make information public and try to benchmark against the performance of the UK standard or other organisations.

REFERENCES

Reference list

Aldana, S. G., "Financial Impact of Health Promotion Programs: A Comprehensive Review of the Literature," *American Journal of Health Promotion*, Vol. 15, No. 5, 2001, pp. 296–320.

Askenazy, P., *Les Désordres du Travail: Enquête sur le Nouveau Productivisme*, Seuil: La République des Idées, 2004.

Aust, B., and A. Ducki, "Comprehensive Health Promotion Interventions at the Workplace: Experiences with Health Circles in Germany," *Journal of Occupational Health Psychology*, Vol. 9, 2004, pp. 258–270.

Bamberg, E and C. Busch (1996), Betriebliche Gesundheitsförderung durch Streßmanagementtraining: Eine Metaanalyse (quasi-)experimenteller Studien. Zeitschrift für Arbeitsund Organisationspsychologie, 40(3), pp. 127-137.

Bambra, C., M. Egan, S. Thomas, M. Petticrew, and M. Whitehead, "The Psychosocial and Health Effects of Workplace Reorganisation. 2. A Systematic Review of Task Restructuring Interventions," *Journal of Epidemiology and Community Health*, Vol. 61, 2007, pp. 1028–1037.

Bambra, C., M. Gibson, A. J. Sowden, K. Wright, M. Whitehead, and M. Petticrew, "Working for Health? Evidence from Systematic Reviews on the Effects on Health and Health Inequalities of Organisational Changes to the Psychosocial Environment," *Preventive Medicine*, Vol. 48, No. 5, 2008, pp. 454–461.

Bambra, C., M. M. Whitehead, A. J. Sowden, L. Akers, and M. P. Petticrew, "Shifting Schedules: the Health Effects of Reorganizing Shift Work," *American Journal of Preventive Medicine*, Vol. 34, No. 5, 2008, pp. 427–434.

Bevan, S., E. Passmore, and M. Mahdon, *Fit for Work? Musculoskeletal Disorders and Labour Market Participation*, London: The Work Foundation, 2007.

Black, C., *Working for a Healthier Tomorrow*, London: The Stationery Office, 2008.

Blaxter, M., *Health and Lifestyles*, New York: Routledge, 1991.

Brewer, S., D. Van Eerd, B. C. Amick, E. Irvin, K. M. Daum, F. Gerr, J. S. Moore, K. Cullen, and D. Rempel, "Workplace Interventions to Prevent Musculoskeletal and Visual Symptoms and Disorders Among Computer Users: a Systematic Review," *Journal of Occupational Rehabilitation*, Vol. 16, No. 3, 2006, pp. 317–350.

