Horwath Consulting Ireland

in association with

BOMEL CONSULTANTS

Final Report to the

HEALTH AND SAFETY AUTHORITY

Impact Assessment of the Working at Height Campaign in the Construction Sector

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EXECUTIVE SUMMARY

Introduction

1. Horwath Consulting Ireland, in association with Bomel Limited (UK), were appointed by the Health and Safety Authority (HSA) in early 2007 to undertake an impact assessment of the HSA's activities and initiatives on the accident rate related to falls from height.

2. This impact assessment followed an earlier study by Indecon Economic Consultants who examined the impact of the Safety, Health and Welfare at Work legislation to date. The Indecon report indicated an overall positive impact but found no direct or significant relationship between the resources devoted to occupational safety and health and subsequent incident rates.

3. As a result, the HSA decided to commission this impact assessment to probe in more detail any possible link between resources deployed and incident rates, relating specifically to working at height. The three main objectives for this impact assessment were to:
   - *Assess the impact of the HSA's activities on work at height in construction;*
   - *Establish whether there is a link between concentration of the HSA's resources and reductions in the rate of falls in construction;*
   - *Identify the key lessons learnt such that they may be applied to other HSA initiatives.*

Background

4. Major increases in construction activity from the mid-1990s, alongside several major scaffolding collapses on building sites in 1997, prompted the HSA to initiate a series of measures to improve health and safety performance in this area. Extensive work has been done by the HSA to allocate designated resources to Working at Height in terms of legislation, guidance and enforcement activity. This includes:
   - *Introduction of dedicated construction sector inspectors, hired by the HSA from a construction background;*
   - *Publication of codes of practice regarding inspection and enforcement;*
   - *Safety campaigns and extensive publicity;*
   - *Visible enforcement by the HSA, up to and including prosecution of non-compliant employers;*
   - *Provision of ongoing technical training to HSA inspectors.*

5. In addition, the last decade has seen significant changes within the construction industry, in terms of equipment and technology. There has been increased availability of safety nets, air bags and other safety-oriented equipment, and new types of scaffolding have been introduced to further facilitate safe working at height.

Findings – Quantitative Data

6. The data analysed within the impact assessment covers the period up to and including 2005, i.e. the period before the Safety Health and Welfare at Work (Work at Height) Regulations 2006 were launched.

7. Overall, we found that whilst it is very difficult to prove that the HSA's activities and campaigns on working at height were solely responsible for producing positive outcomes, there appears to be a strong correlation between HSA activities and such outcomes.

8. Key findings in respect of accident data included:
   - *The rate of fall-related accidents increased between 1995 and 2000 from around 40 per 100,000 employees to 180 per 100,000 employees, but since 2001, the rate has been decreasing and was 60 per 100,000 employees in 2006;*
   - *The largest number of fall related fatal injuries involve older workers, suggesting that younger workers may be more risk-aware;*
   - *Some anomalies appear to exist in the fall-related accident statistics regarding self-employed and non-national workers, suggesting possible under-reporting and/or the need for more focus on reducing their risk of falling from height.*

9. Key findings in respect of prohibition and improvement notices included:
   - *There was a near-linear increase in the number of notices issued by the HSA, relating to work at height issues in the construction industry, between 1998 and 2001, followed by a near-linear decrease in the number of notices issued since 2001. The number of notices issued in 2006 is now lower than the number issued in 1998. This may suggest that there have been fewer occasions when the HSA inspectors have felt it necessary to issue prohibition notices to stop work at height on construction sites, and could be an indicator of improving work practices;*
   - *In respect of visits by HSA inspectors for which work at height related notices were issued, we found that inspections for compliance generate the largest number of notices, although the number of notices issued has reduced by around a factor of two between 2001 and 2005. The number of notices issued as a result of complaint-generated visits has also been reducing.*

10. Key findings in respect of inspections and visits by HSA inspectors included:
    - *In relation to inspections for compliance, both the number and proportion of work at height related visits have increased between 1998 and 2005. Similarly, the number and proportion of work at height related complaint investigation visits have increased between 1998 and 2005. This could be attributed to the increased public profile of the HSA's role in investigating complaints.*
    - *Work at height related accident investigation visits have remained consistently at around 12% of the total number of visits for all of the period except for 2003.*
    - *We believe that increases in inspection activity are perceived by industry participants to be an incentive to comply with regulations and is related to the issuing of fewer prohibition notices.*

Findings – Qualitative Issues

11. In order to understand the views of individuals and organisations within the construction industry regarding working at height, we used a variety of methods to canvass opinion from key informants, including a written questionnaire, a telephone survey, and a workshop session. Key findings from this qualitative assessment included the following:

- *Only a third of questionnaire respondents felt that HSA information has had a positive effect on Working at Height safety;*
- *Just over half of questionnaire respondents agreed that HSA regulations and enforcement of safety legislation have had a positive effect on safety in Working at Height;*
- *Just over three-quarters of questionnaire respondents felt that there has been a perceived improvement in Working at Height safety in recent years;*
- *Between 80% and 90% of questionnaire respondents stated that there had been an investment by their firm in Working at Height safety equipment and/or in training;*
- *Most respondents to the questionnaire indicated that they felt that the resources and information are in place to facilitate better safety whilst working at height, a finding supported during the telephone and workshop consultations;*
- *Importantly, prohibition notices issued by HSA inspectors are regarded as a major incentive to comply with the regulations;*
- *A more uniform application of regulations and issuing of prohibition notices by inspectors would be welcomed by the industry and would be seen to better facilitate industry participants to comply with regulations;*
- *Most firms conclude that promoting health and safety in Working at Height is 'good for business';*
- *There is a perception that larger firms are being 'hit harder' by the HSA and that smaller firms operating 'under the radar' are enjoying what amounts to a competitive advantage compared to larger firms;*
- *It was felt that HSA literature and support documentation should be simplified and/or translated with extensive use of diagrams so that it can be utilised at all levels of the industry and particularly for those workers who have poor levels of English literacy;*
- *Codes of practice and HSA guidance have generally been regarded as being useful but the industry would like HSA inspectors to liaise more closely with firms prior to and during changes to regulations.*

Findings – Impact of the HSA's Expenditure and Activities

12. Although the reasons for improved health and safety amongst those working at height in the construction industry are multi-faceted and not attributable to single interventions, we would strongly suggest that the cumulative effect of the HSA's interventions aimed at reducing risk undertaken between 1995 and 2005 has contributed to the reduction in accident rate.

13. Similarly, we believe that the HSA's increased expenditure aimed at reducing risk in construction-related activity was starting to have an effect by 2000, and there were fewer unsafe practices leading to fewer fall-related accidents.

14. Our analysis shows that over the period 1995 to 2006, the HSA has invested around €39M on work at height related activities in the construction industry, and has seen an increase in the number of lives saved and an increase in the number of injuries prevented leading to economic benefits in the order of €300M.

15. We believe that this represents a valuable return on the investment by the HSA in construction-related activities aimed at risk reduction in relation to working at height.

Conclusion

16. We conclude that the HSA's work in the area of safety in Working at Height has been effective in reducing the rate of accidents and has made a strong and positive impact to the area of health, safety and risk reduction in the construction industry.

Recommendations

17. The HSA should maintain its vigilant stance in relation to safety in Working at Height in order to further contribute to the reduction of the rate of accidents caused by falls from height.

18. The HSA should specifically target non-national construction workers using easy to read (translated) safety material and pictorial safety aids.

19. The HSA should also target self-employed workers in the construction industry to reduce their risk of falls from height. There is evidence to indicate that they are significantly under-reporting non-fatal falls.

20. The HSA should target safety information at older workers (40+ years) as it appears from our analysis they are more prone to fatal injury fall from height accidents than younger workers (20-24 years).

21. The high levels of under-reporting of accidents is a significant cause for concern for the HSA and we recommend that this be tackled by the HSA with assistance and input from the Construction Industry Federation to ensure buy-in from the industry.

22. The HSA should explore construction industry requests for increased availability of input from HSA inspectors relating to the provision of greater levels of advice and guidance.

23. As the HSA has one of the lowest number of inspector staff per capita of comparator countries such as the UK, the US, and Australia, further analysis should be undertaken to assess the HSA's staffing requirements consistent with adoption of the recommendations listed above.

24. Consideration be given by the HSA to the development of an information system which would assist with the ready extraction and manipulation of source data relating to workplace accidents, particularly in examining trends and patterns within different parts of the industry.

1. INTRODUCTION

1.1 Preamble

The Health and Safety Authority (HSA) was established under the Safety, Health and Welfare at Work Act, 1989. The Authority is a state sponsored body under the aegis of the Department of Enterprise, Trade and Employment, funded by the Exchequer. The job of the Authority is to promote the safe and healthy working environment that all workers in Ireland have a right to expect. In pursuit of this aim, the HSA uses its resources to implement national programmes aimed at preventing risk and enforcing compliance. A major focus of the HSA's work has been the development and promotion of codes of practice, and guidelines on safety and the prevention of accidents in various sectors.

The Authority has responsibility for promoting occupational safety and health and for developing and enforcing relevant legislation. The Authority's mission is to achieve a working environment:

- In which the safety and health of people is ensured, at the highest level possible, consistent with technical development, and with economic and social progress;
- In which a preventive approach is maintained, underpinned by occupational health and safety law;
- In which there is widespread consultation between those affecting and those affected by working conditions, especially between employers and employees.

A recent report for the Department of Enterprise, Trade and Employment by Indecon Economic Consultants assessed the impact of the Safety, Health and Welfare at Work legislation to date. The report indicates an overall positive impact but found no direct or significant relationship between resources devoted to occupational safety and health and subsequent incident rates.

Given the broad remit of the Indecon study, it was proposed that a demonstrable relationship between resources and outcomes may become apparent if analysis were to focus specifically on the issue of Working at Height. Trends in the data suggest that the significant concentration of resources in this area by the Authority has had a positive impact in terms of accident and fatality rates. Accordingly, the Authority seeks formally to establish this link so that the methods and lessons learned from the Working at Height campaign may be applied to other HSA initiatives.

Against this backdrop, Horwath Consulting Ireland, in association with Bomel Limited (UK), were appointed by the HSA in early 2007 to undertake an impact assessment of the HSA's activities and initiatives on the accident rate related to falls from height.

The data to be analysed within the impact assessment covers the period up to and including 2005, i.e. the period before the Safety Health and Welfare at Work (Work at Height) Regulations 2006 were launched.

1.2 Background

Since 1993, there have been sustained high levels of activity within the construction industry, which has seen a steep rise in the number of employees in the industry, rising from 79,000 in 1993, to 160,000 at the end of 1990s, to almost 280,000 construction workers at present. (The Construction Industry Federation figures indicate that total construction employment stands at 277,800, of whom 242,500 are Irish nationals.)

Many of the new entrants to the industry in recent years are from overseas, many with low levels of English language literacy, which complicates the communication of important health and safety information and the steps which these workers are required to follow to comply with regulations.

The boom in construction activity from the mid-1990s, coupled with several major scaffolding collapses on building sites in 1997, prompted the HSA to initiate a series of measures to improve health and safety performance in this area. In the past decade, the HSA has allocated considerable, designated resources to Working at Height in terms of legislation, guidance and enforcement activity.

Inspections are largely driven by complaints, with half of complaints coming from members of the public and the other half made by workers, unions, safety consultants, and safety representatives on adjacent sites. In the past, prohibition notices may have been issued straight away; now, voluntary notices tend to be the first step. The HSA always re-visits sites after prohibition notices have been served to ensure that the actions have been taken. The reasons for issuing a notice are more complex than there being a problem on site. The inspector has to judge whether they can get the company to take the required action in any other way; if not a notice is issued. HSA Inspectors also conduct concentrated ‘blitzes’ at regular intervals during the year on construction sites, typically taking place in June and September.

In 2000, the HSA introduced dedicated construction sector inspectors who were recruited from a construction background, giving them insights and experience to address complex safety issues with designers and senior managers in building firms. Codes of practice provide inspectors with material to inspect and enforce against.

Inspectors have received technical training since recruitment. However, the number of construction inspectors has remained constant since 2000, despite significant growth in the size of the construction industry. The 2001 amendment to Construction Regulations led to more directed HSA inspection activity and targeting of work at height issues. For example, individuals (e.g. foremen) can now be prosecuted for non-compliance with relevant regulations.

The Construction Safety Partnership led to the development Safe Pass scheme. and it was subsequently included in the 2001 revision to the construction regulations. The Construction Skills Certification Scheme (CSCS) arose out of the above Partnership.

The CSCS provides for the training, assessment, certification and registration of non-craft operatives within the construction sector. The CSCS is covered under Schedule 4 of the Safety, Health & Welfare at Work Act 2005 – Construction Regulations 2006 Legislation. The aims of the CSCS are to provide opportunities for participants to become competent, confident and committed in applying the skills, knowledge and attitude that are associated with their occupations in construction. Operators who successfully complete an approved CSCS Training and Assessment Programme are awarded FETAC Certification and are eligible to apply for a CSCS Registration Card.

The increased availability of safety nets, air bags, and so on, was used by the HSA to signal to the industry that such equipment should be deployed and the HSA was instrumental in having such equipment widely introduced to the construction industry. Scaffolding has improved significantly due to the enforcement of the code of practice, and constant inspection of scaffolding has reinforced good practice. There is a Safety Representative Facilitation Scheme which facilitates airing of issues to/from staff and management on sites.

To summarise, the HSA initiatives and activities from 1995 to 2005 are tabulated below:

Year	Description Of Initiative
1995	Safety Health and Welfare at Work Regulations Mobile Training Unit
1996	Safety campaign and publicity drive
1997	Construction Strategic Review Committee The first prohibition orders (site closure orders) were issued in 1997/1998 on the basis of Working at Height hazards;
1998	Public Sector clients mandate the use of safety standards by contractors The HSA increases levels of construction training
1999	Scaffolding Code of Practice
2000	Creation of a team of specialist construction inspectors Concentrated safety campaign
2001	Safety Health and Welfare at Work Regulations CSCS and Safepass schemes
2003	Senior Labour Inspectors Committee Campaigns New Construction Safety Partnership Plan
2004	Promotional Working at Height campaign
2005	Safety Health and Welfare at Work Act Roof-work Code of Practice

Table 1: Chronology of the HSA Safety in Working at Height Initiatives

1.3 Structure of the Report

We describe below the material set out in this report.

Section 2 contains a comparative summary of Irish and international Working at Height documentation.

Section 3 contains the project methodology used to undertake the impact assessment.

Section 4 contains analyses of the quantitative data provided by the HSA. In particular, the subsections contain the following analyses:

- accident data reported to the HSA.
- prohibition and improvement notices issued by the HSA relating to work at height in the construction industry.
- visits made by the HSA relating to work at height in the construction industry.
- conclusions drawn from the quantitative analyses.

Section 5 contains the findings based on the returns from the industry questionnaire and related qualitative analysis and the conclusions drawn from the qualitative analyses.

In **Section 6,** the data analyses are brought together as follows:

- a range of variables including expenditure, visits and notices are compared with the rate of falls-related accidents to ascertain whether there are links between the variables.
- indicative estimates of the potential return on the HSA's investment in relation to its work at height programme in the construction industry.

Section 7 documents overall conclusions from the impact assessment and how it has met the criteria set by the HSA at the outset of the project.

2. COMPARATIVE SUMMARY OF WORKING AT HEIGHT DOCUMENTATION

2.1 Introduction

The information presented in this section is based on a brief review of a selection of Working at Height-related documentation from Ireland and other countries, including the UK, USA, Canada, Australia and New Zealand. This summary provides a wider context for the impact assessment and informs our overall analysis.

2.2 Irish Practice

2.2.1 Working at Height-Related Regulations, Codes of Practice, Guidelines and Work Plans

Legislation and documentation relating to safety in work at height in construction for the Irish context is listed below:

- ***The Safety, Health and Welfare at Work (Construction) Regulations (2001).*** As a result of these regulations, employers are required by law to ensure that employees on construction sites in Ireland carry Safe Pass cards.
- ***Code of Practice for Access and Working Scaffolds (1999).*** This applies to all places of work where scaffolds are used to provide working platforms, protection from falls or means of access during construction work. This includes guidance on the erection, use, inspection, dismantling and training in these areas for both System and Tube scaffolds – the two most commonly used in Ireland.
- ***Code of Practice for Safety in Roofwork (2005).*** This gives practical guidance to roofing companies, clients, designers and specifiers, project supervisors, safety representatives, and other people involved in roof work. A key theme of the guidelines is how to reduce accidents such as falls by removing risks and in many cases recommending straightforward physical protection measures.
- ***Timber Frame Erection Guidelines (2002)*** – these focus on good practice and the responsibilities of those erecting time frame constructions.
- ***The HSA Safe System of Work Plan Pictogram Books (2005 onwards)*** are safety management tools which enable persons to identify the major hazards associated with construction work activities and select the appropriate controls, and help to ensure that these controls are in place before work commences. Published in several languages, the books cover different construction activities, including House Building, Ground Works, New Commercial Buildings, Civil Engineering, and Demolition.

2.3 International Practice

2.3.1 Introduction

The section is presented for two reasons: to give a comparison with Irish practice, and to highlight the availability of other information, such as guidance or best practice, that may be of relevance to Ireland.

2.3.2 United Kingdom

The UK's Health and Safety Commission and its operating arm, the Health and Safety Executive (HSC/E) have spent over twenty years modernising the structure of health and safety law. They aim to protect the health, safety and welfare of employees, and to safeguard others, principally the public, who may be exposed to risks from work activity. The HSE's job is to help the Health and Safety Commission ensure that risks to people's health and safety from work activities are properly controlled.

The UK's Work at Height Regulations 2005 apply to all work at height where there is a risk of a fall liable to cause personal injury. They place duties on employers, the self-employed, and any person who controls the work of others (e.g. facilities managers or building owners who may contract others to work at height) to the extent that they control the work.

UK practice is defined by a hierarchy of information ranging from regulations that define what must be done, to good practice guides that provide suggestions on what should be done.

2.3.3 North America

The US Department of Labor's Occupational Safety and Health Administration (OSHA) has a section on its web site devoted solely to fall protection. The OSHA notes that, each year, falls consistently account for the greatest number of fatalities in the construction industry and are always a major concern in other industries.

The OSHA has revised its construction industry safety standards and developed systems and procedures designed to prevent employees from falling off, onto, or through working levels and to protect employees from being struck by falling objects. The performance-oriented requirements make it easier for employers to provide the necessary protection.

Canada's equivalent agency to the HSA is the Canadian Centre for Occupational Health and Safety. Canada introduced a Slips/Falls From Height Standard Operating Procedure (SOP), the purpose of which is to provide a protocol for the creation of procedures/practices to ensure that persons will not be injured or harmed by falling from heights. It is also intended that this procedure will assist firms in ensuring compliance with the Occupational Health and Safety Act and the Regulation for Industrial Establishments.

2.3.4 Australasia

Australia's equivalent to the HSA is the National Occupational Health and Safety Commission (NOHSC). In 2004, the NOHSC released a draft standard for construction work and a draft code of practice for falls prevention in the construction industry. The literature located from Australia has a different emphasis to that located from Canada, New Zealand or North America. Instead of the usual emphasis on hardware, the emphasis in the Australian literature appears to be on spotting the hazards, assessing the risks and then acting accordingly.

New Zealand's Department of Labour, Occupational Safety and Health Service has produced clear and informative guides on Working at Height. Practice in New Zealand is largely based on domestic regulations, codes, standards and guides. However, reference is also made to Australian, European and UK codes and standards.

2.4 Discussion

On an international basis, the regulations address all aspects relating to work at height including the selection and use of work equipment, and the way the work is planned, organised and managed. Regulations are generally intended to minimise the risk of falls whilst working at height, which is one of the most common causes of fatalities and injuries at work.

In most jurisdictions, there are a large, proportionate number of fatalities from falls reported to enforcing authorities from the construction sector. There is also usually a large, proportionate number of non-fatal injuries caused by falls from height. The UK has reported that the actual number of non-fatal injuries may be higher than the numbers reported because the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) is subject to under-reporting. This is consistent with the experience of accident under-reporting in the Irish context.

Within different industry sectors there were significant variations in the types of fall accident. The services sector had the highest number of fall-related accidents below two metres. Some of the agents involved in falls from height accidents were ladders, stairs, scaffolding, and roofs.

Given that falls from height typically account for a sizeable portion of fatal injuries and major injuries to workers, most countries report that the potential benefit of preventing these injuries is significant. The cost of a workplace accident is higher than is immediately obvious. The injured worker faces costs in terms of pain, grief and suffering, and loss of income. Employers face costs in terms of lost output, equipment damage and disruption. There are also resource costs to society in terms of medical treatment, social security administration and payments and compensation payments.

There is increasing focus on the risks associated with equipment such as ladders and moves towards the use of Mobile Elevated Work Platforms (MEWPs) in preference to more 'traditional' equipment. In practice, this may also increase the use of ropes, braces, and ladder stabilising devices. Work at

Height Regulations internationally have, in general terms, resulted in some changes in equipment use, from ladders to low level access or mobile platforms which are subject to stricter inspection and ladder replacement regimes. Underlying causes of falls from height accidents were unsafe systems of work, inadequate training, poor communication, lack of experience, and lack of information. In addition to the regulatory requirements such as the requirement to produce risk assessments, there is a variety of control measures for work at height, including the use of ladders, fall arrest equipment, scaffolds and work platforms.

The following generic measures have been reported as being used either in isolation or combination to reduce falls from height accidents:

- Elimination of the need to work at height e.g. clean from ground level using jet washers;
- Design in permanent measures to permit safe work at height e.g. where maintenance has to be done at height, design in permanent access;
- Provide temporary access to permit safe work at height e.g. scaffolding, roof ladders, mobile platforms;
- Provide global protective equipment in areas where working at height is necessary e.g. hole covers, inflatable bags, safety netting, and edge protection;
- Provide personal protective equipment to personnel working at height e.g. fall arrest systems, harnesses, lanyards, and ropes.

