WORKPLACE RELATIONS MINISTERS' COUNCIL

Comparative Performance Monitoring

Case Study on Performance Outcomes in the BUILDING AND CONSTRUCTION INDUSTRY

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EXECUTIVE SUMMARY

This project has been commissioned to further examine the underlying factors that may explain higher-level macro trends in occupational health and safety (OHS) performance in the building and construction industry. The project uses the general framework established by the Department of Employment and Workplace Relations to interpret high-level outcome measures. This framework identifies structural factors and policy interventions as the two key streams of influence on high-level outcomes. From an analysis of the available data any factors that help explain the trends in the building and construction sector are identified.

This analysis of occupational health and safety outcomes in the industry from 1998/99 to 2000/01, as measured by the incidence and type of workers' compensation claims, expands on information available in the Comparative Performance Monitoring reports and looks at claim profiles within the building and construction industry by jurisdiction and sub industry. The following points are of particular note.

- Even though open compensation claims are still maturing, as at the end of 2001 the direct cost of 1998/99 claims was $267 million. With national building and construction activity levels at around $50-$60b this represents approximately 0.5% of total industry revenue.
- The average direct cost of a compensation claim is $20-25,000.
- The annual industry incidence rate is around 28 claims per 1,000 workers. NSW and WA have higher rates, although they have been reducing over the review time frame. Victoria has low rates and is relatively stable while Queensland and Tasmania have deteriorating performance from a low base.
- The major mechanisms of injury are body stressing with muscular stress from lifting and handling the cause of 30% of all injuries in the industry.
- The rate of fatalities in the building and construction industry is high (around 5 to 8 per annum per 100,000 employees) but has been decreasing over recent years.

A strong relational model could not be generated using the structural factors used in the study. The range of policy interventions from awareness campaigns to enforcement programs indicated that each jurisdiction has targeted the sector to achieve improved performance. The impact of awareness, information and education interventions are difficult to estimate. One of the few interventions subject to formal evaluation was the Memorandum of Understanding

between the NSW government and major construction companies that resulted in significant reductions in claims incidence rates.

The policy intervention dimension focussed on legislation and enforcement given the traditional industry specific approach taken in most jurisdictions. The challenge for governments is to better target legislative coverage and enforcement activity to encourage better OHS performance in the building and construction industry.

The structure and diversity of the industry challenges the effectiveness of performance drivers at the institutional level such as compensation and OHS systems. The need to identify new or better ways of influencing industry and workplace practices, either through these institutional mechanisms, or through other mechanisms, is likely to be critical in accelerating the rate of industry improvement.

Analysis of structural features of the industry, particularly the different sub-industries, revealed some notable differences including:

- Within the sub-industries, Building Construction (ANZSIC classification 411) has a relatively low incidence rate of about 20 claims per 1000 workers, with Non-Building Construction (ANZSIC 412, at 45 claims per 1000 workers), Site Preparation Services (ANZSIC 421, 40 claims per 1000 workers) and Building Structure Services (ANZSIC 422, 40 claims per 1000 workers) having the highest rates.
- Across jurisdictions the greatest variations from the national average were found in NSW with a 68% higher rate in sub-industry 412, Victoria with a 65% higher rate in sub-industry 421, Victoria with 59% lower rate in sub-industry 425 (Other Construction Activities) and Queensland with a 55% lower rate in sub-industry 422.
- In the Non-Building Construction sub-industry there are no hazard-specific or practice-specific reasons to explain NSW having an incidence rate 68% higher than the national average. The evidence suggests that it is industry structure and culture issues rather than specific risk exposure and risk management practices that influence these outcomes.
- In the Site Preparation Services sub-industry, it is clear that Victoria has had exceptionally high levels of muscular stress (lifting) claims with 1 in every 40 employees in this industry lodging a compensation claim for a lifting injury during 2000/01. The data suggests this pattern is influenced by specific risk exposure and risk management

practices. In the Other Construction Activities sub-industry, Victoria's incidence rate is 59% lower than the national average. Victoria has low rates against all major mechanisms and agencies, suggesting an overall better approach to OHS rather than better performance on particular hazards.

- In the Building Structure Services sub-industry, Queensland incidence rates are low against all major mechanisms and agencies, especially falls from height and falls on the same level where its rates are about one quarter of that in NSW, SA and WA. The consistency of the agency and mechanism pattern in Queensland suggests that there is a lower risk exposure and better risk management practices that help explain this case.
- Analysis of the industry by age showed that Victoria claimants are on average older than those in other jurisdictions with WA having the youngest claimant profile. Within jurisdictions, there is a clear relationship between age and claims with the incidence rate higher for older age groups. Furthermore, not only are the incidence rates higher for older workers, the % of 60+ days claims are higher too.
- Size of employer revealed a clear association between larger firms and lower incidence rates. NSW had the biggest proportion of larger employers suggesting its relative poor claims performance may be found in smaller firms within the non-building construction sector.
- Occupation is likely to be an important factor but data limitations did not allow meaningful analysis of this factor.

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1 INTRODUCTION

This project has been commissioned to further examine the underlying factors that may explain higher-level macro trends in occupational health and safety (OHS) performance in the building and construction industry. In particular the project has the following objectives:

- To assist the Workplace Relations Ministers' Council understand the different strategic policy settings in each jurisdiction and assess the potential impact on macro outcomes as reported in Comparative Performance Monitoring (CPM) reports
- To provide an analytical framework that would assist jurisdictions in linking high level outcome data to specific policy settings within the jurisdiction

The project uses the general framework established by the Department of Employment and Workplace Relations to interpret high-level outcome measures. This framework identifies structural factors and policy interventions as the two key streams of influence on high-level outcomes.

Previous work done on structural factors for the Department[1] indicated that of the variables examined only a few had any significant relationship to injury outcomes, and in this project only a limited number of structural variables will be examined. The range of policy interventions to be considered in this project include:

- Education and information programs
- Training programs
- Knowledge and best practice transfer programs
- Inspection and enforcement programs
- Regulations and codes

Policy initiatives may be at the institutional level (e.g. legislative change), the industry level (e.g. guidance or codes) and the workplace level (e.g. hazard programs, management systems). How these initiatives are delivered may also vary. From an analysis of the available data factors that help explain the trends in the building and construction sector are examined.

[1] Access Economics, *Pilot Study: Interpreting CPM Outcomes- Property and Business Services*, 2001

2 OVERVIEW OF THE SECTOR

The performance of the building and construction sector must be seen in the context of the changing profile of the industry. This profile is influenced by many factors including demographics, economic, policy and regulatory changes and labour market factors.

2.1 Profile of the sector

This study uses the Australian New Zealand Standard Industry Classification (ANZSIC) to define the scope of the industry. The key elements of the classification are shown below:

Division E **CONSTRUCTION**	
Subdivision 41: **GENERAL CONSTRUCTION**	Subdivision 42: **CONSTRUCTION TRADE SERVICES**
411: Building Construction 412: Non-Building Construction	421: Site Preparation Services 422: Building Structure Services 423: Installation Trade Services 424: Building Completion Services 425: Other Construction Services

Subdivision 41: General Construction

411: Building Construction: covers the construction, alteration and repair of housing and other residential buildings; and non-residential buildings such as hotels, hospitals and prisons;

412: Non-Building Construction: covers the construction and repair of structures such as roads and bridges, railways, harbours, dams and pipelines.

Subdivision 42: Construction Trade Services

421: Site Preparation Services: covers activities such as earthmoving, such as in excavating and trench-digging, and the hire of excavation equipment with operators;

422: Building Structure Services: covers activities such as concreting, bricklaying, roofing services and structural steel erection services;

423: Installation Trade Services: covers activities such as plumbing, electrical, air conditioning and heating services and fire and security system services;

424: Building Completion Services: covers activities such as plastering and ceiling services, carpentry, tiling, painting, decorating and glazing services; and

425: Other Construction Services: covers activities such as landscaping and other special services such as sand blasting and scaffold construction.

The size of the sector can be illustrated by the annual value of activity. In 2001 this was estimated at $52 billion and accounted for about 5% of Australia's gross domestic product.[2] New South Wales (NSW), Victoria and Queensland accounted for the majority of building and construction activity.

The public sector accounts for about 30% of activity in the sector. The level of building activity within the study period varies considerably with a peak in 1999/00 and a dramatic fall off into 2000/01. Factors relevant include the Sydney Olympics, the impact of the GST, the first home buyers grant and the collapse of HIH Insurance.

The overview from the recent Cole Royal Commission highlights the following characteristics of the industry:

- Large number of small firms most of which were in the construction trade services area. The Royal Commission describes the industry thus:

  > "The shape of the industry structure is that of a flattened pyramid, with a handful (20) of very large contractors and a few (1,200) large contractors (more than 20 employees) at the top, and many small subcontractors forming the base"[3].

- Highly unionised nature of industry and wide variety of industry associations
- Complex contractual arrangements reflecting different subcontracting arrangements from subcontracting firms that employ others to self-employed subcontractors who seek work individually.

[2] Royal Commission into the Building and Construction Industry, *Overview of the nature and operation of the Building and Construction Industry*, Discussion Paper One, 2002, p.16.
[3] ibid, p.21.

- Broad range of regulatory requirements from building standards to health and safety regulations.

2.2 Labour force

The building and construction industry employed over 700,000 people[4] in 2001 of which about 85% were employed full time and 15% employed part time. Compared with other industries there are a relatively low level of employees (60%) in the building and construction industry, with comparatively high levels of employers and own account workers. Most workers are tradespeople and the age profile of the industry is similar to that for all industries.

The average wage levels are similar to national averages but the variability in income is much higher than most other industries[5]. A relatively high level of income is earned through overtime and building and construction workers work longer hours than the national average.

Construction workers are more mobile than workers in most other industries, and given their employment arrangements are particularly mobile within the industry.

Working days lost in industrial disputation per thousand workers are higher in the building and construction industry than most other sectors, although the mining industry has the highest levels of disputation. Levels vary from state to state and from year to year.

2.3 Recent reviews of OHS in the sector

The health and safety performance of the building and construction sector has been subject to specific attention by OHS agencies in a number of jurisdictions. High fatality rates and compensation costs have been the main reasons why the sector has been subject to specific investigation.

[4] ibid, p.15.
[5] Royal Commission into the Building and Construction Industry, *Statistical Compendium for the Building and Construction Industry*, Discussion Paper Two, 2002, p.37.

2.3.1 Royal Commission into the Building and Construction Industry

Part of the brief of the Royal Commission was to inquire into the state of health and safety in the industry and to this end the Commission prepared a report on OHS performance[6] and followed up with an OHS conference on key issues. Arising out of these activities the final report included a specific chapter[7] on health and safety.

The Discussion Paper addressed the performance of the industry, the legislative arrangements, risk management approaches, training and the structure of the industry (sub-contracting, role of clients). The paper strongly recommended the value of safe design initiatives as a means to improve performance by eliminating risks at the design stage. To illustrate the path that the industry could take the paper examined the improvement of performance in the mining industry. The mining industry has historically been one of the riskiest industries and the sector has attempted to improve performance by getting much stronger commitment from senior management backed up by specific risk reduction programs. Injury rates have declined but fatalities still remain a problem in the mining industry.