- Briand, C., M.-J. Durand, L. St Arnaud, and M. Corbière, "How Well do Return-to-Work Interventions for Musculoskeletal Conditions Address the Multicausality of Work Disability?," *Journal of Occupational Rehabilitation*, Vol. 18, 2008, pp. 207–217.
- Brown, A., A. Charlwood, C. Forde, and D. Spencer, *Changing Job Quality in Great Britain 1998–2004*, Employment Relations Research Series, No. 70, London: Department of Trade and Industry, 2006.
- BUPA, *BUPA Wellness Launches New Health at Work Service for SMEs*, London: BUPA, 5 October 2005.
- Bültman, U., D. Sherson, J. Olsen, C. Lysbeck Hansen, T. Lund, and J. Kilsgaard, "Coordinated and Tailored Work Rehabilitation: A Randomized Controlled Trial with Economic Evaluation Undertaken with Workers on Sick Leave Due to Musculoskeletal Disorders," *Journal of Occupational Rehabilitation*, Vol. 19, No. 1, 2009, pp. 81–93.
- Cahill, K., Moher M., and T. Lancaster, "Workplace Interventions for Smoking Cessation: A Review," *Cochrane Database Systematic Reviews*, Vol. 8, No. 4, 2008.
- Chapman, L. S., "Meta-evaluation of Worksite Health Promotion Economic Return Studies: 2005 Update," *American Journal of Health Promotion*, July/August 2005.
- Childress, J. M., and G. M. Lindsay, "National Indications of Increasing Investment in Workplace Health Promotion Programs by Large- and Medium-Size Companies," *North Carolina Medical Journal*, Vol. 67, No. 6, 2006, pp. 449–452.
- Curtis Breslin, F., and P. Smith, "Age-Related Differences in Work Injuries: A Multivariate, Population-Based Study," *American Journal of Industrial Medicine*, Vol. 48, 2005, pp. 50–56.
- Daniels, K., and A. Guppy, "Occupational Stress, Social Support, Job Control, and Psychological Wellbeing," *Human Relations*, Vol. 12, 1994, pp. 1523–1544.
- Danna, K., and R. W. Griffin, "Health and Wellbeing in the Workplace: A Review and Synthesis of the Literature," *Journal of Management*, Vol. 25, No. 3, 1999, pp. 357–384.
- Dishman, R. K., B. Oldenburg, H. O'Neal, R. J. Shephard, "Worksite Physical Activity Interventions," *American Journal of Preventive Medicine*, Vol. 15, No. 4, 1998.
- Edwards, D., and P. Burnard, "A Systematic Review of Stress and Stress Management Interventions for Mental Health Nurses," *Journal of Advanced Nursing*, Vol. 42, No. 2, 2003, pp. 169–200.
- Egan, M., C. Bamba, S. Thomas, M. Petticrew, M. Whitehead, and H. Thomson, "The Psychosocial and Health Effects of Workplace Reorganisation. 1. A Systematic Review of Organisational-level Interventions that Aim to Increase Employee Control," *Journal of Epidemiology and Community Health*, Vol. 61, 2007, pp. 945–954.
- Elders, L. A., A. J. van der Beek, and A. Burdof, "Return to Work After Sickness Absence due to Back Disorders," *International Archive of Occupational Environmental Health*, Vol. 73, No. 5, 2000, pp. 339–348.
- Emmet, E. A., "Physical and Chemical Agents at the Workplace," in G. M. Green and F. Baker (eds.), *Work, Health, and Productivity*, New York: Oxford University Press, 1991.

Engbers, L., M. van Poppel, M. Chin, A Paw, and W. van Mechelen, "Worksite Health Promotion Programs with Environmental Changes: A Systematic Review," *American Journal of Preventive Medicine*, Vol. 29, No. 1, 2005, pp. 61–70.

European Commission, *Employment in Europe*, Luxembourg: Office for Official Publications of the European Communities, 2008.

European Commission, *Improving Quality and Productivity at Work: Community Strategy 2007–2012 on Health and Safety at Work*, Communication from the Commission to the Council and the European Parliament, 2007

European Network for Workplace Health Promotion, *Making the Case for Workplace Health Promotion – Analysis of the Effects of WHP*, Brussels: ENWHP, 2004.

Ferrie, J. E., "Health Consequences of Job Insecurities," in J. Ferrie, M. Marmot, J. Griffiths, and E. Ziglio (eds.), *Labour Market Changes and Job Insecurity: A Challenge for Social Welfare and Health Promotion*, WHO Regional Publications, European Series, No. 81, Copenhagen: World Health Organization, 1999.

Franche, R. L., K. Cullen, J. Clarke, E. Irvin, S. Sinclair, and J. Frank, "Workplace-based Return to Work Interventions: A Systematic Review of the Quantitative Literature," *Journal of Occupational Rehabilitation*, Vol. 15, No. 4, 2005, pp. 607–631.

Frank, J., S. Sinclair, S. Hogg-Johnson, H. Shannon, C. Bombardier, D. Beaton, and D. Cole, "Preventing Disability from Work-related Low Back Pain: New Evidence Gives New Hope – If We Can Just Get All the Players Onside," *Canadian Medical Association Journal*, Vol. 158, No. 12, 1998, pp. 1625–1631.

Gallagher, C., E. Underhill, and M. Rimmer, *Occupational Health and Safety Management Systems: A Review of their Effectiveness in Securing Healthy and Safe Workplaces*, Sydney: National Occupational Health and Safety Commission, 2001.

Gatty, C. M., M. Turner, D. J. Buitendorp, and H. Batman, "The Effectiveness of Back Pain and Injury Prevention Programs in the Workplace," *Work*, Vol. 20, No. 3, 2003, pp. 257–266.

