



# Identifying human factors associated with slip and trip accidents

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**RESEARCH REPORT 382**



# Identifying human factors associated with slip and trip accidents

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This report details the findings of a research project to investigate the impact of human factors on the likelihood and severity of slip and trip accidents. Specific objectives of the study were to:

- Investigate fully the human factors associated with slip and trip accidents
- Identify common factors preceding the accident event from the perspective of the duty holder and the injured party
- Determine critical points where the momentum of events leading to the accident could have been neutralised
- Identify usable, practical strategies for the control and reduction of slip and trip accidents.

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## EXECUTIVE SUMMARY

This report details the findings of a research project to investigate the impact of human factors on the likelihood and severity of slip and trip accidents and to develop practical strategies to control and reduce the incidence of these events.

To collect information on the human factors of slip and trip accidents, we developed a diagnostic checklist and sent it to over 200 health and safety personnel within the retail, food and drinks, manufacturing, leisure and service sectors, as well as HSE and Local Authority Inspectors. We asked respondents to complete the checklist for any slip or trip accidents that they may investigate during an eight-month period (February to September 2004).

We received completed diagnostic questionnaires for 62 slip/trip incidents from a variety of industry sectors.

The general issues underlying most of the slips/trips investigated were:

- An individual losing their footing/balance (24%)
- Inadequate maintenance (22%)
- An item not being stored or put away correctly (11%)
- An item dropped by a customer (11%)
- Rainwater on the soles of an individual's shoes (9%).

Human factors played a significant role in the majority of the slips and trips investigated. We identified a series of common contributory factors preceding the incidents, both from the perspective of the duty holder and the injured person. These included:

- Lack of understanding of requirements of health and safety legislation to identify and control slip/trip risks
- Poor perception of risk
- Failure to identify slip/trip risks
- Failure to report spillages, slip/trip risks etc (employees and members of the public)
- Inadequate or lack of reaction to reported problems
- Lack of ownership of health and safety responsibilities
- Lack of understanding of health and safety responsibilities
- Lack of awareness of slip/trip risks
- Poor understanding of the importance of implementing existing health and safety measures to control slip/trip risks (e.g. effective maintenance/cleaning programmes)
- Failure to provide staff with health and safety training, including slip/trip risks
- Failure to monitor and investigate effectiveness of control measures
- Lack of staff supervision
- Lack of enforcement of health and safety rules

- Poor communication between staff
- Failure to adequately investigate slip/trip incidents and identify ways to prevent recurrence.

If these critical issues had been identified and effectively controlled prior to the incident, it is very likely that the momentum of events leading to the incident would have been neutralised, thus preventing the slip/trip.

Based on the findings of our investigation, we make the following recommendations and suggestions for further work.

### **Recommendations:**

- **Continue to raise awareness amongst employers/duty holders of their legal requirements to control risks from slips/trips**

There is legislation that governs slips and trips, and it is important that awareness of the relevant laws are emphasised whenever possible, namely:

- *The Health and Safety at Work etc Act 1974* – which requires employers to ensure the health and safety of all employees and anyone who may be affected by their work. This includes taking steps to control slip and trip risks.
- *The Management of Health and Safety at Work Regulations 1999* – includes duties on employers to assess risks (including slip and trip risks) and where necessary take action to safeguard health and safety.
- *The Workplace (Health, Safety and Welfare) Regulations 1992* – require floors to be suitable, in good condition and free from obstructions. People must be able to move around safely.

It is known from this investigation that there were several instances of a breach of this legislation. It is essential therefore that awareness of the need to comply with relevant health and safety legal requirements is continually raised with employers.

- **Provide practical information for employers/duty holders on identifying slip/trip risks**

It appears that many employers conduct checks and inspections of their workplaces to identify slip/trip risks but that slip/trip risks are either not identified or are not perceived as being a risk. Clear, simple information should be provided on what constitutes a slip/trip hazard, for example:

- Any spillage (liquid or food) on a floor
- An uneven floor (e.g. raised carpet edge, uneven floor tile or unsecured mat)
- Any object left in an access route
- Any object not stored or put away correctly
- Leaks from equipment/roofs
- Recently cleaned/wet floors
- Rainwater brought inside on the soles of people's shoes

- Snow/ice
- Using stairs whilst carrying objects by hand
- Rushing around whilst using stairs.

Information on how to identify risks, for example, an inspection checklist that covers a variety of common slip/trip hazards, would also be helpful and would encourage staff to inspect all areas of their workplace, both internally and externally to identify hazards.

- **Provide practical information for employers/duty holders on controlling slip/trip risks**

Practical guidance on measures that can be implemented to control any identified slip/trip risks should be provided to employers/duty holders. Based on the findings of this investigation, information on the following practical control measures should be provided. We have prioritised our control measures in terms of high, medium and low priority, in accordance with the factors associated with most of the slips/trips investigated. A high priority has been assigned to control measures associated with the most common underlying causes of the slip/trip incidents investigated. A medium priority has been given to control measures associated with a considerable number of the slips/trips investigated. A low priority has been assigned to control measure associated with a small number of the slips/trips investigated.

***High priority control measures:***

- Ensure all staff and management are aware of their health and safety responsibilities and that there is a nominated, competent individual who is responsible for the overall management of health and safety (including identifying, controlling, monitoring and investigating slip/trip risks).
- Provide staff with regular health and safety training, including identifying and reducing slip/trip risks. Showing staff pictures/photos of their work environment (containing slip/trip risks) and asking them to identify them during a test would be a practical way of raising awareness. Staff could also be tested on what action they would take. Customising training around the actual work situation would not only raise awareness but also would also help create ownership and make staff aware of how to deal with a slip/trip hazard or incident. This would be particularly valuable in retail premises. Regular refresher courses should also be provided.
- Conduct regular checks of floor surfaces and workplaces to identify slip/trip risks and immediately fence off and/or contain any identified spillages/contaminated areas and mark any uneven ground.
- Display warning/caution signs (e.g. ‘uneven floor’ or ‘wet floor’).
- Regularly communicate identified slip/trip hazards to staff, including being careful when walking/up down stairs and using a handrail (if present) and what measures are in place to control them.
- Ensure an effective maintenance programme is in place so that prompt repairs are made and equipment is regularly maintained.
- Ensure an effective cleaning programme is in place so that spillages/contaminated areas are promptly cleaned (including drying the floor after cleaning and cleaning out of hours whenever possible).

***Medium priority control measures:***

- Make slip/trip-relevant safety behaviour part of staff job descriptions and measure/appraise them on it.
- Foster a culture of responsibility amongst staff and encourage them to report and deal with any slip/trip hazards (including spillages) and not to ignore them.
- Involve staff in generating solutions to slip/trip hazards.
- Investigate all slips/trip incidents to identify underlying factors associated with the incident. Findings from these investigations should be used to identify further control measures and prevent a recurrence. Our diagnostic checklist could be adapted as a tool for companies to use when investigating slip/trip incidents.
- Review and provide feedback on any incidents/accidents/near misses at regular staff meetings to emphasise the importance and potential severity of slips/trips.
- Supervise staff and enforce health and safety rules.
- Provide recognition and praise for good safety behaviour. For example, a notice board that lists the names of people who have contributed to accident prevention by reporting, fencing off, or clearing up spillages.
- Investigate the effectiveness of all control measures.
- Use health and safety and ergonomics advice during the procurement process (e.g. pilot equipment to avoiding purchasing mats which don't absorb enough water, leaky dishwashers etc.).

***Low priority control measures:***

- Ensure staff are provided with adequate cleaning materials and are trained in the correct procedures to use when cleaning spillages/contaminated areas etc.
- Store cleaning materials close to where spillages may occur.
- Ensure staff wear adequate footwear for their work environment.
- Ensure the floor surface/finish is adequate for the environment (i.e. avoid terrazzo tiles or wooden floors in areas that may get wet with spillages or rainwater).
- Ensure that the health and safety of staff and customers is not compromised by staff shortages (i.e. all existing slip/trip control measures should be implemented regardless of staff sickness/holiday absence).

**Suggestions for further work:**

- **Conduct research into customer behaviour**

11% of the slip/trip incidents investigated as part of this study involved a customer dropping an item and causing a food/liquid spillage or a temporary obstruction that someone then slipped on. None of the customers who dropped the items reported it. The reasons why are unknown. Why customers do not report spillages etc should be investigated, as should what would encourage them to report any spillages or dropped items. The information from this research could then be used to develop practical control measures to reduce the number of unreported spillages, and thus the number of slip/trip incidents.

- **Encourage companies to use the diagnostic checklist when investigating slip/trip incidents**

Our checklist (used in this study) has been adapted following feedback from respondents and the HSE. It has been designed for companies to use when investigating slip/trip incidents and is available from HSE. Companies should be encouraged to use the checklist as it will provide them with a comprehensive, diagnostic tool, covering all human factors issues, and will enable them to identify the underlying causes of the slip/trip incident. Armed with this information, companies will be able to develop and implement appropriate control measures to prevent a recurrence.



# 1 INTRODUCTION

This report details the findings of a research project to investigate the impact of human factors on the likelihood and severity of slip and trip accidents.

On average, 33% of all reported major injuries at work are the result of a slip or trip, the single most common cause of injuries at work. These cost employers an estimated £512 million every year due to lost production and other costs<sup>1</sup>. Understanding the key human factors associated with the slip or trip is essential in identifying the key underlying cause(s). This information can be used to develop workable, practical solutions for employers, duty holders and the HSE in order to reduce the incidence of slips and trips.

The aim of the project was to identify the range of human factors that contribute to slip and trip accidents and to develop practical strategies to control and reduce the incidence of these events.

Specific objectives of the study were to:

- Investigate fully the human factors associated with slip and trip accidents
- Identify common factors preceding the accident event from the perspective of the duty holder and the injured party
- Determine critical points where the momentum of events leading to the accident could have been neutralised
- Identify usable, practical strategies for the control and reduction of slip and trip accidents.

In this report, we present the findings from our investigation.

The report is structured as follows. The introduction and objectives of the investigation are detailed in chapter 1. The methods of investigation are outlined in chapter 2, and in chapter 3 we present our general findings. In chapters 4 to 13 we present a full breakdown of the underlying issues and human factors associated with the slip/trip incidents investigated. Our conclusions are discussed in chapter 14. Finally, in chapter 15, we present our recommendations.

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<sup>1</sup> Source: Health and Safety Executive Website [www.hse.gov.uk](http://www.hse.gov.uk)

## 2 METHODS OF INVESTIGATION

To collect information on the human factors of slip and trip accidents, we developed a diagnostic checklist (please see Appendix 1). The checklist was based on the definition of human factors in HSG48<sup>2</sup>: ‘human factors refers to environmental, organisational and job factors, and human and individual characteristics which influence behaviour at work in a way which can affect health and safety’. The diagnostic checklist we developed was designed to address and investigate these human factors issues and included section on individual factors, management and organisational factors, as well as physical and environmental factors.

The diagnostic checklist was developed to be practical and usable by people who have some health and safety competence, but who are not necessarily qualified health and safety practitioners or human factors/ergonomics specialists. Whilst the checklist may seem lengthy, we intend it to be fully comprehensive, covering all issues that involve human factors.

We sent the diagnostic checklist to over 200 health and safety personnel within the retail, food and drinks, manufacturing, leisure and service sectors and asked them to complete the checklist for any slip or trip accidents that they may investigate during an eight-month period (February to September 2004).

We also sent the checklist to HSE and Local Authority Inspectors to use and complete when investigating a slip or trip accident (during the same eight-month period).

Details of those contacted can be found in Appendix 2.

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<sup>2</sup> HSG48 – Reducing error and influencing behaviour, HSE Books, 1999.

### 3 OUR FINDINGS – GENERAL ANALYSIS

We received a total of 62 completed diagnostic checklists for slips and trips within a variety of industry sectors, including retail, leisure, manufacturing, and service.