Volume 6 of the final report made recommendations about OHS including:

- The need for better coordination of information and strategies through the National Occupational Health and Safety Commission;
- The consideration of a national OHS system for the industry with the associated need for national standards;
- To examine the value of a more prescriptive regulatory approach, such as that used in the United Kingdom;
- To promote safe design principles and practices;
- To upgrade the OHS content of procurement policies adopted by the Australian Government as part of a strategy to influence change through the role of the Government as a client;

[6] Royal Commission into the Building and Construction Industry*, Workplace Health and Safety in the Building and Construction Industry*, Discussion Paper Six, 2002.
[7] Royal Commission into the Building and Construction Industry, *Final Report, Reform-Occupational Health and Safety*, Volume 6, 2003.

- Strengthen pre-tender OHS qualification processes;
- Increase and encourage inspectorial resources on construction sites;
- Establish a Commissioner for Occupational Health and Safety in the Building and Construction Industry;
- Amending the National Code of Practice for the Construction Industry to reflect Commission recommendations; and
- Develop safety issue resolution processes to minimise industrial relations abuses of health and safety.

The commissioner concluded that:

> "The occupational health and safety performance of the building and construction industry is unacceptable. The powerful competitive forces in the industry too often work against occupational health and safety. The industry strives to complete projects on budget and on time. Too often safety is neglected. There must be cultural and behavioural change. That can come about by harnessing the competitive forces in the industry to work for occupational health and safety".[8]

Some of the Royal Commission recommendations in the area of national uniformity are being taken up in the Productivity Commission inquiry into Workers' Compensation and OHS.

2.3.2 New South Wales

The NSW government initiated a workplace safety summit in July 2002 with the construction industry being one of the key areas in which recommendations were made.[9] The summit adopted a 20% injury reduction target to be achieved in 5 years with the focus on falls, noise and manual handling.

A more detailed examination of the performance of the sector was undertaken in a study titled Safely Building NSW in 2001[10]. The study examined the impact of major initiatives, particularly the Memorandum of Understanding (MOU) entered into by major construction companies and the government. Participating companies recorded reductions in the claims incidence rate of a third, a much greater reduction rate than achieved across the industry. The project also developed specific tools for better managing OHS in the building and construction industry. The following extract summarises some of the key findings from the study.

[8] ibid, p.7.
[9] NSW Workplace safety summit-Communique, July 5, 2002
[10] WorkCover NSW, *Safely Building NSW: Priority Issues for Construction Reform*, WorkCover NSW, 2001.

"**Summary of key issues**

- The construction industry is characterised by complex horizontal and vertical relationships that create ambiguity and undermine OHS management systems or the ability to properly implement such systems.
- While OHS is a criterion for tender selection of subcontractors, its application may often be diluted by other factors such as price and availability.
- It is evident that OHS is often only evaluated after selection of the successful tender and the award of the contract.
- The key to successful pre-qualification of subcontractors is to ensure that sufficient project-specific health and safety information is provided in the scope of work or specification. This will ensure health and safety is priced appropriately as part of the tender, allowing evaluation to occur based on the subcontractor's method of addressing the information provided.
- The inclusion of OHS in the design stage of a project is not widely practiced in the Australian construction industry and few companies practise a formalised process of integration of design and OHS.
- Inclusion of OHS in the design of a project is an integral step in achieving better management of OHS. It also enables the process of elimination or minimisation of risk to start at the very conception of the project.
- OHS legislation does not give an appropriate focus to the conception and planning stage of a project.
- Few clients specify OHS criteria for their prospective projects (top down approach). In general, the reverse appears to be the case (bottom up approach). A principal contractor generally develops a generic OHS plan that reflects the organisation's corporate OHS management system requirements. The document is forwarded to the client for information.
- OHS is typically disregarded at the commissioning and handover stages of a project.
- Inclusion of clients as OHS obligation bearers may reduce the tendency for them to select the cheapest tender for a project irrespective of the contractor's OHS management competence and injury record."[11]

2.3.3 Queensland

In 1999 the government initiated an inquiry into the building and construction industry overseen by an industry based task force. The terms of reference were to recommend programs to improve safety, increase compliance with the law and to recommend systems for

[11] WorkCover NSW, op.cit, 2001, p.27.

collecting and analysing data on sector performance. The final report[12] was released in 2000 and made recommendations including:

- Enhancements to existing claims based and injury reporting systems;
- Clarifications of the duties of principal contractors and other regulatory changes such as the requirement for induction training;
- Upgrading of the range and interaction of enforcement tools and strategies including on the spot fines, sentencing guidelines and specific industry blitzes;
- Information and guidance to be better targeted to assist in improving compliance;
- Consultation processes to be facilitated by training for health and safety representatives;
- Data bases to be upgraded to enable better monitoring of sector activity; and
- Better partnerships with stakeholders to improve performance.

The findings of this inquiry are pertinent to the study window of this project although implementation of any of the recommendations is unlikely to have had any impact on the trends in the 1998/99-2000/01 period. The recommendations, however, provide a guide for interpreting data analysed in the period and reflect possible explanatory factors.

2.3.4 Australian Capital Territory

A construction industry task force was established in 2001 to examine health and safety performance in the sector[13]. The report provided a "snapshot" of OHS performance and highlighted the concentration of injuries in building construction-non residential, installation trade services and general construction sub sectors. Sprains and strains and open wounds were the most common injuries. The next stage is to examine the most appropriate strategies for improving performance.

[12] Department of Employment, Training and Industrial Relations, *Health and Safety in the Building and Construction Industry,* Building and Construction Industry (Workplace Health and Safety) Taskforce – Final Report, 2000.
[13] ACT government, *Building and Construction in the Australian Capital Territory-2001, 2001*

2.3.5 Western Australia

In 2000, the WorkSafe Western Australia Commission resolved to examine the construction industry in Western Australia, to determine whether the pattern of work-related injury and disease was changing and to set future directions for improvements in safety performance. The final Report details the deliberations and final recommendations of the tripartite Construction Industry Safety Advisory Committee, which was set up by the Commission to undertake this task[14]. The major recommendations made included:

- Mandatory accredited generic safety induction training for employers, employees, contractors, sub-contractors and self-employed people working in the construction industry;
- Additional training in safety management systems for managers and supervisors and ongoing refresher training;
- Provision of information (including to contractors and sub-contractors; architects, designers and engineers);
- Improved data collection through research and potential modifications to the ANZSIC categories, particularly for self employed and those not covered by the workers' compensation system;
- Continuation of the Committee as an industry consultative forum specialising in matters of occupational safety and health.

These recommendations are currently being progressed particularly the development of an induction program for the industry.

[14] Occupational Safety and Health in the Construction Industry In Western Australia: A report from the Construction Industry Safety Advisory Committee to the WorkSafe Western Australia Commission

3 OHS PERFORMANCE IN THE BUILDING AND CONSTRUCTION SECTOR

The objective of this project is to provide a basis for explaining OHS performance in the building and construction sector using claims based outcome data. This data is important but should not be considered as the only measure of either risk or ability to manage health and safety.[15] Using the National Data Set database (NDS) provided by the National Occupational Health and Safety Commission (NOHSC) a profile of the industry was assembled using similar indicators to those used in the CPM report. The results are summarised below.

3.1 Overall claims trends in the industry: cost

As at the end of 2001 the overall cost of 1998/99 compensation claims in the building and construction industry was $267 million (Table 1). Costs continue to accrue for these and open claims from later years which are relatively less mature. With national building activity levels at around $50-$60 billion, the direct cost of compensation claims to date represents around 0.5% of total industry revenue.

Table 1: Total Compensation Costs

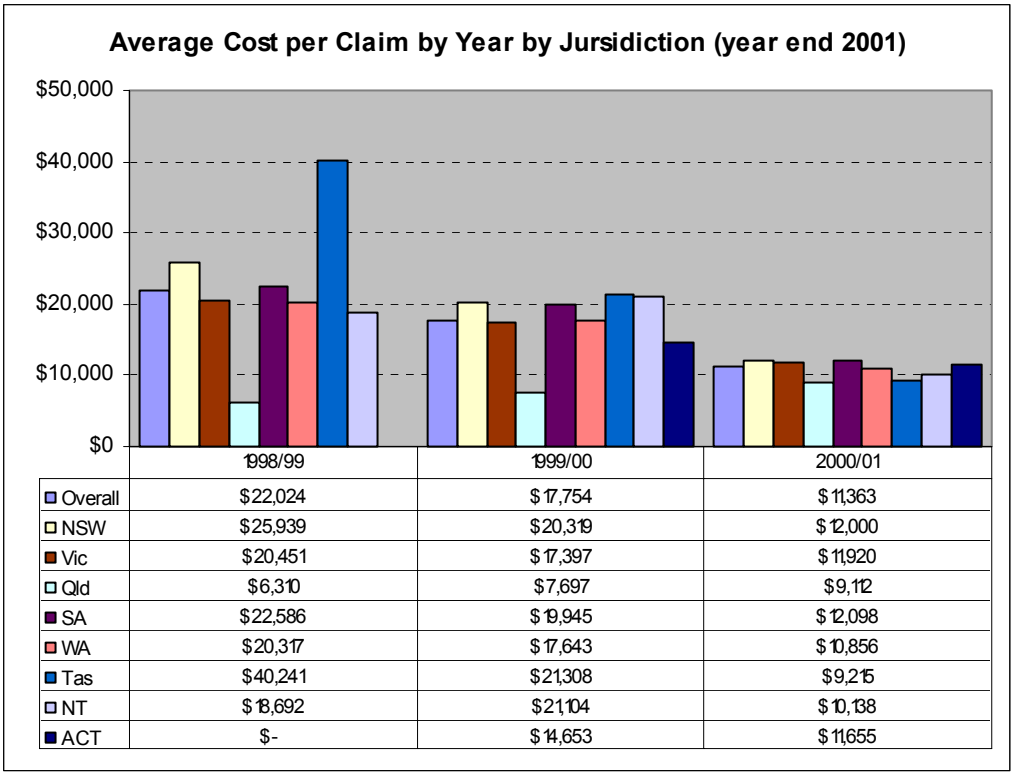
Total Compensation Cost by Year by Jurisdiction (at end 2001)

$ million	1998/99	1999/00	2000/01
Overall	267	224	136
NSW	157	123	67
Vic	43	36	25
Qld	8	13	16
SA	16	15	8
WA	36	31	16
Tas	5	3	2
NT	2	2	1
ACT	0	2	2

The average compensation cost per claim for 1998/99 is around $20-25,000 as at the end of 2001 (Chart 1). This figure is increasing as claims mature. Queensland's average cost per claim has increased but it is still well below other jurisdictions.

[15] The consultants are aware of the debate about claims data as an indicator of OHS performance and the difficulty in separating out claims outcomes as a measure of risk exposure and claims outcomes as a measure of OHS performance.

