

# **UNDERSTANDING AND PREVENTING FALLS**

**EDITED BY**

**Roger Haslam  
David Stubbs**



**Taylor & Francis**  
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# Preface

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Falls are a leading cause of injury in the workplace, health care, home, and other domestic situations, to the extent that it might reasonably be argued that the falls problem is of international epidemic proportions. Although reductions have occurred in the number and severity of injuries from other causes over recent decades, the incidence of injuries from falling has remained at a consistently high level. Despite this, many falls are preventable. This book provides an authoritative guide to the nature and extent of the falls problem, emphasising that falls occur due to a combination of factors, such as the design and condition of the walking surface, footwear, lighting, and weather conditions. These environmental factors interact with the health, fitness, strength, balance, vision, and activities of individuals involved. Falls in differing circumstances, including slips and trips on the level, falls on stairs, falls among older people, falls in the workplace, and falls during entry/egress from vehicles, are considered in terms of their causation and prevention, drawing on the latest research. The case is made for a systems approach to falls prevention, taking into account the complex interaction between individuals and the environment. Although more obvious concerns, such as the nature of footwear and the walking surface, are important, prevention of falls also requires attention to issues such as knowledge of falls risks and corresponding behaviour, together with influences, such as those affecting job and task design and the implementation of effective risk management procedures.

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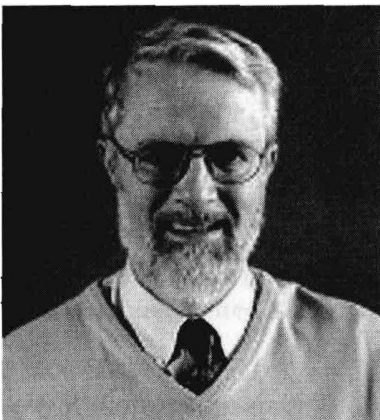
# The Editors

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**Roger Haslam, Ph.D.**, is Professor of Ergonomics, Director of the Health and Safety Ergonomics Unit, and head of the Department of Human Sciences at Loughborough University. Professor Haslam's research addresses human factors aspects of health and safety, and he has a long-standing interest in falls in both occupational and domestic situations. Research in this area has included consideration of falls not only in distribution, food manufacturing, catering, and forestry industries, but also in sporting facilities and among older people in and

around the home. Professor Haslam is an editor of the scientific journal *Applied Ergonomics* and he was until recently Chairman of Council of the Ergonomics Society.



**David Stubbs, Ph.D.**, is Professor of Ergonomics at the Robens Centre for Health Ergonomics, EIHMS, at the University of Surrey. He is the former Director of the Robens Institute of Industrial and Environmental Health and Safety at Surrey and past President of the Ergonomics Society. His interest in slip, trip, and fall accidents (STFA) dates back to 1982 when the Robens Institute and the Medical Commission on Accident Prevention jointly ran the first of five international STFA conferences. His main research

interests relate to the ageing workforce, and most recently, his attention has been focussed on systems design, accidents, and incidents in health-care settings.

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# *Chapter 1*

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# **Introduction**

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Roger Haslam and David Stubbs

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## **1.1 Background**

Falls are an intriguing problem. On the one hand, they are commonplace events, afflicting the human species from childhood through to old age. Often, the outcome is no more serious than a loss of dignity and a degree of embarrassment for the individual concerned. When injuries result, however, they can be debilitating and far-reaching, with detrimental consequences for the injured person's family, his or her colleagues, and employer. Set against this, efforts aimed at prevention face the considerable challenge of foiling the many, varied, and interacting circumstances that cause falls to occur.

The scale of the falls epidemic was highlighted almost 25 years ago at the first University of Surrey “Slipping, Tripping and Falling Accidents” (STFA) conference in 1982. Two years later, at the second STFA '84 meeting, Lord Porritt, introducing the event, was perplexed by the limited attention fall accident research was receiving, disproportionate to the “... gargantuan world-wide epidemic” of the problem (Porritt 1985). Porritt went on to observe that the wider community appears to form “... a vast, disinterested host of young and old who fall over at work and at play, in the home and in the streets, seemingly without caring, except perhaps at the time of the individual incident.” Despite these strong comments, it has taken many years for this persistent leading cause of injury at home and in the workplace to be taken seriously. Fortunately, within the last 10 years, a widespread, international effort has been directed at improving understanding of the causes of falls and their prevention. Much still needs to be done, however, toward achieving a meaningful, sustained reduction in the high incidence of fatalities and injuries arising from falls.