In addition to these generic measures, other measures include:

- Certification schemes for those regularly working at height;
- Training;
- Providing information and guidance;
- Increasing awareness of the risks of working at height.

The issues addressed in the international sources appear to be very similar to those addressed in Irish practice, in particular:

- Falls from roofs appear to be the dominant focus;
- Whilst hazard identification and risk assessments are considered, the emphasis is very much on the hardware and precautions – the exception is in Australian literature;
- The generic risk control measures suggested are very similar i.e. edge protection, roof ladders, mobile platforms and Personal Protective Equipment (PPE).

The quality of the information accessed is high, with some good examples of clear and well thought out documents. Despite the quality of individual documents, the means of communicating the information tended to be piecemeal. In most cases, several separate documents are required to convey an integrated picture of hazard identification, risk assessment, risk control measures and legislation.

Whilst the UK and other countries have produced information recommending risk control measures, there appears to be little information available on accident causation, comparisons between various industries or why particular risk control measures are recommended. Various countries appear to have reached similar conclusions on risk control measures. Without information about the underlying problems, it is difficult to make judgements on the effectiveness of particular risk control measures.

There is little information published in the literature on the effectiveness of various control strategies for falls from height. It may take several years to fully realise the impact of any regulatory change to reduce falls from height.

3. PROJECT METHODOLOGY

3.1 Introduction

Horwath Consulting Ireland and Bomel were requested by the HSA to establish a link between the reduction in accident rates and the activities and initiatives undertaken by the HSA over the period 1995 to 2005. We have sought to establish this link by analysing the HSA inputs over this period and the outcomes which have arisen from the Authority's initiatives and activities. We were requested to consider the impact of high profile generic interventions (such as construction regulations) with lower profile specific interventions (e.g. scaffolding, Working at Height, roofing, etc).

In this impact assessment for the HSA, we have taken the view that detailed econometric analysis was not required at this level of investigation, and instead we concentrated on the measurable costs and benefits which accrue directly to firms and individuals as a result of the Working at Height campaign. Our key focus was to establish the measurable indicators, both quantitative and qualitative, which provide empirical and evidence-based insight into the impact of the campaign; this may then lead on to wider econometric analysis at a later stage.

This following section contains an overview of the approach taken by our team, as illustrated in Figure 1 below.

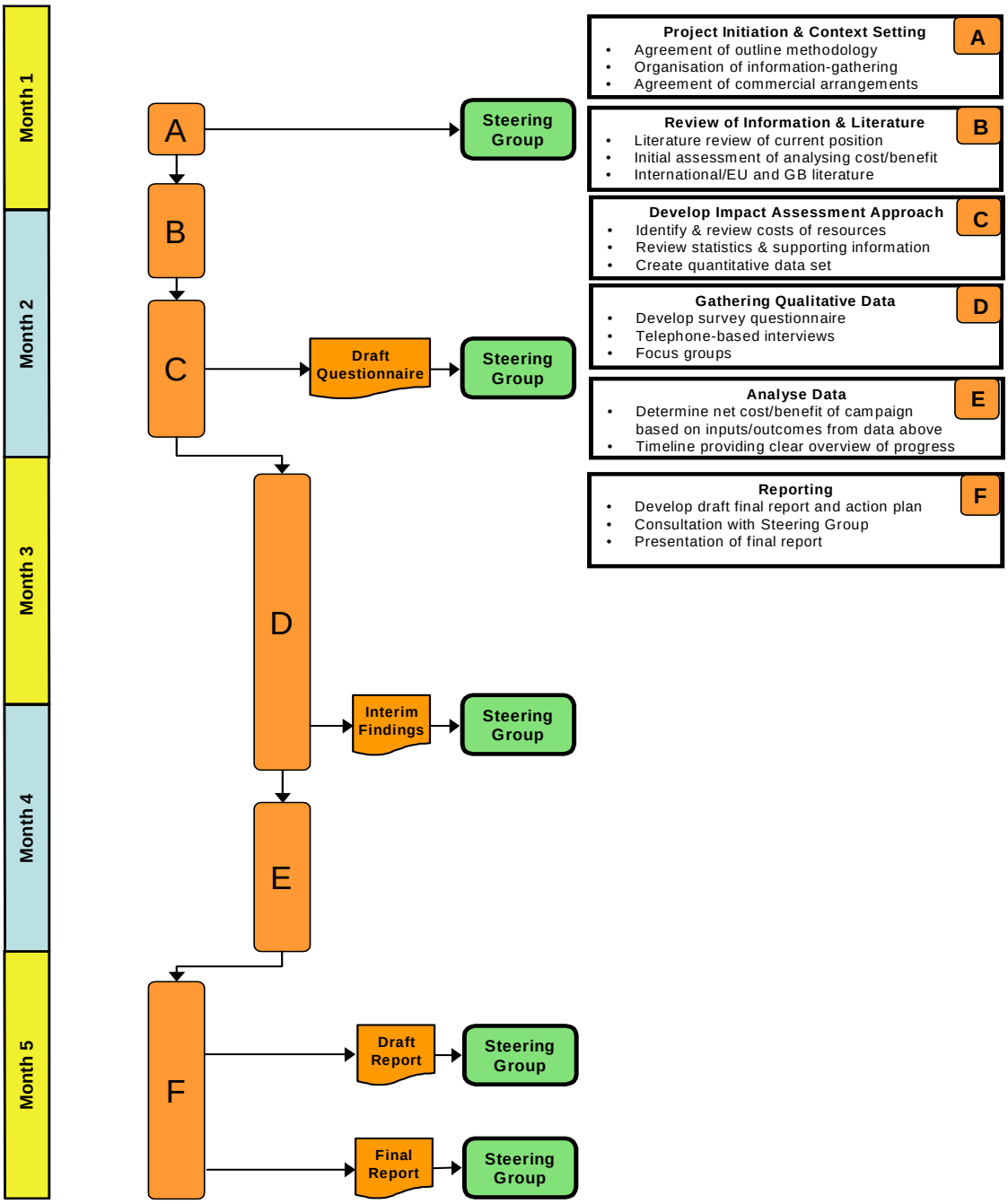

Figure 1: Overview of Project Methodology and Timetable

3.2 Initial Data-Gathering Activities

The project team had several fact-finding meetings with senior HSA staff in the early stages of the impact assessment project to explore the logic behind the different strands of the Working at Height initiative. This allowed the assessment team to develop an understanding of the HSA's concerns about historical and current Working at Height accident incidence and related work and safety practices in the industry. We conducted a brief series of workshops with senior HSA management and inspection staff in which the project team investigated the factors that caused the HSA to allocate such resources to tackling the issue of Working at Height in the construction sector.

3.3 Quantitative Analysis

The HSA provided the project team with its various data sources related to accidents and fatalities in Working at Height. These were primarily derived from the HSA's SAFE (System for Accident and Field Enforcement) information technology (IT) system. The SAFE system provides HSA management with statistics for planning future inspection and prevention programmes. All inspectors have access to SAFE and it is based around a standard set of questions used on visits.

There are limitations with the data provided as it includes reported accidents only and is therefore likely to underestimate significantly the true levels of Working at Height-related accidents in the construction industry.

The accident rates are presented without correction for the level of under-reporting in the construction industry. Reporting levels may be estimated from the results of surveys undertaken by the Central Statistics Office. Unfortunately, these data are only available for 2003, 2004 and 2005 and, as such, a clear picture of the trends with time is not possible. Whilst this underestimates the rate of non-fatal injury accidents, it is unavoidable in the absence of further data.

Using this information, we prepared detailed analyses of Accidents, Notices and Visits. These are described in Section 4 below.

3.4 Qualitative Analysis

3.4.1 Introduction

The HSA contact database was used to gather the survey population; this database is comprised of Companies Registration Office 2005 data. Companies only feature on the HSA database when they are brought to the HSA's attention for reasons such as complaint, inspection, or accident. We developed a list of approximately 120 construction industry stakeholder firms to be invited to participate in the completion of a questionnaire. The aim of the questionnaire was to assess the response of the construction industry to the HSA's initiatives and activities in Working at Height safety over the past decade.

Overall, the qualitative analysis was undertaken using three separate data-gathering methods:

- Questionnaire;
- Telephone Interviews;
- Industry Workshop.

This is described in Section 5 below.

We acknowledge that there may be potential bias inherent in the industry responses to the questionnaire. Similarly, we acknowledge the subjective nature of participants' responses in the telephone interviews and industry workshops.

3.4.2 Questionnaire Development

We developed a survey questionnaire to cover the necessary areas relating to inputs and outcomes from the industry perspective. We issued this draft questionnaire to the Steering Group for their comments and then finalised the draft prior to issue. The questionnaire was intended to be straightforward for respondents to complete. The main use for the tool was to provide high-level opinion findings from the construction sector on the HSA's Working at Height campaign.

The key areas to be assessed in the survey questionnaire were as follows:

- The type of information provided by the HSA in relation to safety in Working at Height which has had a positive effect on safety in the construction sector;
- The effect of the HSA inspection and enforcement on safety in Working at Height in the construction industry;
- The type of investment in the provision of safety equipment for Working at Height carried out by companies;
- Training provided to employees or sub-contractors in the area of safety in Working at Height;
- Description of the risk assessments carried out by companies in relation to Working at Height;
- Extent of company satisfaction with the information and resources to manage the risks of work at height effectively;
- Documentation of the types of assistance that companies would value from the HSA to improve safety in Working at Height.

3.4.3 Issue of Questionnaire

We issued 120 questionnaires to a sample of firms. These were emailed and also sent by surface mail, where possible, to the Safety Officer (where one was in place) at a range of construction-related organisations with a view to achieving a response rate of 33% i.e., 40 responses. The knowledge of the industry within the HSA was utilised to support us in gathering an appropriate sample population. The actual response rate to the survey was in the region of 25%, and each non-respondent was contacted by email, where available, and by telephone to maximise the response rate.

3.4.4 Telephone Survey and Industry Workshop

A key function of the questionnaire was its use as an entrée for the assessment team to be able to contact stakeholders associated with the construction industry for telephone interviews and to participate in an industry fact-finding workshop.

We conducted follow-up telephone interviews with a sample of the above firms. We then invited these firms to a workshop where the issues could be discussed in greater depth.

3.4.5 Analysis and Presentation of Findings, Conclusions, Recommendations

We selected the key variables including the HSA's expenditure, visits and notices activities and compared these with the rate of falls-related accidents to ascertain whether there are links between the variables. This was used to determine potential return on the HSA's investment in construction-related activities in the area of safety in Working at Height.

We presented our results to the HSA during Summer 2007, and on the basis of these discussions we wrote up our analysis, findings and conclusions for submission to the HSA.

4. QUANTITATIVE ANALYSIS

4.1 Introduction

The areas analysed within this section are listed below:

- Accident Data;
- Prohibition and Improvement Notice Data;
- Inspection/Visit Data.

The accident rates are presented without correction for the level of under-reporting in the construction industry.

Accident Data

Accidents resulting in more than three consecutive days' absence from work must be reported to the HSA. We analyse below the reported accidents that relate to falls from height. The dataset includes fatal incidents involving any employed or self-employed person, which was caused by an accident during the course of their work and non-fatal incidents sustained in the course of their employment, which prevents any employed or self-employed person from performing the normal duties of their work for more than three calendar days, not including the date of the accident.

Inspection/Visits Data

During inspections, the HSA's inspectors look for site-specific health and safety plans, safety statements, the provision of welfare facilities, and the notification and appointment of health and safety duty-holders. Inspectors also examine measures in place for working at heights and managing plant and equipment. Inspectors also scrutinise overall site traffic with regard to workplace health and safety requirements. In the course of these inspections, inspectors advise employers on, and monitor compliance with, carrying out risk assessments, preparing and maintaining safety statements, and the liabilities of directors.

Prohibition and Improvement Notice Data

We have analysed details of the enforcement actions taken as a result of inspection visits. Prohibition notices and improvement notices (defined at Section 4.4.1 below) are issued by the HSA and, where necessary, legal action may be taken to enforce compliance.

4.2 Accident Data

4.2.1 Introduction

The accident data analysed in this section is listed below:

1. Accidents involving falls from height;
2. Accidents involving falls from height related to employment status;
3. Accidents involving falls from height related to age of injured workers;

4. Accidents involving falls from height related to nationality of injured worker.

These are documented in detail in the paragraphs below.

4.2.2 Accidents involving Falls from Height

Figure 2 shows that the number of falls reported in the construction industry has risen from 29 in 1993 to 200 in 2001. Since 2002, the number of reported falls has typically been between 170 and 180 per year. This figure also shows the rate of falls per 100,000 workers (the data points joined by lines corresponding to the right hand scale).

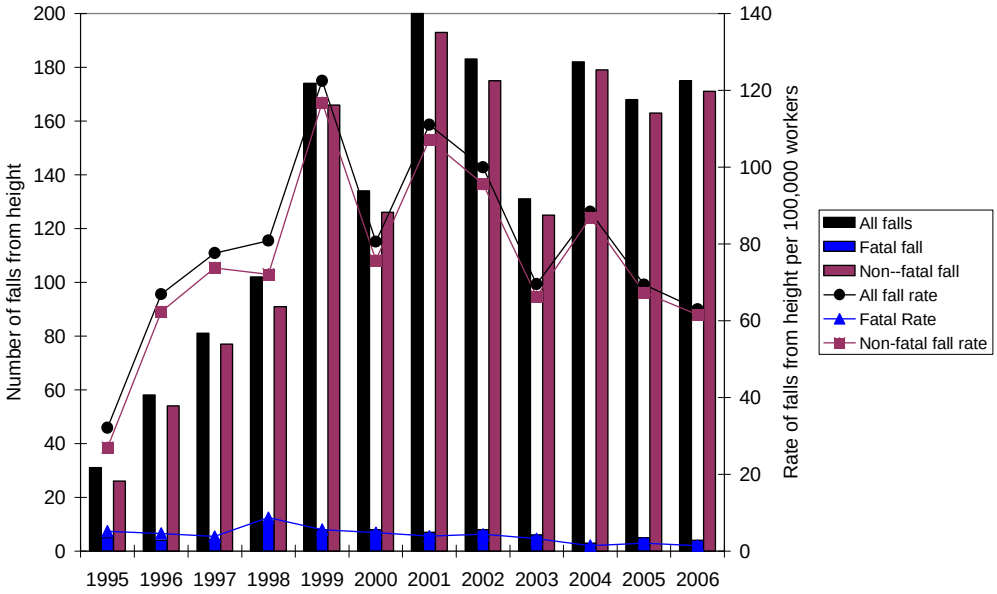

Figure 2: Accidents involving falls from height reported to the HSA in the construction industry by number and rate per 100,000 workers

This figure shows that the rate of fall-related accidents increased between 1995 and 2000 from around 40 per 100,000 employees to 180 per 100,000 employees, but since 2001, the rate has been decreasing and was 60 per 100,000 employees in 2006.

4.2.3 Accidents involving Falls from Height related To Employment Status

Figure 3 shows the variation in the number of construction fall-related accidents reported to the HSA. Whilst the ratio of non-fatal falls between employees and the self-employed is 16.6 to 1 (1,407 compared with 85), the ratio of fatal falls is 2.5 to 1 (45 compared with 18). The rate of accidents reported by the self-employed is typically low.

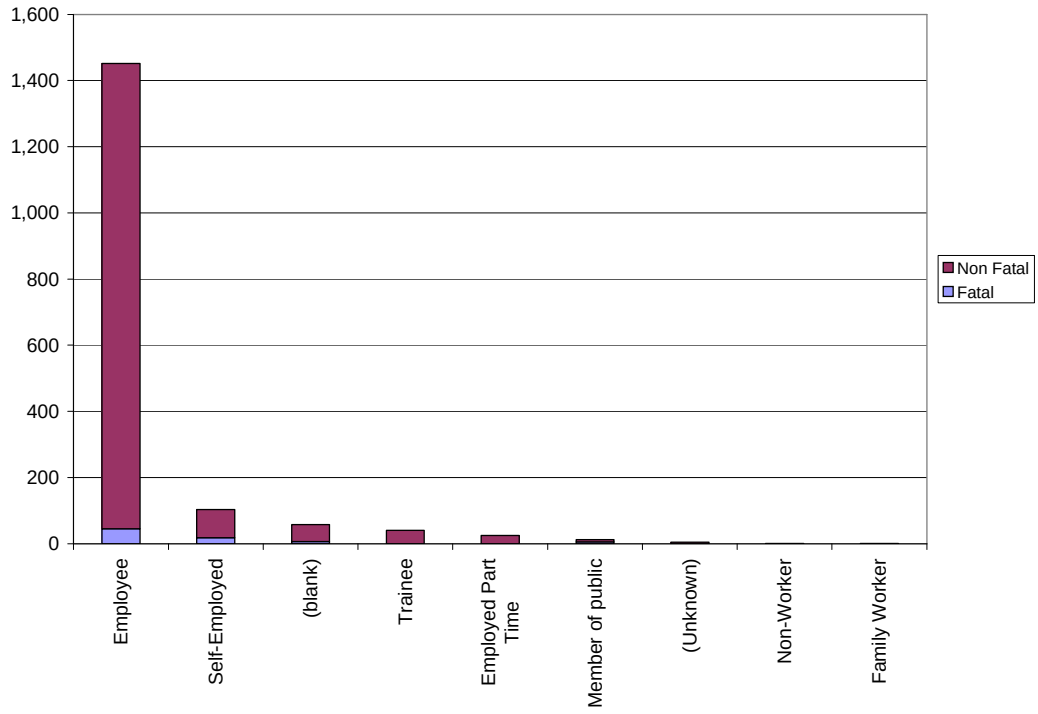

Figure 3: Accidents involving falls from height reported to the HSA in the construction industry by employment status

Given that the self-employed are likely to be facing similar risks to the employed, this figure suggests that there could be around 560 non-fatal falls involving the self-employed (i.e. 1,407 divided by 2.5). In addition, the employee figures are also likely to be subject to under-reporting, suggesting that, overall, the number of fall-related accidents occurring is somewhat larger than that shown in this figure. **This suggests that significant targeting of the self-employed is required to reduce their risk of falling from height.**

4.2.4 Accidents involving Falls from Height related to age of Injured Worker

Figure 4 shows the variation in age of those workers involved in construction falls.

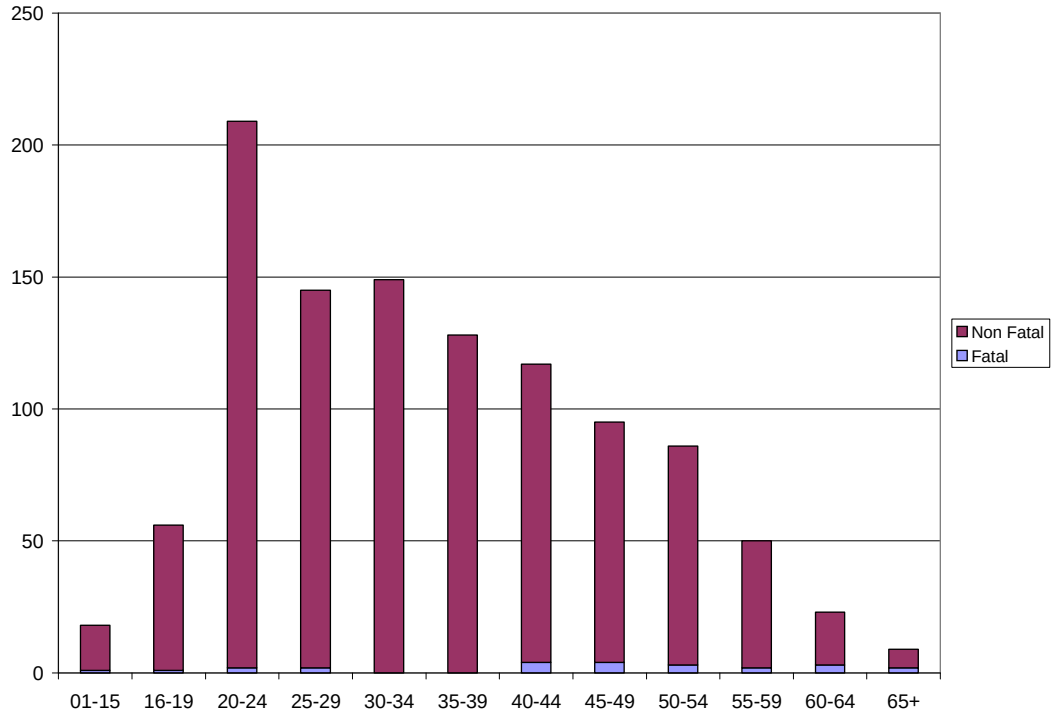

Figure 4: Accidents involving falls from height reported to the HSA in the construction industry by age of the injured person

Whilst the largest overall number of falls are reported to involve younger workers (20-24), the largest number of fatal injury accidents involve older workers (40+). As the age profile in the construction industry is relatively young, one would expect there to be more accidents involving younger workers. This could suggest that the HSA messages are having greater impact on some age ranges than others.

4.2.5 *Accidents involving Falls from Height related to Nationality of Injured Worker*

Figure 5 shows the variation in construction falls by nationality. This figure shows that the number of Irish nationals injured outnumbers other nationalities by around 15 to 1. However, issues such as the number of workers of other nationalities working in the Irish construction industry and the accident reporting rate among non-Irish nationals need to be considered before drawing firm conclusions.

