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**Literature Review on the Reporting
of Workplace Injury Trends**

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EXECUTIVE SUMMARY

This document reviews the literature on reporting patterns for accidents and injuries, focusing particularly on research carried out from 1990 onwards.

OBJECTIVES

To conduct a review of literature to:

- Provide a comprehensive overview of reporting patterns for accidents and injuries;
- Investigate accident reporting levels by accident type and severity; nature of industry, and size of business;
- Gain insight into the underlying factors influencing inaccurate reporting such as reporting systems, safety culture, use of incentives and motivation;
- Look at the reporting patterns for other recordable occurrences (e.g. hospital contamination incidents)

MAIN FINDINGS

Accuracy of reporting figures

On the basis of the research evidence considered, the under reporting of accidents, injuries and illness appears to be a worldwide phenomenon, with confirmatory studies conducted in a wide range of countries. As would be expected, trends in accident rates and reporting accuracy vary from country to country, reflecting cultural differences, as well as variation in reporting systems and legislation.

Inaccurate reporting by type of company

Industry Sector: Comparisons between the Labour Force Survey results and RIDDOR statistics reveal that reporting rates vary significantly by sector. Most notably, reporting accuracy is generally high in the extraction and utility supply sector, yet low within hotels / restaurants and finance / business. A number of studies, primarily from UK or US sources, cited evidence of varying degrees of under reporting of accidents and injuries in agriculture, construction, healthcare and the voluntary sector.

Company Size: In both the UK and US, there exists a general consensus amongst researchers that small firms are more likely to under report or not report at all. Explanations offered include a lack of awareness of legal reporting requirements among smaller enterprises, penalties for poor record keeping infrequently levied on small firms, and completing the relevant paperwork posing a greater relative burden for smaller rather than larger firms.

Inaccurate reporting by type of injury

Musculoskeletal Disorders: Research suggests that the incidence rates for work-related musculoskeletal disorders are heavily under reported. As a result, researchers advocate the need for improved regulatory policy-making and resource allocation for programmatic prevention efforts.

Eye Injury: HSE research indicated a greater propensity to under report eye injuries as opposed to other types of injury site. This may be related to over-3-day injuries (of which a large majority of eye injuries are classed) suffering from significant under reporting.

Reasons for under reporting

The literature reviewed identified a number of powerful disincentives to participating in a reporting scheme, for both employers and employees. These are as follows:

Safety Incentive Programmes: Safety incentive programmes, which offer rewards for reductions in the number of workplace accidents and incidents, have been widely introduced in industrial settings with the aim of improving safety records and cutting safety-related costs. However, it is evident that limited consensus exists with regard to the efficacy or utility of incentives to improve safety performance in workplace contexts. Some general conclusions may be drawn:

- Most commentators are in agreement that incentives can improve performance, but that inherent problems may surface as a result of the manner in which they are implemented. It should be appreciated that a one-size-fits-all approach is unlikely to work, as it is widely postulated that such schemes ‘rarely travel well’. Therefore, it is imperative that any incentive scheme allows for flexible implementation.
- It may tentatively be concluded that incentives do not necessarily lead to perverse motivations (i.e. to under report), although the manner in which incentives are presented, and the methods of performance measurement utilised may potentially affect the likelihood of such adverse consequences. Thus, most criticism has been based on issues of design and implementation rather than principle.
- Programs based on outcomes, such as reductions in injuries, have drawn greatest condemnation from researchers yet such programs remain popular, largely because they are easy-to-administer and may superficially improve injury statistics.
- It is generally accepted that the potential for under reporting is greatest when incentives are of a financial nature, possess a high exchange value, or are of the ‘all or nothing variety’. Furthermore, in terms of accident reporting, it is widely held that peer pressure can exert a suppressive effect.

Safety Culture: It is generally agreed within the literature reviewed that the under reporting of accidents and incidents is promoted by the presence of a poor safety culture, with inadequate systems in place for reporting dangerous occurrences. One aspect critical to the successful implementation of any reporting scheme is the need for active and visible management commitment to the scheme. Therefore, under reporting is also likely to be symptomatic of poor management commitment to ensuring a safe workplace, as conscientious organisations with a strong managerial commitment to safety make it clear to all employees and supervisors that under reporting of accidents is unacceptable.

Research highlighted that under reporting of work-related injuries can also stem from lack of knowledge of reporting requirements, administrative barriers and inadequate reporting mechanisms. More specifically, these unsatisfactory reporting systems are considered by staff to be time-consuming; ineffective in actually stimulating positive change, and often unclear with

regards to what classifies as a reportable injury. The research suggests that reporting rates may increase if programs are easily accessible, efficient, and confidential. It was also advocated that worker safety training include instruction and encouragement to report workplace injuries.

Employee perceptions of reporting: The available research on this topic, albeit limited, suggests a range of factors other than those described above that potentially influence employees' willingness to report accidents and injuries. These include fear of reprisal; loss of pay / overtime pay; not wishing to be labelled as a complainer, feeling that suffering from symptoms is a sign of weakness, concerns about privacy and discrimination, and the perception that nothing can be done about the situation.

Workplace violence / bullying: The key factors held to induce under reporting of workplace violence and bullying are fear of blame or reprisal, lack of an appropriate reporting system, and employer disinterest. The effects of workplace violence are more acutely observed in certain sectors, with a wealth of research identifying prevalent under reporting in the care and voluntary sector.

RECOMMENDATIONS

Given the apparently widespread nature of accident under reporting, there appears to be a lack of research targeting the depth and breadth of this problem. More attention has been spent on understanding the causes of this phenomenon, although it may be [tentatively] concluded that these are wide ranging and, to some degree, situation / company specific, making them difficult to effectively target on a national basis.

It is recommended that further attempts to identify existing deficiencies in the current occupational safety surveillance and enforcement system be made. To improve reporting levels, there may be scope to take account of current research on incident and near miss reporting, and apply this to the RIDDOR system. For example, it is likely that improvements in the ease of making accident reports, demonstration of positive results as a consequence of proper reporting, and the provision of rapid, useful, accessible and intelligible feedback to the reporting community would be of benefit.

Insights from the literature are limited, or effectively absent, with regard to a number of salient issues. Therefore, on the basis of the gaps identified, the following recommendations for further research are suggested:

- Studies investigating prevalence of under reporting of eye injuries and work-related musculoskeletal disorders would be useful in order to examine the possible interaction between injury type, injury severity and industry sector on reporting behaviour.
- Further investigation into the area of employer's perceptions of laws, rules and regulations regarding reporting duties would be of interest. In addition, a more detailed consideration of employees' attitudes towards reporting injuries, illnesses and incidents may be useful to understand means by which to encourage increased reporting.
- There is a lack of scientific literature providing evidence of accident reporting accuracy by age group, gender, and occupation, which could be addressed.

1 INTRODUCTION

This document reviews the literature on reporting patterns for accidents and injuries, focusing particularly on research carried out from 1990 onwards.