Of these 62:

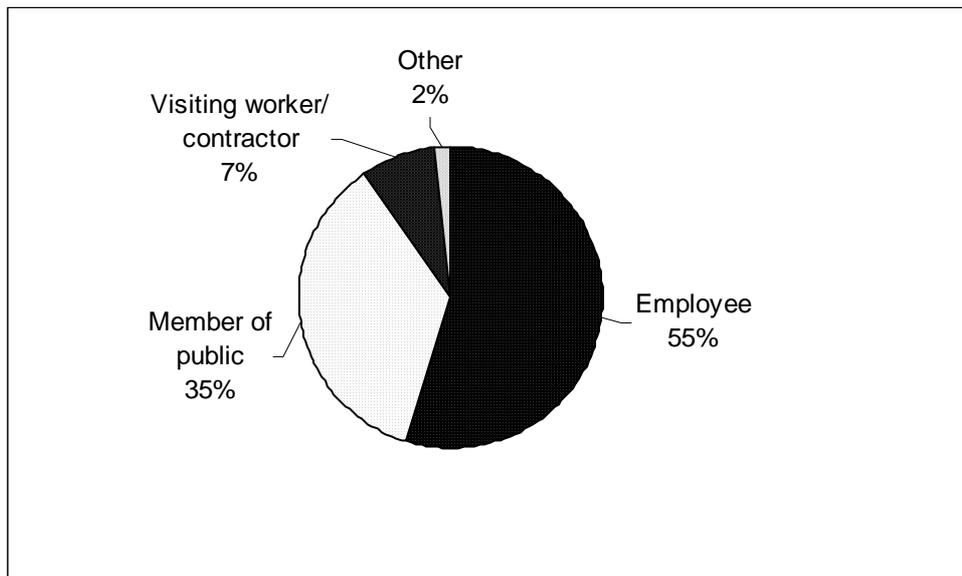
- 38 (61%) were for slips
- 24 (39%) were for trips.

In the remainder of this section, we present a general analysis of the slips and trips we received completed diagnostic checklists for, including who was involved, where the person slipped/tripped, what the person slipped/tripped on, details of the nature and severity of any injury sustained, as well as whether or not the incident was considered to be avoidable.

A full breakdown of the human factors associated with the incidents and the underlying causes is presented in chapters 4 to 13.

#### 3.1 WHO SLIPPED/TRIPPED?

Details of who was involved in the slip/trip incidents investigated are shown in Figure 1.

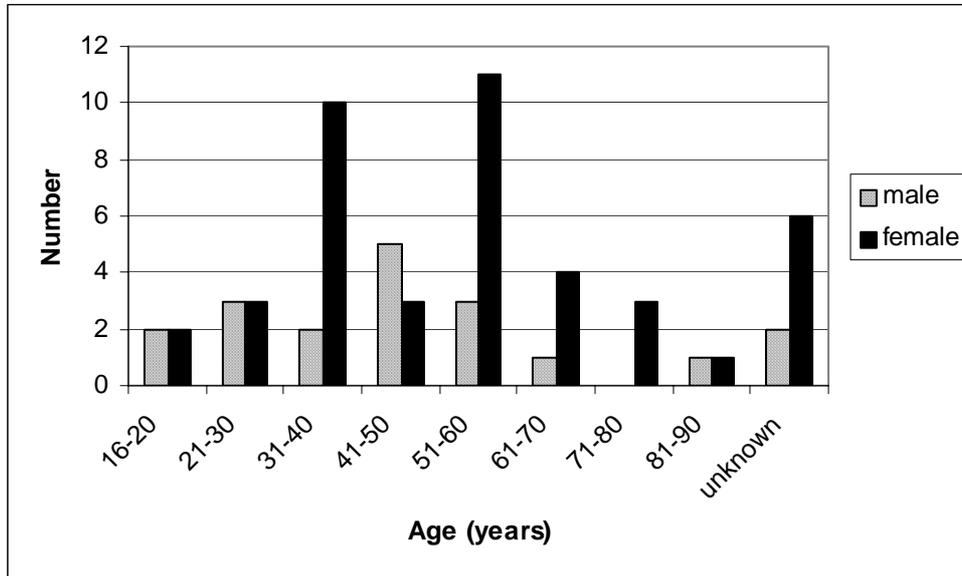


**Figure 1** Person who slipped/tripped

Of the 62 slips/trips investigated, the majority (34 [55%]) involved an employee. Members of the public were involved in 22 (35%) of the incidents investigated and visiting workers/contractors were involved in 5 (7%). One incident (2%) involved a secondee (other).

### 3.2 GENDER AND AGE OF PERSON WHO SLIPPED/TRIPPED

Of the 62 people involved in a slip or trip, 43 (69%) were female and 19 (31%) were male. The ages of those involved in the slip/trip incidents investigated are presented in Figure 2.

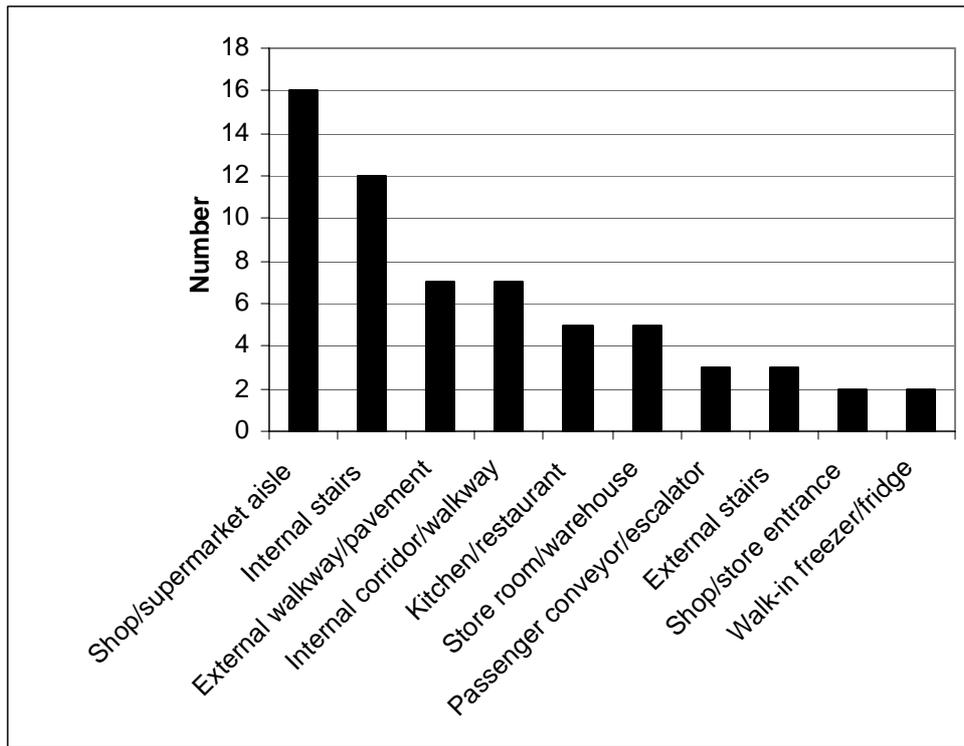


**Figure 2** Age and gender of people who slipped/tripped

Individuals aged between 51 and 60 years were involved in the largest number (14 [22%]) of slip/trip incidents. Individuals aged between 31 and 40 years were also involved in a large number (12 [19%]) of the slips and trips investigated.

### 3.3 WHERE DID THE PERSON SLIP/TRIP?

The location of where each of the slip/trip incidents occurred is detailed in Figure 3.

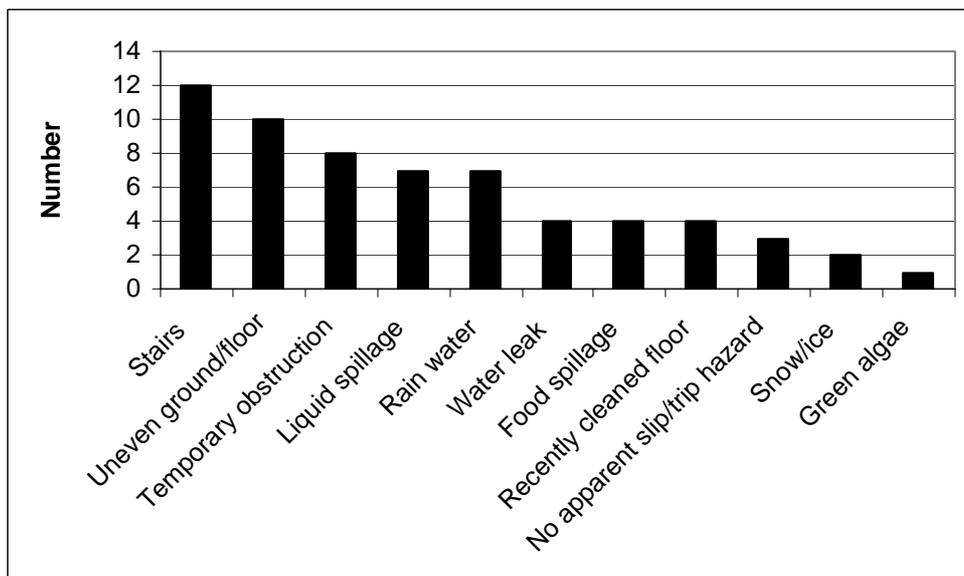


**Figure 3** Location of slip/trip incident

As shown, most (16 [25%]) slip and trip incidents occurred in a shop or a supermarket aisle. Internal stairs (12 [19%]) were also common places for slips/trips to occur, as were external walkways/pavements and internal corridors/walkways, both accounting for 11% (7 cases). These findings are not surprising, given the industry sectors we contacted.

### 3.4 WHAT DID THE PERSON SLIP/TRIP ON?

Details of what the person slipped or tripped on are presented in Figure 4.

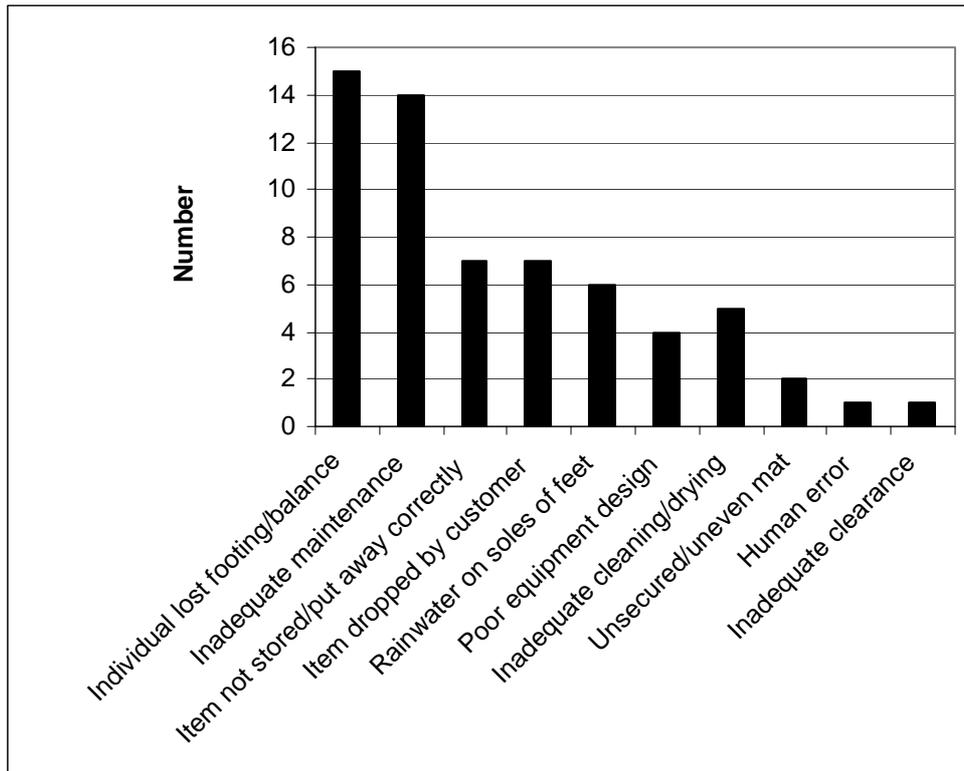


**Figure 4** What the person slipped/tripped on

Individuals slipped or tripped most commonly on stairs or steps, accounting for 12 (19%) of the slips/trips investigated. An uneven ground/floor and temporary obstructions were also commonly associated with slips and trips, accounting for 10 (16%) and 8 (12%) incidents respectively.

### 3.5 UNDERLYING ISSUE OF SLIP/TRIP

Each slip and trip was assigned a category based on the general underlying issue. These are shown in Figure 5.