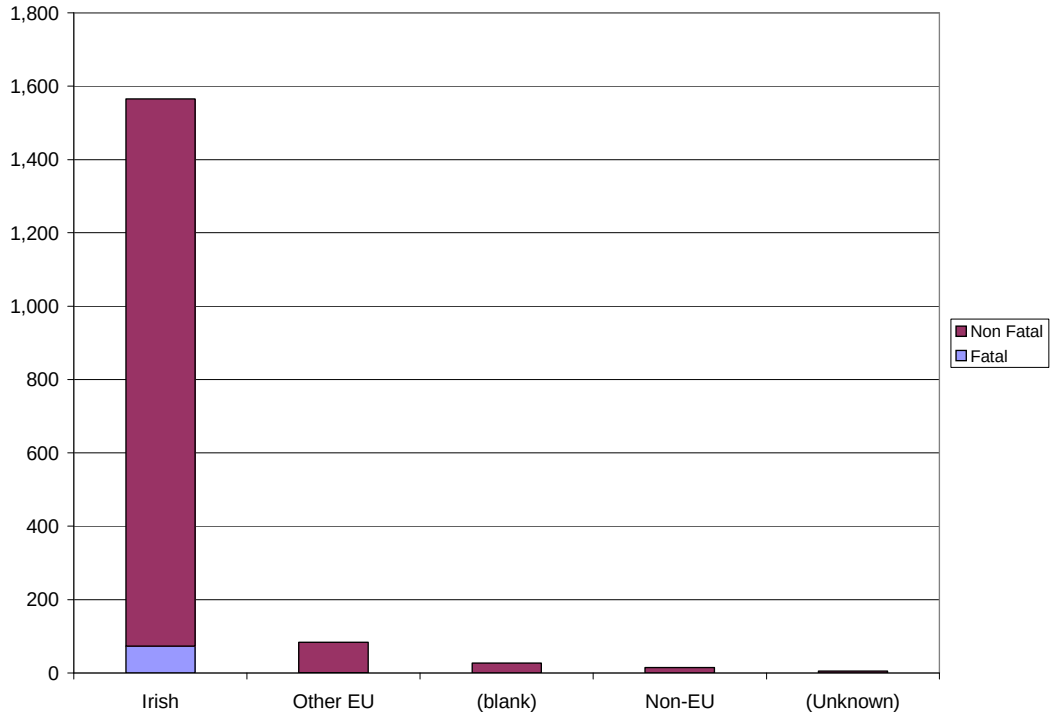

Figure 5: Accidents involving falls from height reported to the HSA in the construction industry by age of the injured person

The HSA report 'Summary of Fatality, Injury & Illness Statistics 2005-2006' indicates that around 10% of the construction workforce in Quarter 1 2007 were non-Irish nationals. **This implies a gap between the incidence of non-Irish nationals working in the construction industry and those non-Irish nationals reporting non-fatal injuries.**

4.3 Inspection/Visit Data

4.3.1 Introduction

The inspection/visit data analysed in this section is listed below:

- Work at height visit related to compliance, complaint investigation and accident investigation

This is documented in detail in the paragraphs below.

4.3.2 Work at Height Visits related to Compliance, Complaint Investigation and Accident Investigation

Figure 6 shows the variation in the number of work at height related visits made by the HSA in relation to inspections for compliance, complaint investigation and accident investigation.

HSA inspectors can visit and inspect all places of work and monitor compliance with health and safety laws. These can be undertaken on a reactive basis i.e., responding to a complaint and/or accident, or on a proactive basis, i.e., to enforce compliance with legislation at the workplace, and can result in the HSA taking enforcement action (up to and including prosecutions).

This shows the main variation to be in the number of compliance visits, with smaller numbers being made in 2003 and 2004 in comparison to adjacent years.

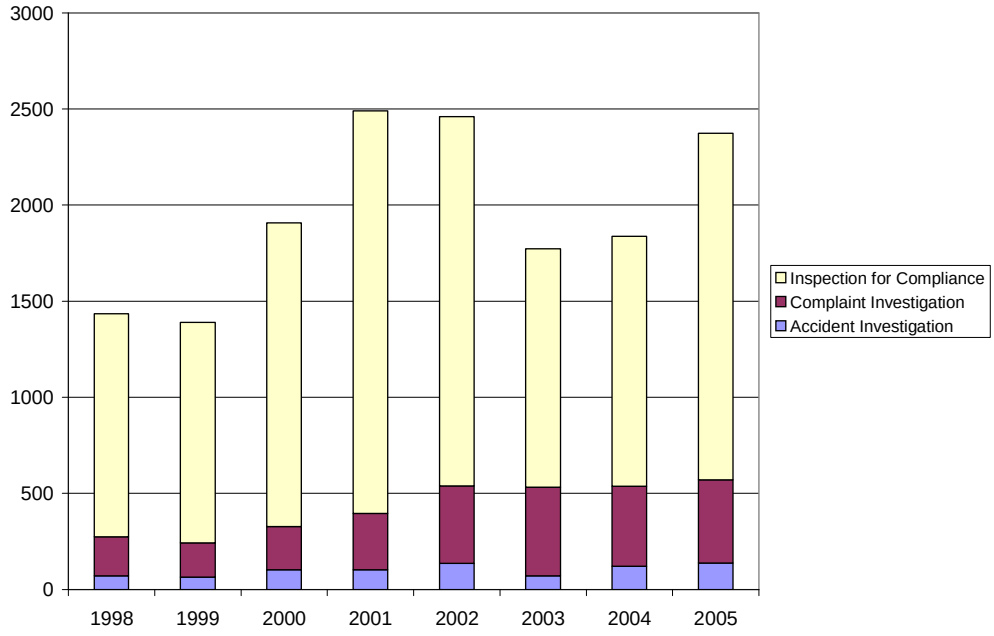

Figure 6: Work at height related visits made by the HSA to the construction industry by year

This **inspection for compliance** figure shows that both the number and proportion of work at height related visits have increased between 1998 and 2005. Both the number and proportion of work at height related **complaint investigation visits** have increased between 1998 and 2005. This could be attributed to increased public awareness of the HSA and its role in undertaking inspections.

This figure shows that the work at height related **accident investigation visits** have remained consistently at around 12% of the total number of visits for all of the period except for 2003.

4.4 Prohibition and Improvement Notice Data

4.4.1 Introduction

The prohibition and improvement notice data analysed in this section is listed below:

- Notices issued related to work at height issues;
- Visits and work at height related notices.

A **Prohibition Notice** is issued in relation to an activity, which the inspector is of the opinion, has been or is likely to be a risk of serious personal injury to persons at work. This might require an immediate stoppage of work.

An **Improvement Notice** is issued where the HSA Inspector states, in his opinion, that an employer has broken a provision of an Act or Regulation.

These are documented in detail in the paragraphs below.

4.4.2 Notices issued related to Work at Height Issues

Figure 7 shows the variation in the number of notices issued by the HSA relating to work at height issues in the construction industry. This shows that there was a near-linear increase in the number of notices issued between 1998 and 2001 followed by a near-linear decrease in the number of notices issued since 2001. The number of notices issued in 2006 is now lower than the number issued in 1998.

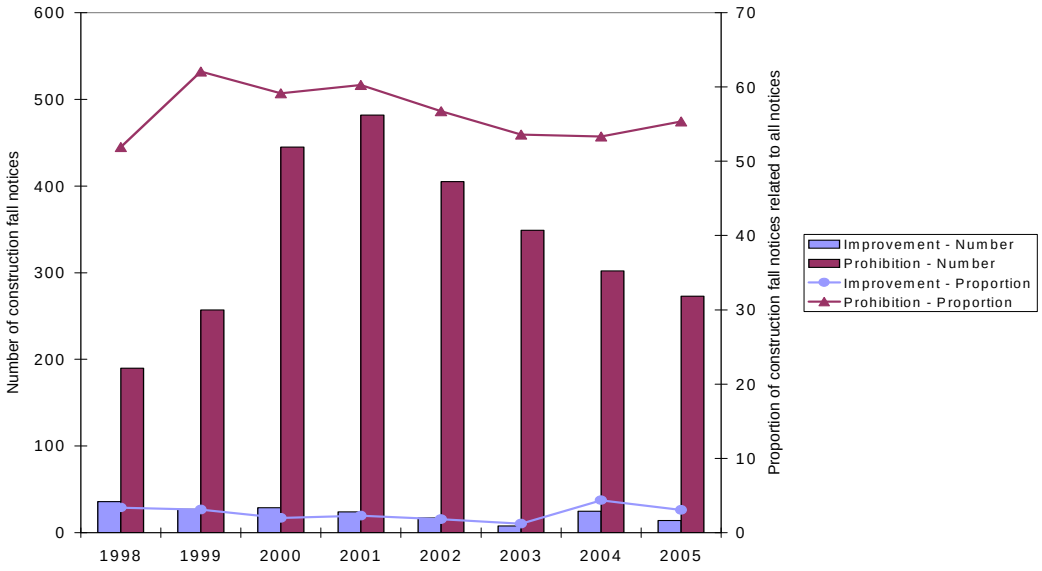

Figure 7: Work at height related notices issued by the HSA to the construction industry by year

Given that the majority of notices issued are **prohibition notices**, this reduction in the number of notices issued may suggest that there have been fewer occasions when the HSA inspectors have felt it necessary to issue prohibition notices to stop work at height on construction sites. **If there are fewer potentially dangerous work practices being observed, we would suggest that this could be an indicator of improving work practices.**

4.4.3 Visits and Work at Height Related Notices

Figure 8 shows the variation in types of visit for which work at height related notices were issued. This shows that inspections for compliance generate the largest number of notices, although the number of notices issued has reduced by around a factor of around two between 2001 and 2005.

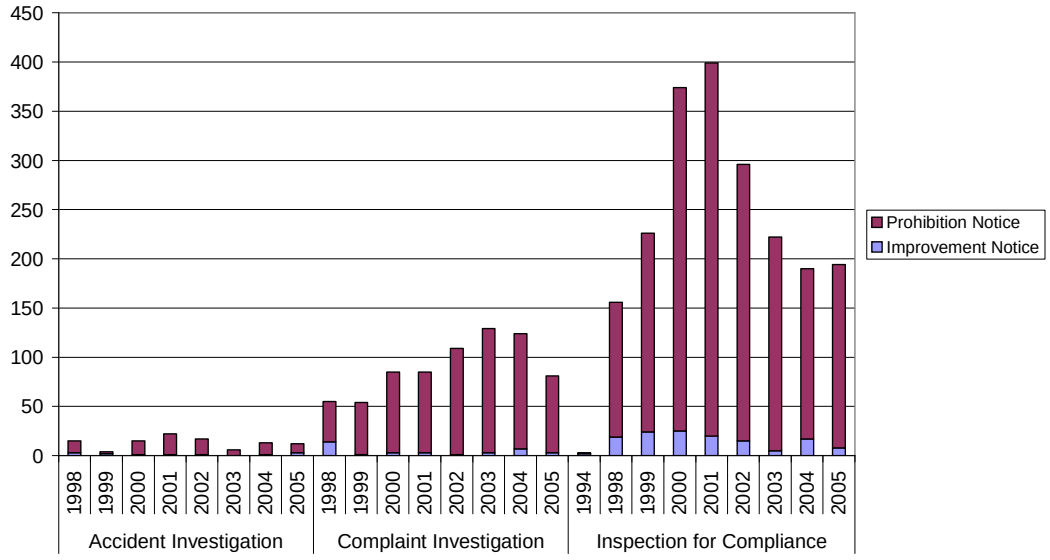

Figure 8: Work at height related notices issued by the HSA to the construction industry by type of visit

The number of notices issued as a result of complaint visits has also been reducing, but from 2004 rather than 2001.

4.5 Conclusions from Quantitative Analysis

Based on the analysis undertaken during this study, the following conclusions have been documented:

Accident Data

- The number of falls from height reported in the construction industry rose from 1993 to 2001 and has stabilised since 2001. The rate of fall-related accidents increased between 1995 and 2000, but since 2001, the rate has been decreasing and was 60 per 100,000 employees in 2006.
- Our analysis indicates that there is under-reporting of non-fatal falls by both employed and self-employed workers in the construction industry.
- Whilst the largest overall number of falls are reported to involve younger workers, the largest number of fatal injury accidents involve older workers. This suggests that targeting of information and advice at older workers would produce benefits
- The number of Irish nationals injured outnumbers other nationalities by around 15 to 1. We suggest that there is a gap between the incidence of non-Irish nationals working in the construction industry and those non-Irish nationals reporting non-fatal injuries.

Prohibition and Improvement Notice Data

- There has been an overall reduction in notices issued suggesting that there have been fewer occasions when the HSA inspectors have felt it necessary to issue prohibition notices to stop work at height on construction sites, which could be an indicator of improving work practices.

Visit Data

- The number and proportion of work at height related visits have increased between 1998 and 2005. We suggest that this increase in inspection activity is perceived by industry participants to be an incentive to comply with regulations and is related to the issuing of fewer prohibition notices referred to in the above paragraph.

5. QUALITATIVE ANALYSIS

5.1 Introduction

The three main areas of qualitative analysis are described in this section.

1. Questionnaire – returns received from companies in the construction industry
2. Telephone Interviews – undertaken with companies to follow up on the questionnaire received
3. Industry Workshop – conducted with companies to explore further the future areas etc.

5.2 Questionnaire

5.2.1 Introduction

In the sections below we set out the findings based on the responses to the questionnaire. The areas which we report on are as follows:

1. Responses by county;
2. Size of firm;
3. Sectoral breakdown of respondents;
4. Has HSA information had a positive effect on Working at Height safety?
5. Has HSA enforcement had a positive effect on Working at Height safety?
6. Has there been a perceived improvement in Working at Height safety?
7. Have firms made investments in Working at Height safety equipment?
8. Have firms made an investment in Working at Height training?
9. Do firms carry out Working at Height risk assessments?
10. How satisfied are firms with the information they have available to implement necessary Working at Height safety measures?
11. How satisfied are firms with the resources they have at their disposal to implement necessary Working at Height safety measures?

Each of the above points is reported upon in greater detail in the paragraphs below.

5.2.2 Responses by County

As can be seen in Figure 9 below, 56% of respondents were located in Dublin, 20% of non-Dublin respondents were based in Leinster and the remainder (24%) were located across the rest of the country.

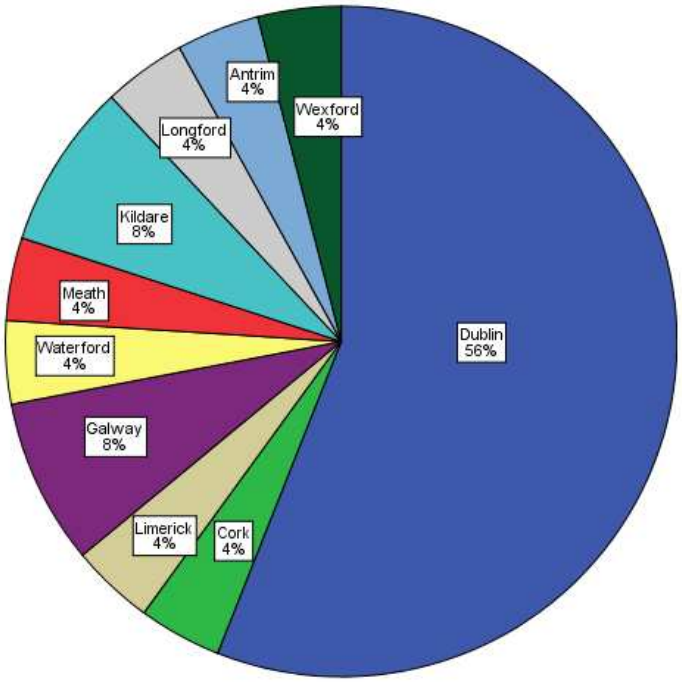

Figure 9: Breakdown of respondents by county

5.2.3 Size of firm

Figure 10 indicates that 44% of respondents were based in firms with 50-249 employees, 24% in firms with 250-1000 employees. 20% were either small or very large firms and 12% did not supply this information.

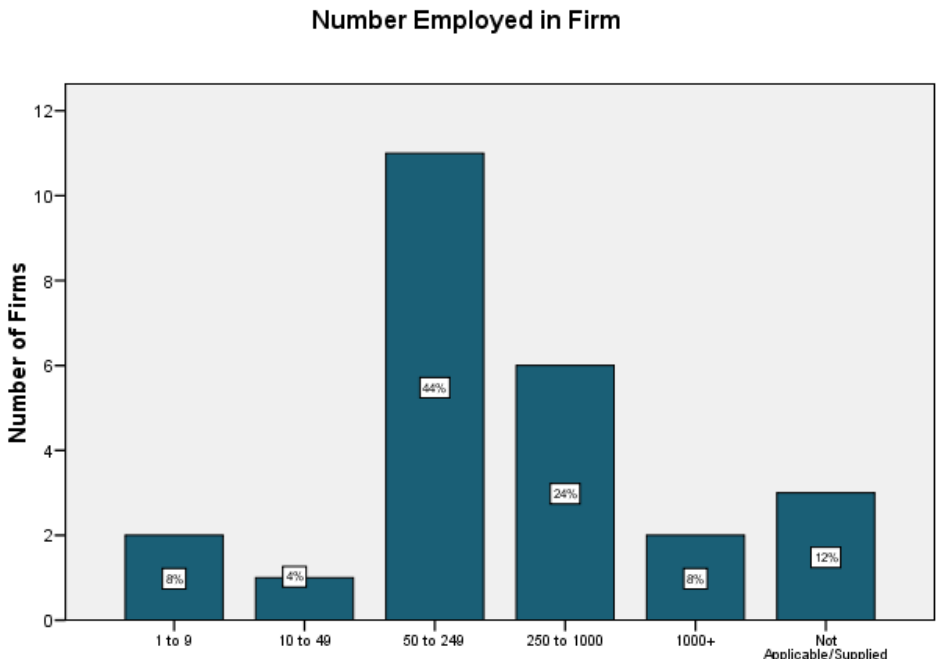

Figure 10: Breakdown of respondents by size of firm

5.2.4 Sectoral breakdown of respondents

We asked firms to indicate within which sector or sectors they were operating. Figure 11 below demonstrates the main areas:

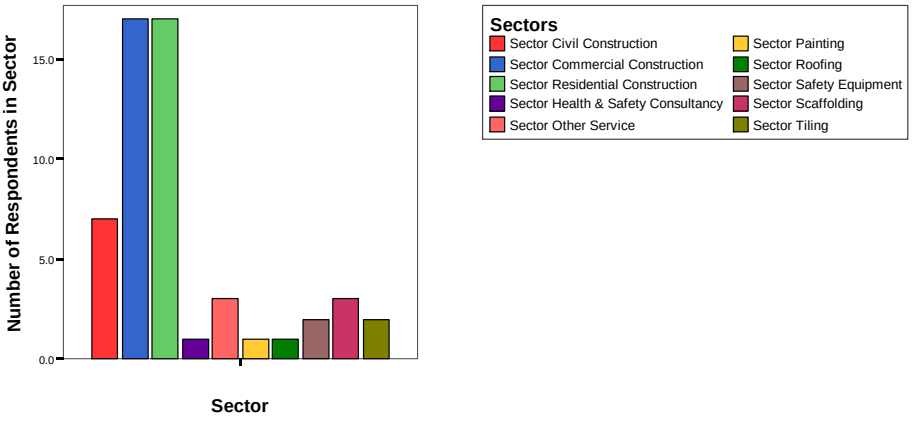

Figure 11: Sector of construction industry

The majority of respondents are working in the commercial and residential construction sectors, with civil construction the next biggest sector.

5.2.5 *Have HSA campaigns had a positive effect on Working at Height safety?*

On the question of whether **HSA campaigns had a positive effect on Working at Height safety:**

- 33% of respondents strongly agreed or agreed
- 38% were neutral, and
- 29% disagreed or strongly disagreed

This is illustrated in Figure 12 below:

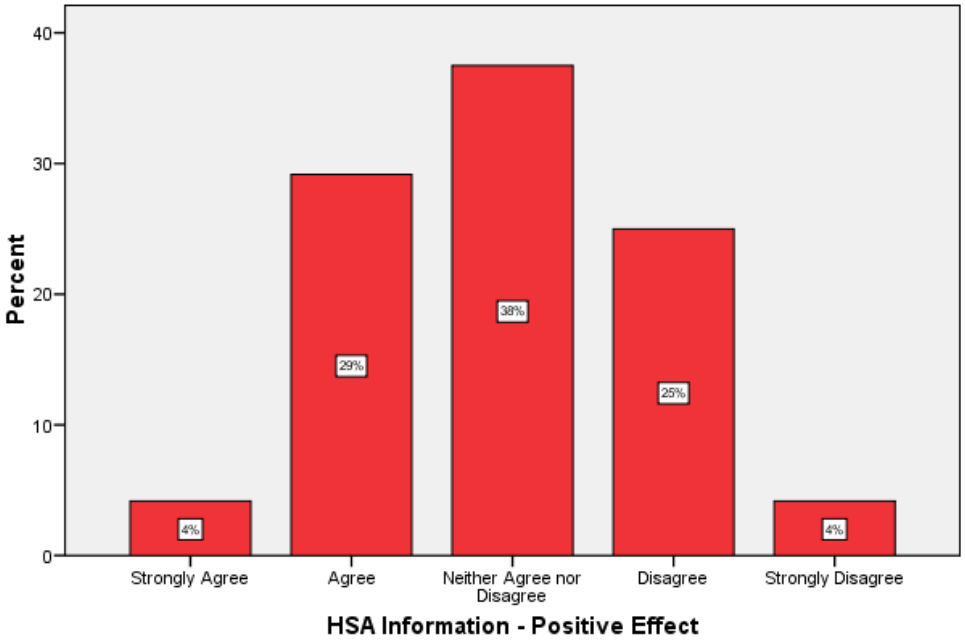

Figure 12: Whether the HSA's campaigns have had a positive effect on safety in Working at Height

5.2.6 *Has HSA enforcement had a positive effect on Working at Height safety?*

On the question of whether **HSA enforcement has had a positive effect on Working at Height safety:**

- 52% of respondents strongly agreed or agreed;
- 16% were neutral; and
- 32% disagreed or strongly disagreed.