1.1 OBJECTIVES

The following review is designed to summarise published findings on the reporting of accidents and injuries. The primary aim is to review accident reporting research undertaken in the UK, as this is of most direct relevance to the activities of the Health & Safety Executive (HSE), by whom this work is commissioned. Nevertheless, to provide a more comprehensive overview of reporting patterns, international research is referenced, although differences existing between reporting systems are acknowledged.

Within the review remit, available literature regarding accident reporting levels by accident type and severity, nature of industry, and size of business is considered. Gaining insight into the underlying factors influencing inaccurate reporting is also of particular interest, hence the review explores this literature base, with reference to reporting systems, safety culture, use of incentives and motivations.

Whilst the reporting of accidents and injuries is the principal focus of the review, literature considering reporting patterns for other recordable occurrences is also discussed (for example, studies that consider reporting of ill-health, work-related bullying and hospital injury reporting systems).

1.2 SCOPE

Findings from this review are presented in a number of discrete sections, although inevitably a degree of overlap will be observed on certain issues. The literature reviewed has been drawn from a wide range of sources and includes contributions from peer-reviewed academic research and policy documents, as well as safety, management, and public administration periodicals (e.g. PsycInfo, SciSearch OSHRom; IOM Database; Healsafe; Management & Marketing abstracts; Gale group management contents). The search strategy concentrated on the under reporting / reporting levels of accidents and injuries. To ensure that the literature reviewed was current, only documents produced post-1990 were examined¹.

Throughout the review, references and evidence sourced from non-peer reviewed sources such as practitioner publications are referred to as 'grey literature', as a means of distinguishing them from published academic articles in refereed journals. The distinction is potentially important, as it has implications for the relative degree of confidence in the reliability and validity of reported findings. Although findings from the grey literature are not necessarily invalid, they may, at worst, contain unsubstantiated claims and some degree of comment at the level of rhetoric and opinion. However, excluding findings from the grey literature completely may result in the omission of potentially important insights. In order to place the findings in context, the reader's attention is drawn to the credentials of evidence at the appropriate points within the review.

¹ Prepared Summer 2004; authorised Autumn 2005

2 ACCURACY OF REPORTING FIGURES WITHIN THE UK

2.1 BACKGROUND

Accidents and injuries occurring at work account for several million working days lost each year in the UK (Wadsworth, Simpson, Moss & Smith, 2003). Official information on workplace injuries is collected under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). These regulations stipulate that employers have a legal duty to report to HSE any injuries to employees resulting in an absence from normal work for more than three days. Under the RIDDOR system, HSE categorises injuries in terms of severity (fatal, major, or over-3-day absence), nature and bodily site of injuries, age, sex, and employment status of injured persons; and industry of occurrence.

At a national level, recorded accident data, such as that collected under RIDDOR, is used by health and safety enforcement agencies to identify industries where interventions are most needed to control high rates of injury. Accurate reporting of work-related injuries and illnesses can help to identify unsafe work environments and work practices; monitor worker health and well being; and eliminate hazards; or, at least, control the health and safety risks to employees.

2.2 UNDER REPORTING IN THE UK

It should be noted that with the exception of HSE commissioned research, there appears to be a paucity of current research into accident reporting in the UK. That which is available is discussed below.

Whilst reporting of workplace fatalities is thought to be accurate, HSE remain concerned regarding the reporting accuracy of non-fatal workplace injuries, particularly those injuries involving over-3-day absence from work (Anonymous, 1995).

To appraise this situation, HSE sponsored a detailed set of questions covering workplace injury within the 1990 Labour Force Survey (LFS). The LFS is a self-report measure drawn from a stratified random sample of UK households providing data on labour market statistics and related topics such as training, qualifications, income and disability. The additional questions enquired whether, in the preceding year, respondents had suffered any accident that resulted in injury at, or in the course of, their work (LFS rates are assumed not to be subject to the under reporting which affects the injury statistics collected through RIDDOR; National Statistics, 2003).

A comparison of the LFS figures with those reported under RIDDOR confirmed HSE concerns that employers substantially under report non-fatal injuries (Employment Gazette, 1992, as cited in National Statistics, 2001). The LFS revealed that the level of mandatory injury reporting had declined in recent years (National Statistics, 2001, 2003; also see HSC, 2001a). In 1997/1998, 47% of non-fatal RIDDOR-reportable injuries to employees were reported to the appropriate enforcing authority. By 1999-2000, only 44% of non-fatal injuries to employees were reported, and by 2001/02, this figure had fallen further to around 41%. Also of concern, consistently fewer than 5% of reportable injuries sustained by the self-employed were actually reported to HSE.

Both the LFS and RIDDOR reporting figures show reductions in the rate of non-fatal injury over the last 5 years (the LFS rate of reportable injury falling by 9% whilst the rate reported under RIDDOR dropped by 2%). HSE postulates that the smaller reduction in RIDDOR rates

reflects an improvement in employer reporting of injuries over the period, although more recent figures imply a slowdown in the rate of these improvements (National Statistics, 2001). The Health and Safety Commission (HSC) suggest that reporting levels fell again by 2003 (National Statistics, 2003):

“The rate of employee reported non-fatal (major plus over-3-day) injury fell by 7% between 1994/95 and 1998/99 but unlike the LFS rate, has continued to fall by a further 11% from 1998/99 to 2002/03. This reduction, together with the levelling-off of the averaged LFS rate suggests that reporting levels have declined since 1998/99”

In response to this prevalent trend of under reporting, HSE, Local Authorities and employers have worked together through a range of awareness-raising initiatives, in an attempt to improve the level of reporting over the past 10 years (HSC, 2000; HSC, 2001b).

3 ACCURACY OF REPORTING FIGURES IN OTHER COUNTRIES

Accurate data on occupational accidents is available from few countries worldwide, as a result of under reporting (as is the case in the UK), limited coverage by reporting and compensation schemes, and non-harmonized accident recording and notification systems. The problem of under reporting of accidents may be exacerbated in countries without a tradition of collecting accident descriptions (e.g. developing countries). It should also be noted that the reasons for under reporting in Europe and the United States (US) differ from those in the developing nations, due to their differing socio-economic climates. These factors clearly undermine efforts to obtain worldwide information on occupational accidents, as highlighted in the current research and accident reporting statistics outlined below.

3.1 FATAL ACCIDENTS

There appears to be a scarcity of published research specific to the under reporting of fatal accidents, although this should by no means be taken as evidence that fatal accidents are reported accurately throughout the globe. Therefore, although the literature on under reporting of fatal accidents in other countries may not be entirely relevant to the situation prevailing within the UK, it still merits some consideration.

Lerer and Meyers (1994) reviewed 8,502 deaths registered at a South African state mortuary for an 18-month period (between 1990-1991). When fatal occupational injuries located from this data source were matched with the records of the relevant occupational safety inspectorate, it was found that 28% had not been reported in terms of statutory regulations (i.e. those identified in medical examiner records but which had not been reported to the occupational safety authorities). Unreported deaths accounted for 25% of all fatal occupational injuries in the construction industry, whilst none of the fatal occupational injuries in agriculture and fishing had been reported appropriately. Similarly, a rural-based South African study by Schierhout, Midgley and Myers (1997) found that 85% of occupational fatalities were unreported. Drowning (68%), chemical poisoning (10%) and tractor accidents (9%) accounted for the greatest number of unreported fatalities. Only 5% of fatalities in women were reported, indicating that differential under reporting of occupational fatalities by gender requires further investigation. The authors conclude that these high levels of unreported fatal occupational injury indicate gross deficiencies in the current reporting system, occupational safety surveillance, and enforcement in South Africa.