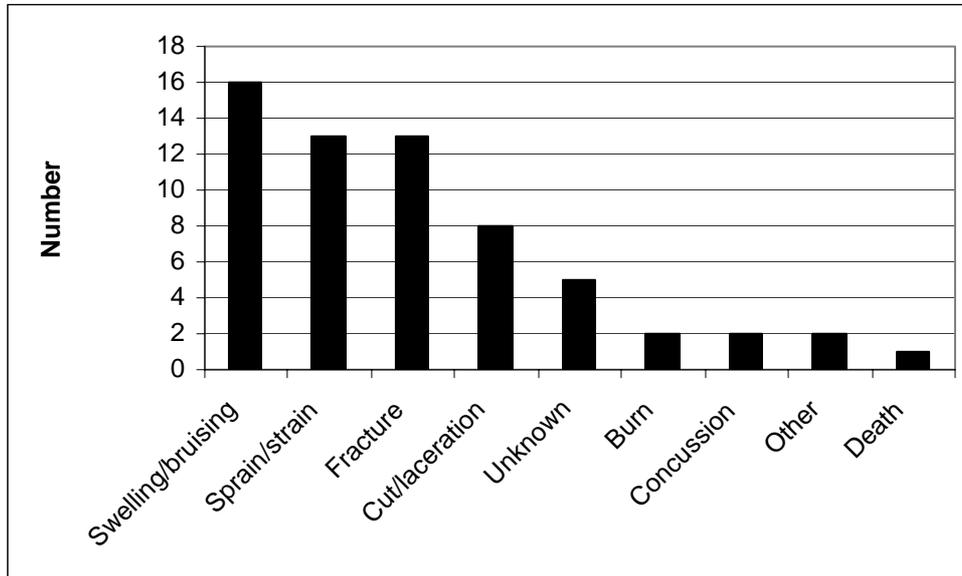
**Figure 5** General underlying cause

As can be seen from Figure 5, the issue associated with the most (15) slips and trips was the individual losing their footing or balance (24%). The second most common associated issue was inadequate maintenance, accounting for 14 (22%) of the slips/trips investigated. Items not being put away or stored correctly and customers dropping items that other shoppers or employees then slipped on or tripped over were also associated with a large number of slips and trips, both accounting for 11% (7 incidents).

Each of these underlying issues is discussed in more detail in sections 4 to 13.

### 3.6 WHAT INJURY WAS SUSTAINED?

Details of the type of injury sustained following the slip/trip incidents investigated are shown in Figure 6.



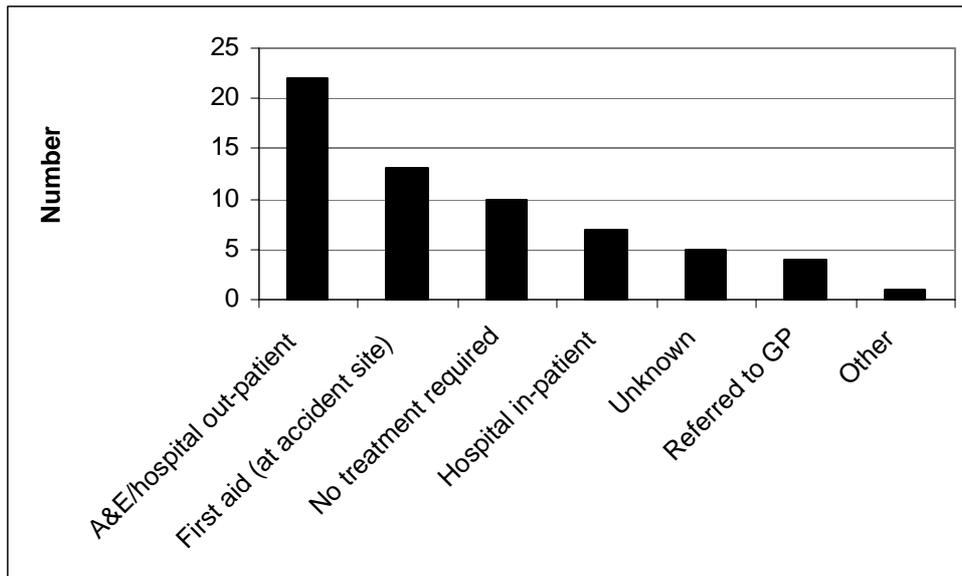
**Figure 6** Type of injury sustained

Swelling/bruising was the most common injury type sustained, with 16 (25%) of the individuals who slipped/tripped sustaining such an injury. Sprains/strains and fractures were also common injury types, both accounting for 20% (13 incidents), as were and cuts/lacerations (12%).

One individual (member of the public) slipped and died as a result of her injuries. More information is given in section 5.6.

### 3.7 WHAT TREATMENT WAS RECEIVED?

The treatment received by the individuals who slipped/tripped is detailed in Figure 7.



**Figure 7 Treatment received**

The treatment received by most individuals who slipped or tripped was a visit to Accident and Emergency (A&E) or a hospital in-patient admission, accounting for 22 (35%). First aid was given at the accident site in 13 of the slips/trips investigated, accounting for 20%. 10 (16%) individuals required no treatment.

### **3.8 RELATIONSHIP BETWEEN CAUSE AND INJURY SEVERITY**

The relationship between the underlying cause of the slip/trip and the injury severity is displayed in Table 1.

Injury severity has been measured in terms of a score. The score, based on the treatment received, was calculated using the following system:

- a score of 0 was assigned if no treatment was necessary
- a score of 1 was assigned for first aid treatment
- a score of 2 was assigned if the individual was referred to their GP
- a score of 3 was assigned if they visited A&E or were admitted as a hospital out-patient
- a score of 4 was assigned if they were admitted as a hospital in-patient.

The scores for all slips/trips associated with each of the underlying causes have been averaged.

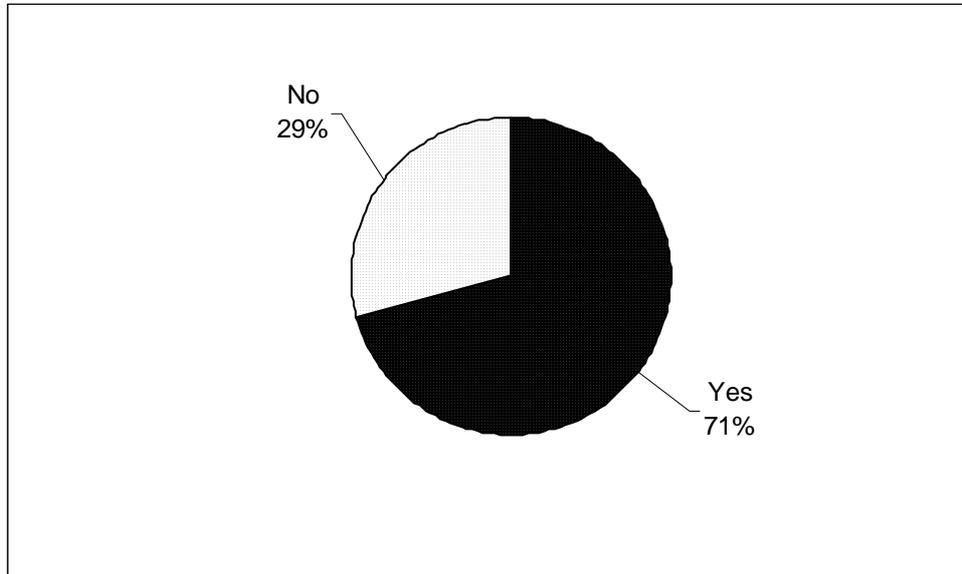
**Table 1** Cause and injury severity

<b>Underlying cause</b>	<b>Injury severity score</b>
Inadequate cleaning/drying	3.2
Human error	3.0
Inadequate maintenance	2.9
Item not put away/stored correctly	2.4
Poor equipment design	2.3
Rainwater on soles of feet	2.0
Unsecured/uneven mat	2.0
Item dropped by customer	1.2
Individual lost footing/balance	1.1
Inadequate clearance	0

Slips and trips resulting from inadequate cleaning/drying (5 cases) were the most severe in terms of injury and consequent treatment, with an injury severity score of 3.2. Human error (1 case) scored the second highest in terms of severity. It is interesting to note that slips/trips resulting from the individual losing their footing/balance, which were the most common cause of slips/trips, caused the least severe injuries, with a score of only 1.1.

### 3.9 WAS THE SLIP/TRIP AVOIDABLE?

We asked the respondents who investigated the slip/trip incidents to comment on whether or not they believed that the incident was avoidable. As shown in Figure 8, 71% (44 of the 62) slips/trips investigated were considered to be avoidable.



**Figure 8** Slip/trip avoidable?

Of the 18 slip/trip incidents that were considered unavoidable, 14 involved individuals losing their footing or balance (with no apparent slip or trip hazards present). Individuals investigating these accidents deemed them unavoidable due to inherent human nature.

In most instances, we agreed with the person completing the checklist in terms of whether or not the accident was avoidable. However, there were four incidents that were considered unavoidable by investigators, that we believe were actually avoidable. We believe that a poor perception of risk and a failure to apply the principles of prevention in the Management of Health and Safety at Work Regulations 1999 were the main reasons that these four incidents (6%) were wrongly deemed unavoidable. This raises questions as to the competency of the individuals investigating slip/trip incidents, as well as the adequacy of the investigation itself.

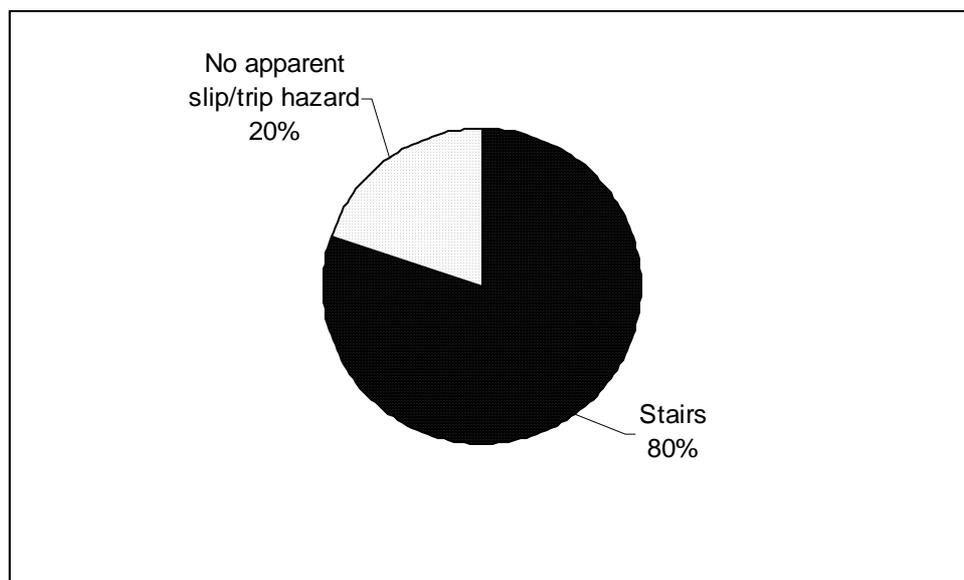
## 4 OUR FINDINGS – INDIVIDUAL LOST FOOTING/BALANCE

The general issue underlying 15 (24%) of the 62 slips/trips investigated was the individual losing their footing or balance. Of these 15:

- 7 (47%) involved a slip
- 8 (53%) involved a trip.

In 14 of the 15 cases, the slip/trip incident was considered to be unavoidable.

Details of what the person slipped/tripped on are presented in Figure 9.



**Figure 9** What the person slipped/tripped on

In 12 of the 15 cases (80%), the person slipped or tripped on a staircase or step. In the remaining 3 cases (20%) it was reported that the person slipped on flat, even ground and that there was no apparent slip or trip hazard.

As detailed in section 3.8, whilst an individual losing their footing/balance was the most common cause of slips/trips, they resulted in the least severe of injuries and consequent treatment, based on our injury severity calculation.

### 4.1 STAIRS

In 12 of the 15 cases, the person slipped or tripped on a staircase or step.

In all instances, no spillages, items of contamination or obstructions were found after the incident that may have contributed to the slip or trip. The floor condition was considered adequate in all instances with no uneven areas or slippery finishes. The steps/stairs were reported to be even, in a good state of repair and clearly marked in all instances. The level of lighting was considered adequate in all instances, with no areas of shadow or glare.

In 11 cases it was reported that the individual lost their footing or balance when walking up/down the stairs and that the incident was unavoidable. In one case, however, the individual

involved was walking up stairs with a kettle in one hand and a bag in the other, which meant the she was unable to watch her step. She was also reported to be ‘rushing around’. It was reported that this incident could have been avoided.

It was reported that there was a handrail present in four of the cases investigated. There was no handrail in four instances, and in the remaining four instances it was unknown if there was a handrail.

It was reported in over half of the cases investigated (8) that staff were aware that there was a general slip/trip risk associated with walking up/down stairs, as this information was provided as part of their induction/health and safety training. It is unknown if the person carrying a kettle in one hand and a bag in the other was aware of the risk involved.