Figure 13 below illustrates the responses:

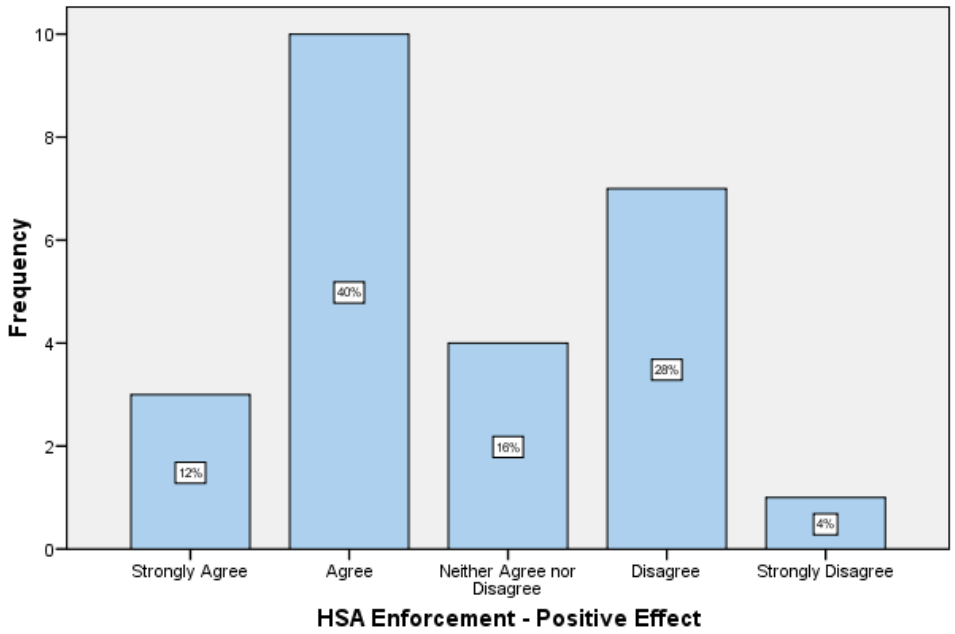

Figure 13: Whether HSA regulations and enforcement of safety legislation have had a positive effect on safety in Working at Height

Respondents' comments on information and enforcement

The bullet points below illustrate comments made by firms about enforcement.

- *"Generally the Guidance Documents and Codes of Practice have been useful."*
- *"I feel the one positive area improved by the introduction of the Working at Height regulations is the removal of the "2 metre rule". I believe that Working at Height should be based on risk assessment and risk reduction and each specific task risk-assessed."*
- *"The Scaffolding code of Practice is a good example of how the authority laid down their specific requirements vis-à-vis improvements to provision of safe scaffolding."*
- *"The guidelines for Working at Height have some positive aspects but also contain ambiguous statements which dilute and cast doubt on its purpose."*

5.2.7 Has there been a perceived improvement in Working at Height safety?

On the question of whether there has been a **perceived improvement in Working at Height safety:**

- 76% of respondents strongly agreed or agreed;
- 4% were neutral; and
- 20% disagreed or strongly disagreed.

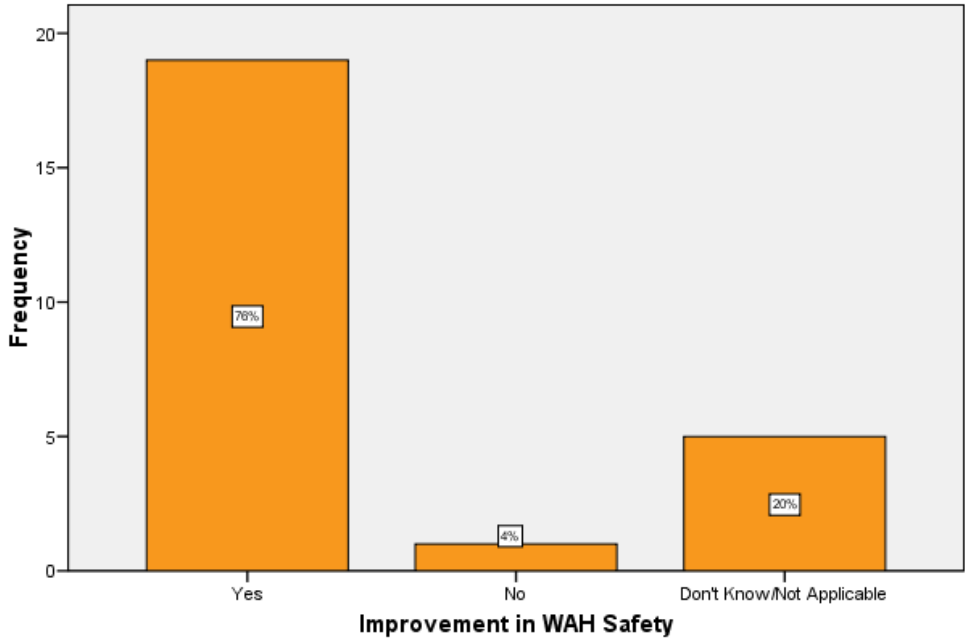

Figure 14: Perceived improvement in Working at Height safety

Respondents' comments on improvements in Working at Height safety

The bullet points below illustrate comments made by firms about Working at Height safety improvements.

- *"The improvement has come by way of pressure put on companies by the likes of the courts following fatal accidents; some companies have led the way in the field by choosing the safe way to work and implementing good safety policies."*
- *"There has been a reduction in accidents due to falls from height due to the increase in awareness to personnel working in the industry particularly through training."*
- *"Awareness training, simple documentation requirements, i.e., the Working at Height form are straightforward and anyone who has the right approach will find them useful."*
- *"Working at Height has been targeted and brought to the fore by most companies and the HSA in both provision of knowledge/statistics relating to injuries from Working at Height and in inspections."*
- *"Yes, I do believe there has been an improvement, but this is down to better systems being introduced and the construction industry taking a more proactive approach to H&S."*

5.2.8 *Have firms made investments in Working at Height safety equipment?*

On the question of whether **there had been an investment by the firm in Working at Height safety equipment:**

- 88% of respondents said they had invested;
- 8% said they did not know or it was not applicable; and
- 6% did not respond to the question.

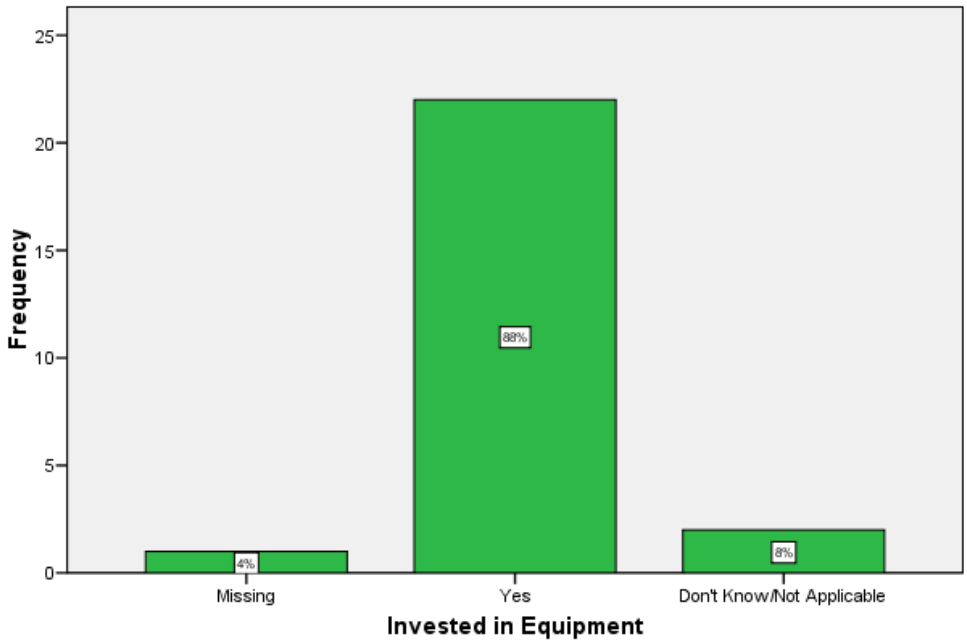

Figure 15: Whether respondents have invested in additional safety equipment for Working at Height

Respondents' comments on types of equipment

Respondents added details of the types of equipment in which they have invested.

- *"Harnesses, safety lines, handrails, alternative trestle systems."*
- *"Edge protection regimes such as nets, crash decks, scaffolding, K Guard, harness and life lines systems, handrails etc"*
- *"Scaffolding, MEWP hire & training, stair landing gates, beanbags, harnesses "*
- *"We have provided safety training to all risk assessed activities and provided the appropriate fall arrest systems including permanent safety lines on flat roofs, etc."*

5.2.9 *Have firms made an investment in Working at Height training?*

On the question of whether there **had been an investment in Working at Height training by the firm:**

- 84% of respondents said they had invested;
- 8% said they did not know or it was not applicable;
- 8% did not respond to the question.

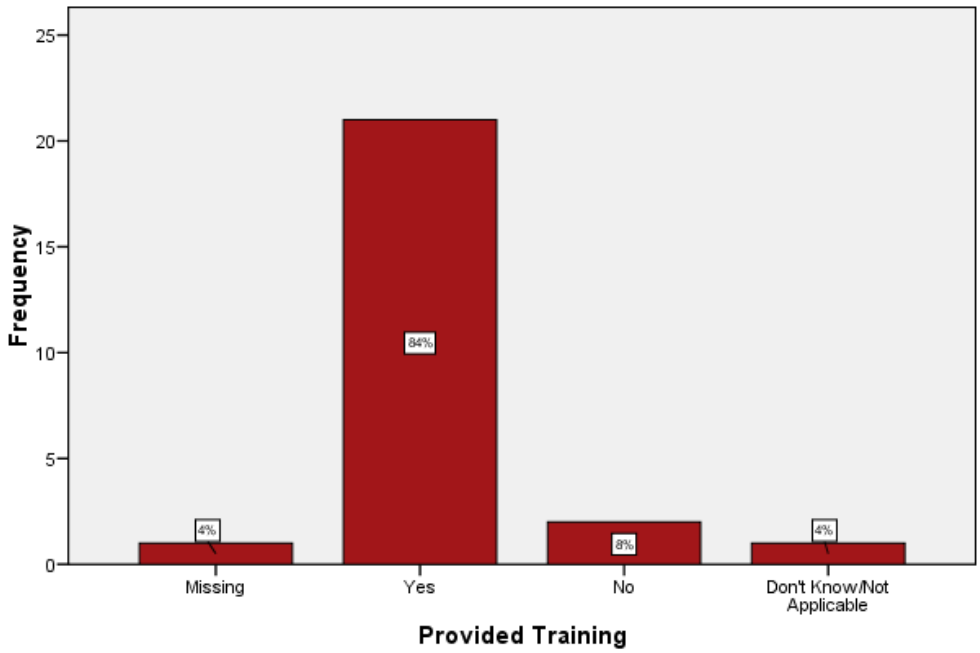

Figure 16: Whether respondents have provided training in Working at Height safety

Respondents' comments on types of training provided

Respondents were asked to list the training provided. Most firms indicated that, where relevant, they provide training in **harness** use and inspection, **scaffolding** and inspection of scaffolding, **Mobile Elevated Work Platforms**, and **general work at height** training

5.2.10 Do firms carry out Working at Height risk assessments?

On the question of whether **firms carry out Working at Height risk assessments:**

- 90% of respondents said they conduct risk assessments;
- 4% said they did not know or it was not applicable;
- 4% said they did not conduct risk assessments.

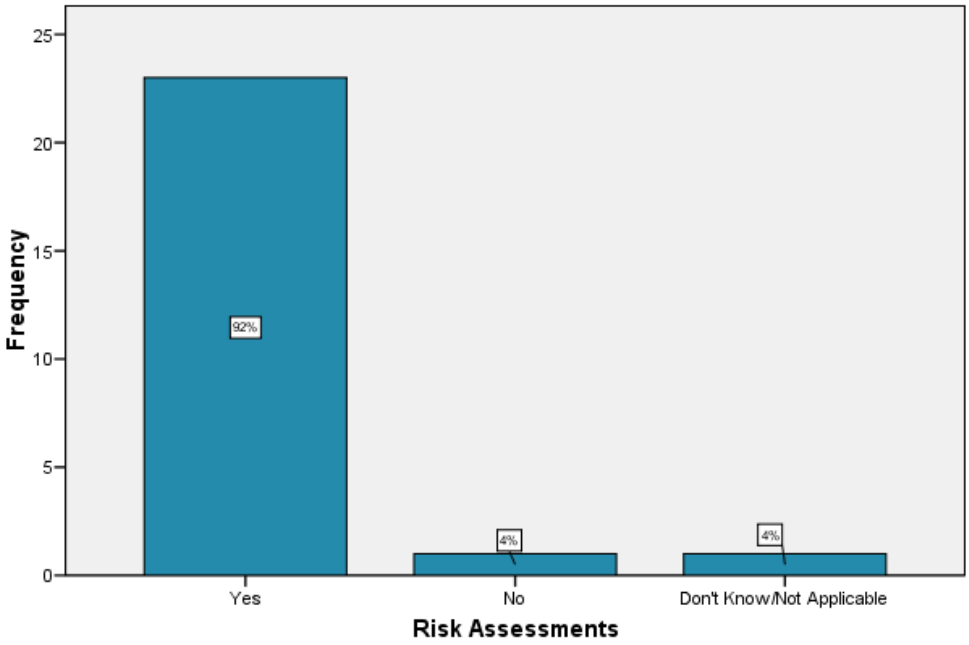

Figure 17: Whether respondents carry out risk assessments in relation to Working at Height

Respondents' comments on risk assessments

Comments from respondents on this question backed up the figures, with most agreeing that they undertook risk assessments for work at height.

- *"Risk assessments are carried out for the all activities involving Working at Height including: Scaffolding, Mobile Elevated Work Platforms (MEWPs), Trestles, Roofwork, Tower Crane erection."*
- *"For each contract and particular height risk within the contracts a full risk assessment is carried out and control measures are documented and carried out."*
- *"As part of ongoing development, we have developed access gates and are developing a stair access (rather than ladder) as a result of assessments."*
- *"All operations are risk assessed by both site management and the subcontractor - Working at Heights forms part how may operations take*

place on site and therefore must form part of the risk assessment and safe working method statement."

- *"We risk assess all block work of trestles and scaffolding and ensure that contractors do the same for all work at heights."*

5.2.11 How satisfied are firms with the information they have available to implement necessary Working at Height safety measures?

On the question of respondents' **satisfaction with the information they have available to implement necessary Working at Height safety measures**:

- 79% of respondents said they are very satisfied or satisfied with available information;
- 13% were neutral; and
- 8% said they were not satisfied with the information.

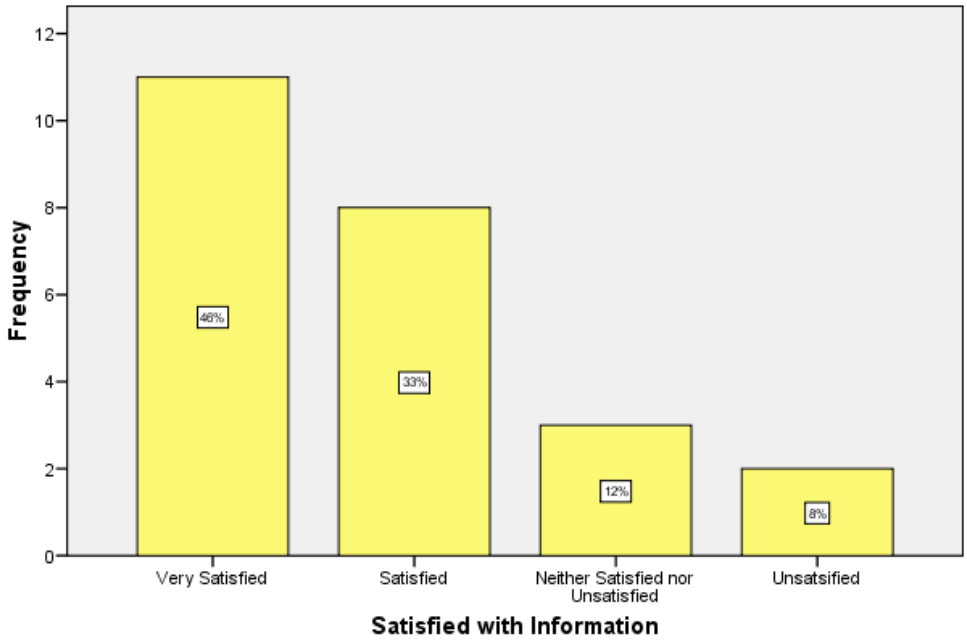

Figure 18: Respondents' satisfaction with information available to them to implement Working at Height safety measures

5.2.12 *How satisfied are firms with the resources they have at their disposal to implement necessary Working at Height Safety measures?*

On the question of respondents' satisfaction with the **resources they have at their disposal to implement necessary Working at Height safety measures:**

- 75% of respondents said they are very satisfied or satisfied with available resources;
- 21% were neutral; and
- 4% said they were not satisfied with the resources.

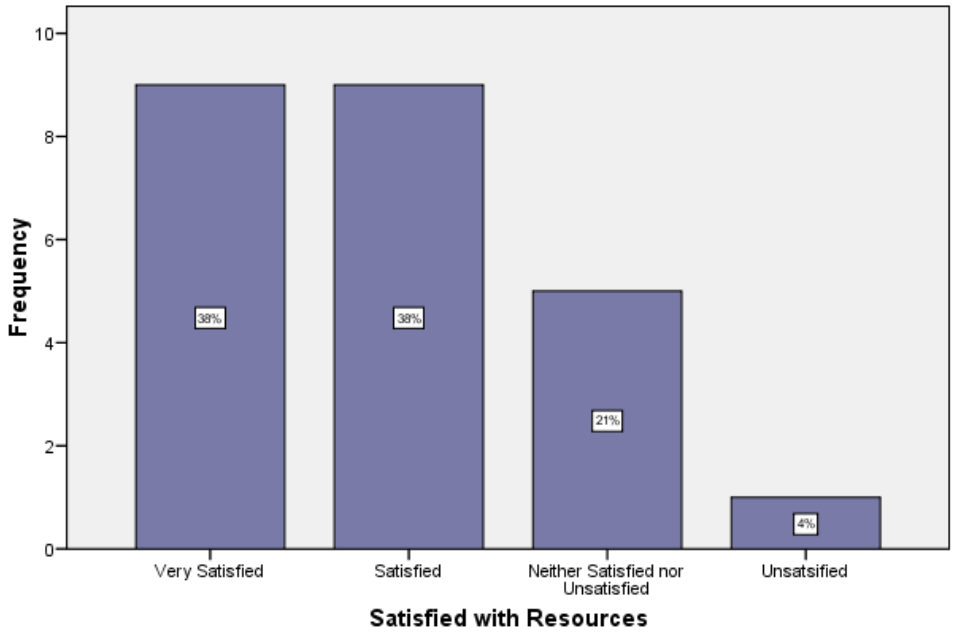

Figure 19: Respondents' satisfaction with resources available to them to implement Working at Height safety measures

Respondents' comments on resources to implement Working at Height safety measures

Respondents emphasised the need for **clarity and consistency of information and enforcement** from the HSA.

- *"The authority needs to decide on clear standards that are communicated to the construction industry and are applied uniformly by all inspectors."*
- *"Clear, concise, unambiguous and consistent information and implementation policy is vital."*

Specific reference was made to the need for **additional clarification and guidance on the use of trestles and ladders**.

- *"Inform the industry what is the HSA meaning of using ladders and trestles on site."*

- *"Clarification on use of trestles, use of ladders and other height work platforms."*
- *"…would value a more pro active approach when asked for advice on the use of trestles and similar equipment."*
- *"…the use of trestles could be made clear."*
- *"Clear guidance on the use of trestles & ladders within the construction industry."*

Respondents indicated that **illustrative material/documents** from the HSA on these issues would be helpful.

- *"Any document or advice notes that would assist the non-safety professional such as site management to carry out their works in compliance with the regulations."*
- *"More pictorial / sketch type of material that we could use on notice boards would be nice. We have and know all the details but sometimes a fresh piece of material just catches the imagination and becomes a standard."*
- *"Timely issue of guidance documents such as the recent draft issues for trestle and ladder use."*

5.2.13 Commentary on Construction Industry Questionnaire Survey

There was no consistent message from industry participants that HSA information had a positive effect on Working at Height safety (33% strongly agreed or agreed, 38% neutral and 29% disagreed). This could be explained by firms taking ownership for their safety responsibilities and their perception that their own actions are influencing safety rather than those of the HSA. This view is supported by the 79% satisfaction rating with the information which is available to implement necessary Working at Height safety measures. Clearly, firms do not necessarily attribute the ready availability of safety-related information to the HSA. However, the Authority's efforts have resulted in a valuable repository of information being available for use by health and safety professionals and 'front-line workers' within construction firms.

Firms were more positive that HSA enforcement activities have positively affected Working at Height safety (52%) and firms strongly perceive (76%) there to be an improvement in the areas of Working at Height safety. A large proportion of firms had invested in Working at Height safety equipment (88%) and training (84%) which is an encouraging sign of progress in the industry. In a related area, a significant proportion of respondents (90%) indicated that their firms carry out Working at Height risk assessments which could be attributed to HSA activities.

It is interesting to note that over 75% of respondents were very satisfied or satisfied with resources available to implement necessary Working at Height initiatives, suggesting that the increased profile of safety in Working at Height fostered by the HSA has translated into resources being made available within firms in the construction industry to ensure compliance with regulations and legislation.

5.3 Telephone Survey

5.3.1 Introduction

Those organisations which indicated their consent to participate in the questionnaire submitted were subsequently interviewed for 30 minutes via telephone. We conducted fifteen such interviews.