Chart 1: Claims Costs



	1998/99	1999/00	2000/01
Overall	$22,024	$17,754	$11,363
NSW	$25,939	$20,319	$12,000
Vic	$20,451	$17,397	$11,920
Qld	$6,310	$7,697	$9,112
SA	$22,586	$19,945	$12,098
WA	$20,317	$17,643	$10,856
Tas	$40,241	$21,308	$9,215
NT	$18,692	$21,104	$10,138
ACT	$-	$14,653	$11,655

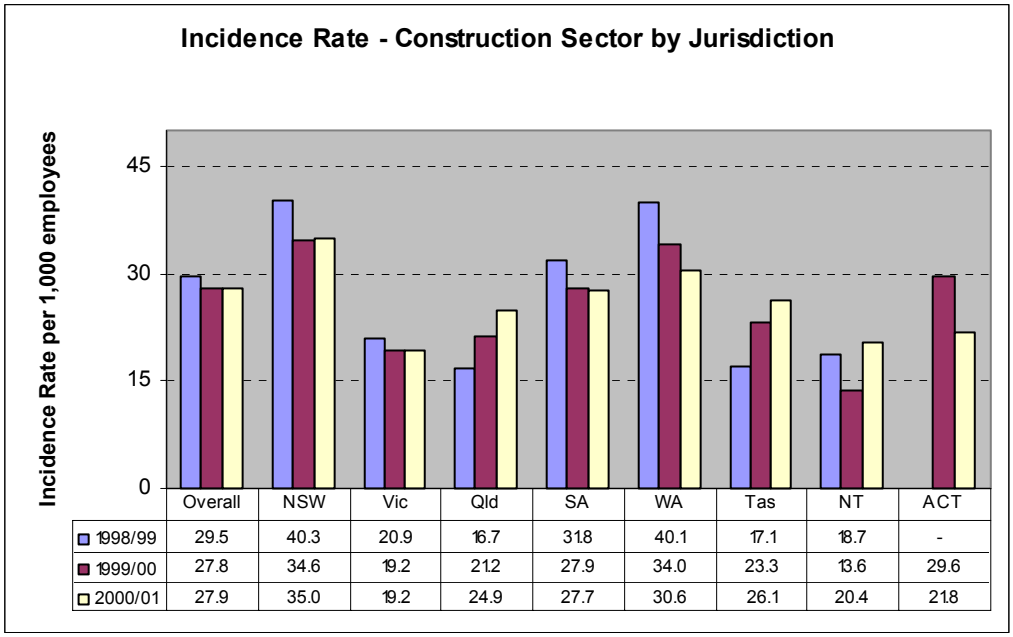
3.2 Overall claims trends in the sector: incidence rates

Overall claims trends have been reported in the most recent Comparative Performance Monitoring Report.[16] Incidence rates (i.e. the number of claims of duration one week or more per 1,000 workers) for the construction industry have decreased by 15% since 1997/98 and been unchanged since 1999/00. Incidence rates for more severe injuries (12 weeks or more) have decreased by 3% since 1997/98 and increased by 8% since 1999/00. These patterns are in contrast to continued declines in the Australian average claims rate.

Breakdowns by jurisdiction from analysis undertaken in this project are shown in Charts 2 to 5. Chart 2 shows significant differences between jurisdictions with NSW and WA having the highest rates and Victoria and Queensland the lowest. NSW and WA are improving off relatively high rates and Queensland and Tasmania are deteriorating off relatively low rates. Chart 3 shows a similar pattern and relativity for frequency rates (i.e. claims per million hours worked).

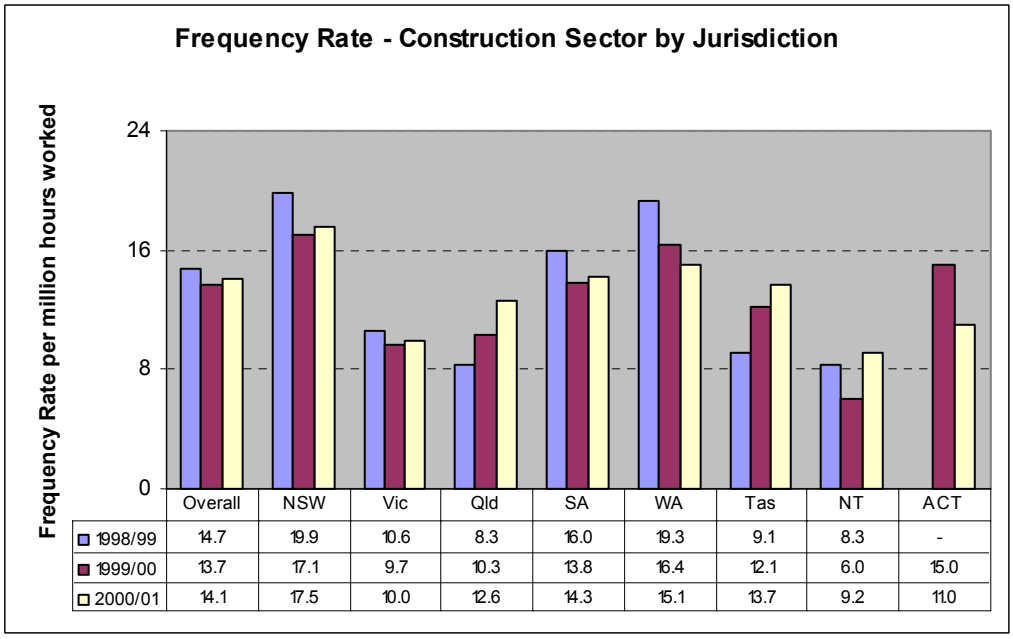
[16] Comparative Performance Monitoring, Fourth report, Australian and New Zealand Occupational Health and Safety and Workers' Compensation Schemes, Workplace Relations Ministers' Council, Commonwealth of Australia, 2002.

Chart 2: Incidence rate



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	29.5	40.3	20.9	16.7	31.8	40.1	17.1	18.7	-
1999/00	27.8	34.6	19.2	21.2	27.9	34.0	23.3	13.6	29.6
2000/01	27.9	35.0	19.2	24.9	27.7	30.6	26.1	20.4	21.8

Chart 3: Frequency rate



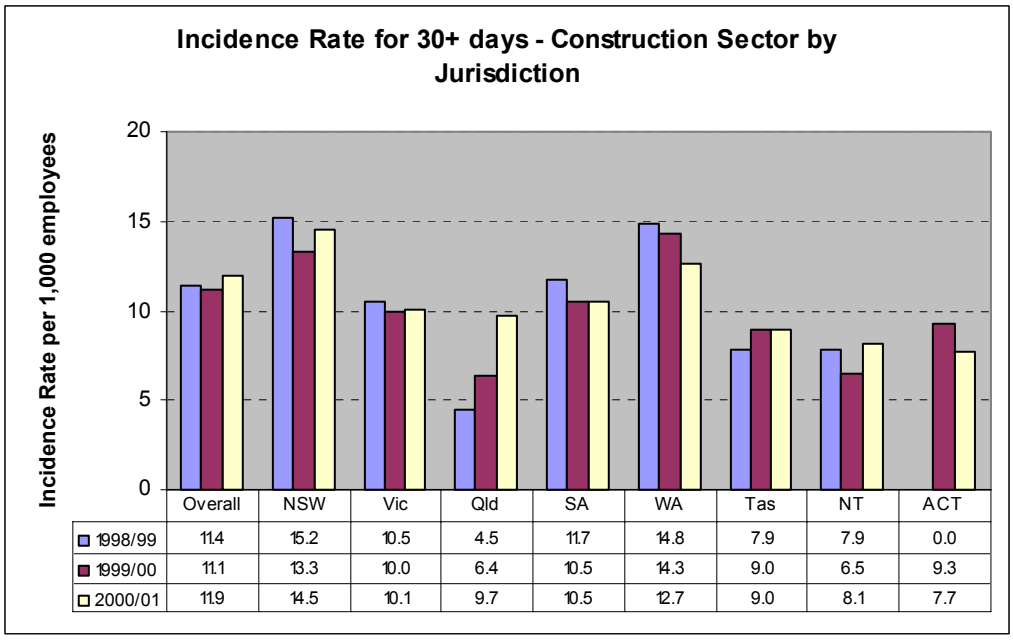
	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	14.7	19.9	10.6	8.3	16.0	19.3	9.1	8.3	-
1999/00	13.7	17.1	9.7	10.3	13.8	16.4	12.1	6.0	15.0
2000/01	14.1	17.5	10.0	12.6	14.3	15.1	13.7	9.2	11.0

In this study, in line with the parent CPM report, incidence rates will be the primary comparative measure. Unless otherwise indicated all charts refer to all claims of 5 days or more.

In Charts 4 and 5 trends with more severe injuries are shown and again the relativities are maintained.

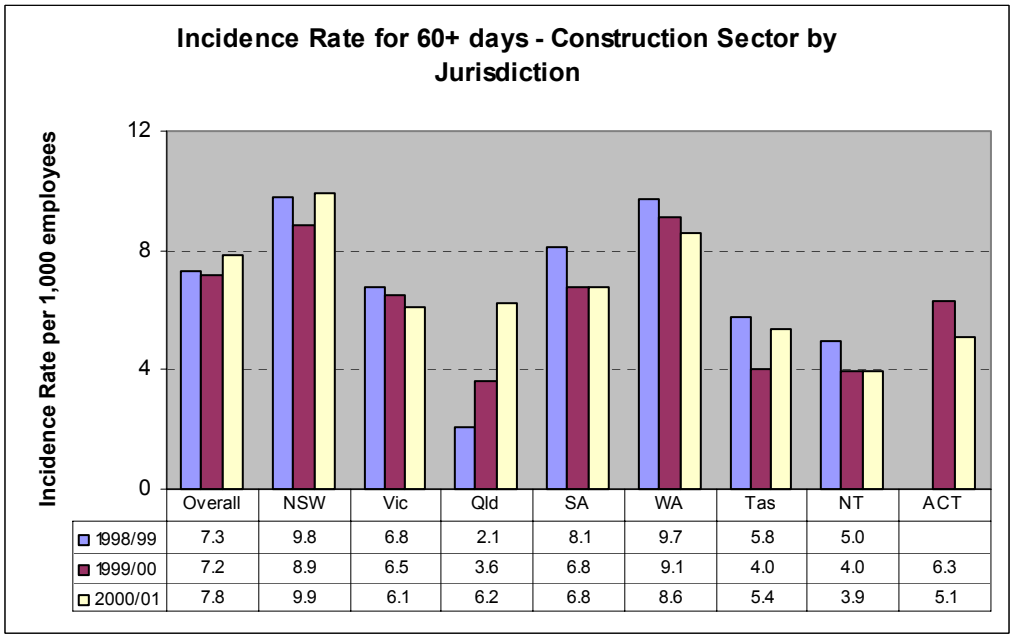
These tables continue to show Victoria as the most stable jurisdiction with little variation in its relatively low rates across severity levels. NSW may be improving but there is little change in their longer term incidence rates. WA is improving but is still high compared to other jurisdictions. Queensland shows both increasing incidence rates and duration rates.