Hayden, Gerberich and Maldonado (1995) found large discrepancies in the numbers of agricultural fatalities identified in one US state, depending upon which data source was used (either through death certificate data or the Newspaper Clipping Service). Differences in reporting between the two data sources were noted for gender, age, injury type, anatomical site, source, mechanism of injury, and multiple versus single injury. Thus, if only death certificates had been utilised, 18% of the fatalities would have been missed, revealing that death certificate surveillance alone would miss mortality data and detection of certain potential risk factors. This highlights the importance of reliable reporting systems in ensuring that accidents do not go unreported.

More broadly, Takala (1999) studied global estimates, based on reports to the International Labour Office, of fatal occupational accidents at work by region. In 1994, the total estimated number of fatal occupational accidents for the whole world was 335,000, which equated to an

average estimated fatal occupational accident rate of 14.0 per 100,000 workers, a rate higher than that previously estimated. As would be expected, the rates differ for individual countries, regions, and separate branches of economic activity. In comparison, the rate of fatal injury to workers in the UK, 2002/03 was 0.79 deaths per 100,000 (National Statistics, 2003).

3.2 NON-FATAL ACCIDENTS

European research describes a picture of prevalent non-fatal accident under reporting comparable to that observed in the UK. Haastrup and Romer (1995) analysed accident reports from seven European accident-reporting databases² to estimate the number of unreported accidents between 1984 and 1992. Reports were specific to industrial accidents involving hazardous materials that resulted in fatalities, injuries, evacuation and/or large economic loss at installations relevant to European Commission legislation. None of the described accidents were listed in all seven databases and there was little overlap between databases. Estimates of 87 accidents and 14 fatalities per year were generated on the basis of this analysis, in comparison to actual reported values of 59 accidents and 12 fatalities each year, leading the authors to conclude that the number of accidents involving hazardous materials in the EU is underreported and that the list of industries covered by the Major Accident Hazard Directive should be expanded.

The current review uncovered numerous articles on under reporting in the US and, although the structure of the reporting system is different from that in the UK, the US research points to some generic factors that are worthy of note. As in the UK, debate has surrounded the extent of under reporting of non-fatal workplace injuries to the US Bureau of Labour Statistics (BLS). Research by Leigh, Marcin and Miller (2004) concluded that there was substantial under-capture in the BLS Annual Survey; some due to the exclusion of employee categories such as government workers and the self-employed, and some resulting from under reporting. Previously in the US, occupational injury and illness rates declined substantially from 1992 to 1997 and research in this area often attributes this decline solely to prevalent under reporting (to avoid inspections / gain incentives for good safety performance). There are, however, several other potential explanations for this observed decrease (Mustard, 2002; Karr, 2000; Conway & Svenson, 1998):

- Changes in the nature of work led to less hazardous workplaces in many industries.
- Industry recognition of hazards has changed. US employers are realising that increasing safety at the workplace lowers 'worker compensation' costs.
- Success of occupational health and safety programs in preventing accidents.
- Occupational Safety and Health Administration (OSHA, the US equivalent of HSE), implemented measures to increase compliance and reduce violations of safety standards. For example, standard interpretation letters were produced regarding compliance with industrial accident record keeping (i.e. guidelines for determining a work-related injury).

In further support of the premise that the decrease in US injury rates is multifactorial, a study by Conway and Svenson (1998) found that, although under reporting persisted in the US, there was no apparent increase in the size of the problem. In addition, no data were identified that would support the hypothesis of a sudden and dramatic increase in under reporting; suggesting that

² The databases included the Major Accident Reporting System (MARS) of the European Union (EU); the Failure and Accident Technical Information System (FACTS) from the Netherlands; the Major Hazardous Incidence Database System (MHIDAS) from the United Kingdom; CHEMAX from the European Commission; ZEMA, the German accident database; the French database; and the OECD database.

under reporting cannot explain the recent decline in occupational injury and illness rates in the US. Whether similar conclusions will be reached by HSE is under investigation and is as yet uncertain. As McKnight et al. (2001) suggested, the recent observed rise in UK injury rates might be due to changes in the workforce composition rather than changes in reporting levels.

Both the HSE and OSHA have attempted to discover more about the quality of reported data. One US-based study by Eisenberg and McDonald (1988) recorded evidence of both under reporting and over-reporting of non-fatal incidents. Surprisingly, 15% of incidents logged were over-recorded (i.e. were not supposed to be recorded under the BLS record-keeping guidelines), possibly reflecting confusion amongst duty-holders as to their reporting responsibilities or unclear reporting systems (see Section 6.2.1). Other findings revealed that total injuries and illnesses were under reported by about 10%, whereas lost-workday injury and illness cases were under reported by 25%. Individual establishments were rarely responsible for the under reporting, indicating that this is a systematic rather than a random phenomenon. A follow-up study of 250 construction establishments some 10 years later replicated this pattern of under reporting (see Conway & Svenson, 1998).

4 ACCURACY OF REPORTING BY INDUSTRY SECTOR

Within the UK, industry sectors with above-average rates of injury include construction, transport, storage and communication, agriculture, manufacturing, hotels and catering, and distribution and repair (HSC, 2001c; HSC, 2004a; HSC, 2004b). While some sectors are generally accepted to have higher injury rates due to the more hazardous nature of work performed, reporting rates are also thought to vary. Comparisons between LFS results and RIDDOR statistics show that actual reporting rates differ significantly by sector. Assuming that the LFS-based rates give a reasonably accurate representation of the industrial distribution of workplace injuries, reporting rates vary from about 80% to 10%. Reporting accuracy is generally high in the extraction and utility supply sector, yet low within hotels and restaurants, and finance and business (HSE, 2001b; McKnight, Elias & Wilson, 2001).

Due to the relative scarcity of research specific to UK industry, the following section outlines current *global* research into reporting accuracy by industry sector, although readers should be conscious of between-country differences in reporting systems.

4.1 HEALTHCARE

A number of research studies have considered the degree of under reporting within the UK healthcare sector. According to the averaged LFS rate of reportable injury, which allows HSE to estimate the level of reporting, reporting accuracy of non-fatal injuries has decreased since 1999/2000 (HSC, 2004c). The following studies also provide confirmatory evidence of under reporting practices.

Burke and Madan (1997) investigated reporting of contamination incidents among UK doctors and midwives. Despite hospital, Department of Health and HSE guidelines for the active management of incidents, it is estimated that healthcare workers only report a small proportion of injuries sustained. Reasons for this were cited as reporting being time-consuming, and the perception that nothing could be done about these injuries; despite good awareness of the comprehensive services offered by the occupational health unit. These explanations appear to be related to inconsistencies in risk perception of infection likelihood.