Glanz, K., G. Sorenson, and A. Farmer, "The Health Impact of Worksite Nutrition and Cholesterol Intervention Programs," *American Journal of Health Promotion*, Vol. 10, No. 6, 1996, pp. 453–470.

Goetzel, R. Z., and R. J. Ozminkowski, "The Health and Cost Benefits of Work Site Health Promotion Programs," *Annual Review of Public Health*, Vol. 29, pp. 303–323, 2008.

Gollac, M., and S. Volkoff, *Les Conditions de Travail*, Paris: La Découverte, Collection Repères, 2007.

Green, G. M., and F. Baker (eds.), *Work, Health, and Productivity*, New York: Oxford University Press, 1991.

Hagberg, L. A., and L. Lindholm, "Cost-effectiveness of Health Care-based Interventions Aimed at Improving Physical Activity," *Scandinavian Journal of Public Health*, Vol. 34, No. 6, 2006, pp. 641–653.

- Health and Safety Executive, *Managing Sickness Absence Case Study (Centrica)*, 12 May 2008. As of July 22, 2009: <http://www.hse.gov.uk/sicknessabsence/casestudies/centrica.htm>.
- Health and Safety Executive, "Interim Update of the Costs to Britain of Workplace Accidents and Work-Related Ill-health", note by HSE's Economic Advisers Unit, 2004a. As of July 31, 2009: [http://www.hm-treasury.gov.uk/d/5\(1\).pdf](http://www.hm-treasury.gov.uk/d/5(1).pdf).
- Health and Safety Executive, *Managing Sickness Absence in the Public Sector: A Joint Review by the Ministerial Task Force for Health, Safety and Productivity and the Cabinet Office*, [London]: [Department for Work and Pensions], 2004b.
- Health and Safety Executive, Health and Safety Statistics 2007/08, Caerphilly, HSE, 2008.
- Health Development Agency, "Workplace Interventions: Alcohol and Diet," *HDA Briefing*, 19 June 2004.
- Heaney, C. A., and R. Z. Goetzel, "A Review of Health-related Outcomes of Multi-component Worksite Health Promotion Programs," *American Journal of Health Promotion*, Vol. 11, No. 4, 1997, pp. 290–307.
- Hemp, P., "Presenteeism: At Work – But Out of It," *Harvard Business Review*, October 2004.
- Hennrikus, D. J., and R. W. Jeffery, "Worksite Intervention for Weight Control: A Review of the Literature," *American Journal of Health Promotion*, Vol. 10, No. 6, 1996, pp. 471–498.
- Hill, D., D. Lucy, C. Tyers, and L. James (2007), *What Works at Work?: Review of Evidence Assessing the Effectiveness of Workplace Interventions to Prevent and Manage Common Healthcare Problems*, Norwich: HMSO.
- International Labour Organisation, *Occupational Health Services Convention*, ILO Convention No. 161, 1985. As of May 7, 2009: http://www.ilocarib.org.tt/projects/cariblex/pdfs/ILO_Convention_161.pdf.
- Kallestal, C., M. Bjurvald, E. Menckel, A. Schoerstrom, L. Schelp, and C. Unge, *Workplace Health Promotion: Effects of Interventions Referred to in Systematic Knowledge Reviews and in Swedish Reports*, Swedish National Institute of Public Health, 2004.
- Karasek, R. A., "An Analysis of 19 International Case Studies of Stress Prevention Through Work Reorganization Using the Demand/Control Model," *Bulletin of Science, Technology and Society*, Vol. 24, No. 5, 2004, pp. 446–456.
- Karjalanian, K., A. Malmivaara, M. M. van Tulder, M. Roine, R. Jauhiainen, H. Hurri, and B. Boes, "Multidisciplinary Biopsychosocial Rehabilitation for Subacute Low Back Pain Among Working Age Adults," *Cochrane Database of Systematic Reviews*, Vol. 3, 2003.
- Kreis, B. T., and W. Bodeker, *Health-related and Economic Benefits of Workplace Health Promotion and Prevention: Summary of the Scientific Evidence*, Essen: BKK Bundesverband, 2004.
- Linton, S. J., and M. W. van Tulder, "Preventive Interventions for Back and Neck Pain Problems," *Spine*, Vol. 26, No. 7, 2001, pp. 778–787.