#### 4.2 NO APPARENT SLIP/TRIP HAZARD

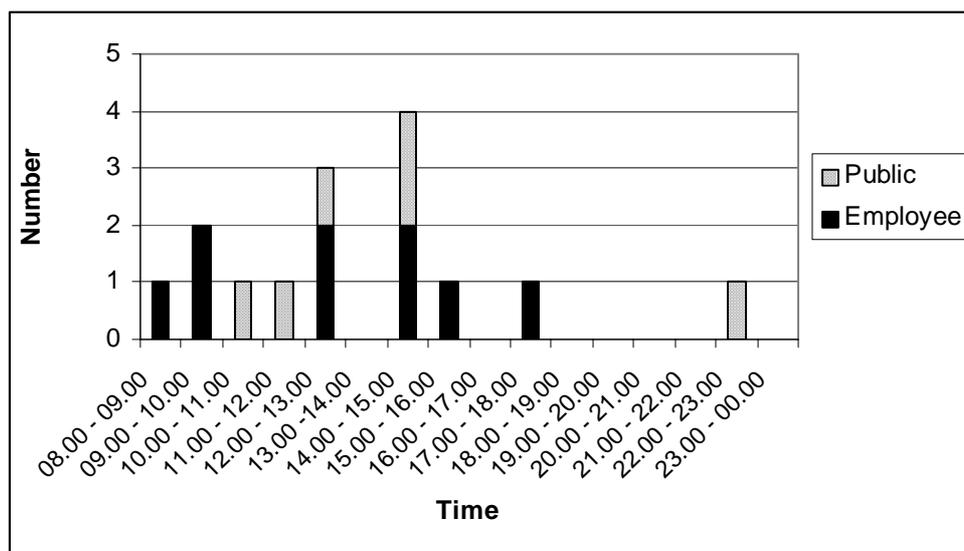
There were no apparent slip/trip hazards associated with 3 of the incidents investigated. Of these 3 cases:

- 1 involved a member of the public slipping on a shop floor/supermarket aisle
- 1 involved an employee slipping in the reception area of their place of work
- 1 involved an employee tripping on an external walkway/pavement outside their place of work.

It was reported that the person involved in each of the 3 cases simply lost their footing or balance, with no other slip or trip hazards present. No spillages, items of contamination or obstructions were found after the incident that may have contributed to the slip or trip. The floor/ground condition was considered adequate in all instances with no uneven areas or slippery finishes.

#### 4.3 TIME OF INCIDENT

The time of day that individuals lost their footing/balance is shown in Figure 10.



**Figure 10** Time of day individual lost their footing/balance

Most cases of an individual losing their footing or balance occurred between 14.00 and 15.00 (4 cases), with over half (53% [9 incidents]) occurring in the afternoon (between the hours of 12.00 and 16.00). The reasons for this trend are unknown. None of the individuals involved reported feeling tired or distracted. However, the findings suggest that there may be a relationship between the time of day and the likelihood of a person losing their footing or balance, resulting in a slip or trip.

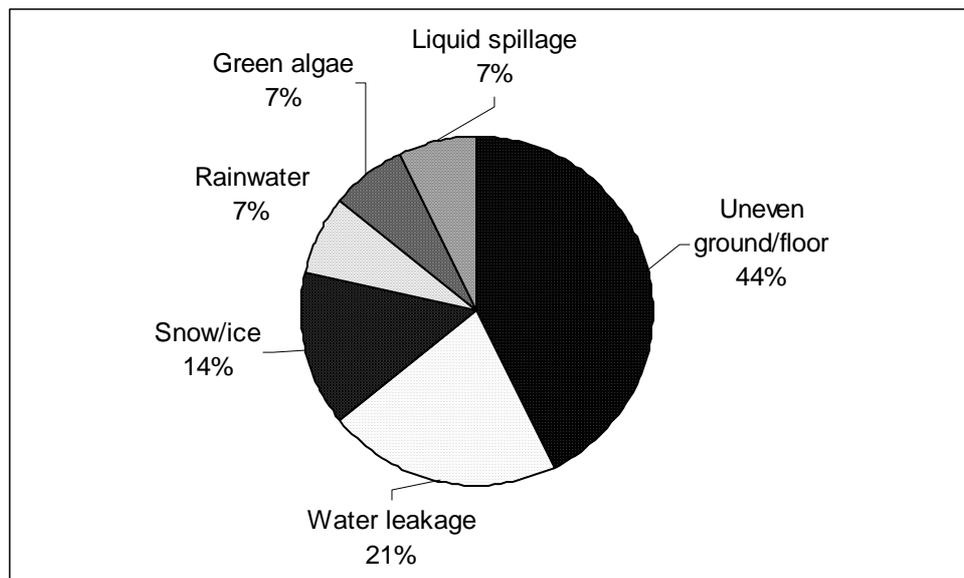
## 5 OUR FINDINGS – INADEQUATE MAINTENANCE

The general issue underlying 14 (22%) of the 62 slips/trips investigated was inadequate maintenance. Of these 14:

- 9 (64%) involved a slip
- 5 (36%) involved a trip.

In all 14 cases, the slip/trip incident was considered to be avoidable.

Details of what the person slipped or tripped on are presented in Figure 11.



**Figure 11** What the person slipped/tripped on

Inadequate maintenance resulting in an uneven ground/floor caused the most slips/trips (42% [6 cases]). Inadequate maintenance resulting in water leakages and untreated snow/ice were also associated with several slips/trips, accounting for 3 (21%) and 2 (14%) incidents respectively.

Slips/trips caused by inadequate maintenance were the third most severe in terms of injury severity, as detailed in section 3.8.

### 5.1 UNEVEN GROUND/FLOOR

In 6 cases the individual tripped on uneven ground/floor. In 3 instances the incident occurred outside. The remaining 3 incidents occurred inside.

The 3 external cases involved:

- 2 trips on uneven paving
- 1 trip over an uneven drain grate.

The 3 internal cases involved:

- 2 trips over a pothole in a concrete floor
- 1 trip over worn flooring tile.

In all instances the floor/ground condition was reported to be inadequate. Additionally, no markings or warnings were displayed in the vicinity of the uneven ground/floor.

In 2 instances, it was reported that regular checks of floor/surface conditions were made (internally and externally) and that management were aware of the problems. The reason given for not rectifying the problem (an uneven floor caused by contractors digging up the yard) in one of the cases was 'cost'. It is unknown why the uneven ground/floor was not fixed in the other case.

In one of the remaining 3 cases where regular checks were not made, it was reported that management were aware of the uneven ground/floor prior to the slip/trip incident, and were awaiting agreement to proceed with the repair.

## **5.2 WATER LEAKAGE**

In all 3 instances where the person slipped on a water leak, the source of the leak was faulty equipment:

- 1 faulty freezer door in a store-room
- 1 faulty chiller unit in a supermarket aisle
- 1 faulty dishwasher in a restaurant kitchen.

In all cases, management was aware that the equipment causing the leak was faulty. It was reported that the equipment involved had been faulty for 4 weeks, 11 months and 2 years respectively. In all 3 cases, it was reported there was no proper or effective programme of equipment maintenance or repair in place.

The water leaks had not been contained or fenced off. In one instance caution/warning signs had been displayed (in the restaurant kitchen). However, there were no warning signs displayed in the remaining two cases.

The individuals who slipped on a water leakage were:

- 1 contractor (who slipped in the store-room)
- 1 member of the public (who slipped in the supermarket)
- 1 employee (who slipped in a restaurant kitchen).

It was reported, in the 2 cases involving an employee and contractor, that the individual who slipped was aware of the problem and subsequent slip risk. However, the incidents happened in areas that were regularly accessed throughout the course of their work and it was reported that the water leaks could not therefore be avoided. Both individuals were wearing their own non-safety footwear.

In the supermarket chiller unit case, it was reported that there were procedures in place for staff to mop up the water leak and dry the affected area on an hourly basis. However, on the day of the incident staff shortages meant that this was not done. It was reported that following the incident the spillage covered a floor area measuring 2 metres by 6 metres.

A lack of ownership of the problem was cited as being a major contributory factor in two of the cases (involving an employee and contractor). Additionally, a general lack of awareness by staff of the seriousness of the slip risk was also reported as being a contributory factor.

### **5.3 SNOW/ICE**

Two individuals slipped on snow/ice on an external walkway leading to their place of work. No grit or salt had been applied to the external areas in either case. It was reported in both cases that regular checks of external ground conditions were made. However, it appeared that no further actions were taken as the snow/ice was left untreated. It is unknown why this is the case i.e. the employers were not aware of their responsibilities under the Management of Health and Safety at Work Regulations 1999 to assess risks (including slip and trip risks) and to take actions where necessary to safeguard health and safety, or whether management were aware of the slip risk and their legal duties but did not implement any control measures.

### **5.4 RAINWATER**

One person (employee) slipped on rainwater on an internal walkway/corridor. The source of the leak was a faulty roof.

Management was aware that the roof was leaking and that the leak was a slip hazard, as was the person who slipped. It was unknown how long the roof had been leaking prior to the incident, but the leak had been reported three times. Despite this, it had not been repaired. It was reported there was no proper programme of maintenance or repair in place.

The rainwater leak had not been contained or fenced off. Warning signs were, however, displayed.

A lack of communication between site-based and regional management was cited as being a major contributory factor in the lack of repair and subsequent slip incident.

### **5.5 GREEN ALGAE**

One individual slipped on green algae on an external walkway outside their place of work (part of their employer's site). It was reported that checks were not made of external areas as part of the employer's health and safety inspections and that management were not therefore aware of the slip risk from the algae.

### **5.6 LIQUID SPILLAGE**

One individual (member of the public) slipped on an oil spillage on an external staircase on a garage forecourt and died as a result of her injuries. It was reported that checks were not made of external areas as part of the employer's health and safety inspections and that management were not therefore aware of the slip risk from the oil.

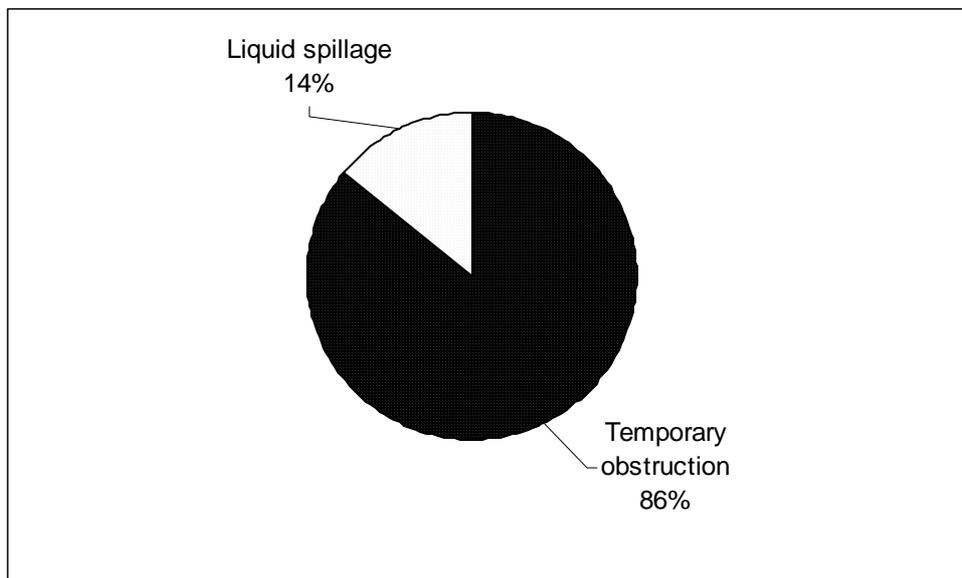
## 6 OUR FINDINGS – ITEM NOT STORED/PUT AWAY CORRECTLY

The general issue underlying 7 (11%) of the 62 slips/trips investigated was an item not being stored or put away correctly, which an individual then slipped on or tripped over. Of these 7:

- 1 (14%) involved a slip
- 6 (86%) involved a trip.

In all 7 cases, the slip/trip incident was considered to be avoidable.

Details of what the person slipped or tripped on are presented in Figure 12.



**Figure 12** What the person slipped/tripped on

In 6 of the cases investigated, an item that was not put away correctly resulted in a temporary obstruction, which caused the slip/trip, accounting for 86% of incidents. The remaining one case involved a liquid that was not stored correctly, and subsequently spilled on to the floor.

### 6.1 TEMPORARY OBSTRUCTION

In 6 cases the individual tripped over a temporary obstruction. Of these 6:

- 3 individuals (2 contractors and 1 employee) tripped over items (a bag of confidential waste, plastic packaging and a ramp used for deliveries) on an internal walkway or corridor
- 2 individuals (employees) tripped over items (a box of nails and a box containing supplies) in a store room/warehouse
- 1 individual (contractor) tripped over a trolley on a shop floor/supermarket aisle.