Hettiaratchy, Hassall, Watson, Wallis and Williams (1998) found that junior UK hospital staff reported only 17.5% of needle stick injuries. Surgeons suffered the most needle stick injuries, yet were least likely to report them. A literature review by Porta and Handelman (1999) on needle stick injuries states that research addressing under reporting cited rates varying from 21% - 95%. In addition, Mangione, Gerberding and Cummings (1991) found that only 30% of the needle stick injuries were reported, mainly because of time constraints, perception of insignificant exposure, a lack of knowledge about the reporting procedure, and concerns about privacy and discrimination. The authors conclude that reporting rates may increase if programs are easily accessible, efficient, and confidential. However, the currently observed low reporting rates may have serious implications (e.g. risk of acquiring bloodborne infections; lack of documentation of contamination incidents for medico-legal and/or compensation purposes), particularly in view of the UK government guidelines on needle stick injuries, which involve HIV-infected blood.

Weddle (1996) conducted a study to determine the extent to which US hospital workers' injuries were being under reported. Despite employers complying with OSHA requirements, 30% of workers sampled recalled having been injured during the past year, of which 1/3 failed to report the injury. Among those injured, older workers were less likely to report the injury

than younger workers, and workers who had held the same job for a longer time were also less likely to report. The two most common reasons for not reporting an injury were thinking the injury too minor, and not wanting the supervisor to think the worker was careless (also see Section 6.2.2, and Monnery, 1999). The author recommended that worker safety training should include instruction and encouragement to report workplace injuries.

Finally, a UK study by Cutter and Jordan (2004) sampling surgery theatre nurses and midwives employed in general operating theatres found that 74% of respondents reported sustaining an inoculation injury in the 10 years prior to the study. However, under reporting of injuries was common, with 32% of the sample admitting to failing to report these injuries.

4.2 AGRICULTURE

Agriculture has one of the highest occupational injury and mortality rates, ranking among the most hazardous sector, in terms of personal injury, yet there is a dearth of reliable agricultural injury data. Researchers indicate that the under reporting of occupational injuries and fatalities is commonplace, with estimates of up to a 77% under reporting rate cited (Hayden, Gerberich & Maldonado, 1995; Earle-Richardson, Jenkins, & Slingerland; HSE, 2004a; also see Schierhout et al., 1997; Pickett, Brison, Niezgod, Chipman, 1995; Lerer & Myers, 1994; Myers & Hendricks, 2001).

In developing economies such as South Africa, agriculture is the largest single employment sector and a sizable proportion of farm workers are seasonal / casual workers. Schierhout et al. (1997) suggested that employers dominate the poor transport and communication infrastructure, which hinders workers' ability to report. In the UK, the risk of experiencing an occupational accident has been shown to be above average for the agriculture industry; this employment sector accounts for less than 4% of employment, yet HSE estimate that it is responsible for around 26% of all reported employee injuries (HSC, 2004b).

4.3 CONSTRUCTION

The averaged LFS rate of reportable injury allows estimates of the level of reporting of non-fatal injuries. The estimate for the level of reporting of non-fatal injuries in construction in 2001/02 was 46%, a decreased level from that observed in 1999/2000 (HSC, 2004b). In the US, contrary to reports of a decrease in the construction industry's injury and illness rate (Korman, Richard & Reinain, Peter, 1997) evidence from the construction of Denver International Airport (DIA) suggests that construction injury rates may exceed US national estimates (Glazner et al., 1998). Complete reporting, facilitated by the existence of a single 'workers' compensation' plan, an on-site medical clinic, and designated medical providers, yielded injury rates significantly higher than previously reported. The relatively small difference between DIA payment rates and expected loss rates suggests that the discrepancy between DIA's injury rates and national estimates is due to under reporting of lost-work-time injuries to the BLS. It is however important to note that this is only one study and may not reflect the whole industry in either the US or the UK.

4.4 VOLUNTARY WORKERS

The HSE fears that under reporting in the voluntary sector is commonplace, even though health and safety reporting legislation covers volunteers (Gates, 1998). It is argued that this is due in part to the attitudes of the volunteers themselves; it is likely that they are highly motivated to

contribute to their cause, which in turn may cause them to become desensitised to the risks they might be facing. In insurance terms, volunteers are not high risk but the increasing litigation culture in the UK may change attitudes. Currently volunteers may be unwilling to make a claim against a charity, hence under reporting is more prevalent. There is also thought to be a lack of statistics kept by charities on workplace accidents, despite the fact that the maintenance of records is a statutory obligation for charities.

5 OTHER FACTORS INFLUENCING REPORTING ACCURACY

5.1 SIZE OF COMPANY

In both the UK and US, it is thought that small firms are more likely to under report accidents and injuries, or even not report them at all (Leigh et al., 2004; Oleinick, Gluck & Guire, 1995; Anonymous, 1991). Explanations offered include a lack of awareness of legal reporting requirements among smaller enterprises, penalties for poor record keeping being rarely levied on small firms, and completing relevant paperwork could be a greater relative burden on smaller rather than larger firms.

However, McKnight et al. (2001) offer an alternative explanation in their research finding that the risk of experiencing a 'reportable' workplace injury appears to be lower in smaller workplaces. Their study revealed that workers employed in small workplaces (1-10 employees) have lower injury rates than those in larger workplaces, regardless of whether or not the accident is deemed 'reportable'.

5.2 AGE

It has been established that the incidence of injury decreases with age but the injury severity and the incidence of fatal occupational injuries increase with age (Karr, 2000; Conway & Svenson, 1998). However, there is a general paucity of scientific literature providing evidence of inaccurate accident reporting by age group, the exception being U.S based research by Parker, Carl, French, and Martin (1994), which suggests that there is substantial under reporting of adolescent work injuries, based on findings that two thirds of adolescent work injuries, many of which were agriculture based, were not reported to the appropriate authority.

5.3 TYPE OF INJURY

5.3.1 Eye Injury

Some figures cited within the grey literature claim that there are roughly 2,500 reportable eye injuries each year in the UK (HSE, 1991, cited in Anonymous, 1991; also see Low, Griffith, & Alston, 1996). Recent HSE research indicated a greater propensity to under report eye injuries (HSE, 1991), although this finding was not corroborated in any of the literature appraised during this review. HSE suspects that the basis for their findings may be related to over-3-day injuries (of which a large majority of eye injuries are classed) suffering from significant under reporting. HSE has also identified low reporting levels within construction and manufacturing; two industries where eye injuries predominantly occur.

5.3.2 Musculoskeletal disorders

A number of studies, predominately US based, suggest that work-related musculoskeletal disorders (WRMSD) suffer from high levels of reporting inaccuracy. For example, research by Morse, Dillon, Warren, Hall and Hovey (2001) compared cases of WRMSD reported through the 'worker's compensation' insurance system to cases identified in the state physician based occupational disease and injury reporting system. Using this epidemiologic capture-recapture methodology Morse et al. uncovered substantial under reporting of WRMSD either to 'worker's

compensation' insurance or to existing regulatory surveillance programs for occupational injuries and diseases. Unreported cases exceed those officially reported by a factor of 11:1.