- Lock, D., and N. Colford, *International Review of Literature Relating to Benefits of Limbering up at Work*, prepared by Human Engineering Limited, Research Report 309, Caerphilly: Health and Safety Executive, 2005.
- Lucas, R. E., E. Diener, and E. Suh, "Discriminant Validity of Wellbeing Measures," *Journal of Personality and Social Psychology*, Vol. 71, No. 3, 1996, pp. 616–628.
- Maher, C. G., "A Systematic Review of Workplace Interventions to Prevent Low Back Pain," *Australian Journal of Physiotherapy*, Vol. 46, No. 4, pp. 259–269, 2000.
- Marine, A., J. Ruotsalainen, C. Serra, and J. Verbeek, "Preventing Occupational Stress in Healthcare Workers," *Cochrane Database of Systematic Reviews*, Vol. 4, 2006.
- Marsden, D., and S. Moriconi, *The Value of Rude Health*, report for Royal Mail Group, London: London School of Economics, 2008.
- Melamed, S., D. Yekutieli, P. Fromm, E. Kristal-Boneh, and J. Ribak, "Adverse Work and Environmental Conditions Predict Occupational Injuries," *American Journal of Epidemiology*, Vol. 150, No. 1, 1999, pp. 18–26.
- Milne, D., C. Burdett and J. Beckett (1986), "Assessing and reducing the stress and strain of psychiatric nursing", *Nursing Times*, 82, pp. 59–62.
- Murphy, L. R., "Stress Management in Work Settings: A Critical Review of the Health Effects," *American Journal of Health Promotion*, Vol. 11, No. 2, 1996, pp. 112–35.
- Murphy, L. R., "State-of-Science Review: SR-C1, Current Sources of Workplace Stress and Wellbeing," in Foresight, *Mental Capital and Wellbeing: Making the Most of Ourselves in the 21st Century*, London: Foresight Mental Capital and Wellbeing Project, The Government Office for Science, 2008.
- National Audit Office, *The Management of Staff Sickness Absence in the National Probation Service*, London: The Stationery Office, 2006.
- National Audit Office, "The Management of Staff Sickness Absence in Department of Transport and its agencies", London: The Stationery Office, 2007.
- Pathak, M., *The Costs to Employers in Britain of Workplace Injuries and Work-related Ill-health in 2005/06*, Health and Safety Executive Discussion Paper Series, No. 2, September 2008. As of July 31, 2009: <http://www.hse.gov.uk/economics/research/injuryill0506.pdf>
- Pelletier, K. R., "Clinical and Cost Outcomes of Multi-factorial, Cardiovascular Risk Management Interventions in Worksites: A Comprehensive Review and Analysis," *Journal of Occupational Environmental Medicine*, Vol. 39, No. 12, 1997, pp. 1154–1169.
- Pelletier, K. R., "Review and Analysis of the Clinical and Cost-effectiveness Studies of Comprehensive Health Promotion and Disease Management Programs at the Worksite: 1998-2000 Update," *American Journal of Health Promotion*, Vol. 16, No. 2, 2001, pp. 107–116.
- PricewaterhouseCoopers, *Building the Case for Wellness*, [London]: PricewaterhouseCoopers LLP, 2008.