In 2 of the 6 cases, the items (a box of nails and a box of supplies) had not been stored correctly as there was no room in the already over-stocked storeroom/warehouse. As a result, the boxes had been placed on the floor.

In the remaining 4 cases, the person who had last used the item had not stored it or put it away correctly or in the correct place.

It was reported in 2 instances (a contractor tripping over a ramp and a contractor tripping on plastic packaging) that staff were not fully aware of their health and safety responsibilities (i.e. tidy up and don't leave objects on walkways etc.). The reason for this lack of awareness was unknown.

In 5 of the 6 cases, it was reported that staff members and contractors were effectively supervised and that health and safety rules were enforced by managers/supervisors. Whilst in theory this may be true, the effectiveness in practice was questionable given the trip incidents that occurred.

Regular checks of floor surfaces were reportedly made in 2 of the 6 cases. In both instances, the trip hazards (a ramp and a bag of confidential waste) were identified prior to the incident but were not deemed to be a hazard.

## **6.2 LIQUID SPILLAGE**

In this case, waste oil was not stored correctly, resulting in a spillage. The individual who failed to store the oil correctly slipped on the oil approximately two hours later.

It was reported that the staff member was aware of her health and safety responsibilities. The spillage had been contained using cardboard. It was also reported that the area was regularly cleaned but that the correct cleaning regime was not used, despite the correct cleaning materials being available. As a result, the floor remained slippery with oil.

The staff member that slipped had not reported the spillage.

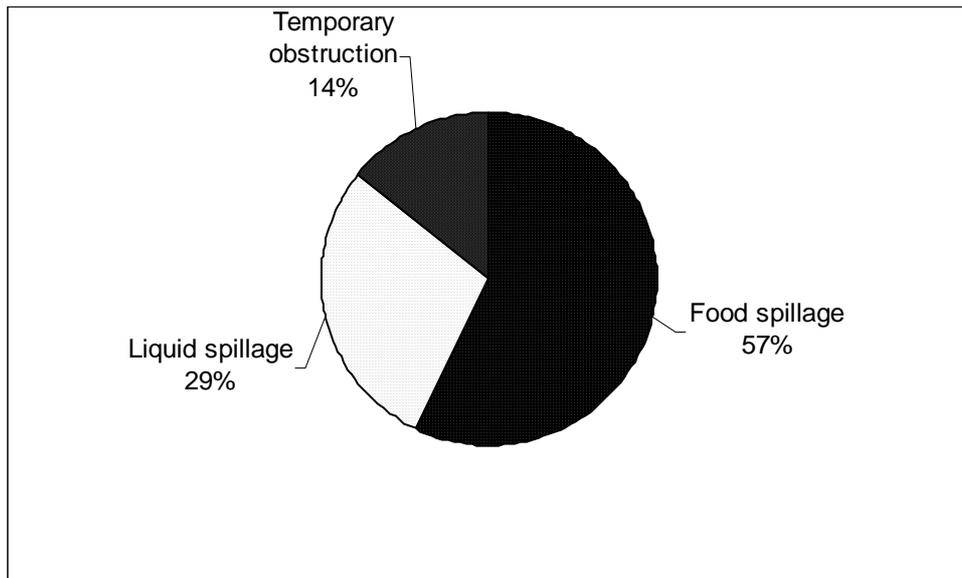
Regular checks of internal areas were reportedly conducted. At the time of the incident, the oil had been spilling onto the floor for two hours. It is unknown how frequently such visual inspections were performed. It is also unknown if the spillage was identified prior to the slip incident, and if so whether or not it was deemed to be a slip hazard.

## 7 OUR FINDINGS – ITEM DROPPED BY CUSTOMER

The general issue underlying 7 (11%) of the 62 slips/trips investigated was an item reportedly being dropped by a customer, which another individual then slipped on.

In all 7 cases, the slip incident was considered to be avoidable.

Details of what the person slipped on are presented in Figure 13.



**Figure 13** What the person slipped on

In 4 of the 7 cases, a customer dropped an item of food (food spillage), and 2 customers caused a liquid spillage. One customer dropped a temporary obstruction.

### 7.1 FOOD SPILLAGE

In 4 cases, a customer dropped a food item, causing a food spillage. Of these:

- 1 customer dropped a pie that another customer then slipped on
- 1 customer dropped a trifle that another customer slipped on
- 1 customer dropped ice-cream that another customer slipped on
- 1 customer dropped a carton of yoghurt that an employee slipped on.

In all of the cases, it is unknown how long the food spillage had been on the floor prior to the slip incident.

Staffing levels were reported to be sufficient in all three cases on the day of the incident. Despite this, none of the spillages had been reported (prior to the incident) to a member of staff. As a result, the spillages were not contained or fenced off until they could be cleaned. It is unknown why the customers who dropped the items did not report it.

Regular checks of floor surfaces were reportedly conducted in all four cases. The frequency of these checks is unknown.

## **7.2 LIQUID SPILLAGE**

In 2 cases, a liquid spillage (caused by a customer) led to a slip/trip incident. Of these:

- 1 customer dropped a pint of milk that another customer then slipped on
- 1 customer dropped a carton of juice that an employee slipped on.

In the milk incident, the floor was a terrazzo floor that was reported to be very slippery when wet, which is likely to have contributed to the incident.

Neither of the spillages had been reported (prior to the incident) to a member of staff. As a result, the spillages were not contained or fenced off until the affected area could be cleaned. It is unknown why the customers who dropped the items had not reported the spillages.

Regular checks of floor surfaces were reportedly conducted in both cases. The frequency of these checks is unknown.

## **7.3 TEMPORARY OBSTRUCTION**

In this case, a customer dropped a coat hanger that another customer then slipped on. It is unknown how long the coat hanger had been on the floor prior to the incident.

A general lack of awareness by staff of their health and safety responsibilities was cited as being a contributory factor. Staff had been provided with general health and safety training but this had not included information on the risks of slips/trips.

Additionally, management or staff did not conduct regular checks of the floor condition, as this was not part of their health and safety procedure.

## 8 RAINWATER ON SOLES OF SHOES

The general issue underlying 6 (9%) of the 62 cases investigated was the individual slipping as a result of rainwater that they had carried in on the soles of their shoes.

In 3 of the 6 cases (50%), the slip incident was considered to be avoidable.

Of these 6 cases:

- 3 involved a member of the public slipping in a shop/supermarket aisle
- 2 involved a member of the public slipping on an inclined passenger conveyor/escalator
- 1 involved an employee slipping on an external covered walkway.

The 3 cases that occurred in a shop/supermarket aisle happened near the store/shop entrance (those involving members of the public). It was reported that there were mats in place to absorb water. However, it was reported that these mats did not have the capacity to absorb all the water being brought in by pedestrians. It was also reported, in all three instances, that the rain on the day of the incident was very heavy and that such adverse weather made the entrances very slippery.

Wet floor/caution signs were displayed in all 3 instances. Only two of these three cases were considered to be avoidable. In one case, the individual who slipped was wearing high-heeled shoes, which were deemed to be one of the contributory causes of the slip.

In one case, there was a greeter who stood at the shop entrance, warning customers of the danger of slipping. The greeter also had access to a mop to dry the shop entrance. However, the staff member conducting greeting duties on the day of the incident was not aware that a mop was available or that he should regularly dry the affected areas.

One employee slipped on an external covered walkway. The walkway was equipped with a wooden floor which was very slippery when wet and as a result was reported to be an inadequate floor covering. Whilst the wooden walkway was covered, only the roof was covered – the sides were exposed. This meant that the floor got wet when it rained.

The two incidents that happened on an inclined passenger conveyor/escalator involved a member of the public. There were mats in place at the bottom of the conveyor/escalator. However, it was reported that these were not capable of absorbing all the rainwater being brought in to the store by pedestrians. The conveyor/escalator in both instances was metal and was reported to be slippery when wet. Both were equipped with a handrail. It was unknown if the person who slipped was using the handrail, or if the handrail was considered adequate.

It was reported that regular checks of floor conditions were made in 3 of the 6 incidents (those that occurred on a shop floor/supermarket aisle), and that any identified problems were rectified. Mats being in place were considered to be an effective control measure at reducing problems with slips. However, investigating the effectiveness of the mats appeared to have been overlooked.

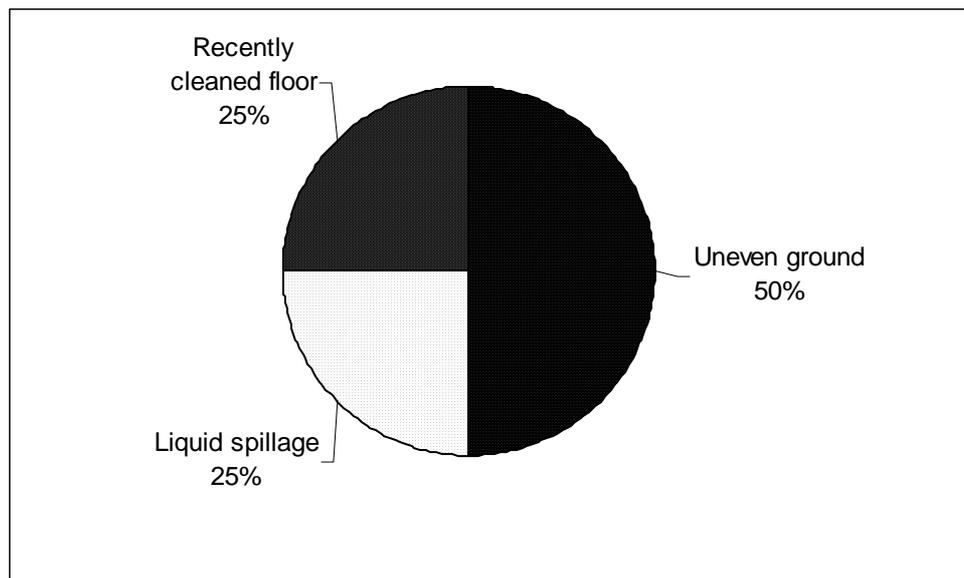
## 9 OUR FINDINGS – POOR EQUIPMENT DESIGN

The general issue underlying 4 (6%) of the 62 slips/trips investigated was poor equipment design. Of these 5:

- 2 (50%) involved a slip
- 2 (50%) involved a trip.

In 3 of the 4 cases, the slip/trip incident was considered to be avoidable.

Details of what the person slipped/tripped on are presented in Figure 14.



**Figure 14** What the person slipped/tripped on

In 2 of the 4 cases, the person slipped/tripped on uneven ground (50%), as a result of poor equipment design. 1 person slipped on a liquid spillage (25%), as did one individual on a recently cleaned floor (25%).

### 9.1 UNEVEN GROUND

In 2 cases, poor equipment design caused an area of uneven ground, which an individual then tripped over. Of these:

- 1 involved a member of the public tripping over a display plinth on a shop floor
- 1 involved an employee tripping on a raised lift edge on a shop floor.

In both instances, a change in floor surface contributed to the trip. There were no floor markings or warning signs in place.

For the incident involving a display plinth, it was reported that the trip risk was not identified or reported prior to the incident.

Regular checks were made of the floor surface in the case involving the raised lift edge. It is unknown, however, if this was identified as a trip hazard.

## **9.2 LIQUID SPILLAGE**

In 1 case, a liquid spillage (caused by poor dishwasher design) led to an incident involving an employee who slipped on a ceramic tiled kitchen floor. The design of the dishwasher meant that water was sprayed on to the floor during cleaning, causing a slip hazard.

Management and staff were aware of the liquid spillage from the dishwasher as contamination of the floor from the dishwasher occurred on a daily basis. It was reported that anti-slip mats were put down to reduce the risk of slipping. As a result of the layout of the kitchen, the spillage could not be contained or fenced off. Additionally, there was no space for caution/wet floor signs. The staff member who slipped was wearing her own non-safety footwear. It was reported that she was aware of the problem and that she was walking tentatively over the affected area when she slipped.

It was reported that numerous accidents, similar in nature to this one, had occurred in the past, but that investigations had not been conducted by management to prevent a recurrence. Equipping the floor with matting was deemed as being an acceptable, effective control measure.

The incident was deemed unavoidable by management, as the inherent design of the dishwasher meant that water was sprayed on to the floor. It would appear that replacing the dishwasher with another design that did not cause a liquid spillage was not considered.