Other researchers, such as Silverstein, Welp, Nelson and Kalat (1998), state that the extent of WRMSD under reporting is in fact much larger, estimating that lost-time cases represent only approximately 36-42% of all WRMSD cases reported to 'worker's compensation' insurers. Silverstein et al. addressed all cases of lost-time-injury and not just the more severe cases as measured by Morse et al. (2001). Evanoff et al. (2002) questioned whether disability is under reported following work injury in the US. The authors argued that existing national data might under report the full burden of occupational injuries and illnesses, suggesting that OSHA logs may provide accurate measures of *initial* episodes of time loss from work but may under represent the full magnitude of lost time following work injury (also see Greenly, 2000; An, Englehardt, Fleming, & Bean, 1999). Finally, a recent study in the aerospace industry found that 69% of workers experienced low back pain, but only 27% reported complaints to the plant medical department, and only 2.3% filed a 'worker's compensation' claim (Jefferson & McGrath, 1996, as cited in Pransky et al., 1999).

Morse et al. (2001) declared that large-scale under reporting of WRMSD has potentially important implications for the general economy in the US. This includes the costs to 'worker's compensation', medical insurers, and out-of-pocket expenses. Although the above research is US-based and the differences in reporting requirements are not particularly comparable, it could be argued that significant repercussions, in terms of social and personal costs, may also affect the UK economy. In the UK costs of WRMSDs are met through the NHS and sickness invalidity benefit. There are costs to the individual through loss of income, etc. A requirement for improved regulatory policy-making and resource allocation for programmatic prevention efforts was proposed by Morse et al. (also see Kemmlert, 1997).

6 REASONS FOR 'UNDER REPORTING'

There are many powerful disincentives to participating in a reporting scheme, for both employers and employees, as outlined throughout this section.

6.1 SAFETY INCENTIVE PROGRAMMES

6.1.1 Prevalence of programmes

A substantial proportion of the literature concerning the use of incentives has focused on their utility as a method of influencing workforce safety performance to achieve desired safety targets. Safety incentive programmes, which offer rewards for reductions in the number of workplace accidents and incidents, have been widely introduced in industrial settings with the aim of improving safety records, and cutting safety-related costs. Safety incentive schemes in operation currently cover a broad spectrum in terms of the incentives they offer, although the majority appear to be based upon prizes as opposed to financial remuneration.

Findings from the safety literature highlight the frequently intense debate between proponents and critics of safety incentive schemes. While those who champion such schemes continue to herald their merits as a means of encouraging worker safety and promoting safe behaviour (e.g. Hislop, 1993; Petersen, 1989), those who oppose them stop little short of accusations of bribery, and of buying safe behaviour (e.g. Hansen, 1994; Hansen, 1995; Smith, 1995; Derocher, 1998). It has been argued that the real incentive for many workers is the reward (often monetary), hence injuries go under reported and the underlying cause of workplace hazards remains unaddressed. However, it should be noted that the majority of literature in this area lacks scientific rigour, with much of the debate being at the level of opinion rather than established research findings (see Marlow, 2003, for a review).

Numerous articles provide statistical evidence of impressive reductions in lost-time accidents (LTAs) since the introduction of safety incentive schemes (e.g. Eich, 1996; Bodycombe, 1986; Groover et al. 1992), although underlying these results tends to be the suspicion that this amounts to rewards for non-reporting. The broadly positive findings concerning the use of safety incentive schemes from within the grey literature may be tainted by the potential for a number of undesirable side effects, which are discussed in more detail in the next section. The reader is directed to Weyman (1999) for a more comprehensive review of safety performance related incentive schemes.

The peer reviewed literature raises serious questions over the utility of safety performance incentive schemes, regarding the potential for incentives to promote perverse motivations to under report (e.g. Hale & Glendon, 1987; Geller, 1996). Smith (1997), for example, comments that incentive schemes will inevitably create friction between management and employees, and between groups of employees, which he believes to be a potentially divisive influence within an organisation. The aspect of safety incentive schemes that has received perhaps the most criticism relates to the focus on reductions in the numbers of lost-time accidents (LTAs) over a given time frame as a measure of safety (see 6.4 for more discussion). A number of authors have made claims that there is good evidence that incentive schemes based solely on LTAs are an inappropriate performance indicator and a counter-productive method of improving safety performance (e.g. Grover et al. 1992; Smith, 1993; MacFie, 1997; McAfee & Winn, 1997; McMahan, 1993).

6.1.2 Perverse motivations to under report

Some authors have sought to address, what they believe to be, potentially negative influences of peer pressure, in motivating a suppression of accident reports. This potential has been said to be greatest where incentives are of a financial nature; possess a high exchange value; or, are of the 'all or nothing variety' (Hinze, 1995 cited in Eich, 1996; Levitt & Samelson, 1993). A specific drawback of any organisation electing to use incentives of particularly high value is that workers may try to hide minor injuries or be encouraged to continue at work despite being injured, so as to avoid jeopardising their chances of receiving the incentive (Grunberg, Moore, & Greenburg, 1996).

Labour inspectorates, such as the Occupational Safety and Health Administration (OSHA), have been suspicious of traditional safety incentive programs featuring large cash rewards as reasons for under reporting. They argue that employee interest and participation in incentive programmes tends to wane over a period of time, with concern that some employers substitute the programmes for efficient safety policies. OSHA was so concerned about under reporting of accidents that it encouraged the inspectors to scrutinise incentive programmes and impose fines where necessary (see Flanders & Lawrence, 1999; Nash, 2000; Willen, 2000; Atkinson, 1999a Atkinson, 1999b).

Team-based incentives are likely to become more commonly used within organisations, since team structures frequently provide the normal unit of organisational performance (Katzenbach & Smith, 1993). However, some researchers claim distinct negative outcomes can arise from basing incentives on team performance. The principal argument against such schemes is that they encourage 'free-riding', in that they penalise performers and reward passengers (Makinson, 2000; Gaynor & Pauly, 1990). Thus, undeserving employees are swept into the pool of rewarded employees when group incentives are given (Tompkins, 1994). From a safety perspective, the efficacy of an intervention may be undermined as even relatively unsafe workers may be rewarded. Furthermore, individuals may be subject to peer pressure that suppresses the motivation to report incidents in instances where incentives are ascribed to individual groups or work teams; conformity influences are likely to be of salience (Groover et al. 1992; Bailey & Jorgensen, 1995; MacFie, 1997).

It has also been suggested by economists that indemnity (insurance) payments may increase reports of workdays lost as generous benefits could result in workers taking fewer precautions. There is also a greater chance of fraud; once workers have received the benefits the workers have less incentive to return to work (Leigh et al., 2004; Davies & Elias, 2000). However, the current review did not note any peer-reviewed articles investigating this phenomenon in the UK.