The key areas which were covered in the phone interviews are as follows:

- Assessment by industry participants on what is being done differently in recent years by industry participants in relation to Working at Height compared with 5-10 years ago;
- Perceptions about how the HSA and its inspectors have contributed to how things are done differently now in relation to Working at Height;
- The HSA initiatives on construction safety which have had the most influence on the rate of fall-related accidents;
- Assessment of the HSA website's resources to assist the industry to promote safety in Working at Height.
- Perceptions about the effectiveness of Prohibition Notices in influencing industry behaviour;
- Reasons behind under-reporting of Working at Height accidents to the HSA;
- Age and nationality profile of workers most likely to have accidents arising from Working at Height;

5.3.2 Telephone Survey – Summary of Feedback

The key areas of industry feedback from the telephone interviews are listed below:

1. There has been a significant uplift in Health and Safety investment such as equipment and training since the late 1990s which has brought marked positive changes to safety processes on site;
2. There has been a focus on safety driven by HSA activity leading to improvements in the following areas i.e., scaffolding, MEWPs, Safepass, focus on Collective Protection apparatus;
3. It is felt that health and safety activity has primarily been driven by the HSA drafting, enactment and enforcement of regulations. This coupled with negative outcomes in relation to insurance where companies are seen to transgress the regulations has led firms to conclude that promoting health and safety in Working at Height is 'good for business';
4. Prohibition Notices issued by HSA inspectors are regarded as a major incentive to comply with the regulations;
5. Where regulations are open to interpretation, this is not welcomed by the industry which has articulated a need for consistent and timely guidance to assist them to comply with regulations;
6. There is a perceived difference in standards and compliance burden between larger and smaller firms, leading to the perception that larger firms are being 'hit harder' by the HSA and that smaller firms operating 'under the radar' are enjoying what amounts to a competitive advantage compared to larger firms;
7. In relation to the HSA Inspectors, respondents indicated a strong preference for the following:
    - consistency of approach and more definitive responses to work at height queries;
    - greater coverage for inspections and more targeting of smaller firms;
    - greater levels of industry specific knowledge.
8. Respondents would like to see the HSA literature and support documentation simplified so that it can be utilised at all levels of the industry and particularly for those workers who have poor levels of English literacy.

5.4 Industry Workshop

5.4.1 Introduction

Those organisations which participated in the phone survey were invited to participate in an industry workshop in June 2007. We conducted a workshop with firms from the construction industry, hosted by the Construction Industry Federation at their offices in Dublin. Companies in attendance included a range of small and large construction firms, training providers, engineering and equipment contractors.

The key focus of the industry workshop was to obtain feedback on what could be done differently by industry and the HSA, to foster safer Working at Height in the construction industry.

5.4.2 Industry Workshop – Summary of Feedback

The main issues articulated by attendees at the workshop are listed below:

1. The industry wishes to see the HSA becoming more vigilant about the safety implication of activities of smaller companies;
2. The industry wishes to engage with the HSA in partnership mode, for example, about new initiatives and regulations so that firms are fully prepared and briefed prior to implementing new processes impacted by the introduction of new regulations etc;
3. The industry would welcome more leadership from the HSA in the areas of practical advice, e.g., models of implementation, guidance and education;
4. The industry have noted that in their experience issuing of prohibition notices can be done in what is perceived as an arbitrary fashion. As prohibition notices cannot be withdrawn they are regarded as very negative for companies who have to make prohibition notices information available to private and public-sector tenderers and to their insurance companies.
5. The HSA material is generally well written and concise but it is found that guidance could be tailored more closely to the needs of its intended readership. The HSA material is found to be quite legalistic and for some Safety Officers it was found to be difficult to read. In addition, it was felt that there is a dearth of easily understood material for Safety Officers to use as training material with an audience which needs safety information to be explained very simply with the use of diagrams to overcome English language literacy deficiencies.

5.5 Conclusions from Qualitative Analysis

The findings from the surveys which we have utilised in our consultations with the construction industry support our quantitative evidence that the HSA's activities have resulted in improvements to Working at Height safety standards and compliance. In response to the HSA's initiatives in the area of Working at Height, the construction industry has invested in training and safety equipment, such as scaffolding, MEWPs and collective protection apparatus. The industry perceives there to be an improvement in Working at Height safety and has broadly welcomed HSA inspection and guidance.

In responding to our various survey methods, construction firms indicated strongly that there is considerable interest in and commitment to invest in risk reduction and safety in Working at Height. The enforcement of regulations by the HSA, and avoidance by firms of prohibition notices, have underpinned this trend by firms to invest in health and safety equipment and training in order to reduce incidence of Working at Height related accidents.

6. IMPACT OF THE HSA'S EXPENDITURE AND ACTIVITIES

6.1 Preamble

In this section, a range of variables including the HSA's expenditure, visits and notice-related activities are compared with the rate of falls-related accidents to ascertain whether there are links between the variables. This is followed by a discussion on the potential return on the HSA's investment.

All of the figures shown in this section have been normalised to a value of 100 in the baseline year of either 1995 or 1998. This allows comparison of the data trends with time, making it possible to consider the relative variations of different variables on the same figure.

6.2 Areas examined to assess the impact of HSA's Expenditure

6.2.1 Introduction

In order to assess the impact of the HSA activities and expenditure, we have examined the following aspects within this section, as listed below – greater detail appears in the paragraphs that follow:

1. Relationship between the HSA grant and the growth in the construction workforce.
2. Trends in rate of fall-related accidents plotted against key HSA Initiatives.
3. Predicted trend in the rate of falls from height without HSA's initiatives.
4. Relationship between HSA expenditure on construction-related activities and issue of work at height related notices.
5. Relationship between notices issued and the rate of fall-related accidents.
6. Relationship between the HSA's expenditure and the rate of fall-related accidents.

6.2.2 Relationship between HSA Grant and Growth in Construction Workforce

Figure 20 shows the variation in the HSA's grant along with the proportion of that grant that is spent on the construction industry and the growth in the number of construction workers (used as a proxy measure for the growth of the Irish construction industry during this period). This shows that up to 2000, the variation in the HSA's grant closely followed the growth of the construction industry. However, between 2000 and 2001, the HSA's grant increased at a faster rate than the growth in the number of construction employees. Since 2001, the HSA's grant has been growing at a similar rate to the number of construction employees.

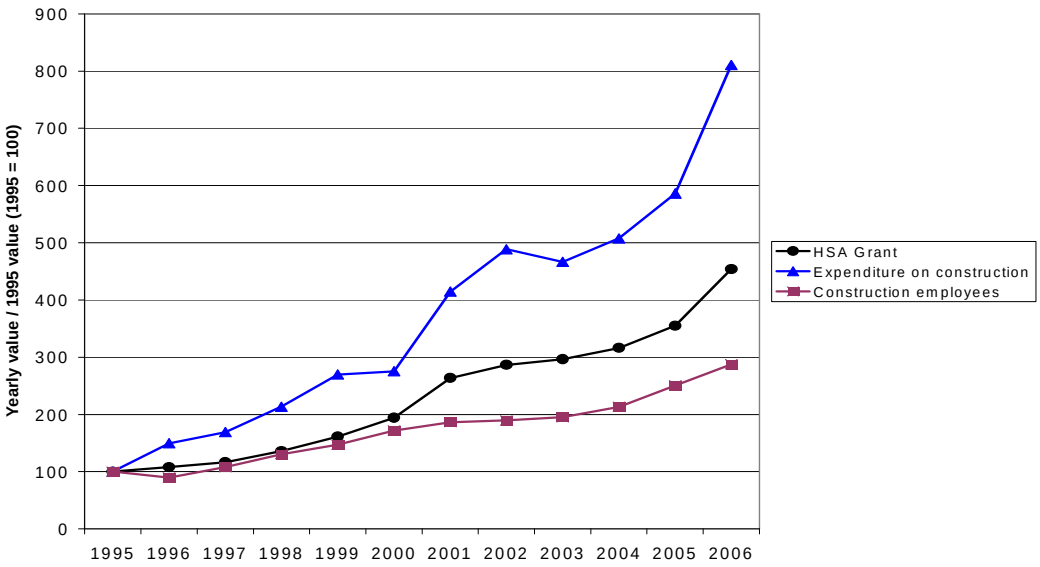

Figure 20: Relation between HSA Grant, HSA expenditure on construction and the number of construction industry workers in Ireland (1995 taken as the baseline)

The HSA's expenditure on construction has been growing at a greater rate than the number of construction employees. Whilst the number of construction employees has doubled between 1995 and 2006, the HSA's expenditure on construction has increased sevenfold.

6.2.3 Trends in Rate of Fall-Related Accidents plotted against Key HSA Initiatives

Figure 21 below shows the variation in the rate of fall-related accidents with the key HSA construction-related initiatives, aimed at reducing risk, plotted in chronological order.

Other than an increase in 1998, there has been a downward trend in the rate of fatal injury accidents. The rate of non-fatal injury accidents increased between 1995 and 1999, but has halved between 1999 and 2006. However, there has been considerable variation in the rates of non-fatal falls from height, with higher rates in 1999, 2001, 2002 and 2004 whilst the accident rates in intervening years have typically been the range of 240 to 280 in relation to the baseline year of 1995.

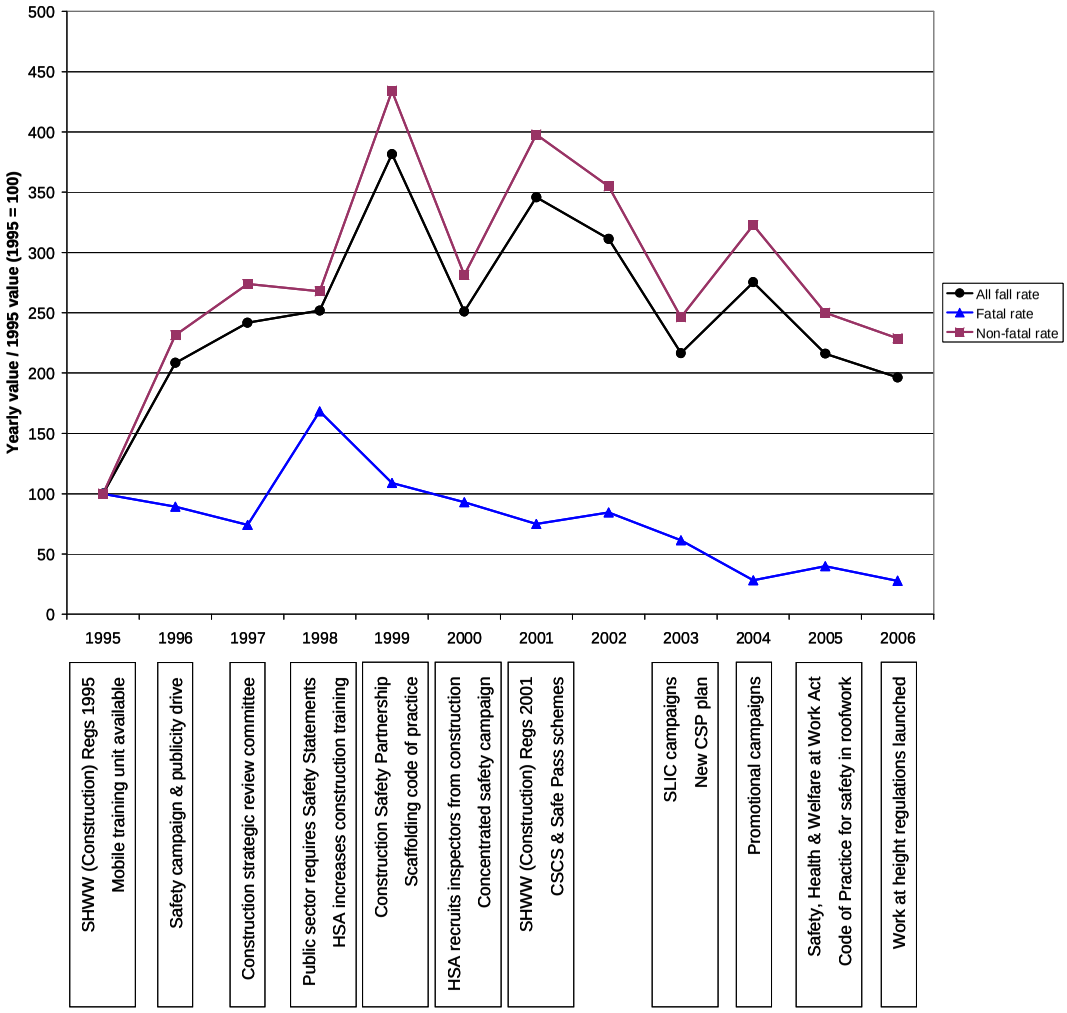

Figure 21: The variation in the rate of falls from height accident in the construction industry reported to the HSA (1995 taken as the baseline) and the influence of HSA initiatives

The inclusion of key HSA construction-related initiatives gives an indication of which interventions may have influenced the reduction in accident rates, either individually or in combination with other interventions. Whilst it is difficult to identify the impact of any one intervention from this figure, **we would strongly suggest that the cumulative effect of the HSA's interventions aimed at reducing risk undertaken between 1995 and 2005 has contributed to the reduction in accident rate.**

6.2.4 *Predicted Trend in the Rate of Falls from Height without the HSA's Initiatives*

Figure 22 shows the predicted trend in the rate of falls from height without the HSA's initiatives. This is termed the counterfactual, and is shown as the dashed line in Figure 22. Our research indicates that if the accident rates had continued rising between 1999 and 2006 at the same rate as between 1995 and 1999, but with no HSA initiatives, the accident rate may have reached 250 accidents per 100,000 workers.

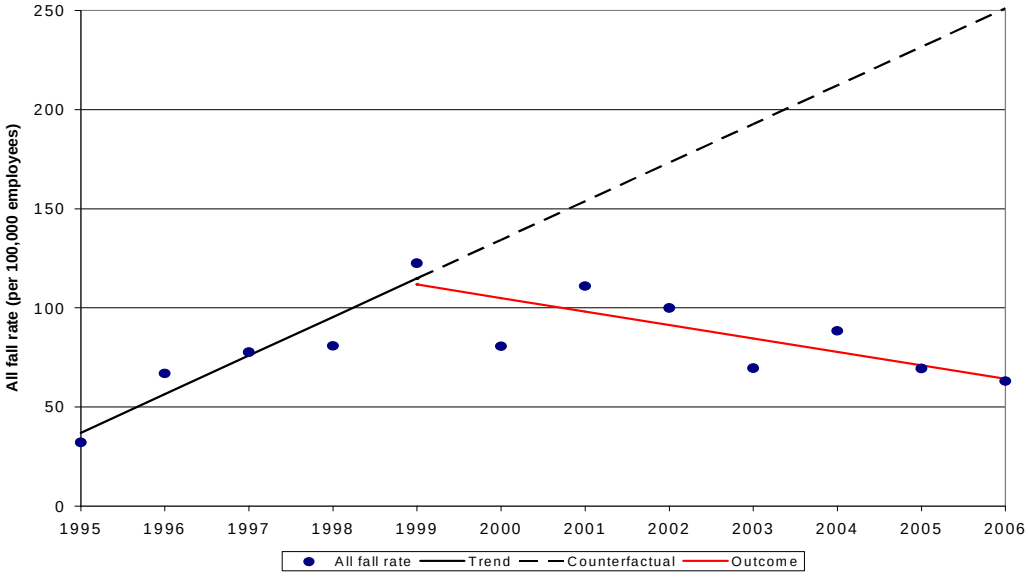

Figure 22: The predicted trend in the rate of falls from height accident in the construction industry without the influence of HSA initiatives

We would therefore suggest that the HSA's initiatives were a significant factor in the accident rate reducing over the period between 1999 and 2006, at which point the rate was 63 accidents per 100,000 employees.

6.2.5 *Relationship between the HSA Expenditure on Construction-Related Activities and Issue of Work at Height Related Notices*

Figure 23 shows the variation in the number of notices issued by the HSA and the HSA's expenditure on construction-related initiatives aimed at reducing risk. This figure shows that the number of notices issued increased, along with expenditure on construction-related initiatives, between 1998 and 2001. Between 2002 and 2006, the HSA's construction-related expenditure on reducing risk continued to increase, but the number of notices issued started to decrease. In particular, the primary decrease was in the number of prohibition notices issued.

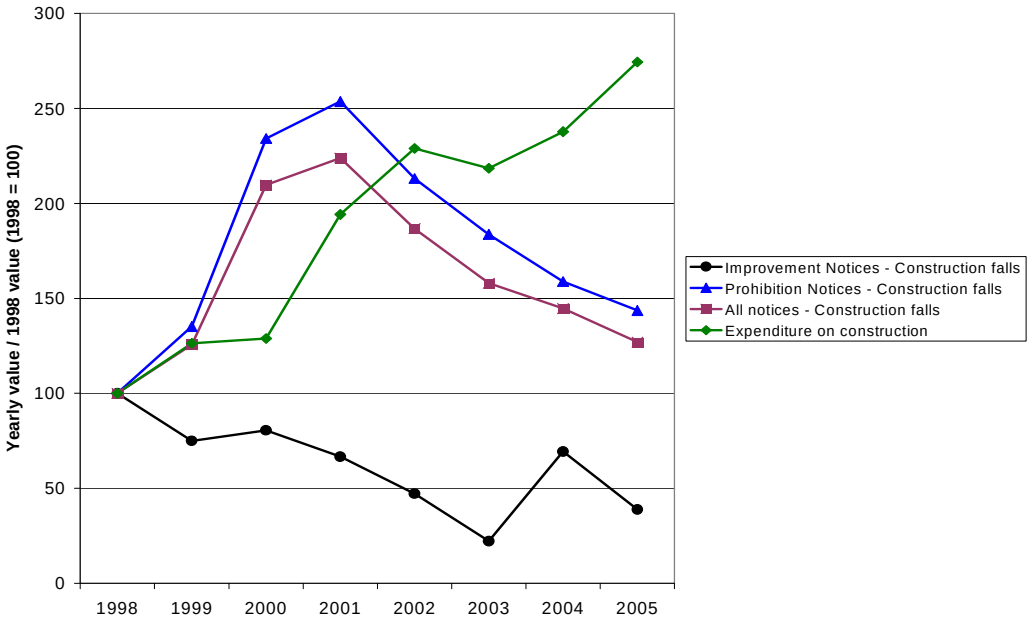

Figure 23: The variation in the number of working at height related notices issued by the HSA in the construction industry and the HSA's expenditure on the construction industry (1995 taken as the baseline)

We would suggest that an explanation for this trend is that the HSA's increased expenditure on construction-related activity aimed at reducing risk was starting to have an effect by 2002, and there were fewer unsafe practices observed on site that warranted the issue of prohibition notices to suspend that work. However, Figure 23 also shows that the number of compliance visits has reduced since 2002; suggesting either that fewer compliance visits were required as practices on site were improving, or that as fewer compliance visits were being made, fewer notices were likely to be issued.

6.2.6 *Relationship Between Notices Issued and the Rate of Fall-Related Accidents*

Figure 24 shows the variation in the number of notices issued by the HSA and the rate of fall-related accidents. This figure shows that the number of notices issued between 1998 and 2001. Between 2002 and 2006, the number of notices issued decreased. However, despite considerable year-on-year variation, the rate of falls has exhibited a downward trend since 1999.

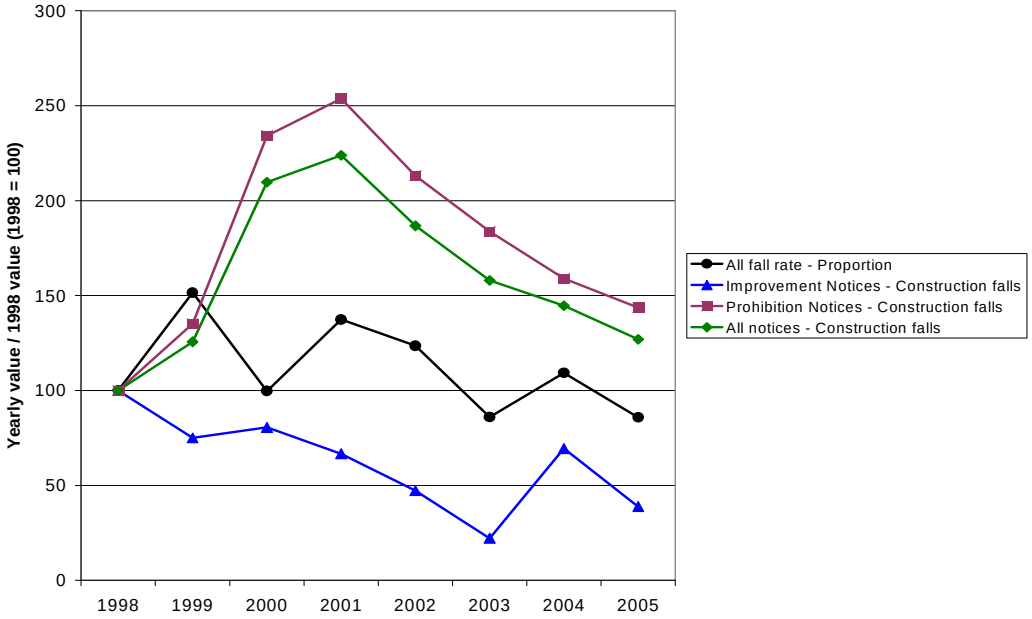

Figure 24: The variation in the number of work at height related notices issued by the HSA in the construction industry and rate of falls from height accidents in the construction industry reported to the HSA (1998 taken as the baseline)

We would suggest that a key factor behind this trend is that the HSA's increase in issuing notices between 1998 and 2001 contributed to raising awareness of working at height and thus reducing the rate of falls. With fewer unsafe practices observed on site that warranted the issue of prohibition notices to suspend work, it would not be unreasonable for the number of notices issued to decrease.

6.2.7 *Relationship Between the HSA's Expenditure and the Rate of Fall-Related Accidents*

Figure 25 shows the variation in the rate of fall-related accidents and the HSA's expenditure on construction. This figure shows that the rate of fall-related accidents increased along with expenditure on construction between 1995 and 1999. Between 2000 and 2006, the HSA's expenditure on construction continued to increase, but the rate of fall-related accidents started to decrease.