## **9.3 RECENTLY CLEANED FLOOR**

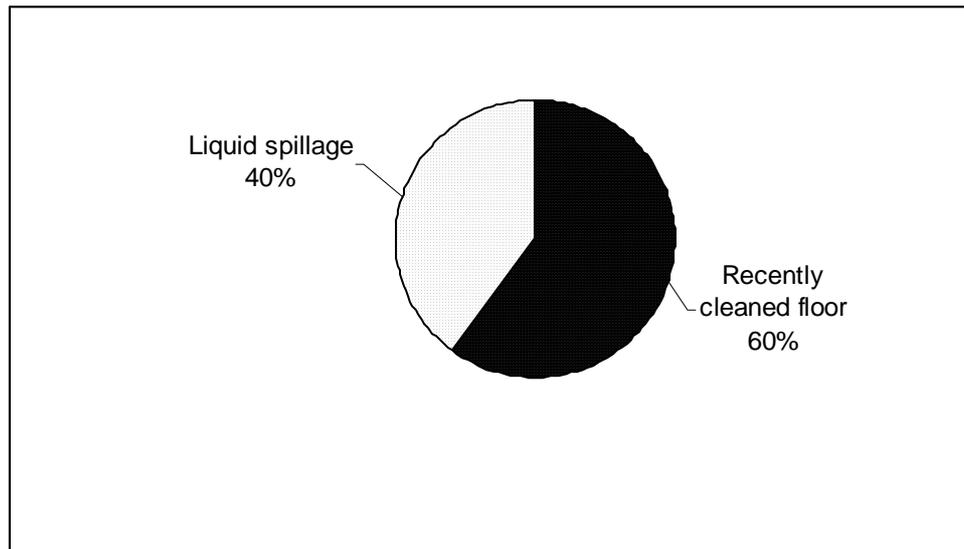
One person (employee) slipped on water from a floor-cleaning machine. The machine pumped out water on to the floor to clean it. The water was then sucked back into the machine when the cleaner pushed the machine over the floor. The machine was an old model and pumped water wider than the area sucked. Management and staff were aware of this. To ensure no wet areas were left, another cleaner was required to dry mop behind the machine. On the day of the incident, however, the cleaner who was dry mopping had fallen behind the rate of the machine and the person who slipped (on her way to the clocking-in machine) walked across an area of the floor that had yet to be dried. Wet floor/caution signs were not displayed. It was company policy for cleaning staff to undertake cleaning duties during shop opening hours.

It was reported that staff had received training in the correct use of the floor cleaning machine, and dry mopping technique. It is unknown if this training included the necessity to remain close together and to work at similar speeds.

## 10 OUR FINDINGS – INADEQUATE CLEANING/DRYING

The general issue underlying 5 (8%) of the 62 incidents investigated was inadequate cleaning/drying. All 5 incidents resulted in a slip and were considered to be avoidable.

Details of what the person slipped on are presented in Figure 15.



**Figure 15** What the person slipped on

Of the 5 cases resulting from inadequate cleaning/drying, 3 (60%) individuals slipped on a recently cleaned floor and 2 individuals slipped on a liquid spillage.

It is interesting to note that whilst inadequate cleaning/drying was the sixth most common cause of slips/trips, the injuries sustained were the most severe, based on our injury severity score (as detailed in section 3.8).

### 10.1 RECENTLY CLEANED FLOOR

Three individuals (two employees and one contractor) slipped on a recently cleaned floor, the employees slipped in a kitchen/restaurant and the contractor slipped on internal stairs. The wet floors/steps were not dried or fenced off until dry. Additionally, no warning/wet floor signs were displayed. In the two cases that occurred in kitchen/restaurant, cleaning duties were undertaken in the morning, at the start of the working day. This meant that other staff members then walked over the recently cleaned floor when starting their shift.

It was reported in all three instances that the correct cleaning procedure was being followed. However, drying the recently cleaned floor was not part of the cleaning procedure.

### 10.2 LIQUID SPILLAGE

In 2 cases, a liquid spillage (caused by inadequate cleaning) led to a slip incident. Of these:

- 1 involved an employee slipping on a spillage of cleaning fluid that a cleaner had left on the floor of an internal corridor/walkway

- 1 case involved an employee slipping on a spillage that had not been cleaned up properly in a kitchen/restaurant.

The spillage of cleaning fluid had not been reported, prior to the incident. As a result, the spillage was not contained or fenced off until the affected area could be cleaned. It was reported that staff members were aware of their health and safety responsibilities (i.e. clean up spillages). It is unknown why the cleaner who spilled the fluid did not report it or clean it up.

The incident that occurred in the kitchen/restaurant involved an individual slipping on a spillage that had not been cleaned properly. Earlier on in the day, there had been a spillage of cooking oil that had been cleaned up, but not reported. Additionally, the correct cleaning regime had not been used. As a result, the floor remained slippery with cooking oil. Inadequate training on the correct use of cleaning equipment and cleaning procedures was cited as being a contributory factor in the slip incident, as was a general lack of awareness of health and safety responsibilities both by staff and management.

## **11 OUR FINDINGS – UNSECURED/UNEVEN MAT**

The general issue underlying 2 (3%) of the 62 incidents investigated was an unsecured or uneven mat. Both incidents involved a member of the public tripping and were considered to be avoidable.

In one case, the mat had been delivered by a contractor and placed on the shop floor with a crease in it. In the other case, it is unknown how the mat became unsecured/uneven.

The unsecured/uneven mats had not been reported prior to the trip incidents. Additionally, it was reported that there was no formal system in place to check the condition of the mats in either case.

## 12 OUR FINDINGS – HUMAN ERROR

The general issue underlying 1 (2%) of the 62 incidents investigated was human error. Whilst human error was one of the uncommon causes of the slips/trips we investigated, the resulting injury was the second most severe, based on our injury severity calculation (as detailed in section 3.8).

An employee left a chiller door open, which caused a build-up of moisture on the floor. Another employee then slipped on the wet floor. The employee who slipped was not meant to be in the chiller store area. Additionally, she was wearing high-heeled shoes, which were inappropriate for the conditions of the chiller store area.

It was reported that regular checks of the floor condition and work areas were conducted. It is unknown how frequently such checks were made, or how long the chiller door had been open prior to the slip incident.

As a result of the moisture build-up not being reported or identified, the water had not been cleaned up or the floor dried.

Staff were apparently supervised and it was reported that managers regularly enforced health and safety rules. It was also reported that staff were aware of their health and safety responsibilities. In this instance, however, it would seem that this was not the case.

## **13 OUR FINDINGS – INADEQUATE CLEARANCE**

The general issue underlying 1 (2%) of the 62 incidents investigated was inadequate clearance between two workstations. An employee was leaving her desk area and tripped over a colleague's chair. The clearance between the two workstations is unknown. However, the person investigating this incident believed this to be the cause. No similar incidents had occurred previously.

Regular checks of the floor and work areas were reportedly made, however the clearance between the two workstations in question was not identified as being a problem.

## 14 CONCLUSIONS

We received completed diagnostic questionnaires for 62 slip/trip incidents from a variety of industry sectors, including retail, food and drink, manufacturing and service. Various HSE and Local Authority Inspectors, as well as in-house health and safety personnel from the companies investigating the incidents, completed the checklists.

The general issues underlying most of the slips/trips investigated were:

- An individual losing their footing/balance (24%)
- Inadequate maintenance (22%)
- An item not being stored or put away correctly (11%)
- An item dropped by a customer (11%)
- Rainwater on the soles of an individual's shoes (9%).

**An individual losing their footing or balance** was the most common cause of slips/trips (15 cases), most commonly on stairs. There were no reported spillages, items of contamination or obstructions that contributed to the slip or trip. The floor condition was considered adequate in all instances with no uneven areas or slippery finishes. The steps/stairs were reported to be even, in a good state of repair and clearly marked in all instances. The individual was reported to have simply lost their footing or balance as a result of inherent human nature. Whilst an individual losing their footing/balance was the most common cause of slips/trips, they resulted in the least severe of injuries and consequent treatment, based on our injury severity calculation (as detailed in section 3.8).

It was reported that there was a handrail present in four of the cases investigated. There was no handrail in four instances, and in the remaining four instances it was unknown if there was a handrail. The provision of a handrail raises some interesting questions: would the outcome have been different (i.e. might the individual have managed to save themselves by holding the handrail, thus not slipping/tripping, or might they have sustained a less serious injury?) if a handrail had been provided?

It was reported in over half of the cases investigated (8) that staff were aware that there was a general slip/trip risk associated with walking up/down stairs, as this information was provided as part of their induction/health and safety training. Again, this raises some interesting issues: staff being aware of the risks involved with using stairs/steps does not appear to prevent slip/trip incidents from happening. However, the exact content of the staff health and safety briefing is unknown, so we do not know if information on the importance of using a handrail (if present) was given or if the seriousness of the risk was effectively conveyed. This may explain why the slip/trip incidents occurred, despite staff being aware of the risks involved.

**Inadequate maintenance** was the second most common underlying issue resulting in slips/trips (14 cases). Most incidents involved uneven ground/flooring or water leakages. In 6 instances, management was aware of the problems but there was no effective programme of maintenance or repair in place. In one case, the reason given for not rectifying the problem (an uneven floor caused by contractors digging up the yard) was 'cost'. No further explanations as to why the uneven ground or water leaks (caused by faulty equipment) remained un-repaired were given for the other cases. However, the fact that the slip/trip hazards remained, despite management being aware of them, highlights a poor reaction to reported problems.

A lack of ownership of the problem and a general lack of awareness by staff of the seriousness of the slip/trip risks were also cited as being contributory factors. This explains why the equipment/ground remained inadequately maintained in the long-term.

**An item not being stored or put away correctly** was the third most common underlying issue resulting in a slip/trip (7 cases). In 2 cases it was reported that staff were not fully aware of their health and safety responsibilities (i.e. tidy up and don't leave objects on walkways etc). The reason for this lack of awareness is unknown.

Regular checks of floor surfaces were reportedly made in 2 of the cases identified. In both instances, the trip hazards (a ramp and a bag of confidential waste) were identified prior to the incident but were not deemed to be a hazard. This raises some serious issues and questions the ability of staff to identify slip/trip hazards. What are staff actually looking for during their checks/inspections? What is their perception of a slip/trip risk? Based on the findings of this investigation, it would appear that many employers/duty holders have a poor perception of risks and are not adept at recognising common slip/trip risks or possibly do not consider such risks as being important enough to warrant rectification.

**An item dropped by a customer** was the fourth most common underlying issue associated with the slips/trips investigated (7 cases). In all cases, it is unknown how long the food and liquid spillages had been on the floor prior to the slip incident. None of the spillages had been identified or reported (prior to the incident) to a member of staff. As a result, the spillages were not contained or fenced off until the affected area could be cleaned. It is unknown why the customers who dropped the items had not reported the spillages. However, further investigations by in-house retail staff may identify possible reasons.

Staff reportedly conducted regular checks of floor surfaces. The frequency of these checks is unknown. However, it would appear that the checks were not frequent enough as the spillages were not identified prior to the incidents.

**Rainwater on the soles of an individual's shoes** was the fifth most common underlying issue, accounting for 9% of the incidents investigated (6 cases). Three cases occurred near a store/shop entrance, involving members of the public. It was reported that there were mats in place to absorb water. However, it was reported that these mats did not have the capacity to absorb all the water being brought in by pedestrians. Wet floor/caution signs were displayed in all 3 instances. It was reported that regular checks of floor conditions were made in 3 of the 6 incidents (those that occurred on a shop floor/supermarket aisle), and that any identified problems were rectified. Mats being in place were considered to be an effective control measure at reducing problems with slips. However, how effective the mats really were appeared to have been overlooked. Again, this highlights a poor perception of risk, and raises some important questions regarding the ability of employers/ duty holders to effectively control slip/trip risks, as required by health and safety legislation.

Of the 62 slips and trips investigated, a total of 44 (70%) were considered by the person investigating them to be avoidable. In our opinion, however 48 (77%) of the incidents could have been avoided. We believe that a poor perception of risk and a failure to apply the principles of prevention in the Management of Health and Safety at Work Regulations 1999 were the main reasons that these four incidents (7%) were wrongly deemed unavoidable. This raises questions as to the competency of the individuals investigating slip/trip incidents, as well as the adequacy of the investigation itself.

As highlighted above, human factors played a significant role in the majority of the slips and trips investigated. We identified a series of common contributory factors preceding the incidents, both from the perspective of the duty holder and the injured person. These included:

- Lack of understanding of requirements of health and safety legislation to identify and control slip/trip risks
- Poor perception of risk
- Failure to identify slip/trip risks
- Failure to report spillages, slip/trip risks etc (employees and members of the public)
- Inadequate or lack of reaction to reported problems
- Lack of ownership of health and safety responsibilities
- Lack of understanding of health and safety responsibilities
- Lack of awareness of slip/trip risks
- Poor understanding of the importance of implementing existing health and safety measures to control slip/trip risks (e.g. effective maintenance/cleaning programmes)
- Failure to provide staff with health and safety training, including slip/trip risks
- Failure to monitor and investigate effectiveness of control measures
- Lack of staff supervision
- Lack of enforcement of health and safety rules
- Poor communication between staff
- Failure to adequately investigate slip/trip incidents and identify ways to prevent recurrence.