At a wider level, there are economic incentives for companies to both under report and over-report. This is particularly notable in the US, a result of 'worker's compensation' systems. Firms risk being denied government contracts if their injury rate is high. A high injury rate could also trigger an OSHA inspection, thus firms like to maintain a public safe image through under reporting their injury statistics. This reasoning is likely to be valid when looking at under reporting to the HSE in the UK.

In summary, it is evident from the research reviewed that poorly planned safety incentive and reward programmes may be counter-productive. Rewards are often based on the absence of an unsafe outcome rather than on the presence of fundamentally safe behaviour, which can lead to under reporting of accidents. Thus, in terms of safety, it is possible that accident reports may decline (possibly due to under reporting) yet underlying safety problems within the system will remain. The obvious solution is to ensure that the results of not reporting should be more detrimental than reporting an injury (Atkinson, 1999a). However, although the solution appears

simple, the practicalities behind such a system are extremely complex. In essence, a well-managed safety culture is required, as described in the next section.

6.2 SAFETY CULTURE

In a discussion of the root causes of injury non-reporting, Sims (2000) suggests that there are many causative factors besides poorly designed incentive programmes, with researchers increasingly acknowledging that organisational factors play an important role in workplace safety. Of these, an organisation's safety culture, or the prevailing norms, values, attitudes, beliefs and practices, may clearly impact upon the willingness of individuals to report accidents and near misses (Reason, 1997). The health and safety culture within an organisation is a major influence on the health and safety-related behaviour of people at work (Wagennar, 1998). Therefore, HSE underscore the importance of developing a positive safety culture if high standards of health and safety are to be achieved and maintained (HSE, 1991).

Under reporting is likely to be a symptom of poor management commitment to a safe workplace, as conscientious organisations with a strong managerial commitment to safety make it clear to all employees and supervisors that under reporting of accidents is unacceptable. For example, Clark (1998) corroborated the critical role of management as a factor influencing the under reporting of accidents in a sample of train drivers. Incident reporting by drivers was influenced by managers' reactions to reports; drivers were less likely to report incidents if they felt that managers would 'take no notice' or would not be concerned. Clark suggests that incident reporting could be viewed as an objective measure of the level of managerial commitment to safety as perceived by employees. If management truly wants to hide injuries, then they can allow poor administration of records; maintain inadequate injury-reporting requirements or intentionally under report injuries. Accurate reporting will not occur unless a clear message is percolated down from top management and communicated to supervisors and employees at the shop-floor level (Mearns, Whitaker & Flin, 2003).

Grunberg, Moore and Greenburg (1996) conducted a study to test the proposition that promoting worker involvement and participation in reporting schemes would reduce under reporting. This was thought to arise through a mechanism of increased control. The authors explored whether mills with 'high worker control' produced safer workplaces than conventional mills. However, they reported that both types had similar accident and injury rates. Grunberg et al. (1996) suggested that the mills categorised as 'higher worker control' might have fallen behind the conventional mills in such things as safety training, the installation of machine guards, and other safety-related improvements due to their vulnerable economic nature. These workers felt greater insecurity and powerlessness, and had the lowest levels of job satisfaction. Powerlessness and job insecurity are significantly associated with days missed due to injuries; this creates additional work tensions on the job and less attention to safe working practices, and thus may result in higher accidents and injury rates. The study concluded that the different injury rates were a result of both reporting and actual safety conditions.

Grunberg et al.'s (1996) study therefore confirms the complex web of factors all needed to create and maintain a positive safety culture. Worker control on its own will not reduce accidents or increase reporting levels. Further studies by researchers such as Hoffmann and Morgeson's (1999) strengthen the argument that the problem of under reporting is not easily rectifiable. Their results did not support the hypothesis that individuals with high perceived organisational support, leader-member exchange, and safety-related communication (i.e. worker control) actually have fewer accidents, and those with low perceived ratings on these factors under report accidents. However they did suggest:

“Employees who perceive the organisation as supportive and those that have high-quality relationships with their leader are more likely to feel free to raise safety concerns. Such safety-related communications, in turn, is related to safety commitment and, ultimately, the frequency of accidents.”

Is it evident from this section that a safety culture is affected by many different elements. According to Reason (1997), there are four critical subcomponents of a safety culture: a ‘reporting culture’, a ‘just culture’, a ‘flexible culture’ and a ‘learning culture’, which interact together to create an ‘informed culture’ or ‘safety culture’. The next section focuses on creating a reporting culture.

6.2.1 Reporting systems

Persuading workers to file critical incident and near miss reports is not an easy task, particularly when it may entail divulging their own errors (Reason, 1997). Even if people do not mind confessing their mistakes, they cannot always see the value in making reports. This is especially true when they are sceptical about the likelihood of management acting upon the information. Reason (1997) offers five essential factors important in determining both the quantity and quality of incident reports:

- Indemnity against disciplinary proceedings, as far as it is practicable.
- Confidentially or de-identification.
- The separation of the agency or department collecting and analysing the reports from those bodies with the authority to institute disciplinary proceedings and impose sanctions.
- Rapid, useful, accessible and intelligible feedback to the reporting community.
- Ease of making the report.

The first three factors are essential in creating a climate of trust and the others are needed to motivate people to file reports. Apart from lack of trust, the perceived absence of any useful outcome will also stifle incident reporting. If companies, small companies especially, see no return from their reports, they may be reticent to engage in this practice. This would therefore suggest that the fact that reporting is a legal requirement is not a strong enough stimulus to assist the government in uncovering the true extent of RIDDOR reportable injuries.

Glendon (1991) also identified several criteria as prerequisite for a *system* that is conducive to reporting and recording accidents. They are as follows:

- Clearly defined system objectives.
- Clearly defined needs of system users.
- System designed to be an important component of a program for controlling accident injuries.
- Providing the system with a capability for supplying data output that will meet legal requirements.
- Ensuring that the system will collect sufficient data for accident analyses, and providing computer links with databases containing sick leave and employment data.

Often, employers and workers do not fully understand the record-keeping definitions. Stated goals communicated to employees about reporting all injuries do not always reflect the actual message received by the workers (Snyder et al. 1991). In many instances, employers do not educate workers about the correct rules for reporting injuries and accidents, hence employees might not even know how to make a claim (Leigh et al., 2004).

6.2.2 Employer and employee attitudes towards accident reporting

Both employee and employer attitudes towards reporting are also likely to be highly influential in determining whether an incident is formally reported. For example, numerous research studies in both commercial and industrial organisations have offered reasons to explain why near miss events are often not reported or recorded (see Prosser, 2003). These include the high relative frequency of minor events, which occur regularly and with little consequence, becoming accepted as a trivial occurrence; time and effort consuming safety investigation processes; and staff embarrassment at revealing their own mistakes. Prosser (2003) warns that failure to collect near miss data of sufficient quality and quantity will limit any attempt to conduct meaningful analyses and develop robust preventive actions.