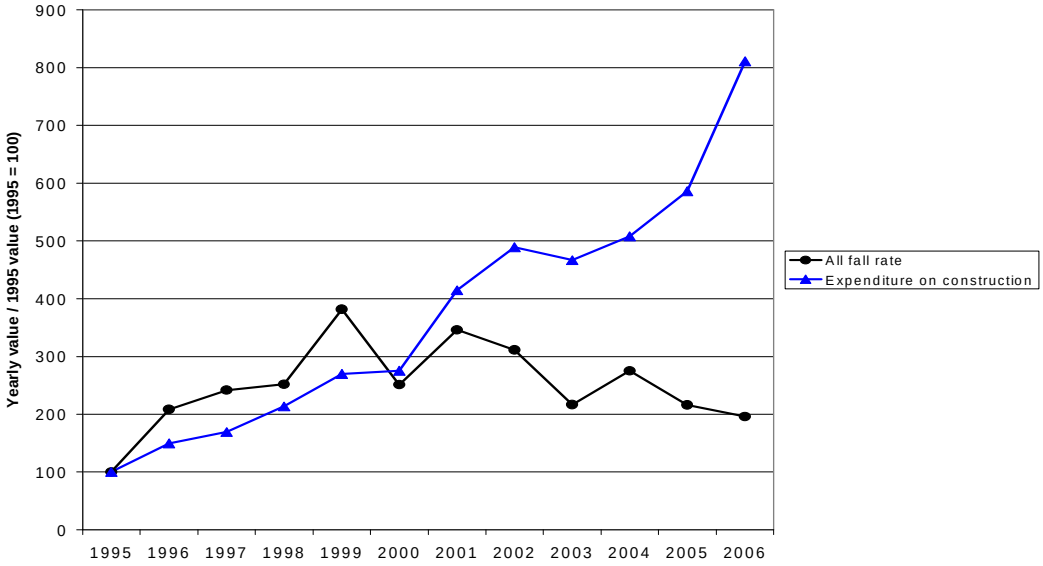

Figure 25: The variation in the HSA's expenditure in the construction industry and the rate of falls from height accidents in the construction industry reported to the HSA (1995 taken as the baseline)

We believe that the HSA's increased expenditure on construction-related activity aimed at reducing risk was starting to have an effect by 2000, and there were fewer unsafe practices leading to fewer fall-related accidents. It is likely that a certain amount of money has to be spent in order to stabilise the rate of fall-related accidents; but with further targeted expenditure it may be possible to reduce the rate of fall-related accidents.

6.3 Estimated Return on the HSA's Investment In Construction-Related Activities

In this section, we make broad order of magnitude estimates of the HSA's return on investment in relation to construction-related risk reduction activity. Our assumptions are listed below which inform the development of order of magnitude estimates in terms of return on investment. *We acknowledge that the estimated costs and benefits will be sensitive to the assumptions made.*

- All HSA expenditure on construction-related activity aimed at reducing risk will impact on working at height as this is such a dominant work process in construction.
- We would estimate that around 70% of the HSA's expenditure on construction can be considered to contribute to working at height.
- The economic cost of a fatal injury is around €1.8M (based on the figure used by the Health and Safety Executive in the UK of around £1.25M). No allowance has been made for the yearly variation in inflation.
- Calculations have not been undertaken to discount yearly costs and benefits to a net present value in the current year.
- The economic cost of a non-fatal injury is around €30k (taken from an average of the figure from the HSE in the UK of around £35k for a major injury accident and £5k for an over 3-day injury accident). No allowance has been made for the yearly variation in inflation.
- The variation in the rate of all fall-related accidents can be described by two straight lines; one increasing from 1995 to 1999 at a rate of 19 falls per 100,000 workers per year, and the other decreasing from 1999 to 2006 at a rate of 7 falls per 100,000 workers per year.
- The 1995 to 1999 variation in the rate of all fall-related accidents is taken to be the counterfactual (i.e., what would have happened anyway without the HSA intervention).
- The accident reporting rate for non-fatal accidents in the construction industry is around 20% over the period 1995 to 2002. (The values extrapolated from CSO survey estimates are: 20.9% in 2003; 24.6% in 2004; and 25.6% inn 2005).
- In Appendix I, Figure 7 we document that a third of injured workers are absent from work for 3 months or more. This suggests that the economic impact of construction falls, to both the employers and the Irish economy, is likely to be high and the benefits of reducing the number of construction falls is similarly high. **The return on investment is likely to be even higher if the reductions in lost work time were considered.**

We illustrate, in Table 2 overleaf, our estimate of the HSA's return on investment in relation to working at height in the construction industry.

Table 2 contains a summary of our cost-benefit calculations. Calculations are undertaken on a yearly basis and then aggregated to give the overall costs and benefits. **The top three rows use the overall HSA budget to obtain estimates of the amount that the HSA spends on construction in general and work at height in construction in particular.** The number of fall-related accidents in construction are converted into accident rates expressed as the

number of accidents per 100,000 employees. These rates are shown plotted in Figure 22, and are used to estimate the economic benefits that result from the HSA programme. These benefits are defined as the difference between the rate of accidents that would have happened without the HSA's programme (the counterfactual) and the rate of accidents that actually occurred. These 'prevented' accidents are then uprated to reflect the level of under-reporting in the construction industry and converted into monetary values.

Table 2: Indicative Order of Magnitude Estimates of the HSA's Return on Investment in Relation to Working at Height in the Construction industry

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
HSA Grant	€ 4,536,322	€ 4,899,228	€ 5,291,166	€ 6,158,229	€ 7,318,770	€ 8,808,173	€ 11,969,000	€ 13,001,000	€ 13,457,000	€ 14,344,000	€ 16,098,000	€ 20,598,000	€ 126,478,887
HSA expenditure on construction	€ 1,257,132	€ 1,880,668	€ 2,127,284	€ 2,684,896	€ 3,392,341	€ 3,462,132	€ 5,213,638	€ 6,146,642	€ 5,866,065	€ 6,384,353	€ 7,368,351	€ 10,191,900	€ 55,975,403
Assumed 70% HSA expenditure on construction falls	€ 879,992	€ 1,316,468	€ 1,489,099	€ 1,879,428	€ 2,374,639	€ 2,423,493	€ 3,649,547	€ 4,302,649	€ 4,106,246	€ 4,469,047	€ 5,157,846	€ 7,134,330	€ 39,182,782
Fatal fall	5	4	4	11	8	8	7	8	6	3	5	4	
Non--fatal fall	26	54	77	91	166	126	193	175	125	179	163	171	
All falls	31	58	81	102	174	134	200	183	131	182	168	175	
Construction employees	96,600	86,700	104,400	126,200	142,100	166,300	180,200	183,200	188,500	206,000	242,200	277,800	
Construction employees - Proportion	100	90	108	131	147	172	187	190	195	213	251	288	
Fatal Rate - per 100,000 employees	5.2	4.6	3.8	8.7	5.6	4.8	3.9	4.4	3.2	1.5	2.1	1.4	
Non-fatal fall rate- per 100,000 employees	26.9	62.3	73.8	72.1	116.8	75.8	107.1	95.5	66.3	86.9	67.3	61.6	
All fall rate- per 100,000 employees	32.1	66.9	77.6	80.8	122.4	80.6	111.0	99.9	69.5	88.3	69.4	63.0	
Fatal rate as a proportion of all reported falls	16	7	5	11	5	6	4	4	5	2	3	2	
Predicted all fall rate - Trend 1995 to 1999	37	57	76	95	115								
Predicted all fall rate - Counterfactual 1999 to 2006					115	134	154	173	193	212	232	251	
Predicted all fall rate - Outcome 1999 to 2006					111.8	105.0	98.2	91.4	84.6	77.8	71.0	64.2	
All fall rate prevented					3	29	56	82	108	134	161	187	
Fatal fall rate prevented					0	2	2	4	5	2	5	4	
Non-fatal fall rate prevented					3	28	54	78	103	132	156	183	
All falls prevented					4	49	100	150	204	277	389	519	
Fatal falls prevented					0	3	4	7	9	5	12	12	
Non-fatal falls prevented					4	46	97	143	195	272	378	507	
Benefits - Fatal falls prevented					€ 365,889	€ 5,248,342	€ 6,314,816	€ 11,803,744	€ 16,805,064	€ 8,214,283	€ 20,844,417	€ 21,362,528	€ 90,959,082
Benefits - Non-fatal falls prevented					€ 126,537	€ 1,377,690	€ 2,901,808	€ 4,303,448	€ 5,835,092	€ 8,168,648	€ 11,325,466	€ 15,220,801	€ 49,259,490
Accident reporting rate in construction industry	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.9	24.6	25.6	26.0	
Benefits - Non-fatal falls prevented uprated for under-reporting					€ 632,683	€ 6,888,449	€ 14,509,042	€ 21,517,241	€ 27,919,099	€ 33,205,887	€ 44,240,103	€ 58,541,542	€ 207,454,045
Total benefits					€ 998,572	€ 12,136,791	€ 20,823,858	€ 33,320,985	€ 44,724,163	€ 41,420,170	€ 65,084,520	€ 79,904,069	€ 298,413,126

6.4 Conclusions from Analysis of Impact of HSA Expenditure and Activities

Based on the assumptions set out in this chapter, we put forward indicative estimates of the HSA's return on investment in relation to working at height in the construction industry. **This shows that over the period 1995 to 2006, the HSA has invested around €39M on work at height related activities in the construction industry, and has seen an increase in the number of lives saved and an increase in the number of injuries prevented leading to economic benefits in the order of €300M.**

This represents a valuable return on the investment by the HSA in construction-related activities aimed at risk reduction in relation to working at height.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

In this section we document our conclusions based on the analysis undertaken. We then make recommendations based on the overall impact assessment of the HSA's activities in the area of Working at Height.

7.2 Conclusions

We set out below our list of conclusions which have been informed by the findings and analysis documented within this report.

- The number of working at height related inspection visits per annum has increased significantly since 1998. However, there has been a steady decrease in the level of Prohibition Notices issued from 1998 to 2005, despite the increase in construction activity over that period. This pattern suggests that HSA is observing fewer potentially dangerous work practices, which is a factor of improved work practices generally within the construction industry.
- The rate of fall-related accidents per employee in the construction industry was 180 accidents per 100,000 employees in 2000 but in 2006 this had been reduced to 60 accidents per 100,000 employees.
- The rate of non-fatal accidents reported by self-employed people compared with employed people (16.6 to1) is far lower than would be expected based on the 2.5 to 1 ratio between employed and self-employed people in relation to fatal falls.
- The rate of accident reporting by non-nationals is lower than their proportion within the overall construction workforce would suggest. Irish nationals reporting accidents outnumber non-nationals by 15 to 1. However, non-nationals constitute over 10% of the construction workforce.
- The survey of the construction industry supports the quantitative evidence that the HSA's activities have resulted in improvements to Working at Height safety standards and compliance. In response to the HSA's initiatives in the area of Working at Height, the construction industry has invested in training and safety equipment, such as scaffolding, MEWPs, collective protection apparatus and so on. The industry perceives there to be an improvement in Working at Height safety and has broadly welcomed HSA inspection and guidance.
- The construction sector growth in activity, number of employees and their diversity have placed great demands on all sector participants and the HSA.
- In responding to our various survey methods, construction firms indicated strongly that there is considerable interest in and commitment to invest in risk reduction and safety in Working at Height. The enforcement of regulations by the HSA and avoidance by firms of prohibition notices has underpinned this trend by firms to invest in health and safety equipment and training in order to reduce incidence of Working at Height related accidents.

- The construction sector has reported that responding to HSA activities and initiatives has, at times, been quite challenging as it has required a significant shift in the industry culture in relation to health and safety practices. From the HSA's perspective it could be argued that the overarching goal of improving safety in relation to Working at Height has been of such vital importance that industry compliance with the Authority's Working at Height initiatives has been greater than the construction sector's 'buy-in' to all of the HSA's initiatives.
- There is little information published in the literature on the effectiveness of various control strategies for falls from height. It may take several years to fully realise the impact of any regulatory change to reduce falls from height.

The HSA has invested considerable resources, both financial and inspection-related, in its programme of activities and initiatives in the field of Working at Height from 1995 to 2005. We estimate that the HSA has invested around €39M in reducing the risks of working at height in construction over this ten year period. Over the same period, the HSA has seen an increase in the number of lives saved, an increase in the number of injuries prevented, and indicative economic benefits of around €300M. The accident rate by 2006 is around 25% of that that would have been expected based on 1995 to 1999 trend.

Our analysis strongly supports the opinion that actions by the HSA in the area of Working at Height have been effective in reducing the rate of accidents and have made a strong and positive impact on health, safety and risk reduction in the construction industry.

7.3 Recommendations

We conclude the report by setting out a list of recommendations for the HSA which have been informed by the analysis documented within this report.

- The return on the investment made by the Authority in Working at Height safety activities and initiatives has been acknowledged in this report to be highly valuable. We recommend that the HSA maintain its vigilant stance in relation to safety in Working at Height in order to further contribute to the reduction of the rate of accidents caused by falls from height.
- Our analysis in Section 4 indicates that under-reporting of accidents by non-nationals is likely to be higher than for Irish nationals. We recommend that the HSA specifically target non-national construction workers using easy to read (translated) safety material and pictorial safety aids.
- Our analysis in Section 4 leads us to recommend that the HSA significantly target self-employed workers in the construction industry to reduce their risk of falls from height. There is evidence to indicate that they are significantly under-reporting non-fatal falls.

- In light of our analysis in Section 4 we recommend that the HSA also target safety information at older workers (40+ years) as it appears from our analysis they are more prone to fatal injury accidents than younger workers (20-24 years).
- The acknowledged high levels of under-reporting of accidents (Section 3.3) is a significant cause for concern for the HSA and we recommend that the HSA work, with assistance and input from the Construction Industry Federation, to greater reporting compliance from the construction industry.
- During the course of the quantitative data gathering (Section 4), there was considerable time spent re-working numerical information from the SAFE system so that it could be manipulated for analysis purposes within this report. It would greatly assist the HSA to have this data in a more 'ready to go' state when conducting future assignments of this nature, or indeed to assist with undertaking the Authority's own regular and ad hoc reporting. Inspectors also noted that having system functionality to access information on 'regular offenders' within the industry would be useful. We recommend that consideration be given to the development of an information system which would assist with such access and use of data.
- The construction industry would welcome increased availability of input from HSA inspectors (Section 5). The provision of an enhanced advisory service on the scale sought by the construction industry would have implications for staff resourcing within the HSA. We recommend that the HSA explore those construction industry requirements which have been articulated and assess the feasibility of delivering such a service, taking account of the downstream added value which would be delivered as a result.
- We understand that the HSA has one of the lowest number of inspector staff per capita of comparator countries such as the UK, the US, and Australia, with the number of construction inspectors remaining constant since 2000, despite significant growth in the size of construction industry. Many of the above recommendations which centre around increased activity and enhanced service provision will be contingent on increased levels of inspection staff. We recommend that further analysis be undertaken to assess the HSA's staffing requirements consistent with adoption of the recommendations listed above.
- On a related note, but not strictly within the scope of this impact assessment, the industry reports issues in complying with 2006 Working at Height Regulations and would strongly favour definitive and consistent direction from the HSA on the use of trestles and free-standing ladders. There would be a preference for these to be prohibited, rather than the perception of a current grey area surrounding such a critical area of safety. We recommend that the HSA address these issues, with the Construction Industry Federation, to assist the industry in meeting its obligations under the new regulations.

APPENDIX I
ADDITIONAL DATA

Appendix 1 to Main Report

CONTENTS **Data Categories**	
Accident data	Figures 1-7
Prohibition and Improvement Notice data	Figures 8-12
Visit data	Figures 13-16
Trends in rates of falls	Figure 17
Variation in the number of HSA visits and rate of fall-related accidents	Figure 18

Accident Data: Figures 1-7

Figure 1 shows the number of accidents and dangerous occurrences reported to HSA in all industries between 1993 and 2006. This figure shows an increase in the number of accidents reported between 1993 and 2000. Between 2001 and 2003 the accidents numbers reduced to a level similar to 1998. Between 2004 and 2006, the number of accidents has remained above 8,000 per year.

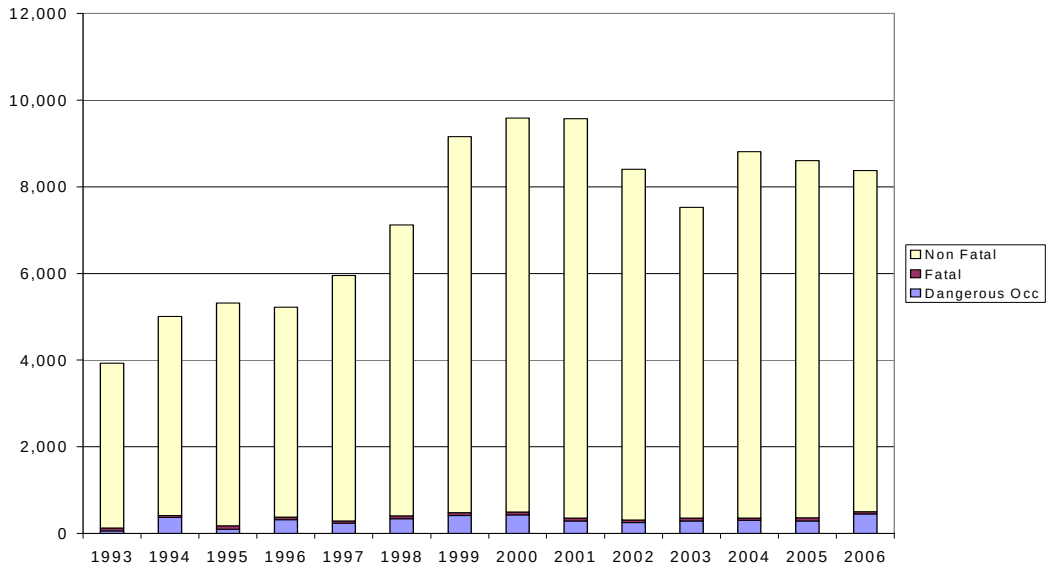

Figure 1 Accidents and dangerous occurrences reported to HSA in all industries

Figure 2 shows the distribution by industry of the number of accidents reported to HSA between 1993 and 2007. It can be seen that the largest number of accidents are reported from the manufacturing industry, followed by the construction industry. However, the largest number of fatal injury accidents was reported from the agriculture industry (270) followed by construction (236) and manufacturing (74).

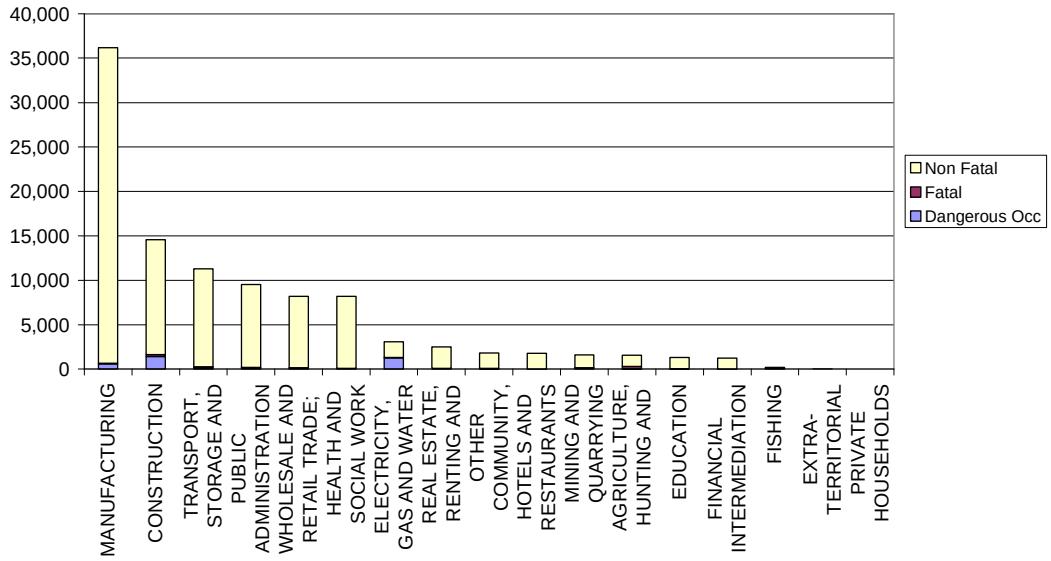

Figure 2 Accidents and dangerous occurrences reported to HSA by industry sector

Figure 3 shows the number of falls from height reported to HSA across all industries in the period 1993 to 2006. Accidents have been classified as being falls from height if the accident trigger has been recorded as being 'falls from height'.

This figure shows almost a linear increase in the number of falls from height between 1993 and 1999. However, since 2000, the number of falls from height has reduced to a figure between 300 and 400 per year. There has typically been between 10 and 15 fatal injury accidents per year as a result of falls from height.

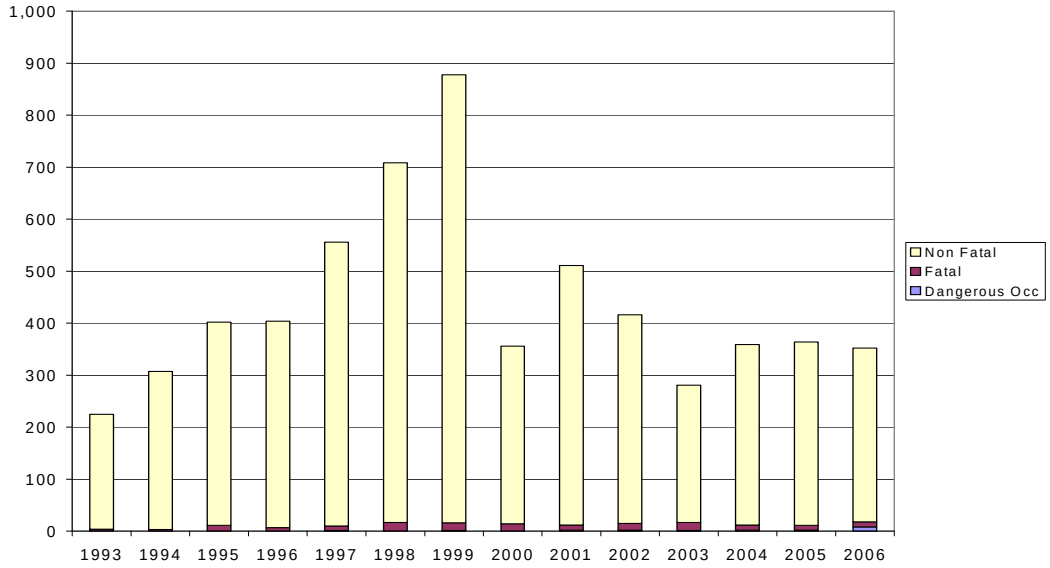

Figure 3 Accidents involving falls from height reported to HSA in all industries

Figure 4 shows the variation in falls from height accidents reported to HSA by industry between 1993 and 2007. The two largest industries are manufacturing and construction, where similar numbers of falls have been reported. However, in this period 13 fatal injury fall accidents were reported in manufacturing whilst 74 were reported in construction. This suggests that falls in the construction industry were having the most severe impact on workplace death and injury across Irish industry.