Chart 4: Incidence rate for 30+ days



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	11.4	15.2	10.5	4.5	11.7	14.8	7.9	7.9	0.0
1999/00	11.1	13.3	10.0	6.4	10.5	14.3	9.0	6.5	9.3
2000/01	11.9	14.5	10.1	9.7	10.5	12.7	9.0	8.1	7.7

Chart 5: Incidence rate for 60+ days

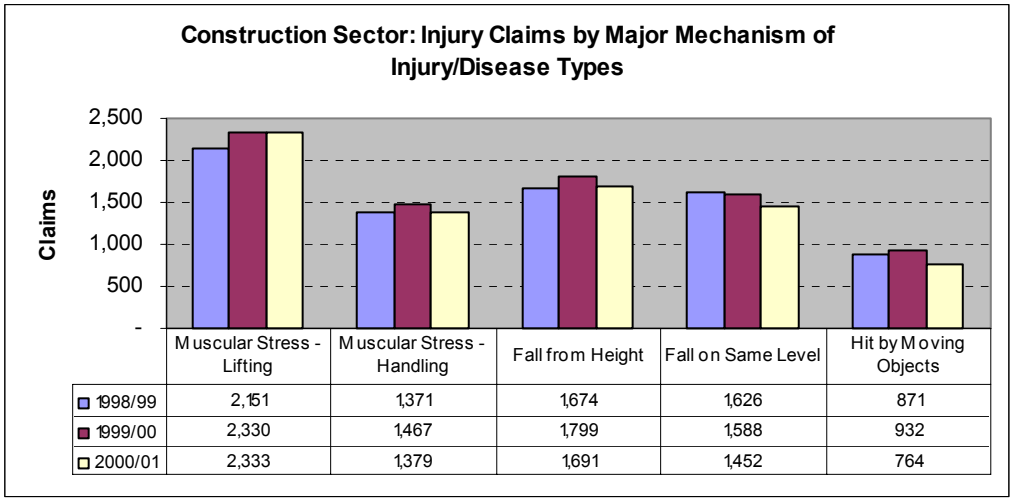


	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	7.3	9.8	6.8	2.1	8.1	9.7	5.8	5.0	
1999/00	7.2	8.9	6.5	3.6	6.8	9.1	4.0	4.0	6.3
2000/01	7.8	9.9	6.1	6.2	6.8	8.6	5.4	3.9	5.1

3.3 Injury trends in the industry: mechanism of injury

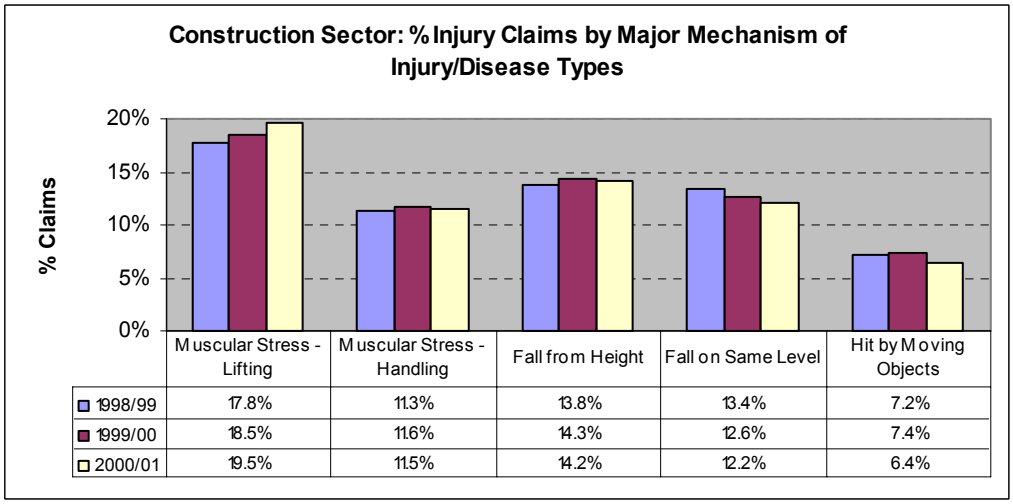
The 4th CPM report shows the most prevalent mechanism of injury in the building and construction industry for claims over 12 weeks is body stressing, followed by falls, trips and slips and being hit by moving objects. The falls category was well above the Australian average. The data analysis from this study shows that the number of muscular stress claims has not changed appreciably in the study period (Chart 6). Chart 7 shows that the share of claims in the major categories has remained stable with a slight increase in the share of muscular stress claims for lifting and handling (i.e. from 29.1% in 1998/99 to 31.0% in 2000/01).

Chart 6: Injury by mechanism



	Muscular Stress - Lifting	Muscular Stress - Handling	Fall from Height	Fall on Same Level	Hit by Moving Objects
1998/99	2,151	1,371	1,674	1,626	871
1999/00	2,330	1,467	1,799	1,588	932
2000/01	2,333	1,379	1,691	1,452	764

Chart 7: Injury by mechanism (%)

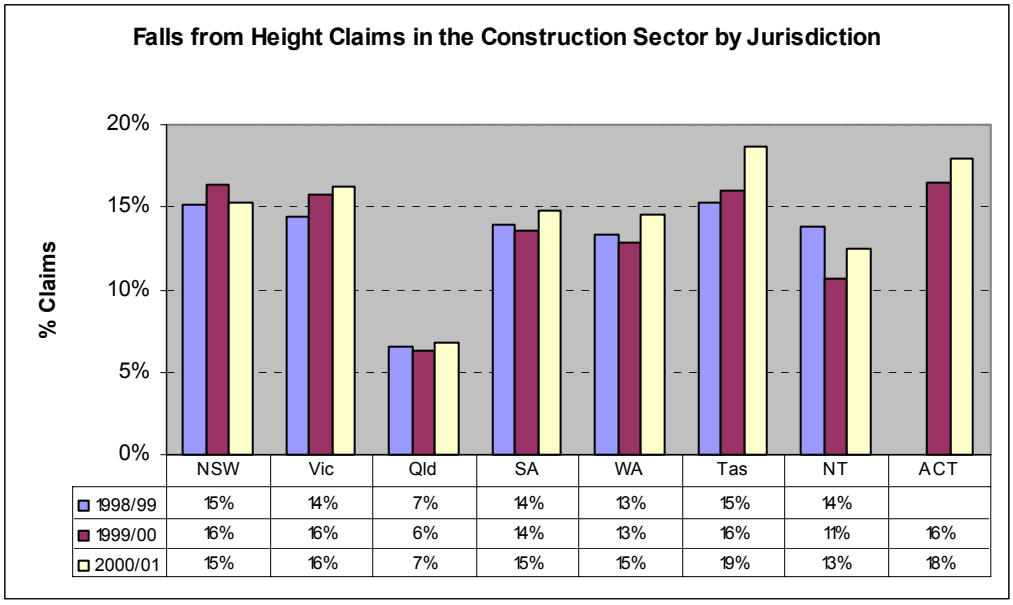


	Muscular Stress - Lifting	Muscular Stress - Handling	Fall from Height	Fall on Same Level	Hit by Moving Objects
1998/99	17.8%	11.3%	13.8%	13.4%	7.2%
1999/00	18.5%	11.6%	14.3%	12.6%	7.4%
2000/01	19.5%	11.5%	14.2%	12.2%	6.4%

In the important category of falls from heights some jurisdictions have seen slight increases in their share of such claims (Chart 8). The low share of claims in Queensland is the most striking feature of this table.

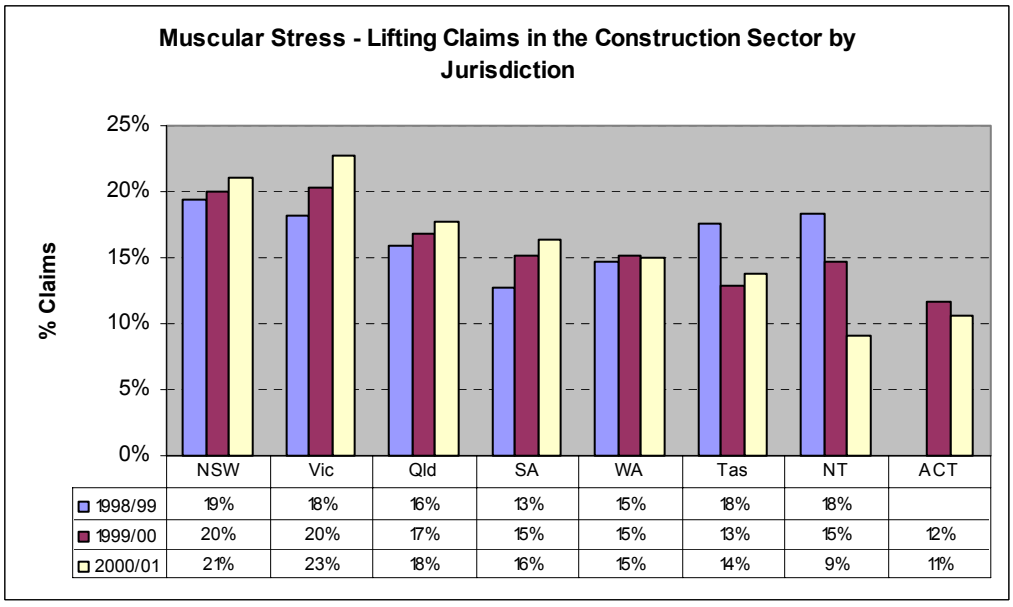
The proportion of muscular stress-handling claims is reducing in some jurisdictions (WA, NSW, NT, ACT) and increasing in others (Qld, Vic, SA, Tas) while muscular stress-lifting (Chart 9) claims are increasing in NSW, Vic, Queensland and SA while other jurisdictions are stable or reducing in proportion.

Chart 8: Falls from Height (%)



	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	15%	14%	7%	14%	13%	15%	14%	
1999/00	16%	16%	6%	14%	13%	16%	11%	16%
2000/01	15%	16%	7%	15%	15%	19%	13%	18%

Chart 9: Muscular Stress-Lifting (%)



	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	19%	18%	16%	13%	15%	18%	18%	
1999/00	20%	20%	17%	15%	15%	13%	15%	12%
2000/01	21%	23%	18%	16%	15%	14%	9%	11%

A breakdown of the share of injury mechanism for selected jurisdictions is shown in Statistical Supplement 1: Mechanism and Agency of Injury.

3.4 Injury trends in the industry: agency of injury

The agency of injury breakdown for the industry (Chart 10) shows that Fastening, Packing and Packaging Equipment (e.g. nails, chains, pallets) is 5% of claims, Ladders and Scaffolds (now separated from Other Non-powered Equipment) is 9% and Non-metallic Minerals and Substances (e.g. cement, bricks, tiles) is around 7%. Other Materials and Objects (including timber, glass and metal) are 14% and the Outdoor Environment is 10%.

The categories covered in the charts are detailed in Table 2.