It is appropriate to comment on what constitutes a fall. An early definition, from a study in a geriatrics context, defined a fall as “an untoward event in which the patient comes to rest unintentionally on the floor” (Morris and Isaacs 1980). This description is worthy of remark, though, because it would seem to include incidents such as an individual being knocked down after being struck violently by another person, while excluding a situation where someone falls onto something other than the floor (e.g., an item of furniture). In both cases this seems counterintuitive. The Kellogg International Working Group on the Prevention of Falls by the Elderly (1987) addressed these points to some extent by defining a fall as “an unintentional event that results in a person coming to rest on the ground or another lower level.” For the purposes of the present book, the Kellogg Working Group definition is a useful starting point. It can be added to this that fall incidents will usually involve a person moving about his or her environment or, when stationary, having his or her balance disrupted through movement of the surface on which they are standing (e.g., as might occur when standing on a moving bus or train). Other circumstances, such as the collapse of a person due to a medical condition, such as epilepsy or syncope, are not excluded from consideration, but should be represented as discrete categories of falling, with distinct causation. The same applies to an individual falling as a consequence of being struck by an object. A person losing his or her balance and falling as a result of being jostled in a moving crowd, for example, would appear to be of legitimate interest from a fall prevention perspective.

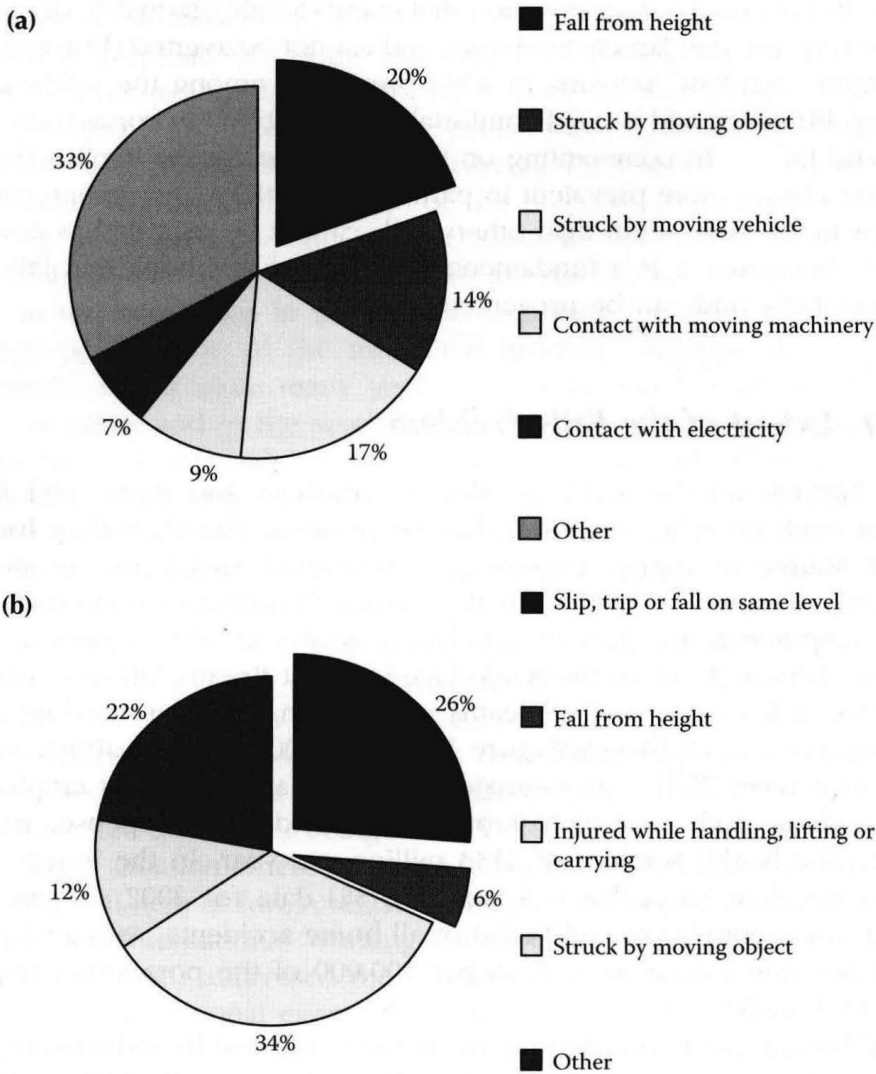
On occasions in the following chapters, falls are referred to as accidents. The term “accident” can be controversial in the field of injury prevention,

owing to the possible interpretation that events leading to injury, described in this way, are due largely to chance and cannot be averted (Evans 2001). The term “accident” remains in widespread use among the safety community, however, and is used comfortably in this book in connection with falls and falling. In commenting on this point, we can be explicit that as falls are clearly more prevalent in particular situations and among certain groups in the population than others, falls cannot be regarded as random events. Moreover, it is a fundamental premise of this book that falls are not inevitable and can be prevented.