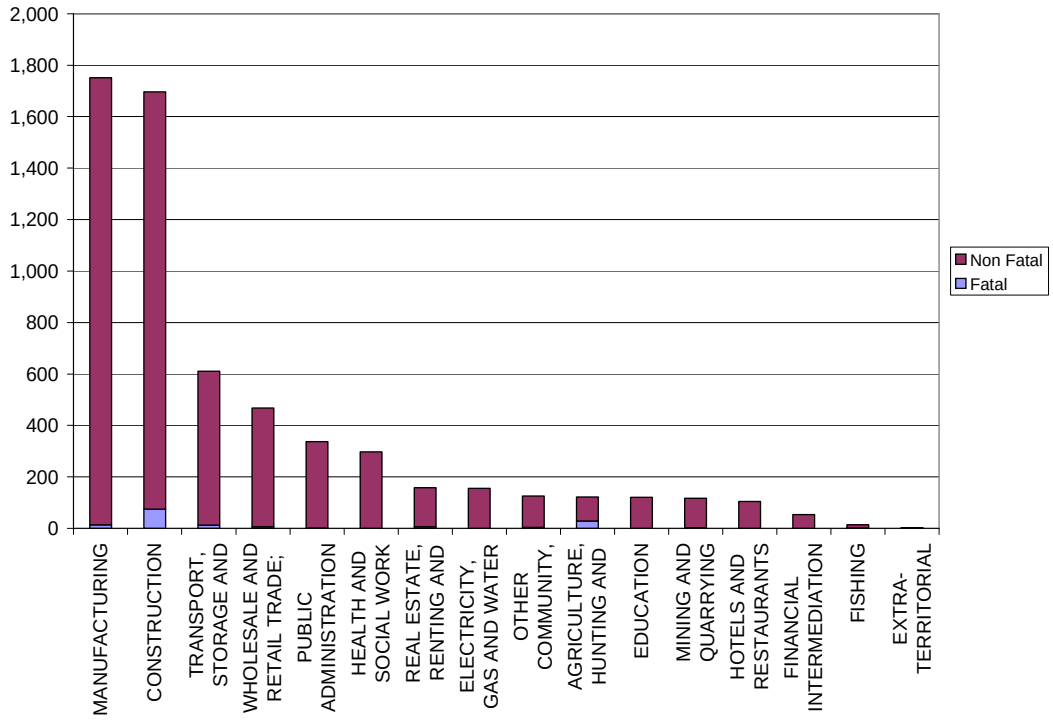

Figure 4 Accidents involving falls from height reported to HSA by industry sector

Figure 5 shows the variation in the number of falls reported to HSA by county. This shows that the largest number of falls were reported in Dublin and Cork, with the number in Dublin being around three times larger than those reported in Cork. This variation may reflect the amount of construction work being undertaken in each county. However, there may also be issues surrounding the accident reporting rate and amount of HSA activity in each county that also affects this variation. In particular, it may be that accidents are more likely to be reported in Dublin.

It is also interesting to note that in Cork and Donegal, the number of fatalities as a proportion of the overall number of reported falls is higher than in Dublin.

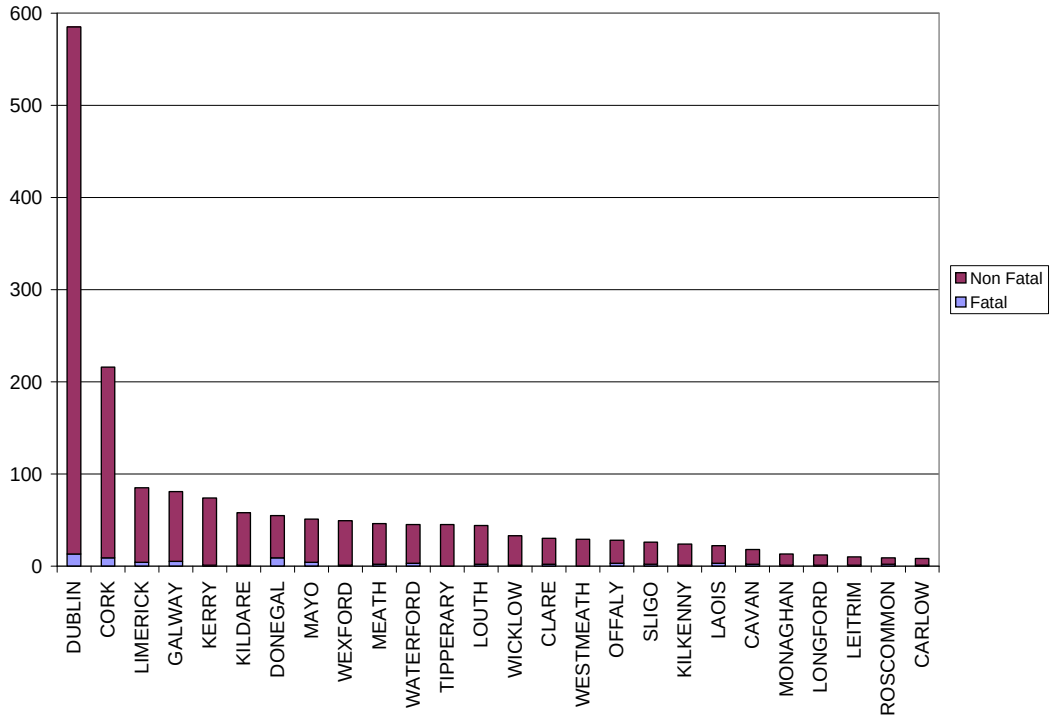

Figure 5 Accidents involving falls from height reported to HSA in the construction industry by county

Figure 6 shows the variation in reported construction falls by occupation. The number of falls involving roofers is the eight largest. However, the number of fatal injury accidents involving roofers is the second highest.

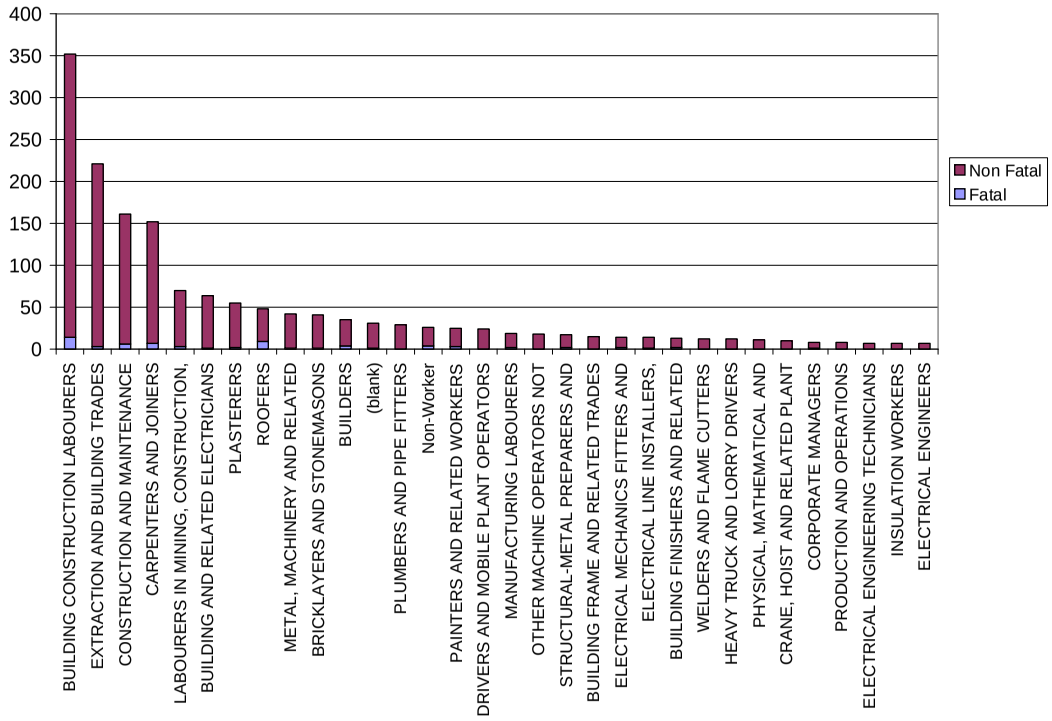

Figure 6 Accidents involving falls from height reported to HSA in the construction industry by occupation

Figure 7 shows the variation in the number of day's absence from work as a result of a construction fall. For the newer data, this shows that around two-thirds of the injured workers are back at work within two weeks. However, a third of the injured workers are absent from work for 3 months or more. This suggests that the economic impact of construction falls to both the employers and the Irish economy is likely to be high and the benefits of reducing the number of construction falls is similarly high.

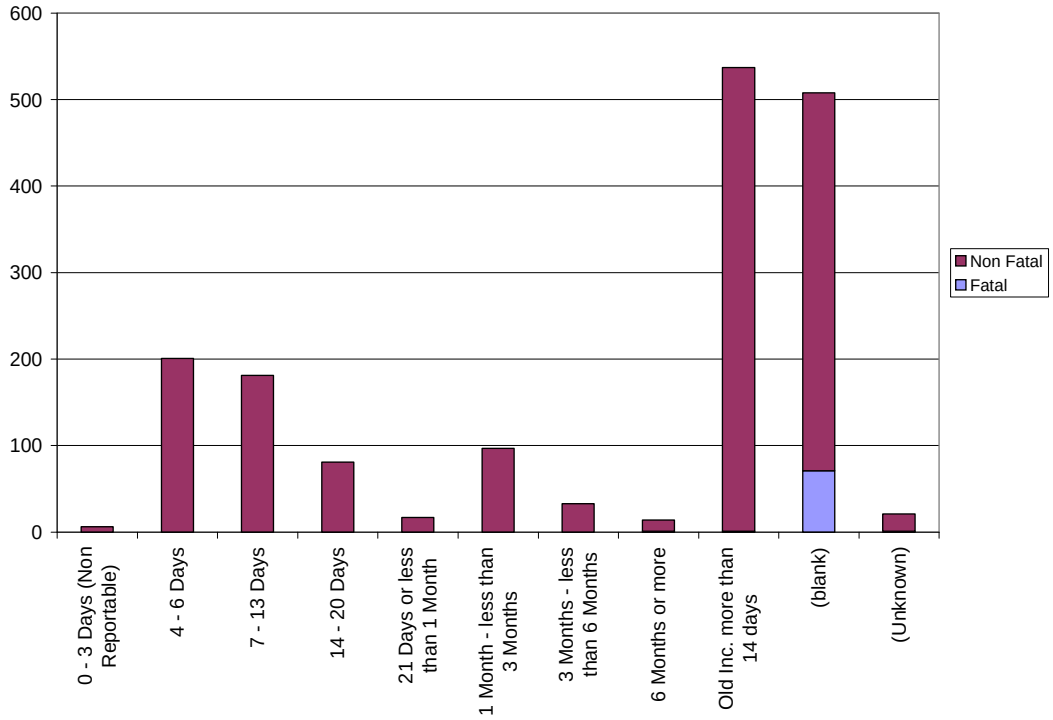

Figure 7 Accidents involving falls from height reported to HSA in the construction industry by days absent from work

Prohibition and Improvement Notice Data: Figures 8-12

Figure 8 shows the variation in the number of notices issued by type of construction. This shows that the largest number of notices were issued to those organisations undertaking house-building activities, with a relatively small number issued to those undertaking civil engineering works. It would be useful to establish whether this reflects the type of organisations undertaking the different type of work (e.g., major international contractors undertaking the civil engineering construction, with smaller contractors undertaking the house building work) or the volume of such work.

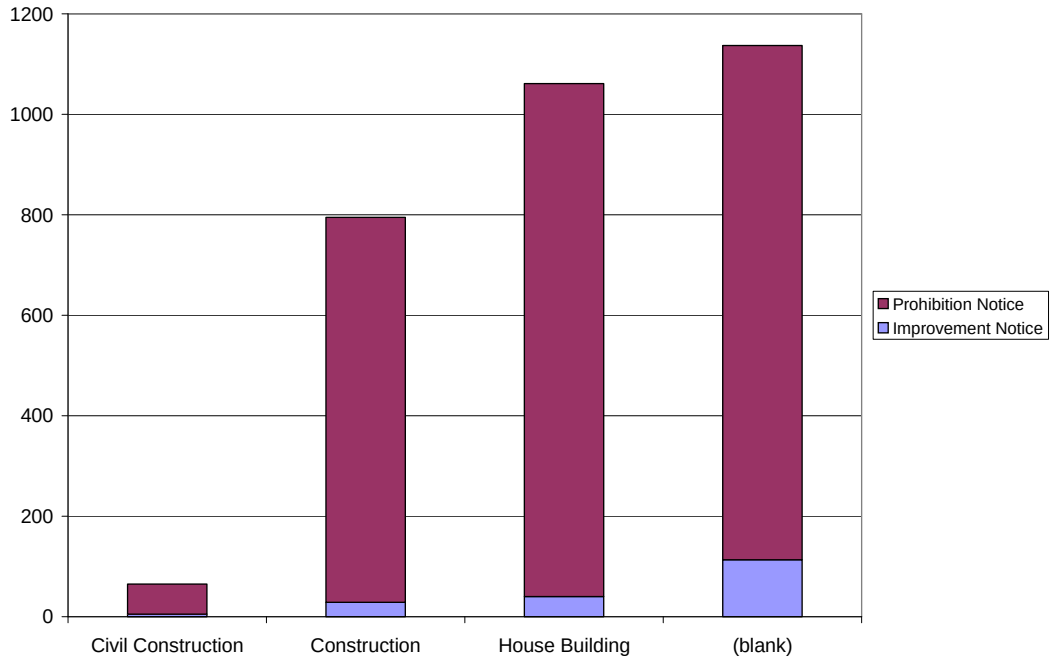

Figure 8 Work at height related notices issued by HSA to the construction industry by type of construction activity

Figure 9 shows the variation in the number of notices issued relating to work at height as a result of **accident investigation visits** along with the number of notices issued per 100 accident investigation visits. The numbers of notices are too small to identify any trends.

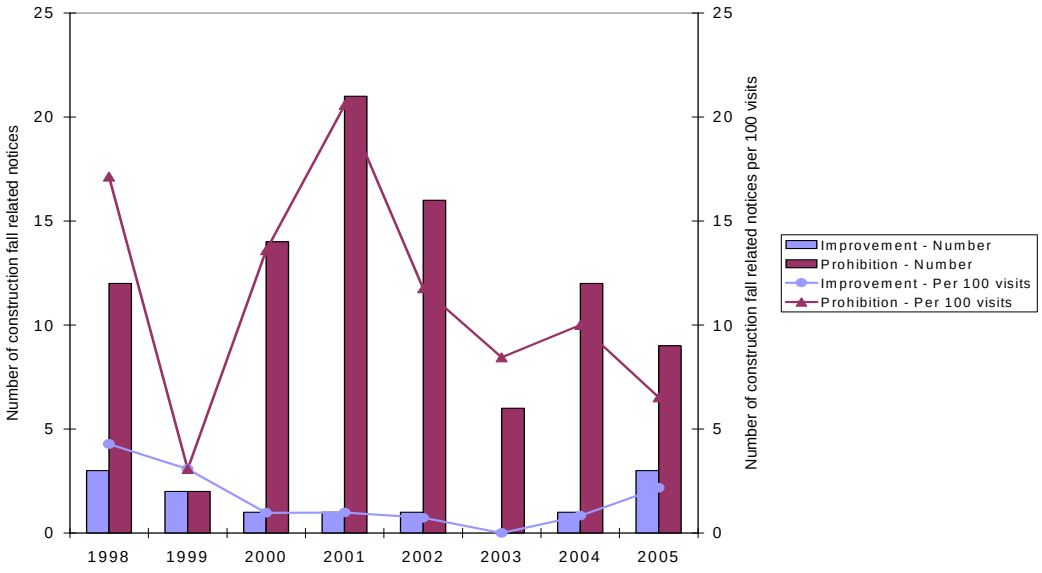

Figure 9 Work at height related notices issued by HSA to the construction industry as a result of accident investigation visits

Figure 10 shows the variation in the number of notices issued relating to work at height as a result of **complaint investigation visits** along with the number of notices issued per 100 complaint investigation visits. This shows a rise in the number of prohibition notices issued between 1998 and 2003. The numbers of prohibition notices issued per 100 complaint investigation visits nearly doubled between 1998 and 2000. The numbers then reduced to around 30 notices per 100 visits in 2001 and remained at that level until 2005, when they reduced to around 18 notices per 100 visits.

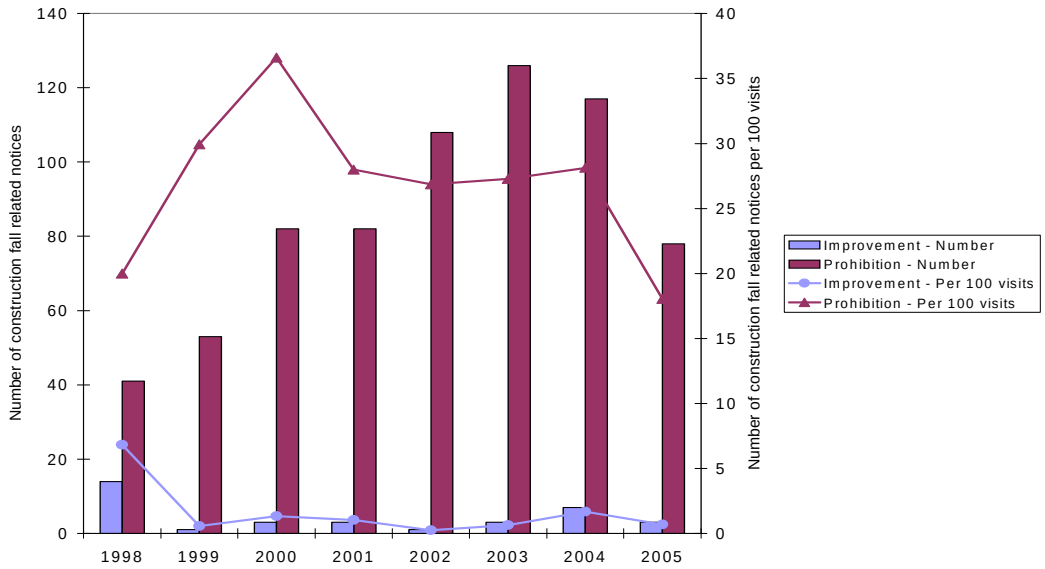

Figure 10 Work at height related notices issued by HSA to the construction industry as a result of complaint investigation visits

Figure 11 shows the variation in the number of notices issued relating to work at height as a result of **inspection compliance visits** along with the number of notices issued per 100 inspection compliance visits. This shows a rise in the number of prohibition notices issued between 1998 and 2003. The numbers of prohibition notices issued per 100 complaint investigation visits doubled between 1998 and 2000. The numbers then reduced from around 20 notices per 100 visits in 2000 to around 10 notices per 100 visits in 2005.

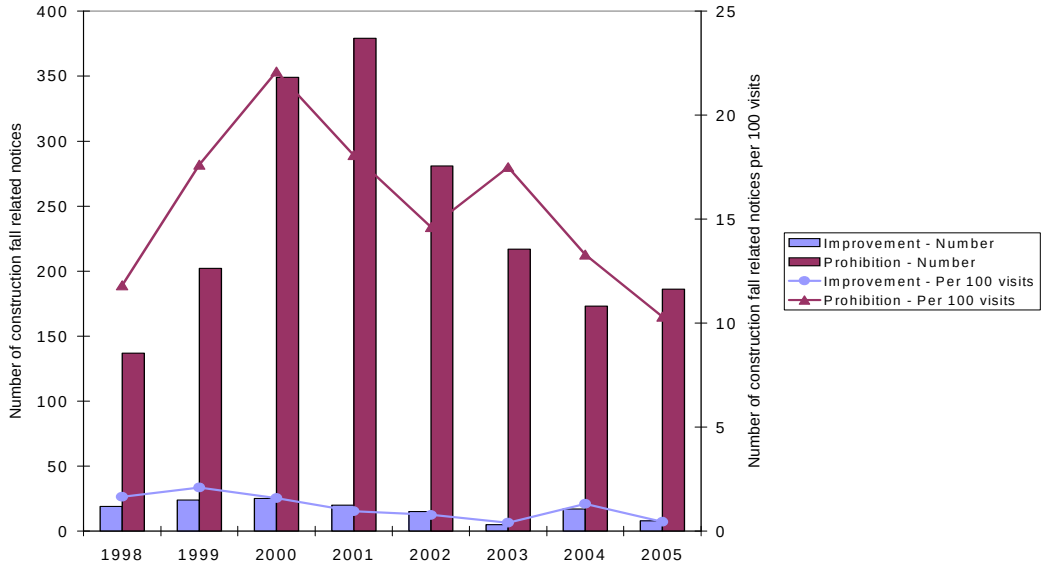

Figure 11 Work at height related notices issued by HSA to the construction industry as a result of inspection compliance visits

Figure 12 shows the variation in the number of notices issued by county. This shows a larger ratio between Dublin and Cork than for accidents.