Chart 10: Injury by agency (%)

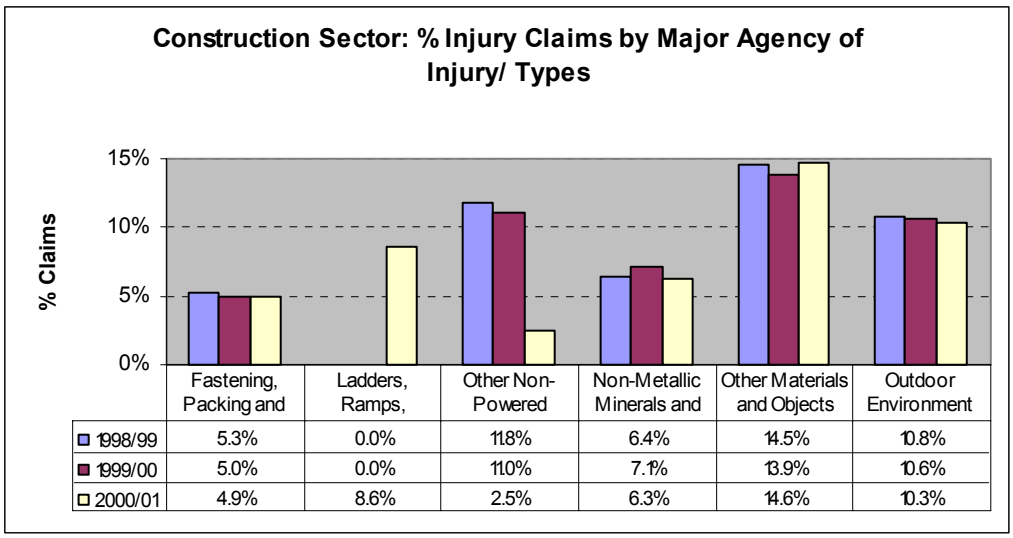
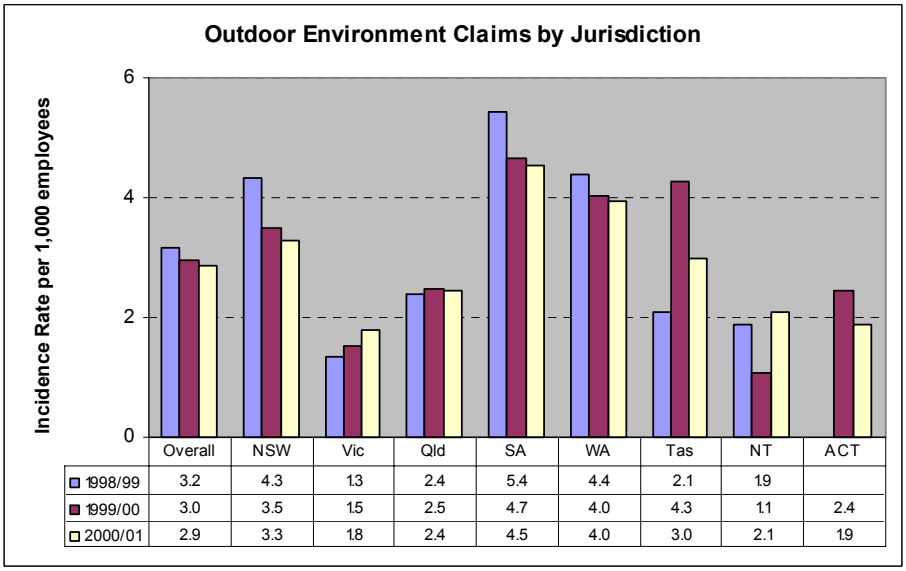


Chart 11 shows the incidence rate by jurisdiction for claims with the outdoor environment including weather, surfaces, building structures and fences as the agency of injury. NSW, WA and SA have the highest rates and the trend is a gradual reduction in rates. In Chart 12 the rates for other materials and objects is shown with no consistent trends. NSW has the highest incidence rates for this agency of injury claims.

Table 2: Type of Occurrence Classification

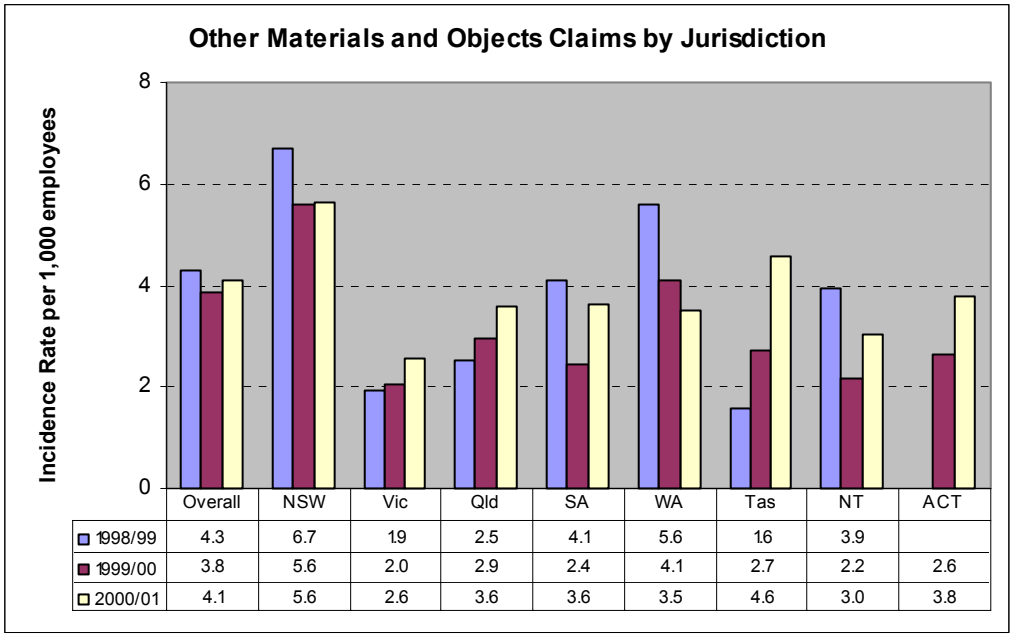
TOOC Code	Agency of Injury includes …
43 – Fastening, packing and packaging equipment	431 – Nails, screws, nuts and bolts 432 – String, twine, rope 433 – Wire, wire rope, metal strapping 434 – Chains 435 – Crates, cartons, boxes, cases, drums, kegs, barrels 436 – Pallets 437 – Bags, bundles and bales 438 – Rolls 439 – Other packing and fastening equipment
46 – Ladders, mobile ramps and stairways, scaffolding	461 – Ladders 462 – Mobile ramps and stairways 463 – Scaffolding
49 – Other non-powered equipment	490 – Refuse or waste bins 491 – Hypodermic syringes 492 – Other medical equipment 493 – Sporting equipment 494 – Playground/sports equipment 497 – Vehicle wheels and tyres 498 – Clothing and footwear 499 – Other equipment
61 – Non-metallic minerals and substances	611 – Abrasive powders 612 – Cement and lime 613 – Wet concrete 614 – Rocks, stones, boulders 615 – Bricks, tiles and concrete, cement and clay products NEC 616 – Dust NEC 617 – Crystalline silica 618 – Asbestos 619 – Other non-metallic minerals and substances
62 – Other materials and objects	621 – Oil and fat (animal or vegetable) 622 – Tree felled for processing or through clearing 623 – Sawn or dressed timber 624 – Ferrous and non-ferrous metal 625 – Fragments 626 – Broken glass 627 – Stationery and paper products 628 – Detached machine or equipment components 629 – Other materials and objects
71 – Outdoor environment	710 – Weather and water 711 – Sun 712 – Holes in the ground 713 – Wet, oily or icy traffic and ground surfaces 714 – Traffic and ground surfaces with hazardous objects 715 – Traffic and ground surfaces other 716 – Buildings and other structures 717 – Fencing 718 - Vegetation 719 – Other outdoor environmental agencies

Chart 11: Outdoor Environment Claims



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	3.2	4.3	1.3	2.4	5.4	4.4	2.1	1.9	
1999/00	3.0	3.5	1.5	2.5	4.7	4.0	4.3	1.1	2.4
2000/01	2.9	3.3	1.8	2.4	4.5	4.0	3.0	2.1	1.9

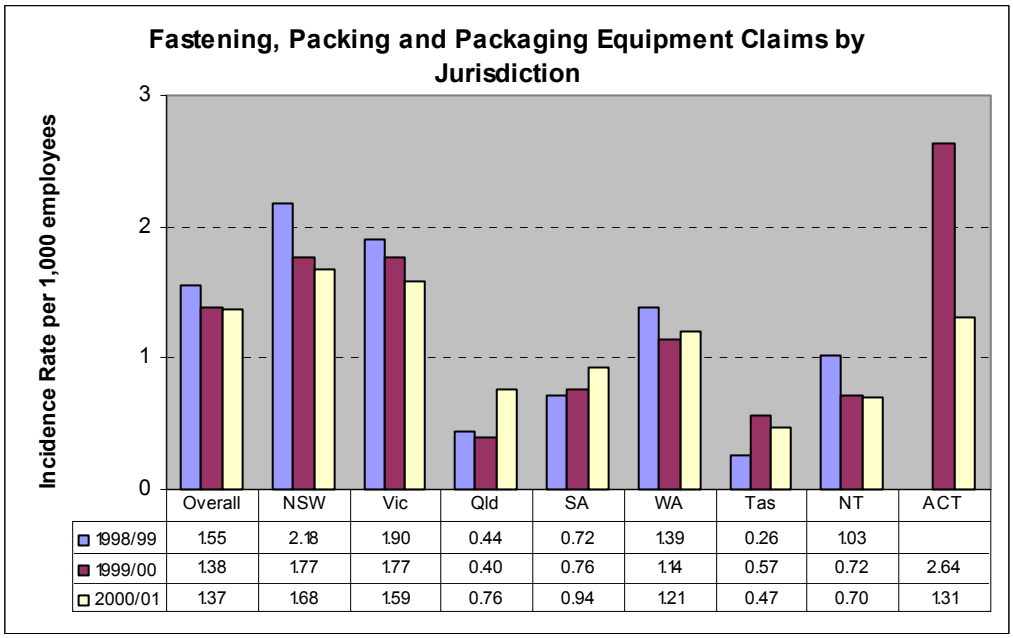
Chart 12: Other Materials



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	4.3	6.7	1.9	2.5	4.1	5.6	1.6	3.9	
1999/00	3.8	5.6	2.0	2.9	2.4	4.1	2.7	2.2	2.6
2000/01	4.1	5.6	2.6	3.6	3.6	3.5	4.6	3.0	3.8

Chart 13 indicates for fastening, packing and packaging equipment agency factors that NSW and Victoria have significantly higher incidence rates than other jurisdictions.

Chart 13: Fastening etc.



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	1.55	2.18	1.90	0.44	0.72	1.39	0.26	1.03	
1999/00	1.38	1.77	1.77	0.40	0.76	1.14	0.57	0.72	2.64
2000/01	1.37	1.68	1.59	0.76	0.94	1.21	0.47	0.70	1.31

A breakdown of the share of agency of injury for selected jurisdictions is shown in Statistical Supplement 1: Mechanism and Agency of Injury.