### **1.1.1 Extent of the Falls Problem**

Falls happen on the level, on slopes, on steps and stairs, and from height, with differing causes and consequences. Together, they form a major source of injury, imposing a substantial social and economic burden on society. Statistics for the United Kingdom indicate that falls were responsible for 22% of accidental deaths in 2002 across all age groups (RoSPA 2004). In the workplace in Great Britain, falls are responsible for at least one in five deaths and one in three reported nonfatal injuries among employees (Figure 1.1) (HSE 2004). The Health & Safety Executive (HSE 2003) has estimated that slips and trips cost employers £512 million each year in lost production and other expense, with a cost to the health services of £133 million per year. In the home, U.K. Home Accident Surveillance System (HASS) data for 2002 suggest that falls account for almost half (46%) of all home accidents, with an annual incidence rate estimated at 2108 per 100,000 of the population (Figure 1.2) (DTI 2003).

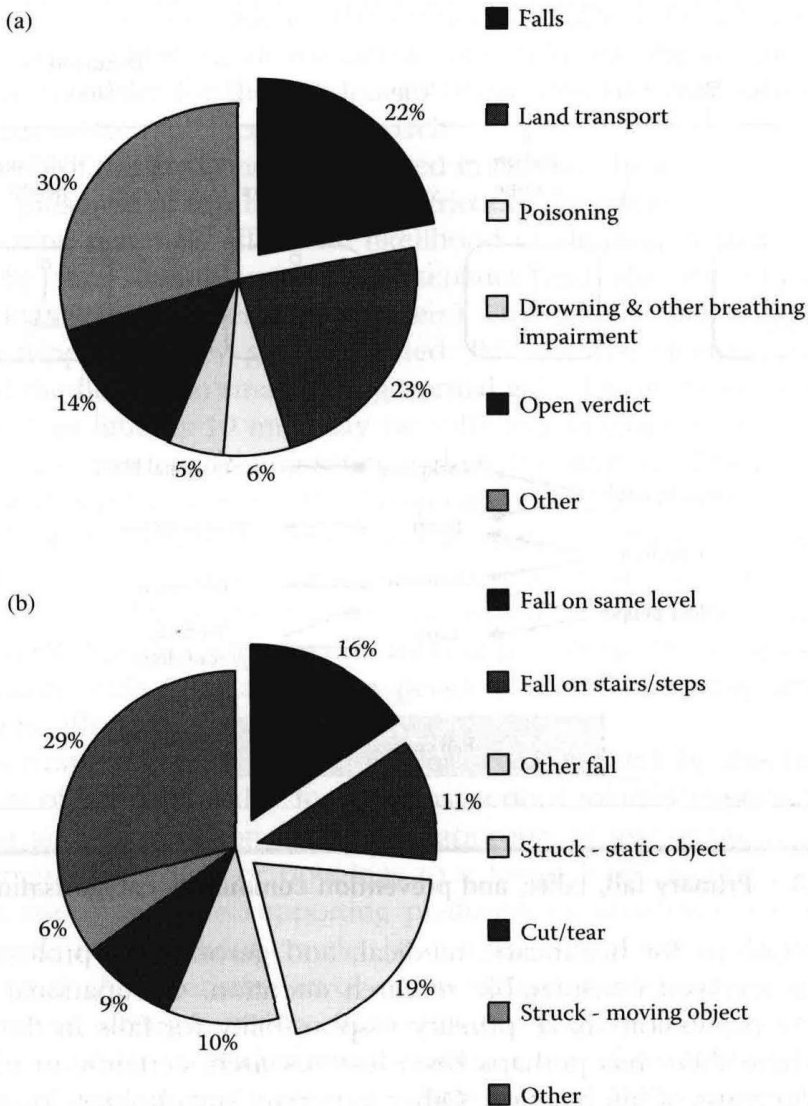
Although international comparisons are impeded by different reporting and recording procedures, data from the U.S. Bureau of Labor Statistics (2004) indicate that falls are involved in 12% of fatal occupational accidents. Similarly, data presented by the National Safety Council (2003) lists falls as the third leading cause of unintentional injury deaths in the general population, behind motor vehicle and poisoning related fatalities, accounting for 15% of the total. Studies in the United States examining the economic impact of falls among older people have estimated the total cost of all fall injuries for people age 65 or older in 1994 to be \$20.2 billion (Englander et al. 1996), with an average health care cost of a fall injury for individuals age 72 and over of \$19,440 (including hospital, nursing home, emergency room, and home health care, but not physician services) (Rizzo et al. 1998). A similar pattern exists in other countries: Falls are a major cause of unintentional death and injury worldwide.