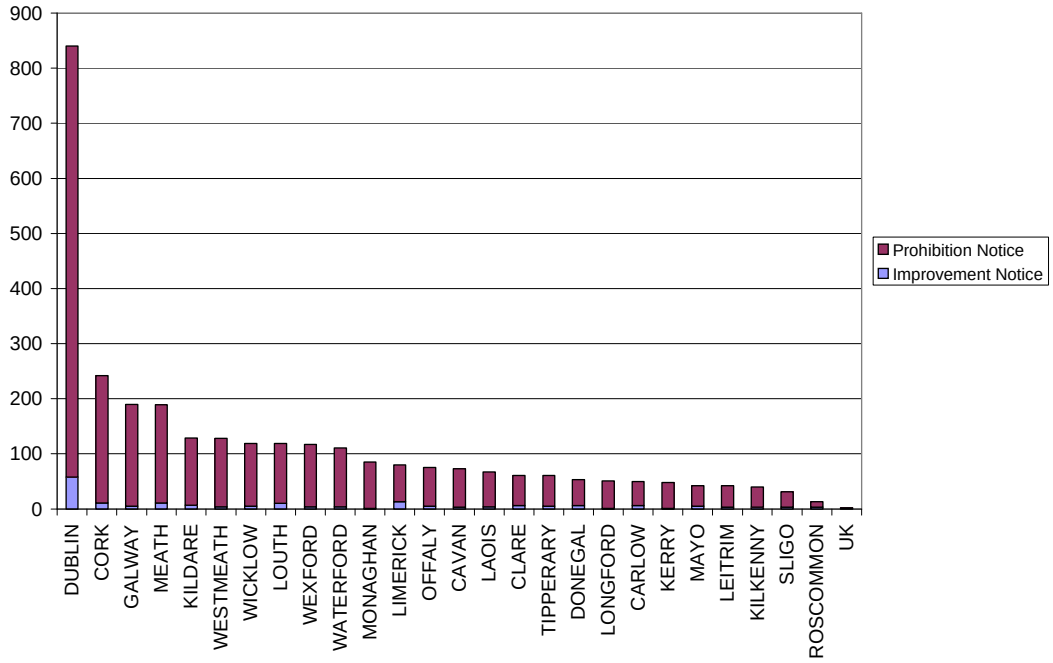

Figure 12 Work at height related notices issued by HSA to the construction industry by county

Visit Data: Figures 13-16

Figure 13 shows the variation in the number of work at height related **accident investigation visits** made by HSA in the construction industry. This is expressed as both the number of visits and the proportion of those visits in relation to the total number accident investigation visits for all accident types in all industries. This figure shows that the work at height related accident investigation visits have remained consistently at around 12% of the total number of visits for all of the period except for 2003.

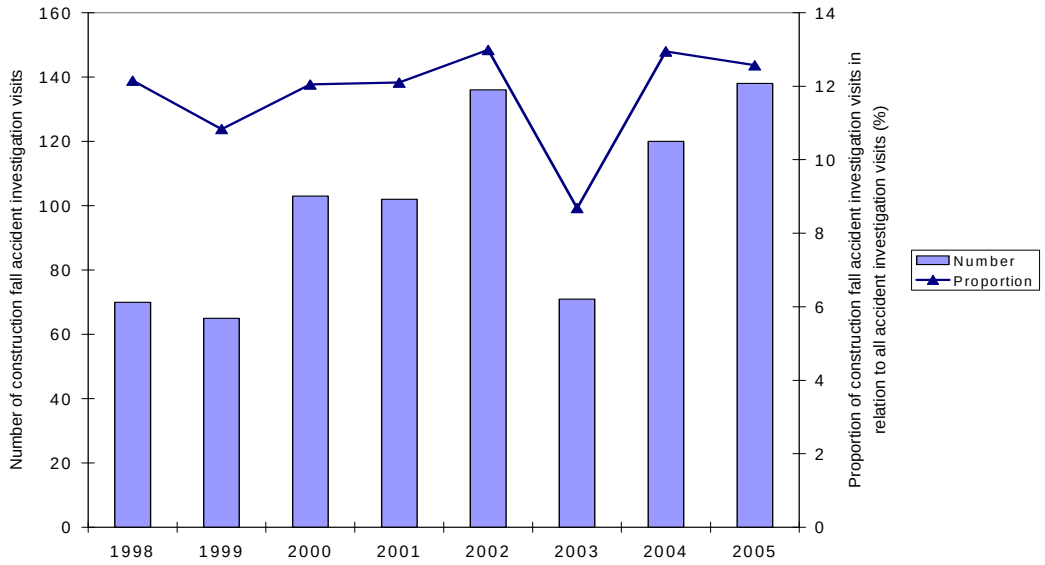

Figure 13 Work at height related accident investigation visits made by HSA to the construction industry in relation to all accident investigation visits

Figure 14 shows the variation in the number of work at height related **complaint investigation visits** made by HSA in the construction industry. This is expressed as both the number of visits and the proportion of those visits in relation to the total number accident investigation visits for all accident types in all industries. This figure shows that both the number and proportion of work at height related visits have increased between 1998 and 2005.

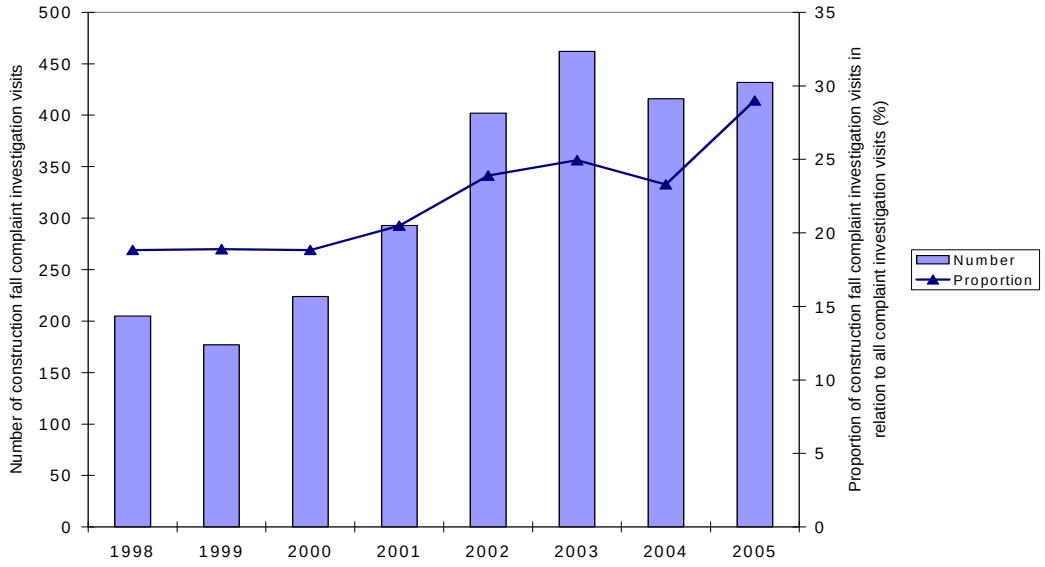

Figure 14 Work at height related complaint investigation visits made by HSA to the construction industry in relation to all complaint investigation visits

Figure 15 shows the variation in the number of work at height related **inspection compliance visits** made by HSA in the construction industry. This is expressed as both the number of visits and the proportion of those visits in relation to the total number accident investigation visits for all accident types in all industries. This figure shows that both the number and proportion of work at height related visits have increased between 1998 and 2002. Whilst the number of visits reduced by around 40% in 2003 and 2004, the proportion of visits reduced by around 15%.

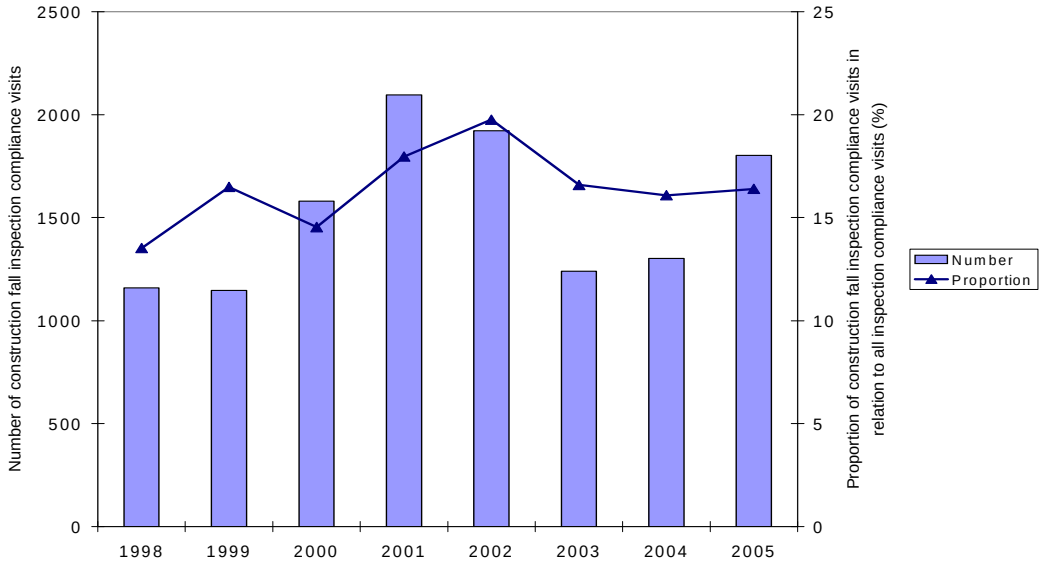

Figure 15 Work at height related inspection compliance visits made by HSA to the construction industry in relation to all inspection compliance visits

Figure 16 shows the variation in work at height related visits made by HSA by county. The ratio of number of visits in Dublin to Cork is around three to one.

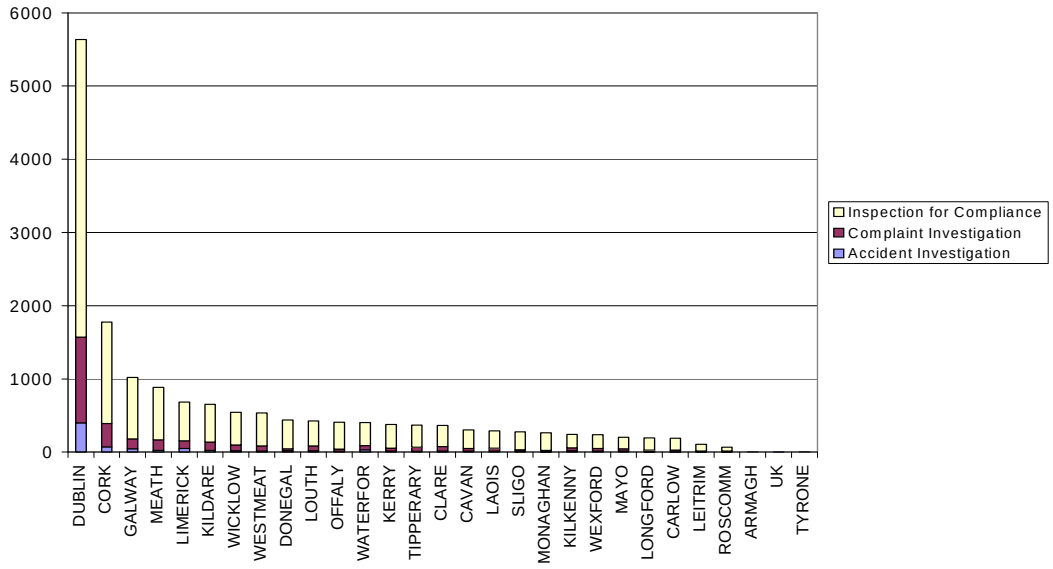

Figure 16 Work at height related visits made by HSA to the construction industry by county

Trends in Rates of Falls: Figure 17

Figure 17 shows the variation in the rate of falls accident. Other than an increase in 1998, there has been a downward trend in the rate of fatal injury accidents.

The rate of non-fatal injury accidents increased between 1995 and 1999, but has halved between 1999 and 2006. However, there has been considerable variation in the rates of non-fatal falls from height, with higher rates in 1999, 2001, 2002 and 2004 whilst the accident rates in intervening years have typically been the range of 240 to 280 in relation to the baseline year of 1995.

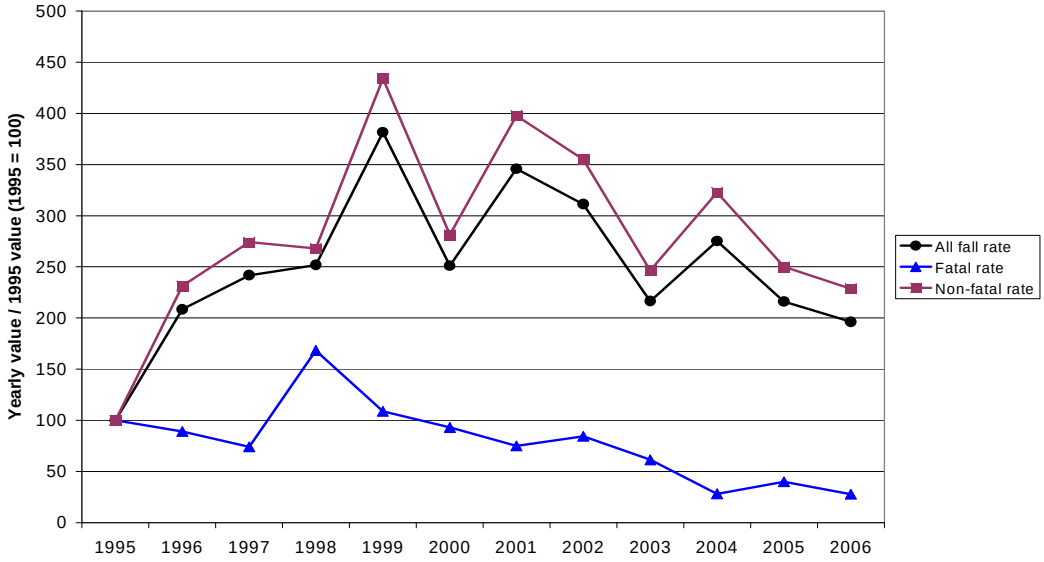

Figure 17 The variation in the rate of falls from height accident in the construction industry reported to HSA (1995 taken as the baseline)

Variation in the number of HSA visits and rate of fall-related accidents:

Figure 18 shows the variation in the number of visits made by the HSA and the rate of fall-related accidents. This figure shows that the number of compliance visits made increased between 1998 and 2001. In 2003 and 2004 the number of compliance visits made decreased to levels similar to that in the 1998. However, despite considerable yearly variation, the rate of falls has exhibited a downward trend since 1999.

With the exception of the increase in compliance visits in 2005, the variation in compliance visits has followed that of the fall-related accident rate. It is not clear from Figure 18 whether the compliance visits influence the rate of falls-related accidents or not.

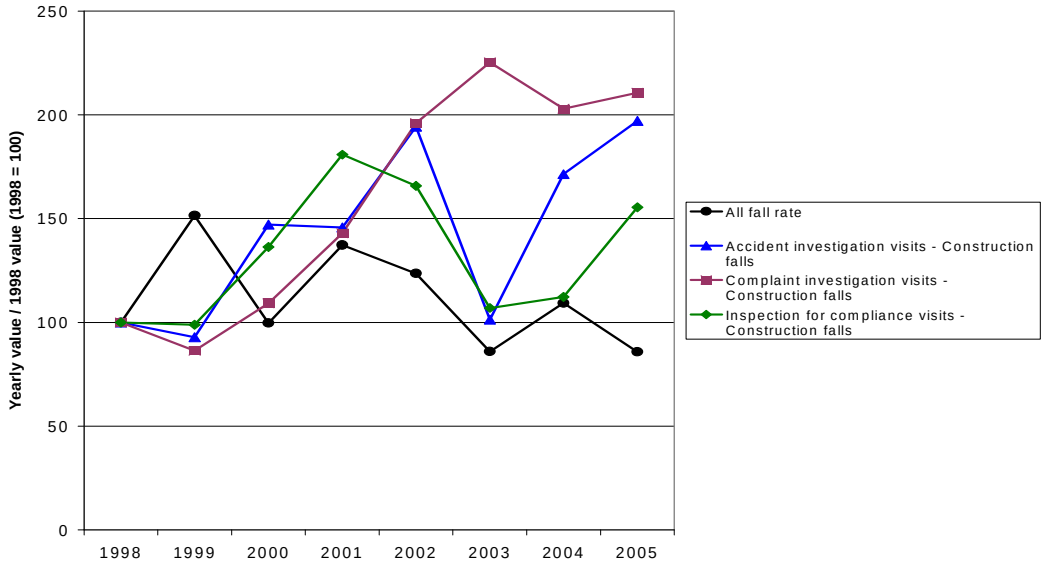

Figure 18 The variation in the number of work at height related visits made by HSA in the construction industry and rate of falls from height accidents in the construction industry reported to HSA (1998 taken as the baseline)

APPENDIX II
INDUSTRY QUESTIONNAIRE

Working at Height Safety Assessment

Questionnaire

Introduction

Horwath Consulting Ireland (HCI), an independent firm of management consultants, has been appointed by Health and Safety Authority (HSA) to undertake an independent assessment of the impact of actions taken by the HSA to foster working at height safety in the construction sector.

We would be grateful if you could assist the independent assessment team by taking a few moments to complete a short questionnaire to provide some information on the impact of measures taken in the construction sector.

All information provided in this questionnaire will be treated in the strictest confidence, and will be seen only by the HCI team, not the HSA. Your completed questionnaire will not be sent to the HSA, and any views that you may express will remain anonymous when HCI are preparing their findings.

The questionnaire has been kept as short as possible, and should take you no more than 15 minutes to complete. You can either fill it in on your computer and send it back by email to the HCI team, or fill in the hard copy and post it back to HCI. Here's how:

1 **By email.** Save this document on to your computer by the command "File/Save as". Fill in the answers, using your tab key to move to the next question, and then save the document again when you have finished. Then, simply send an email to **safety@hbc.ie** with the questionnaire attached.

2 **By post.** If you would prefer to send the hard-copy questionnaire back by post, please send to the address below:

Horwath Consulting Ireland
Safety Assessment Team
Marine House
Clanwilliam Court
Dublin 2.

All completed questionnaires should be returned by Wednesday, May 2nd, 2007.

7.3.1 Completing this Questionnaire

You can move between questions by pressing the 'Tab' / 'Shift-Tab' or 'Page Up' / 'Page Down' keys or by clicking on the grey boxes with a mouse. Please type your replies within the rectangular grey boxes, or click on the square grey boxes to select an answer (e.g. 'Yes' or 'No').

Part 1 Your details:

Name:	
Job title:	
Organisation:	
Street address:	
Town / City:	
County:	
Telephone:	
Fax:	
Email:	
Year Company Formed:	

Part 1 Your details (continued):

Number of employees in your organisation:

Choose one option:

Not Applicable	☐	250 to 1000	☐
1 to 9	☐	1000+	☐
10 to 49	☐	Self employed	☐
50 to 249	☐		

Business sector:

If applicable, please select more than option:

Construction (Commercial)	☐	Construction (Civil)	☐
Construction (Residential)	☐	Roofing	☐
Health & Safety Consultancy	☐	Tiling	☐
Scaffolding Provision	☐	Other Service Activities	☐
Safety Equipment Provision	☐	Other	☐
Painting	☐	Not Applicable	☐

Part 2 Your responses:

Section I – Changes in the Construction Industry Overall

Q1 **To what extent do you agree with the following statement:**

"The information made available to companies by HSA in relation to safety in working at height has had a positive effect on safety in the construction sector"

Choose one option:

- Strongly agree ☐
- Agree ☐
- Neither agree nor disagree ☐
- Disagree ☐
- Strongly disagree ☐

Q1A **Comments: Please indicate what type of information from HSA in relation to safety in working at height has had a positive effect on safety in the construction sector.**

Q2 **To what extent do you agree with the following statement:**

"The inspection of companies and enforcement of regulations by the Health and Safety Authority to ensure adherence to working at height regulations has had a positive effect on safety in working at height in the construction industry"

Choose one option:

Strongly agree	☐
Agree	☐
Neither agree nor disagree	☐
Disagree	☐
Strongly disagree	☐

Q2A **Comments: Please indicate the effect of HSA inspection and enforcement on safety in working at height in the construction industry.**

Q3 **Do you think that there has been an improvement in working at height safety (i.e. a reduction in accidents and fatalities caused by falls from height) over the previous ten years?**

Please select one option:

Yes	☐
No	☐
Don't know/ Not Applicable	☐

Q3A **Comments: Please provide information on what has led to an improvement in working at height safety.**

Section II - Your Own Organisation

Q4 **Has your company invested in the provision of safety equipment for working at height to its employees?**

Please select one option:

Yes	☐
No	☐
Don't know/ Not Applicable	☐

Q4A **Comments: Please provide information with examples**

Q5 **Has your company provided training to its employees or sub-contractors in the area of safety in working at height?**

Please select one option:

Yes	☐
No	☐
Don't know/ Not Applicable	☐

Q5A **If the answer above is "Yes", please provide a breakdown of all training provided.**

Type of Training Provided	Mandatory? Yes/No	Year Introduced

Q6 **Does your company carry out regular risk assessments in relation to working at height?**

Please select one option:

Yes	☐
No	☐
Don't know/ Not Applicable	☐

Q6A **Comments: Please describe the risk assessments carried out by your company in relation to working at height.**

Q7 To what extent are you satisfied that you have:

A. Information;

B. Resources;

to manage the risks of work at height effectively?

Please select one option for

A. Information; and

B. Resources:

	A. Information	B Resources
Very Satisfied	☐	☐
Satisfied	☐	☐
Neither satisfied nor unsatisfied	☐	☐
Unsatisfied	☐	☐
Very unsatisfied	☐	☐

Q8 **Please document below the types of assistance that your company would value from the HSA to improve safety in working at height.**

Please provide any additional comments that you may have on the area of safety in working at height.

Would you be willing to agree to participate in a brief follow-up phone call to explore in more detail some of your responses contained in this questionnaire?

Please select one option:

Yes ☐

No ☐

Please note that, as with the questionnaire itself, any follow-up conversations will be strictly confidential and not passed on to the HSA

Thank you for your help in completing this questionnaire.
Your cooperation is very much appreciated.