3.5 OHS performance and premium levels

The Fourth Comparative Performance Monitoring Report notes that the construction industry had the second highest premium rate and that despite reductions in claims rates the premium rate had increased in the study period. A complete set of data on industry rates and average premium rates was not available, but in Table 3 an outline of premium rates is shown. The rates shown below are drawn from the Head of Workers' Compensation Authority annual comparison and show a comparison between housing and non-residential rates.

Table 3: Industry rates 1999/2000 to 2000/2001 as % of wages/salaries

Jurisdiction	**1999/00**	**2000/01**
New South Wales		
Housing construction	10.52	9.86
Non residential construction	10.52	9.86
All Industries	2.80	2.80
Victoria		
Housing construction	4.78-5.78	4.78
Non residential construction	4.78	3.95
All Industries	2.18	2.22
Queensland		
Housing construction	3.676	3.416
Non residential construction	3.676	3.416
All Industries	1.75	1.55
Western Australia		
Housing construction	2.26	2.14
Non residential construction	4.82	3.76
All Industries	2.97	2.63
South Australia		
Housing construction	3.90	3.10
Non residential construction	4.50	3.80
All Industries	2.86	2.46

3.6 Fatalities

The relatively high level of fatalities in the building and construction industry, as noted in the CPM report, is one of the factors behind the attention given to health and safety practices and outcomes in the industry. Traditionally, construction, mining, transport and agriculture have been industries with high levels of workplace fatalities.

Within the three years in review there were 99 compensated fatalities[17] reported in the industry (Table 4).

Table 4: Compensated Fatalities 1998/1999 to 2000/01

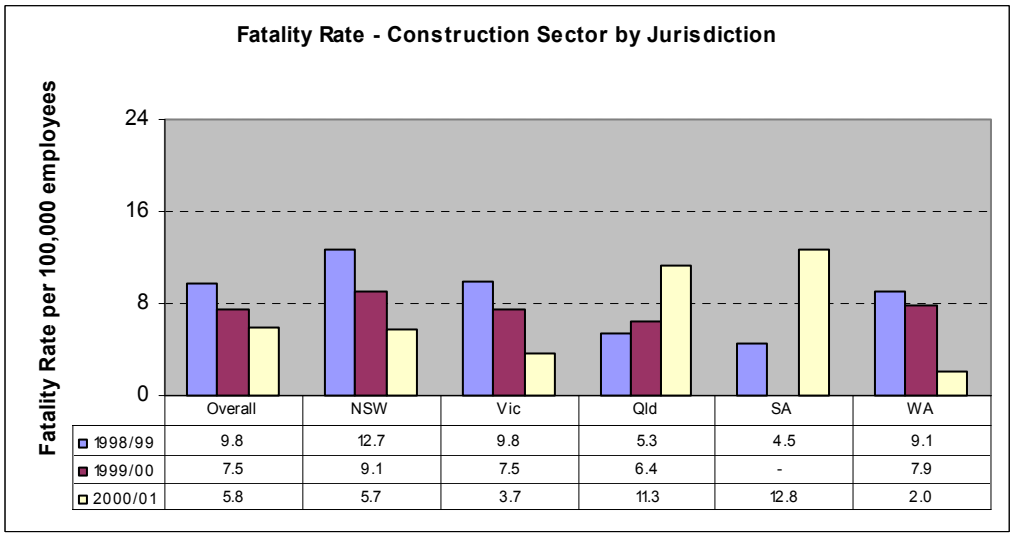
Jurisdiction	1998/99	1999/00	2000/2001	Total
NSW	19	16	9	44
Victoria	10	8	4	22
Queensland	4	5	8	17
SA	1	-	3	4
WA	4	4	1	9
Tasmania	1	-	-	1
NT	1	-	-	1
ACT	0	1	-	1
Total	**40**	**34**	**25**	**99**

Chart 14 shows the volatility in fatality data, especially for smaller jurisdictions which may have no fatalities for a number of years. However, in the larger jurisdictions (e.g. NSW, Vic and Queensland) trends can be observed over time, especially over 5 to 10 year periods. Over the three year period from 1998/99 the annual fatality rate in the construction industry across Australia has fallen by over one-third from 9.8 per 100,000 employees to 5.8.

Chart 15 shows that by far the highest fatality rates are in the Non-building Construction sector, which covers road and bridge building. Industries 421: Site Preparation Services and 422: Building Structure Services are the other industries with relatively high fatality levels.

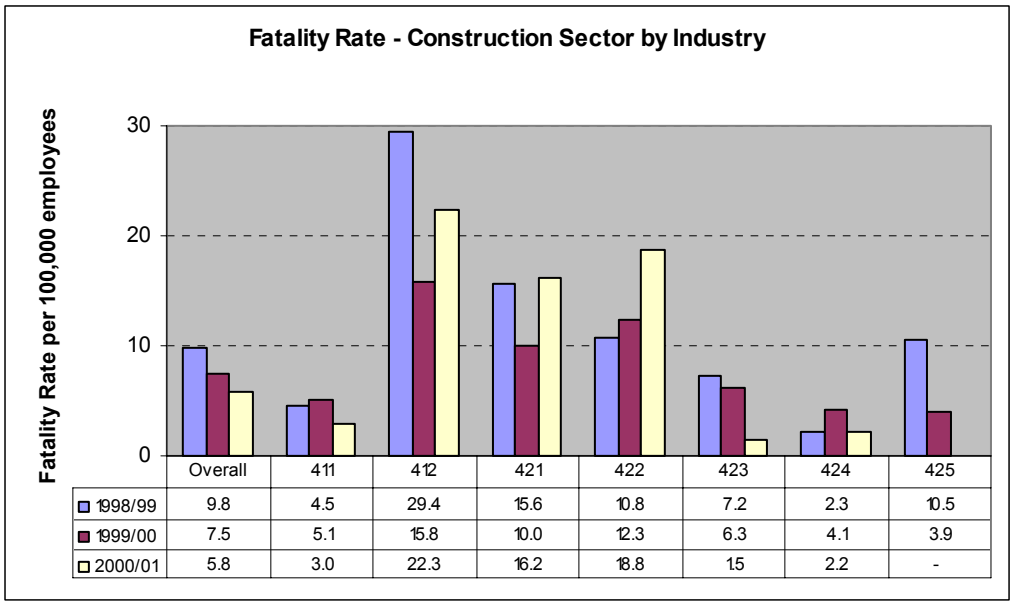
[17] Compensated fatalities are those resulting from traumatic injuries, excluding commuting claims and fatalities

Chart 14: Fatality Incidence Rate by Jurisdiction



	Overall	NSW	Vic	Qld	SA	WA
1998/99	9.8	12.7	9.8	5.3	4.5	9.1
1999/00	7.5	9.1	7.5	6.4	-	7.9
2000/01	5.8	5.7	3.7	11.3	12.8	2.0

Chart 15: Fatality Incidence Rate by Industry



	Overall	411	412	421	422	423	424	425
1998/99	9.8	4.5	29.4	15.6	10.8	7.2	2.3	10.5
1999/00	7.5	5.1	15.8	10.0	12.3	6.3	4.1	3.9
2000/01	5.8	3.0	22.3	16.2	18.8	1.5	2.2	-

This data does not include Victorian fatality data as breakdowns to industry sub group is not undertaken.

4 OUTCOME DATA AND STRUCTURAL FACTORS

Research into the building and construction industry has mainly concentrated on fatality and injury trends and has not looked closely at what has been called prevailing conditions and relational aspects. These terms are used in a National Occupational Health and Safety Commission (NOHSC) report into OHS data in Australia. The NOHSC report, Data on OHS in Australia[18], uses a three part model to consider the adequacy of data sources:

- The Prevailing Conditions encompass what are also called drivers of OHS and include such things as OHS education, training and legislation.
- The Relationships area considers how such Prevailing Conditions might be linked to, or are associated with, OHS Outcomes.
- The Outcomes are the health-related consequences of work activity, with injury and disease the most commonly described.[19]

The building and construction sector is typical of the profile of data found in the NOHSC review. There is ample outcome data, but little on prevailing conditions that might explain these outcomes. This study aims to address this gap where possible and a starting point is some of the published research on key factors that help explain OHS performance in the sector.

[18] National Occupational Health and Safety Commission, *Data on OHS In Australia: An Overview*, (2000), Sydney.
[19] ibid, p.11.

4.1 Explaining OHS performance in Building and Construction

4.1.1 Health and Safety Executive research reports

The Health and Safety Executive in the United Kingdom has commissioned a number of reports on building and construction.

A study in 1992[20] into the management, organisational and human factors in the construction industry set out to establish whether there were factors beyond the control of the individual worker that needed to be understood. A series of accidents were analysed and an alternative causation model was proposed that moves away from the traditional unsafe behaviour model. The model outlined four levels at which failures could be explained:

- Company policy level (e.g. poor methods of procurement)
- Project management level (e.g. poor scheduling of work)
- Site management level (e.g. poor supervision)
- Individual level (e.g. failure to follow instructions)

The study looked at the cultural climate that may impact on each of these levels and also asked managers what they thought were the factors that undermined safety on site. From interviews and analysis the study identified the following factors as most likely to compromise safety:

- Fluctuations in demand create an unstable commercial environment
- Short term contracting of labour and equipment leads to practices including:
    - Lack of effective supervision
    - Lack of accountability
    - Lack of consistency across sites
    - Lack of consideration of safety at planning stage
- Competitive tendering hampers attention to safety at initial stage
- Clients do not exercise influence over safety requirements
- Diversity of work means little learning about safety is transferred
- Organisational culture which sees time and cost pressures dominate decision making.

[20] Human Reliability Associates Ltd, *Research into management, organisational and human factors in the construction industry*, Contract research report 45/1992, Health and Safety Executive. UK, 1992.

The project recommended a series of practices that are based on more systematic management approaches and a greater emphasis on upstream design issues.

A research project released in 2000[21] commissioned by the HSE examined the factors that influenced injury outcomes and also looked at international trends in managing OHS in the construction sector. In the 5 year period between 1992 and 1998 there has been a slight decrease in the number and rate of fatal injuries. One of the profile features in this period is the relationship between injuries to employed workers and self employed workers. Employed workers had about twice the rate of injury to self employed workers.

A broad range of consultation was undertaken in the study to test various hypotheses about management of risk. In summary the study found:

- The construction specific regulations introduced in 1994 are believed to have had a positive impact;
- Despite labour market changes there has not been a corresponding increase in injury rates of self employed workers suggesting levels of reporting may be low amongst the self employed;
- Health and safety improvements are limited by the complexity of the industry;
- The knowledge of clients and designers is a potential barrier to OHS improvement;
- Use of standard technologies and systems is possible within the sector but the ability to implement is the main barrier;
- While it agreed that a positive health and safety culture is important the short term and diverse nature of the sector limits the establishment of any enduring culture;
- Most emphasis is placed on traditional physical hazards and least on health related hazards; and
- Enforcement of regulation is too sporadic to create a deterrence effect in the sector.