- Proper, K. I., B. J. Staal, V. H. Hildebrandt, A. J. van der Beek, “Effectiveness of Physical Activity Programs at Worksites with Respect to Work-related Outcomes,” *Scandinavian Journal of Work, Environment & Health*, Vol. 28, No. 2, 2002, pp. 75–84.
- Proper, K. I., M. Koning, A. J. van der Beek, V. H. Hildebrandt, R. J. Bosscher, and W. Van Mechelen, “The Effectiveness of Worksite Physical Activity Programs on Physical Activity, Physical Fitness, and Health,” *Clinical Journal of Sport Medicine*, Vol. 13, No. 2, 2003, pp. 106–117.
- RED Scientific Limited, *Cabinet Office Analysis of Sickness Absence in the Civil Service, FY2006-07 Report*, Alton: RED Scientific Limited, 2007.
- Rivilis, I., D. Van Eerd, K. Cullen, D. C. Cole, E. Irvin, J. Tyson, and Q. Mahood, “Effectiveness of Participatory Ergonomic Interventions on Health Outcomes: A Systematic Review,” *Applied Ergonomics*, Vol. 39, No. 3, 2008, pp. 342–358.
- Robson, L., J. Clarke, K. Cullen, A. Bielecky, C. Severin, P. Bigelow, E. Irvin, A. Culyer, and Q. Mahood, *The Effectiveness of Occupational Health and Safety Management Systems: A Systematic Review*, Toronto: Institute for Work & Health, 2005.
- Roman, P. M., and T. C. Blum, “Alcohol: A review of the Impact of Worksite Interventions on Health and Behavioral Outcomes,” *American Journal of Health Promotion*, Vol. 11, No. 2, 1996, pp. 136–149.
- Sainsbury Centre for Mental Health, *Mental Health at Work: Developing the Business Case*, Policy Paper 8, London: Sainsbury Centre for Mental Health, 2007.
- Schonstein, E., D. Kenny, J. Keating, B. Koes, and R. D. Herbert, “Physical Conditioning Programs for Workers with Back and Neck Pain: A Cochrane Systematic Review,” *Spine*, Vol. 28, No. 19, 2003, pp. 391–395.
- Shepard, R. (1992) “Twelve years experience of fitness program for the salaried employees of a Toronto life assurance company”, *American Journal of Health Promotion*, 6(4), pp. 292-301
- Secretaries of State of the Department for Work and Pensions and the Department of Health, *Improving Health and Work: Changing Lives: The Government's Response to Dame Carol Black's Review of the Health of Britain's Working-age Population*, Cm 7492, London: The Stationery Office, 2008.
- Seymour, L., and B. Grove, *Workplace Interventions for People with Common Mental Health Problems: Evidence Review and Recommendations*. London: British Occupational Health Research Foundation, 2005.
- Shaw, W., G. Pransky, and T. Fitzgerald, “Early Prognosis for Low Back Disability: Intervention Strategies for Health Care Providers,” *Disability & Rehabilitation*, Vol. 23, No. 18, 2001, pp. 815–828.
- Spurgeon, A., D. Gompertz, and J. M. Harrington, “Modifiers of Non-specific Symptoms in Occupational and Environmental Syndromes,” *Occupational and Environmental Medicine*, Vol. 53, 1996.

Stellman, J. M. and B. R. Snow, "Occupational Safety and Health Hazards and the Psychosomatic Health and Wellbeing of Workers," in M. F. Cataldo and T. J. Coates (eds.), *Health and Industry: A Behavioral Medicine Perspective*, New York: John Wiley & Sons, 1986.

Tompa, E., R. Dolinschi, C. de Oliveira, and E. Irvin, *A Systematic Review of OHS Interventions with Economic Evaluations*, Toronto: Institute for Work & Health, 2007.

Van der Klink, J. L., R. W. B. Blonk, A. H. Schene, and F. J. H. van Dijk, "The Benefits of Interventions for Work-related Stress," *American Journal of Public Health*, Vol. 91, No. 2, 2001, pp. 270–276.

Vaughan-Jones, H., and L. Barham, *Healthy Work Challenges and Opportunities to 2030*, London: BUPA, 2009.

Verhagen, A. P., C. Karelis, S. M. A. Bierma-Zeinstra, L. Burdorf, A. Feleus, S. Dahaghin, H. C. W. de Vet, and B. W. Koes, "Ergonomic and Physiotherapeutic Interventions for Treating Work-related Complaints of the Arm, Neck or Shoulder in Adults (Review)," *Cochrane Database Systematic Reviews*, Vol. 19, No. 3, 2006.

Waddell, G., and A. K. Burton, *Occupational Health Guidelines for the Management of Low Back Pain at Work – Evidence Review*, London: Faculty of Occupational Medicine, 2000.

Warr, P., "Wellbeing and the Workplace," in D. Kahneman, E. Diener, and N. Schwarz (eds.), *Wellbeing: Foundations of Hedonic Psychology*, New York: Russell Sage Foundation, 1999.

World Health Organization, *Constitution of the World Health Organization*. Geneva: World Health Organization, 1948.