Prosser (2003) also reported on statistics relating to the recording of near miss events in the British Fire Service (BFS). According to the author, evidence of complacency about the importance of near misses has led to significant under reporting and is contributing to the still high level of accidents in the BFS. During 2002/03 there were nearly 2,000 major and over-three-day injuries in the BFS. HSE research suggests that there should have been between 200 and 600 times that number of near miss events, yet according to the Fire Service Inspectorate only 20,000 near misses were recorded. Interviews with management representatives revealed administrative and other barriers to reporting, stemming from their desire to attain a goal of no reported injuries, and misconceptions about requirements for recordability. The corporate and facility safety incentives appeared to have an indirect, but significant negative influence on the proper reporting. Under reporting is likely to continue until managers have carefully evaluated and assessed each potential reason why injuries are not reported properly, and identify incentives for under reporting that continue to exist (Guastello, 1993). Additional educational efforts and demonstration of positive results as a consequence of proper reporting will help to encourage workers and supervisors to participate in this process.

Pransky, Snyder, Dembe, and Himmelstein, (1999) produced a case study of three industrial manufacturing facilities to illustrate the extent of under reporting of workplace injuries and illnesses (work-related disorders) and the reasons for its occurrence. Results of a questionnaire survey showed that less than 5% of workers had officially reported a work-related injury or illness during the past year, despite over 85% experiencing work-related symptoms, 50% had persistent work-related problems, and 30% reported either lost time from work or work restrictions because of their ailment.

Workers described several reasons for not reporting their injuries, including fear of reprisal, a belief that pain was an ordinary consequence of work activity or aging, lack of management responsiveness after prior reports, and a desire not to lose their usual job. According to interviews, additional reasons for not reporting included a fear of being assigned to lighter jobs that the workers disliked, loss of overtime pay, and separation from co-workers. Workers expressed concern over abandoning their team during heavy workloads. Some older workers attributed their symptoms to age, others assumed that symptoms would go away once seasonal production demands decreased, but many were worried that reporting would lead their supervisors to conclude that they were unable to do the job. Most workers did not want to be labelled as a complainer, which they believed would jeopardize their chances for pay rises and advancement in the company. Some workers felt that having symptoms was a sign of weakness (Pransky et al., 1999).

Consequently, employees may chose not to report, and instead obtain treatment through group health plans (and thus have the condition labelled as non-occupational), or they may arrange light duty and time away from work by taking sick days, or even changing jobs in order to avoid reporting. Under reporting of work-related conditions can also stem from lack of recognition,

improper diagnosis or causal attribution, lack of knowledge of reporting requirements, administrative barriers and lack of reporting mechanisms. Managers must realise that suppressing accurate reporting can lead to missed opportunities to identify cases at an early and more reversible stage, causing higher injury costs in the long run. Early reporting and associated interventions could also lead to increased productivity, improved training and better morale (see Pransky et al., 1999; Shaw & Blewett, 1998; Zohar, 2000).

6.3 WORKPLACE VIOLENCE / BULLYING

Another potential influence upon the worker's motivation to report accidents and injuries is the threat or use of violence against them by either members of staff or public. This is of particular pertinence in the US, where one sixth of all murders occur in the workplace (Warshaw & Messite, 1996). Workplace violence is thought to be heavily under reported, as a result of a lack of consensus on a taxonomy of violence; cultural acceptance of violence; lack of an appropriate reporting system; lack of employer interest; and fear of blame or reprisal.

Research from the US railroad industry identified harassment and intimidation of employees as the cause of employees under reporting accidents and injuries (Wilner, 1998). Similarly, Barlow and Rizzo (1997) state that violence against US hospital personnel is heavily under reported (for example, less than one in five assault), thus accurate statistics as to the rate of violence against general hospital personnel are difficult to establish. Whether US research is directly comparable with the UK is questionable, although Home Office statistics suggest an increased incidence of violence in many occupations, which is likely to be paralleled by significant levels of under reporting of these incidents (Dickson, Beale, Cox, Farnsworth & Heather, 1993).

In an analysis of non-fatal workplace injury reports (in the US) indicating an assault-related injury, Peek-Asa, Howard, Vargas and Kraus (1997) found that those reported to the police were primarily crime-related, whilst those reported to the OSHA were assault by a client, patient, or inmate. This suggested that using only one reporting source for surveillance would result in serious under reporting. Rates differed by industry with retail, hospital, transportation and police workers exhibiting the highest rates. The rates of non-fatal work-related assault injury are much greater and have different characteristics than fatal injuries.

Menckel, Carter and Viitasara (2000) found that violence towards caregivers of persons with developmental disabilities is a significant problem. Such acts of violence were associated with a small minority of individuals, but grossly under reported and unrecognised in formal reporting systems. Violent and disruptive incidents directed towards personnel were both frequent and common, although the degree of severity was low, as none of the 3,000 incidents recorded during the six-week study required sick leave. The authors thought that the tendency to under report incidents might increase when personnel believed they might be considered to have had some "responsibility" or "blame".

The incidence of injuries related to occupational violence (both verbal and physical abuse) was higher in aged care than in other fields. This was found despite indications of substantial under reporting of violent incidents and injuries (Newhouse, 1997). This under reporting was largely attributed to the fact that many health care workers considered occupational violence in aged care as just another part of the job. Workers often argue that violence is not an issue because it is not intentional; i.e. the aggression from some residents was due to their illness. The lack of guidelines for documenting incidents of occupational violence also contributed to under reporting. Although staff afflicted by violence generally did not report adverse reactions, assaulted staff members had elevated incidences of: burnout; absenteeism; avoiding residence contact; and turnover.

6.4 PROBLEMS OF USING ACCIDENT DATA AS A PERFORMANCE INDICATOR

This review has shown that several factors, most notably under reporting, limit the reliability and utility of accident and fatality measures for organisational research and practice. Nonetheless, government agencies and organisations expend considerable effort on obtaining accurate accident data as a means of preventing occupational accidents.

However, for many organisations, basing safety performance on either OSHA or HSE-recordable injury rates may not be appropriate, given the long time lag between the appearance of a hazard and the occurrence of a reportable injury, and the limitations of injury statistics. One key problem is said to be that such simple accident statistics are often invalid as indices of risk, particularly for small and medium sized enterprises (SMEs), where accidents are rare events, (their absence should not necessarily be taken as a measure of successful risk control). Therefore, they can represent poor, misleading indicators, especially over short time-spans (Young, 2000; Pardy, 1999).

Instead, some commentators, such as (Parker et al., 1994) advocate direct surveys of workplace hazards and self-reporting of symptoms by workers. This may allow employers to develop a system of information gathering that is more responsive to conditions at an early stage and thus focus proactively on areas that need improvement. This type of information is also less likely to stigmatise a single individual by focusing on the experiences of a group of workers (Glendon, 1991).

Using accident data in organisations as an indicator of changes in safety behaviour raises questions over the validity of accident data as a measure (i.e. are accidents an adequate measure of safety performance?); corroboration of accident data with other measures (e.g. safety audit or inspection results); and degree of control (i.e. presence of other underlying, extraneous factors influencing outcomes other than the things being tested) (Glendon, 1991). Thus, at best, accidents data are problematic as a measure of behavioural changes (also see Macaskill & Driscoll, 1998).