A review of practices in the USA, France and Sweden found some common issues and identified practices worthy of consideration in the UK. Overall the project concluded the following actions could improve health and safety in the construction industry:

[21] Entec. UK Ltd, Construction health and safety for the new Millennium, Contract Research Report 313/2000, HSE. UK (2000)

- Increase the awareness of clients to the role they can play in improving health and safety;
- Increase the effort directed to health issues in the sector through better health monitoring;
- Create a more positive health and safety culture, particularly through upgrading the skills of site managers;
- Exploit corporate concern about their reputation to make their performance more accountable;
- Increase efforts to upgrade competencies of operators;
- Create knowledge transfer pathways across the industry to reduce the weaknesses created by the diversity of the sector; and
- Increase the focus on design stages in the construction process.

A further research report released in 2001[22] undertook a task very similar to this project. The study analysed injury data in order to establish causal relationships and to build a model of "influence networks" in the sector.

The report summary of the nature of the construction industry is relevant to the Australian context:

"It is recognised that construction is a challenging regime in which to manage health and safety. It takes place in an inherently hazardous environment with direct exposure to height, forces, power etc; the conditions are constantly changing both physically and in relation to the parties involved; it embraces an enormous breadth of activities, project types and sizes of enterprise; it suffers a macho culture borne of a rugged history; it runs with low margins and incessant pressure on schedule and cost; and it is already subject to industry wide 'initiatives' to improve productivity etc."[23]

The study analysed injury report data for factors that may explain injury trends. The following variables were matched with injury data:

- Trade
- Accident kind
- Accident agent

[22] Bomel Ltd, Improving health and safety in construction: Phase 1 Data collection, review and structure, Contract Research Report 387/2001, HSE. UK (2001).
[23] ibid, p.0.5.

- Underlying cause
- Time of year
- Time of accident
- Employment status
- Age of injured
- Number of people on site
- Contractor's number of Great Britain employees
- Geographical region

From the data analysis the occupations most at risk are roofers, scaffolders, builders and plant operatives (hirers). Falls from height and collapse/overturn events are the most likely cause of an injury or death. The underlying cause of fatalities in these categories is "unsafe transient work" and "failure to control risks". These terms are used by the HSE in their coding of fatality investigations and whilst very generic suggest lack of job planning and predictability is a factor.

The study concluded that employment status was not significant unless coupled with trade type. A similar relational finding was made about size of firm:

> "There is some evidence to suggest that the risks associated with the size of a firm are mediated by the size of the construction site being worked on. Workers from large and small firms have fatal accidents on small sites but on large sites it is workers from small firms who tend to have such accidents".[24]

The factors that were considered to be unrelated to injuries were age, geographical location, time of day and time of year. The data sources used had limitations and thus the project looked at other research to create a model of influencing factors. The study notes that:

> "When deciding on which influences are important in construction safety, it is worth remembering that there is very little correspondence between raw accident data and the factors which are regarded as influencing these accidents. This means that there is limited scope for testing the validity of perceived influences in relation to accident trends".[25]

To address this disconnect between data and factors the project used a method called Influence Networks to map relationships between organisational and human factors and the

[24] ibid, p.4.41.
[25] ibid, p. 5.4.

incidence of errors resulting in injury. The model works back from the incident being investigated to three types of cause, human, hardware and external events. Below these direct causal categories are underlying influences that are the heart of the influence network. The model covers:

- **Direct performance** influences which directly influence the likelihood of an accident being caused. Relates to people and activity on site.
- **Organisational influences** which influence direct influences and reflect the culture, procedures and behaviour promulgated by the organisation. Relates to management and supervision of the work.
- **Policy level influences** which reflect the expectations of the decision makers in the employers of those at risk and the organisations they interface with (e.g. clients, suppliers, subcontractors). Relates to policies and practices at the level of contracting and working with clients.
- **Environmental level** influences which cover the wider political, regulatory, market and social influences which impact the policy influences. Relates to national or state level issues such as regulation and market conditions.

The methodology requires each element identified at each level (the study selected key elements from literature review) to be rated against a best to worst scale and then weight the influence up to the next level. For example, how does regulation at the environmental level influence contracting strategy at the next level and how is it weighted against other environmental influences? This process continues up the network and finally a network index is calculated to identify the critical pathways that explain risk and identify priorities for risk control.

The study conducted a range of focus groups with industry personnel to generate the ratings and influence network. The results of the initial rating based on the final event being a fall from height were that factors such as lack of situational awareness, lack of team work and failure to comply with requirements were the main problems at the direct level while inadequate training and inadequate attention to design were the problems identified at the organisational level.

Lack of client commitment to the life cycle risks of a project was an important policy level issue and market conditions and the low status of construction work were issues at the environmental level.

The ratings profile is shown below[26]. Further weighting of the factors in relation to the different influence levels was then undertaken. For example, at the policy level the contracting strategy has a high influence on organisation level issues such as training, management and supervision, equipment purchasing, design for safe construction and pay and conditions[27].

Figure 1: Influence Network Model

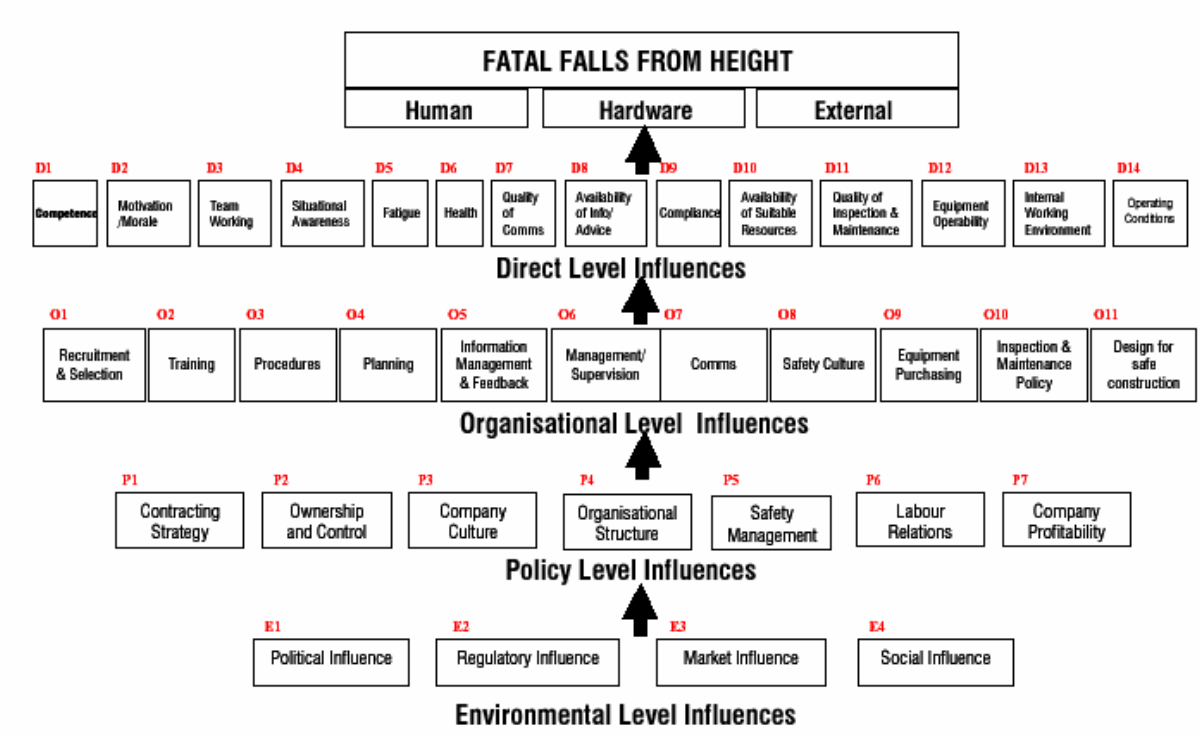


Figure 8.1 Workshop Influence Network with Shorthand IDs in Red

4.1.2 Victorian WorkCover Authority Report

In 2001 the Monash University Accident Research Centre (MUARC) completed a study commissioned by the Victorian WorkCover Authority on serious injury risk in the construction industry.[28]

[26] ibid, p.8.15.
[27] ibid, p. 8.18.
[28] Monash University Accident Research Centre, *Reducing serious injury risk in the construction industry*, a report prepared for the Victorian WorkCover Authority, 2001.

The study incorporated an earlier analysis of claims data by Larsson and Field[29] for the Victorian WorkCover Authority that identified 11 occupational groups and the matching hazards or injury "blackspots" for each group. The groups were:

- Painters (Falls from height, especially ladders and stepladders)
- Crane, earthmoving operators (Falls and manual handling of vehicle attachments)
- Bricklayers (Falls from height, predominantly from scaffolding)
- Plasterers (Falls from equipment they stand on while working)
- Tilers, pavers, concreters (Manual materials handling)
- Steelworkers (Falls from height)
- Roof layers (Falls from roof, power tools)
- Plumbers (Falls from height)
- Carpenters (Power tools and falls from height.)
- Electricians (Falls from height, electrical safety)
- Other construction workers (Falls from height, power tools)

From an analysis of these occupations the direct causes were identified. For example, the risk of fall from heights to bricklayers was related to non-compliant scaffolds while for painters the risk resulted from hazardous work performed on ladders. In the context of the HSE influence network model this research does not move away from the direct causes and try and explain why some of these practices are common.

A survey of 60 construction companies was also undertaken and generated a broad range of responses, including the perceptions of various occupations about the risky aspects of their job.

The different types of construction activity also involved different hazards. For example, the commercial sector had hazards arising from the interaction of trades and activities within confined areas.

The study also sought the views of inspectors on the hazards in the industry.

[29] Larsson., T and Field,. B, *The Distribution of Occupational Injury Risks in the Victorian Construction Industry*, a report prepared for the Victorian WorkCover Authority, 2001

Using these data sources the study concluded that:

- The four main injury risk types were falls from heights, exchange of energy (mobile equipment, power tools etc.), overexertion and chemical exposure;
- Each sector within the industry needs to be treated individually;
- Focus on controls not risk assessments where hazards are well known;
- Incorporate safety into the tendering process;
- Focus on design issues; and
- Upgrade enforcement effort to better control the sub contracted chain of responsibility.

4.1.3 Queensland Work Plan initiative

A study[30] examined the effectiveness of work plans used in the Queensland construction industry following their inclusion in the Workplace Health and Safety Regulations. The regulations required principal contractors, demolishers, employers and the self-employed (contractors and sub-contractors) to prepare Workplace Health and Safety work plans prior to commencing work.

The requirement applied to any site, if the value of the work exceeded $40,000 and if the work involved excavation to a depth of 1.5 metres or more; the work was done by someone who could fall more than 2.4 metres; or the work involved removing, sealing or inspecting for asbestos. By completing a work plan, the obligation holder provides evidence of measures taken to comply with the obligation holder's obligation to remove, or minimise, OHS risks. The plans are built around a risk assessment framework and as such common issues around this topic were identified.

Uptake was typically better in larger employers and typically low with smaller parts of the building industry. The ability of principals to bring smaller contractors through using these plans was recognised as an important mechanism for influencing smaller employers.