If these critical issues had been identified and effectively controlled prior to the incident, it is very likely that the momentum of events leading to the incident would have been neutralised, thus preventing the slip/trip. In section 15, we present details of usable, practical strategies for the control and reduction of slip and trip accidents, based on the findings of our investigation.

## 15 RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER WORK

Based on the findings of our investigation, we make the following recommendations and suggestions for further work.

### 15.1 RECOMMENDATIONS

- **Continue to raise awareness amongst employers/duty holders of their legal requirements to control risks from slips/trips**

There is legislation that governs slips and trips, and it is important that awareness of the relevant laws are emphasised whenever possible, namely:

- *The Health and Safety at Work etc Act 1974* – which requires employers to ensure the health and safety of all employees and anyone who may be affected by their work. This includes taking steps to control slip and trip risks.
- *The Management of Health and Safety at Work Regulations 1999* – includes duties on employers to assess risks (including slip and trip risks) and where necessary take action to safeguard health and safety.
- *The Workplace (Health, Safety and Welfare) Regulations 1992* – require floors to be suitable, in good condition and free from obstructions. People must be able to move around safely.

It is known from this investigation that there were several instances of a breach of this legislation. It is essential therefore that awareness of the need to comply with relevant health and safety legal requirements is continually raised with employers.

- **Provide practical information for employers/duty holders on identifying slip/trip risks**

It appears that many employers conduct checks and inspections of their work places to identify slip/trip risks but that slip/trip risks are either not identified or are not perceived as being a risk. Clear, simple information should be provided on what constitutes a slip/trip hazard, for example:

- Any spillage (liquid or food) on a floor
- An uneven floor (e.g. raised carpet edge, uneven floor tile or unsecured mat)
- Any object left in an access route
- Any object not stored or put away correctly
- Leaks from equipment/roofs
- Recently cleaned/wet floors
- Rainwater brought inside on the soles of people's shoes
- Snow/ice
- Using stairs whilst carrying objects by hand
- Rushing around whilst using stairs.

Information on how to identify risks, for example, an inspection checklist that covers a variety of common slip/trip hazards, would also be helpful and would encourage staff to inspect all areas of their workplace, both internally and externally to identify hazards.

- **Provide practical information for employers/duty holders on controlling slip/trip risks**

Practical guidance on measures that can be implemented to control any identified slip/trip risks should be provided to employers/duty holders. Based on the findings of this investigation, information on the following practical control measures should be provided. We have prioritised our control measures in terms of high, medium and low priority, in accordance with the factors associated with most of the slips/trips investigated. A high priority has been assigned to control measures associated with the most common underlying causes of the slip/trip incidents investigated. A medium priority has been given to control measures associated with a considerable number of the slips/trips investigated. A low priority has been assigned to control measure associated with a small number of the slips/trips investigated.

***High priority control measures:***

- Ensure all staff and management are aware of their health and safety responsibilities and that there is a nominated, competent individual who is responsible for the overall management of health and safety (including identifying, controlling, monitoring and investigating slip/trip risks).
- Provide staff with regular health and safety training, including identifying and reducing slip/trip risks. Showing staff pictures/photos of their work environment (containing slip/trip risks) and asking them to identify them during a test would be a practical way of raising awareness. Staff could also be tested on what action they would take. Customising training around the actual work situation would not only raise awareness but also would also help create ownership and make staff aware of how to deal with a slip/trip hazard or incident. This would be particularly valuable in retail premises. Regular refresher courses should also be provided.
- Conduct regular checks of floor surfaces and workplaces to identify slip/trip risks and immediately fence off and/or contain any identified spillages/contaminated areas and mark any uneven ground.
- Display warning/caution signs (e.g. ‘uneven floor’ or ‘wet floor’).
- Regularly communicate identified slip/trip hazards to staff, including being careful when walking/up down stairs and using a handrail (if present) and what measures are in place to control them.
- Ensure an effective maintenance programme is in place so that prompt repairs are made and equipment is regularly maintained.
- Ensure an effective cleaning programme is in place so that spillages/contaminated areas are promptly cleaned (including drying the floor after cleaning and cleaning out of hours whenever possible).

***Medium priority control measures:***

- Make slip/trip-relevant safety behaviour part of staff job descriptions and measure/appraise them on it.

- Foster a culture of responsibility amongst staff and encourage them to report and deal with any slip/trip hazards (including spillages) and not to ignore them.
- Involve staff in generating solutions to slip/trip hazards.
- Investigate all slips/trip incidents to identify underlying factors associated with the incident. Findings from these investigations should be used to identify further control measures and prevent a recurrence. Our diagnostic checklist could be adapted as a tool for companies to use when investigating slip/trip incidents.
- Review and provide feedback on any incidents/accidents/near misses at regular staff meetings to emphasise the importance and potential severity of slips/trips.
- Supervise staff and enforce health and safety rules.
- Provide recognition and praise for good safety behaviour. For example, a notice board that lists the names of people who have contributed to accident prevention by reporting, fencing off, or clearing up spillages.
- Investigate the effectiveness of all control measures.
- Use health and safety and ergonomics advice during the procurement process (e.g. pilot equipment to avoid purchasing mats which don't absorb enough water, leaky dishwashers etc.).

***Low priority control measures:***

- Ensure staff are provided with adequate cleaning materials and are trained in the correct procedures to use when cleaning spillages/contaminated areas etc.
- Store cleaning materials close to where spillages may occur.
- Ensure staff wear adequate footwear for their work environment.
- Ensure the floor surface/finish is adequate for the environment (i.e. avoid terrazzo tiles or wooden floors in areas that may get wet with spillages or rainwater).
- Ensure that the health and safety of staff and customers is not compromised by staff shortages (i.e. all existing slip/trip control measures should be implemented regardless of staff sickness/holiday absence).

## **15.2 SUGGESTIONS FOR FURTHER WORK**

- **Conduct research into customer behaviour**

11% of the slip/trip incidents investigated as part of this study involved a customer dropping an item and causing a food/liquid spillage or a temporary obstruction that someone then slipped on. None of the customers who dropped the items reported it. The reasons why are unknown. Why customers do not report spillages etc should be investigated, as should what would encourage them to report any spillages or dropped items. The information from this research could then be used to develop practical control measures to reduce the number of unreported spillages, and thus the number of slip/trip incidents.

- **Encourage companies to use the diagnostic checklist when investigating slip/trip incidents**

Our checklist (used in this study) has been adapted following feedback from respondents and the HSE. It has been designed for companies to use when investigating

slip/trip incidents and is available from HSE. Companies should be encouraged to use the checklist as it will provide them with a comprehensive, diagnostic tool, covering all human factors issues, and will enable them to identify the underlying causes of the slip/trip incident. Armed with this information, companies will be able to develop and implement appropriate control measures to prevent a recurrence.

## APPENDIX 1 – DIAGNOSTIC CHECKLIST

*Please note this is the version we sent to respondents who participated in this study. A revised version of the checklist (based on feedback) is available from HSE.*

### Section 1 - Background information

- i. Date of accident: \_\_\_\_\_
- ii. Time of accident: \_\_\_\_\_
- iii. Who slipped/tripped?      employee                        
   member of public                        
   visiting worker/contractor                        
   other                                        
   if other, please give details: \_\_\_\_\_
- iv. Was the person male or female?      male       female
- v. How old was the person who slipped/tripped?      \_\_\_\_\_ years
- vi. Where did the person slip/trip?  
Please give details (e.g. on shop floor, in warehouse, in car park etc):  
\_\_\_\_\_
- vii. What did the person slip/trip on?  
Please give details (e.g. liquid spillage, grape or other item of produce or contaminating substance, obstruction on floor etc):  
\_\_\_\_\_
- viii. Was the slip/trip avoidable?      yes       no   
  
If yes, please give details of how it could have been prevented and why it was not:  
\_\_\_\_\_  
\_\_\_\_\_
- ix. What injury did the person sustain?
- |                   |                          |                |                          |
|-------------------|--------------------------|----------------|--------------------------|
| swelling/bruising | <input type="checkbox"/> | cut/laceration | <input type="checkbox"/> |
| sprain/strain     | <input type="checkbox"/> | unknown        | <input type="checkbox"/> |
| fracture          | <input type="checkbox"/> | other          | <input type="checkbox"/> |
- x. What treatment was received?
- |                              |                          |                     |                          |
|------------------------------|--------------------------|---------------------|--------------------------|
| no treatment required        | <input type="checkbox"/> | hospital in-patient | <input type="checkbox"/> |
| first-aid (at accident site) | <input type="checkbox"/> | unknown             | <input type="checkbox"/> |
| referred to GP               | <input type="checkbox"/> | other               | <input type="checkbox"/> |

## Section 2 - Slip incidents

Only complete this section if the person **slipped**.

<b>Cleaning regime/housekeeping</b>		Yes	No	N/A
1	How long had the spillage/item of contamination been on the floor prior to the slip? Time:			
2	Was the spillage contained or fenced off? If no, please give details (e.g. why not?):			
3	Was the spillage/item of contamination attended at all times? If no, please give details (e.g. why was it left unattended?):			
4	If the person slipped on a wet or recently cleaned floor, had it been dried or fenced off until dry? If no, please give details (e.g. no paper towels or fencing available):			
5	Were wet floor warning/caution signs displayed? If no, please give details (e.g. none available):			
<b>Floor condition</b>		Yes	No	N/A
6	What was the floor surface/finish (e.g. concrete floor coated with a non-slip substance)? Please give details:			
7	Was the floor slippery? If yes, please give details (e.g. slippery floor finish, grease on floor in food preparation area etc):			
8	Was the floor condition adequate (i.e. no spillages or contaminated areas)? If no, please give details:			

9	If the accident happened near to an entrance to a building, were there any mats to absorb water?			
10	Did the entrance mats have the capacity to absorb all the water being brought in by pedestrians?			
11	Were changes in floor surface clearly highlighted/marked? If no, please give details:			
<b>Maintenance/equipment design</b>		Yes	No	N/A
12	If the spillage was a result of a leak or faulty machinery, was the equipment adequately maintained? If no, please give details:			
13	If the spillage was a result of a leak or faulty machinery, was the equipment adequately designed and arranged so as to prevent spillages/leaks? If no, please give details:			
14	Was the spillage or leak adequately contained (e.g. bunds)? If no, please give details:			
15	If the spillage was a result of a leak or faulty machinery, was the fault reported before the accident happened? If no, why not?			
16	How long had the equipment been faulty prior to the slip/trip? Time:			

**Please now proceed to Section 4.**

### Section 3 - Trip incidents

Only complete this section if the person **tripped**.