Furthermore, as mentioned earlier, if incentives are based on accident statistics, businesses might suffer swinging variations in incentive levels as a result of one or two accidents. This may encourage suppression of accident reporting, which can have the effect of hiding poor management systems and workplace hazards.

Unexplained variances in the data (for any statistical population of accidents), due to non-reporting and under reporting of accidents, or transcription errors, is a problem typically faced by researchers using accident data analysis as a measure of prevention effectiveness. It is sometimes possible to predict on a statistical basis how many accidents of a certain type there will be if the sample size for those predictions are large enough (e.g. national data on occupational or road traffic accidents). Minor accidents and injuries are particularly susceptible to the problems of non-reporting (Glendon, 1991). Glendon also comments that reporting systems will not catch a random sample of accidents but tend to catch the more severe accidents, thus the data for analysis will often be biased.

7 CONCLUSIONS

7.1 MAIN FINDINGS

Accuracy of reporting figures

On the basis of the research evidence considered, the under reporting of accidents, injures and illness appears to be a worldwide phenomenon, with confirmatory studies conducted in a wide range of countries. As would be expected, trends in accident rates and reporting accuracy vary from country to country, reflecting cultural differences, as well as variation in reporting systems and legislation.

Inaccurate reporting by type of company

Industry Sector: Comparisons between the Labour Force Survey results and RIDDOR statistics reveal that reporting rates vary significantly by sector. Most notably, reporting accuracy is generally high in the extraction and utility supply sector, yet low within hotels / restaurants and finance / business. A number of studies, primarily from UK or US sources, cited evidence of varying degrees of under reporting of accidents and injuries in agriculture, construction, healthcare and the voluntary sector.

Company Size: In both the UK and US, there exists a general consensus amongst researchers that small firms are more likely to under report or not report at all. Explanations offered include a lack of awareness of legal reporting requirements among smaller enterprises, penalties for poor record keeping infrequently levied on small firms, and completing the relevant paperwork posing a greater relative burden for smaller rather than larger firms.

Inaccurate reporting by type of injury

Musculoskeletal Disorders: Research suggests that the incidence rates for work-related musculoskeletal disorders are heavily under reported. As a result, researchers advocate the need for improved regulatory policy-making and resource allocation for programmatic prevention efforts.

Eye Injury: HSE research indicated a greater propensity to under report eye injuries as opposed to other types of injury site. This may be related to over-3-day injuries (of which a large majority of eye injuries are classed) suffering from significant under reporting.

Reasons for under reporting

The literature reviewed identified a number of powerful disincentives to participating in a reporting scheme, for both employers and employees. These are as follows:

Safety Incentive Programmes: Safety incentive programmes, which offer rewards for reductions in the number of workplace accidents and incidents, have been widely introduced in industrial settings with the aim of improving safety records and cutting safety-related costs. However, it is evident that limited consensus exists with regard to the efficacy or utility of incentives to improve safety performance in workplace contexts. Some general conclusions may be drawn:

- Most commentators are in agreement that incentives can improve performance, but that inherent problems may surface as a result of the manner in which they are implemented. It should be appreciated that a one-size-fits-all approach is unlikely to work, as it is widely postulated that such schemes ‘rarely travel well’. Therefore, it is imperative that any incentive scheme allows for flexible implementation.
- It may tentatively be concluded that incentives do not necessarily lead to perverse motivations (i.e. to under report), although the manner in which incentives are presented, and the methods of performance measurement utilised may potentially affect the likelihood of such adverse consequences. Thus, most criticism has been based on issues of design and implementation rather than principle.
- Programs based on outcomes, such as reductions in injuries, have drawn greatest condemnation from researchers yet such programs remain popular, largely because they are easy-to-administer and may superficially improve injury statistics.
- It is generally accepted that the potential for under reporting is greatest when incentives are of a financial nature, possess a high exchange value, or are of the ‘all or nothing variety’. Furthermore, in terms of accident reporting, it is widely held that peer pressure can exert a suppressive effect.

Safety Culture: It is generally agreed within the literature reviewed that the under reporting of accidents and incidents is promoted by the presence of a poor safety culture, with inadequate systems in place for reporting dangerous occurrences. One aspect critical to the successful implementation of any reporting scheme is the need for active and visible management commitment to the scheme. Therefore, under reporting is also likely to be symptomatic of poor management commitment to ensuring a safe workplace, as conscientious organisations with a strong managerial commitment to safety make it clear to all employees and supervisors that under reporting of accidents is unacceptable.

Research highlighted that under reporting of work-related injuries can also stem from lack of knowledge of reporting requirements, administrative barriers and inadequate reporting mechanisms. More specifically, these unsatisfactory reporting systems are considered by staff to be time-consuming; ineffective in actually stimulating positive change, and often unclear with regards to what classifies as a reportable injury. The research suggests that reporting rates may increase if programs are easily accessible, efficient, and confidential. It was also advocated that worker safety training include instruction and encouragement to report workplace injuries.

Employee perceptions of reporting: The available research on this topic, albeit limited, suggests a range of factors other than those described above that potentially influence employees’ willingness to report accidents and injuries. These include fear of reprisal; loss of pay / overtime pay; not wishing to be labelled as a complainer, feeling that suffering from symptoms is a sign of weakness, concerns about privacy and discrimination, and the perception that nothing can be done about the situation.

Workplace violence / bullying: The key factors held to induce under reporting of workplace violence and bullying are fear of blame or reprisal, lack of an appropriate reporting system, and employer disinterest. The effects of workplace violence are more acutely observed in certain sectors, with a wealth of research identifying prevalent under reporting in the care and voluntary sector.

7.2 RECOMMENDATIONS

Given the apparently widespread nature of accident under reporting, there appears to be a lack of research targeting the depth and breadth of this problem. More attention has been spent on understanding the causes of this phenomenon, although it may be [tentatively] concluded that these are wide ranging and, to some degree, situation / company specific, making them difficult to effectively target on a national basis.

It is recommended that further attempts to identify existing deficiencies in the current occupational safety surveillance and enforcement system be made. To improve reporting levels, there may be scope to take account of current research on incident and near miss reporting, and apply this to the RIDDOR system. For example, it is likely that improvements in the ease of making accident reports, demonstration of positive results as a consequence of proper reporting, and the provision of rapid, useful, accessible and intelligible feedback to the reporting community would be of benefit.

Insights from the literature are limited, or effectively absent, with regard to a number of salient issues. Therefore, on the basis of the gaps identified, the following recommendations for further research are suggested:

- Studies investigating prevalence of under reporting of eye injuries and work-related musculoskeletal disorders would be useful in order to examine the possible interaction between injury type, injury severity and industry sector on reporting behaviour.
- Further investigation into the area of employer's perceptions of laws, rules and regulations regarding reporting duties would be of interest. In addition, a more detailed consideration of employees' attitudes towards reporting injuries, illnesses and incidents may be useful to understand means by which to encourage increased reporting.
- There is a lack of scientific literature providing evidence of accident reporting accuracy by age group, gender, and occupation, which could be addressed.

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