**Figure 1.1** (a) Fatal occupational injuries to employees in Great Britain 2002/03 (HSE, 2004). (b) All reported occupational injuries to employees in Great Britain 2002/03 (HSE, 2004).

### 1.1.2 Types of Falls

In practice, falls are categorised in several ways, according to the circumstances of the fall, age of the person falling and the prevention and research communities most directly addressing the problem (Figure 1.3). In terms of location, it is customary to differentiate between falls on the level, falls on steps and stairs, and falls from height, including those from ladders, raised walking areas, windows, and balconies. Falls in any of



**Figure 1.2** (a) Accidental deaths in the U.K. 2002 (RoSPA, 2004). (b) Home accidents in the U.K. 2002 (DTI, 2003).

these locations may involve a slip or a trip, with these being the common antecedents of falls on the level. Differentiation can be made between falls occurring among children, healthy adults and older people, in terms of individual capability, limitations and the nature of activities typically involved. Differences also exist in the circumstances surrounding falls that happen in domestic, leisure, sporting, and work situations.

An interesting separation exists between authorities and prevention communities addressing falls among different age groups and falls in and away from the workplace. Falls among older people, for example, are a



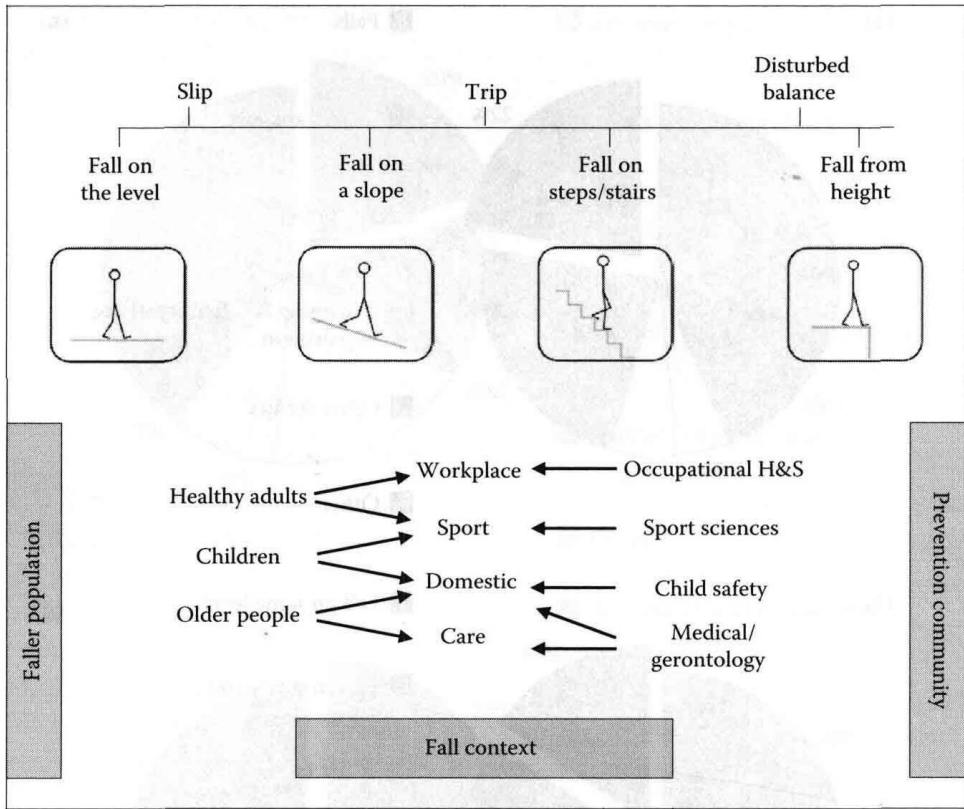


Figure 1.3 Primary fall, faller, and prevention community categorisations.

priority concern for healthcare, medical, and gerontology professionals, and have received considerable research attention. Occupational health and safety professions have primary responsibility for falls in the workplace, where there has perhaps been less research, certainly in terms of the effectiveness of intervention. Other important stakeholders are designers and architects concerned with the built environment. Given the generic aspects of falls, wherever or to whom they occur, it is perhaps surprising how little interaction there has been between specialists from different fields, with little communication or sharing of experience. Underlying this, presumably, is that the development of safety prevention activity and research is an evolutionary process, depending on where expertise is located at the outset, how this develops and the subsequent influence of funding and regulatory bodies.

### 1.1.3 Causes of Falls

In the most general sense, falls involve a loss of balance due to some reason, which results in a person falling to the ground or other lower