<b>Housekeeping</b>		Yes	No	N/A
17	Was the floor free from obstructions? If no, please give details (e.g. items on walkway):			
18	Was the work area tidy (i.e. no supplies/equipment left on floor)? If no, please give details (e.g. staff not tidying up after themselves, inadequate storage etc):			
<b>Floor/ground condition</b>		Yes	No	N/A
19	What was the floor surface/finish (e.g. tiles, carpet etc) Please give details:			
20	Was the floor/surface finish adequate (e.g. no cracks, holes, or loose or worn out mats/rugs)? If no, please give details:			
21	Was the floor surface even/uniform (i.e. no changes of height, surface material etc)? If no, please give details:			
22	Were changes in floor surface clearly highlighted/marked? If no, please give details:			
23	Was external paving/footpaths even and in a good state of repair? If no, please give details (e.g. loose paving):			
24	Were mats/carpets even and securely fixed in place with no curled-up edges or corners? If no, please give details:			

**Please now proceed to Section 4.**

#### Section 4 - Physical factors

<b>Footwear</b>		Yes	No	N/A
25	What type of footwear was the person wearing? Please give details (e.g. safety footwear, trainers, court shoes etc):			
26	Did the footwear fit correctly? (i.e. person wearing correct size)? If no, please give details (e.g. correct size not available):			
27	Was the footwear in a good state of repair/well maintained? If no, please give details:			
28	Was the person able to walk easily (e.g. when wearing safety shoes)? If no, please give details:			
<b>Steps/stairs/ramps</b>		Yes	No	N/A
29	Was there a handrail?			
30	Was the handrail adequate? (i.e. positioned at a comfortable height, easy to grip etc) If no, please give details:			
31	Was the ramp a permanent feature/secured in place? If no, please give details:			
32	Was the ramp/step sizes even/uniform? If no, please give details:			
33	Was the ramp/stairs/steps slippery? If yes, please give details:			

34	Were the stair conditions adequate (i.e. no worn, ripped, cracked, damaged or contaminated areas)? If no, please give details:			
<b>Manual handling, PPE and equipment design</b>		Yes	No	N/A
35	Was the person able to use handrails when carrying objects up/down stairs/ramps? If no, please give details (e.g. what was being carried, size etc):			
36	Was the person able to see in front of them when carrying objects? If no, please give details (e.g. what was being carried, size etc):			
37	Was the person able to see clearly when wearing PPE (e.g. goggles, helmets or hoods)? If no, please give details (e.g. type of PPE restricting vision):			
38	Did the person catch their clothing on a protrusion/edge of shelving or racking? If yes, please give details (and specify if the sharp edge or protrusion was inherent to the design of the equipment/item or if the equipment/item was broken/faulty):			

**Please now proceed to Section 5.**

**Section 5 - Environmental factors**

<b>Lighting, temperature &amp; noise</b>		Yes	No	N/A
39	Did poor lighting contribute to the slip/trip? If yes, please give details (e.g. insufficient light to enable the person to see clearly):			
40	Were there any areas of shadow, dazzling light or glare that made it difficult to see? If yes, please give details:			
41	Was the person in noisy or unpleasant conditions that may have caused a distraction or reduced alertness? If yes, please give details:			
42	Was the person working in a cold room or freezer? If yes, was the floor slippery? Please give details:			
43	Was the person working in an area of high humidity? If yes, was the floor slippery? Please give details:			
<b>Weather conditions</b>		Yes	No	N/A
44	Were there adverse weather conditions (e.g. heavy rain, snow, ice) or leaves that made the ground (outside) slippery? If yes, please give details:			
45	Had the adverse weather conditions made the internal floor surface slippery? If yes, please give details (e.g. heavy rain causing the soles of people's shoes to be wet):			
46	Were there adverse weather or other conditions (e.g. snow or leaves) that covered/masked uneven ground, potholes etc? If yes, please give details:			

**Section 6 - Individual factors**

<b>Personal/individual issues</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>
47	Was the person tired at the time of the accident? If yes, please give details (e.g. due to working shifts, excessive workload/work hours):			
48	Was the person suffering from stress or pressure at the time of the accident? If yes, please give details (e.g. due to family problems, conflicts with work colleagues):			
49	Was the person feeling bored or disheartened at the time of the accident? If yes, please give details (e.g. low job satisfaction):			
50	Was the person running/rushing around at the time of the accident? If yes, please give details (e.g. high workload, in a hurry):			
51	Was the person distracted or not concentrating at the time of the accident? If yes, please give details (e.g. due to an interruption or disruption):			
52	Did the person make an error? If yes, please give details (e.g. due to low skill or competence levels):			
53	Did the person make a deliberate mistake? If yes, please give details (e.g. cutting corners, taking a short cut or violating safety rules):			
54	Did the person have a health or medical problem (e.g. migraine, injured leg) that may have contributed to the slip/trip? If yes, please give details:			

55	Did the person have a disability (e.g. visual, mobility or mental impairment) that may have contributed to the slip/trip? If yes, please give details:			
56	Was the person affected by drugs (either prescribed or illegal) or alcohol at the time of the accident? If yes, please give details:			
57	Was the person aware that there was a slip/trip risk?			
58	Did the person lose their balance or footing?			

**Please now proceed to Section 7.**

**Section 7 - Management & organisational factors**

<b>Management/organisational issues</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>
59	Was the person who slipped/tripped the first to find the spillage/ item of contamination or obstruction/trip hazard? If no, who found it?			
60	Had the spillage/contamination/obstruction/trip hazard been reported before the slip/trip happened? If no, why not?			
61	If reported, was the correct procedure followed? If no, why not?			
62	Was the person doing their normal/routine job at the time of the accident? If no, please give details (e.g. what job they were doing, why they were doing it):			
63	Were staffing levels sufficient at the time of the accident? If no, what effect did this have on the workforce (e.g. some individuals covering another's work as well as their own)?			
64	Had the staff member been provided with adequate and relevant training in the correct use of safety/cleaning equipment? If no, please give details (e.g. training not provided/inadequate):			
65	Was suitable cleaning equipment provided for the type of surface being treated/cleaned? If no, please give details (e.g. cleaning supplies depleted, wrong type ordered/purchased):			
66	Was the correct cleaning procedure being followed for the type of surface being treated/cleaned? If no, please give details (e.g. no time to clean properly):			

67	<p>Was there a proper/effective programme of equipment maintenance and repair in place?</p> <p>If no, please give details (e.g. not part of health and safety policy, no time etc):</p>			
68	<p>Was there effective communication between managers/shift supervisors etc regarding slip/trip incidents, equipment faults etc?</p> <p>If no, please give details:</p>			
69	<p>Were regular checks of <i>internal</i> floor/surface conditions made?</p>			
70	<p>Were <i>internal</i> problems rectified (e.g. cleaning up spillages, repairing worn carpet tiles/mats etc)?</p> <p>If no, please give details:</p>			
71	<p>Were regular checks of <i>external</i> ground/surface conditions made?</p>			
72	<p>Were <i>external</i> problems rectified (e.g. clearing up leaves, putting down salt/grit on ice/snow etc)?</p> <p>If no, please give details:</p>			
73	<p>Was the staff member aware of their health and safety responsibilities (i.e. clean up spillages, tidy up and don't leave objects on walkways etc)?</p> <p>If no, please give details (e.g. no training provided, health and safety not adequately communicated to staff):</p>			
74	<p>Were staff members effectively supervised?</p> <p>If no, please give details (e.g. insufficient staff levels, poor health and safety culture):</p>			
75	<p>Were health and safety rules enforced by managers/supervisors?</p> <p>If no, please give details (e.g. unaware of employer responsibilities, poor health and safety culture):</p>			
76	<p>Had a similar incident to this slip/trip occurred previously?</p>			

77	Were any preventative actions taken? Please give details:			
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## APPENDIX 2 – CONTACTS

Health and Safety personnel from the following companies were sent the diagnostic checklist:

Company	Sector
3M	Manufacturing
Abbey Road Studios	Entertainment
Alexandra Palace	Leisure
Allied Bakeries	Food and drink
Allied Distillers Ltd	Food and drink
Allvac Ltd	Manufacturing
Amgen	Manufacturing
AOL	Software and systems
Archbishop's Council of the Church of England	Service
Arkady Craigmillar	Food and drink
Arla Foods	Food and drink
Athenaeum Hotels and Apts	Hotel and catering
B Brooks (Norwich) Ltd	Food and drink
Bacardi-Martini Ltd	Food and drink
Barclays Bank plc	Banking
Bausch and Lomb	Commercial
BBC	Media
Bear Stearns International Ltd	Finance
Bemrosebooth	Commercial
Benfield Greig	Finance
Bespak Europe	Manufacturing
Bindman and Partners	Legal
Bluecrest Foods	Food and drink
Bolton NHS Trust	Public
Bombardier Transportation	Transport
Bonnington Hotels	Hotel and catering
Bostik Findley	Manufacturing
Britannia Building Society	Banking
British Energy	Service
British Gypsum	Construction
British Standards Institution	Public
British Sugar plc	Food and drink
Burtons Gold Medal Biscuits Ltd	Food and drink
Butterworths Trolley	Media
Cadbury Ltd	Food and drink
Cameron McKenna	Investor relations
Campbells Grocery Products	Food and drink
Cargill plc	Retail
Centre for Ecology and Hydrology	Public
Channel 5	Entertainment
CHI	Public
Chubb Insurance Company	Insurance
City of London Club	Hotel and catering
CNH UK Ltd	Construction

Coca-Cola Schweppes	Food and drink
Colmans of Norwich	Food and drink
Coors Brewers	Food and drink
Crown Cork and Seal	Manufacturing
Cummins Engineering Company	Engineering
Dakocytomation	Pharmaceutical
Dawn Carnaby	Food and drink
De La Rue	Commercial
Department for Transport	Public
Deutsche Bank	Finance
Dove Valley Ashbourne	Food and drink
Draka UK	Engineering
Drake and Skull/Emcor	Commercial
DSDA	Manufacturing
Dura Automotive	Automotive
EBS Dealing Resources International Ltd	Service
EH Booth	Food and drink
Elliot Group	Service
Engineering Construction Industry Training Board	Engineering
English Sports Council	Leisure
Entertainment UK	Entertainment
Ernst and Young	Finance
Eversheds	Legal
Express Dairies	Food and drink
Fairline Boats	Manufacturing
Favor Parker	Manufacturing
FBU	Trade union
Field Boxmore	Manufacturing
Film Council	Entertainment
Ford	Automotives
Fox's Biscuits	Food and drink
Fridgemotors	Manufacturing
Friskies Pet Care	Food and drink
Fujitsu	Manufacturing
FW Farnsworth	Engineering
Games Workshop	Retail
GE Capital	Utilities
GE Medical Services	Manufacturing
General Mills Berwick Ltd	Manufacturing
Gilbert Gilkes and Gordon	Manufacturing
GKN	Engineering
GLMCA	Public
Grampian Country Pork Halls	Food and drink
GW Padley Poultry	Food and drink
H P Bulmer Holdings plc	Food and drink
Heinz Frozen and Chilled Foods	Food and drink
Henderson Global Investors	Investor relations
Hillsdown Ambient Food Group	Food and drink
Honeywell UK	Manufacturing
HR Johnson Tiles	Manufacturing

HSE	Public
Incepta Group plc	Commercial
Industri Kapital	Investor relations
International Institute for Environment and Development	Public
Johnson Controls Automotive UK	Automotives
Kara Foods	Food and drink
Kara Grain D'Or Ltd	Food and drink
Kelloggs	Food and drink
Kerry Foods	Food and drink
KP Nuts	Food and drink
Lincolnshire Police	Public
Linpac Containers	Manufacturing
Lloyds TSB	Banking
London Ambulance Service NHS Trust	Public
London Borough of Bromley	Public
London Borough of Camden	Public
London Stock Exchange	Investor relations
London Underground	Transport
Lorien Engineering Solutions Ltd	Engineering
Marks and Spencer plc	Retail
Matthew Clark plc	Food and drink
McCain Foods	Food and drink
McCormick UK Ltd	Food and drink
McVities	Food and drink
Merlow	Manufacturing
Merril Lynch	Investor relations
MFI	Retail
National Assembly for Wales	Public
Nimir Petroleum Ltd	Oil and gas
Nokia	Manufacturing
Norse Merchant Ferries	Transport
Nortel Networks	Telecommunications
Northern Foods	Food and drink
Northern Rock plc	Banking
ORR	Public
Otis Ltd	Engineering
Overbury Ltd	Construction
Pedigree Petfoods	Food and drink
Pirelli	Manufacturing
Polypipe Building Products	Manufacturing
Premier Brands	Food and drink
Public Guardianship Office	Public
RAC	Transport
Rexard Glass	Manufacturing
Royal College of Physicians	Service
Sanda Foods	Food and drink
Sara Lee Bakery	Food and drink
Sara Lee Intimates UK	Manufacturing
Satchwell Control Systems	Electronics

Sayers (Confectioners) Ltd	Food and drink
Small Business Safety Services	Service
Sodastream Ltd	Food and drink
Somerfield Stores	Retail
Southebys	Service
Sovereign Food Group	Food and drink
SR Gent	Manufacturing
St Ivel Ltd	Food and drink
Sumitomo Electric	Electrical
Sungard	Finance
Sunseeker International	Manufacturing
Takao Europe Manufacturing	Manufacturing
Tate and Lyle Sugars	Food and drink
Thorntons	Food and drink
Tite and Lewis	Finance
Trebor Bassett Ltd	Food and drink
Tribal Property Services	Commercial
Trowers and Hamblin	Legal
TRW	Manufacturing
TUC	Public
UMIST	Trade union
University Hospital Lewisham	Public
USDAW	Trade union
Vesuvius	Manufacturing
VHB	Commercial
Waitrose	Retail
Walkers Midshire Foods	Food and drink
Wandsworth Borough Council	Homecare
Warburtons	Food and drink
Westminster Kingsway College	Education
White and Case	Service
Whitworths	Food and drink
WM Morrison Supermarkets	Retail
Wyeth Research	Pharmaceutical
Zurich Insurance	Insurance

A number of HSE and Local Authority Inspectors were also sent the diagnostic checklist to complete for any slip/trip incident they investigated.









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