[30] National Occupational Health and Safety Commission, *Evaluation of Queensland Construction Safety 2000 Initiative*, report prepared by Richard Johnstone, February 1999.

The study suggests four factors account for the level of awareness of the work plan requirement within the construction industry:

- the degree to which the individual inspectors promote and enforce the requirement and the extent to which they are able to reach obligation holders;
- the extent to which industry associations are able to reach people in the industry, and the extent to which they promote the work plans:
- the extent to which information about the work plans is conveyed by word of mouth;
- the extent to which contractors are required by principal contractors to produce work plans.

One of the issues in assessing the effectiveness of the work plans was the shift in thinking they motivated. Ready made plans that encouraged a 'tick and flick' approach were seen as counter productive by inspectors as it really constituted paper compliance and no guarantee that hazards would be managed consistently.

The study found that while the self-regulatory approach had promise it needed to be better understood by both duty holders and inspectors for it to be an effective adjunct to the existing regulatory regime.

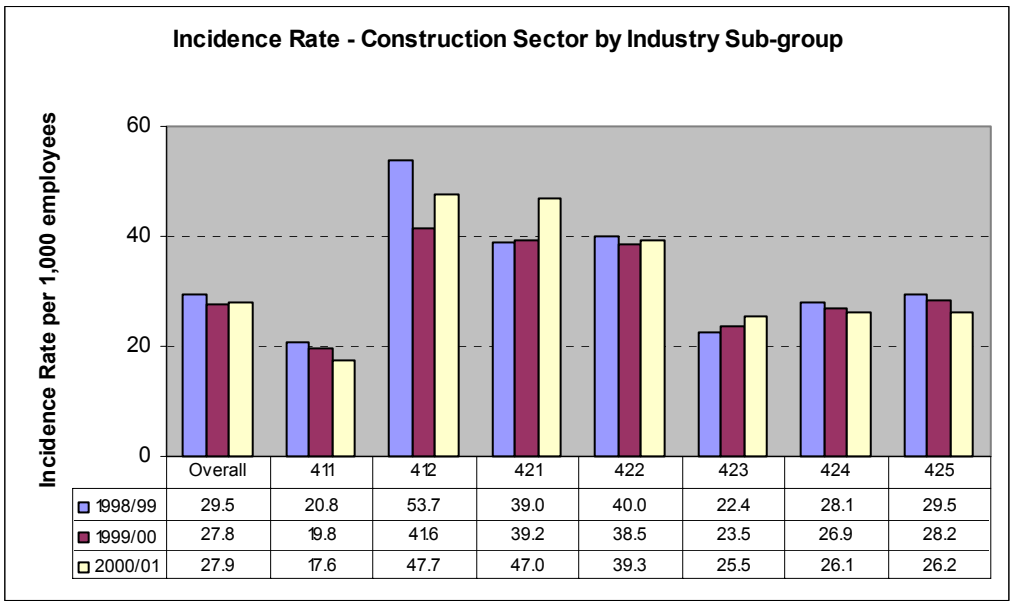
4.2 Analysis of structural factors

In the previous section research into structural factors that may influence OHS outcomes in the building and construction industry were outlined. In this section analysis of structural factors for which there is available data is undertaken. The structural factors included in the analysis below are industry sub group, age, size and occupation.

4.2.1 Incidence rates in industry sub groups

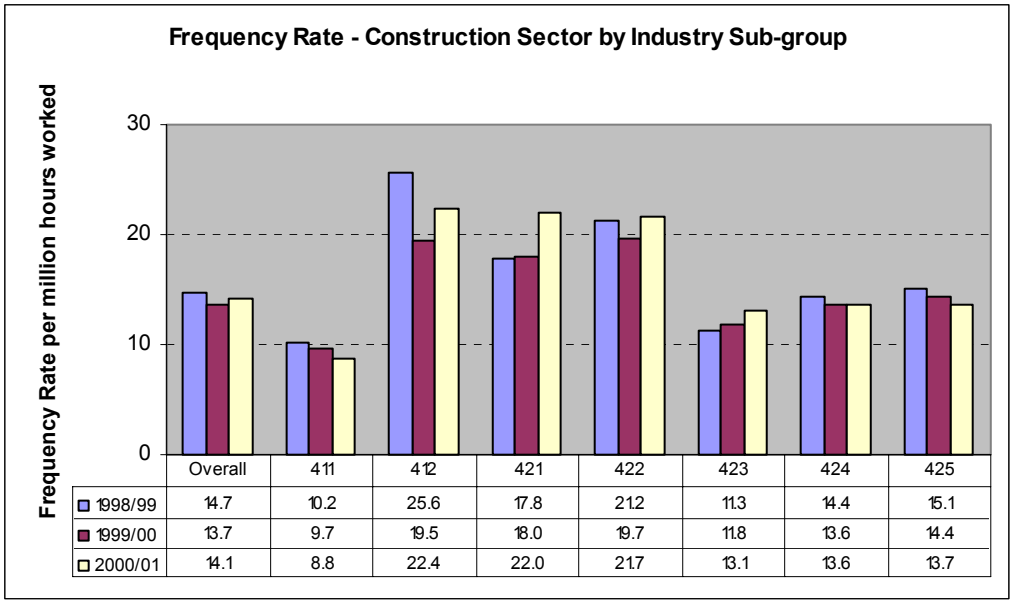
The building and construction industry is made up of diverse activities and these are captured under the ANZSIC classification. Differences in risk exposure are found in these industry sub groups and these may influence claims performance. Incidence and frequency Charts 16 and 17 show similar patterns and incidence rates will again be the measure for further analysis. 411: Building Construction has the lowest rate and 412: Non-Building Construction has the highest incidence rate along with 421: Site Preparation Services and 422: Building Structure Services. There has been little variation over the three years.

Chart 16: Incidence rate by industry sub group



	Overall	411	412	421	422	423	424	425
1998/99	29.5	20.8	53.7	39.0	40.0	22.4	28.1	29.5
1999/00	27.8	19.8	41.6	39.2	38.5	23.5	26.9	28.2
2000/01	27.9	17.6	47.7	47.0	39.3	25.5	26.1	26.2

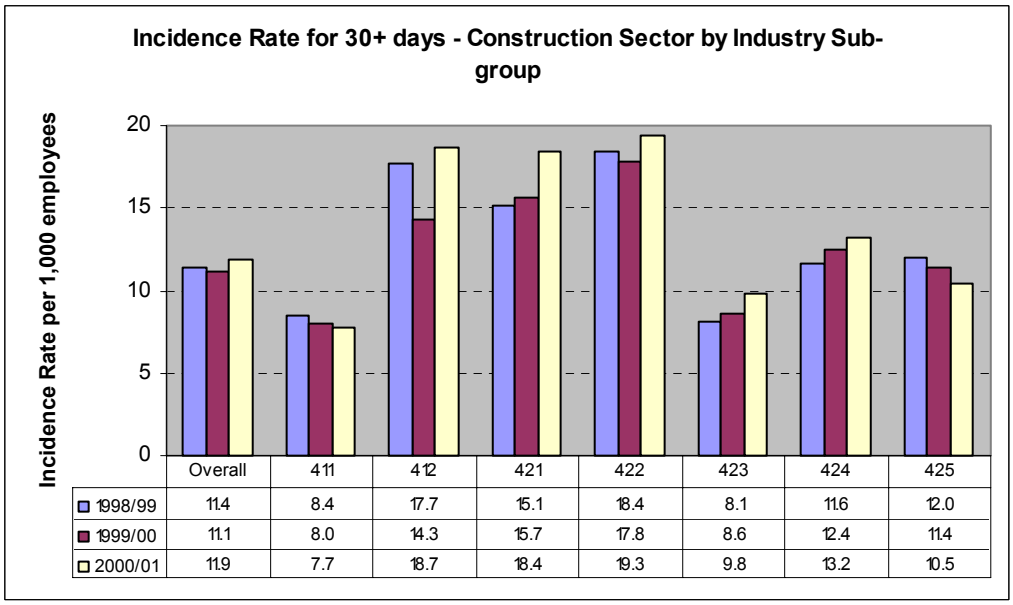
Chart 17: Frequency rate by industry sub group



	Overall	411	412	421	422	423	424	425
1998/99	14.7	10.2	25.6	17.8	21.2	11.3	14.4	15.1
1999/00	13.7	9.7	19.5	18.0	19.7	11.8	13.6	14.4
2000/01	14.1	8.8	22.4	22.0	21.7	13.1	13.6	13.7

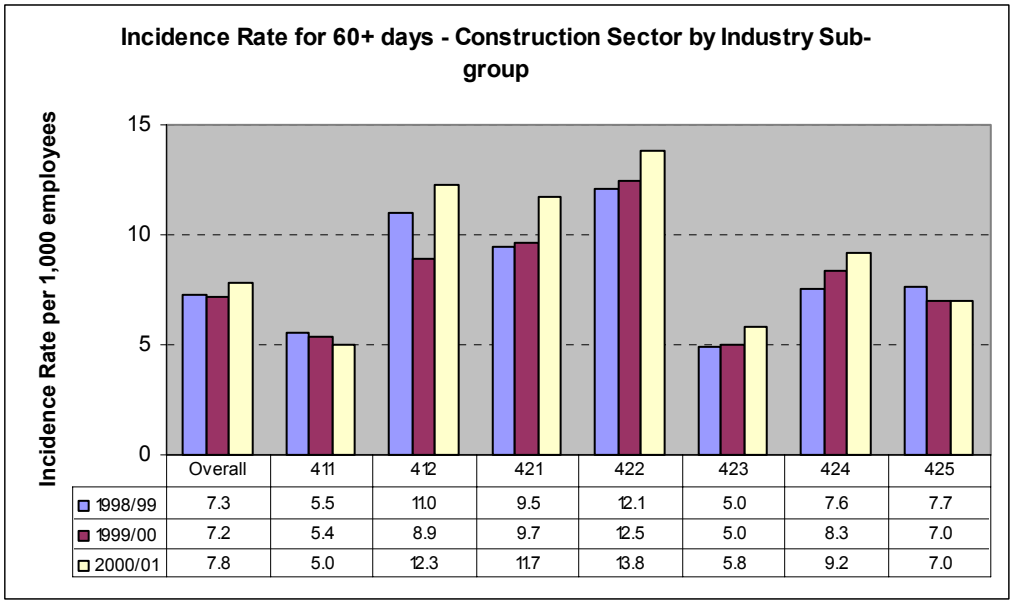
Charts 18 and 19 on long duration claims show similar patterns to overall incidence rates with 422: Building Structure Services the highest rate for longer term claims. About two thirds of 30+ day claims continue on to 60+ day claims.

Chart 18: Incidence rate 30+ days by industry sub group



	Overall	411	412	421	422	423	424	425
1998/99	11.4	8.4	17.7	15.1	18.4	8.1	11.6	12.0
1999/00	11.1	8.0	14.3	15.7	17.8	8.6	12.4	11.4
2000/01	11.9	7.7	18.7	18.4	19.3	9.8	13.2	10.5

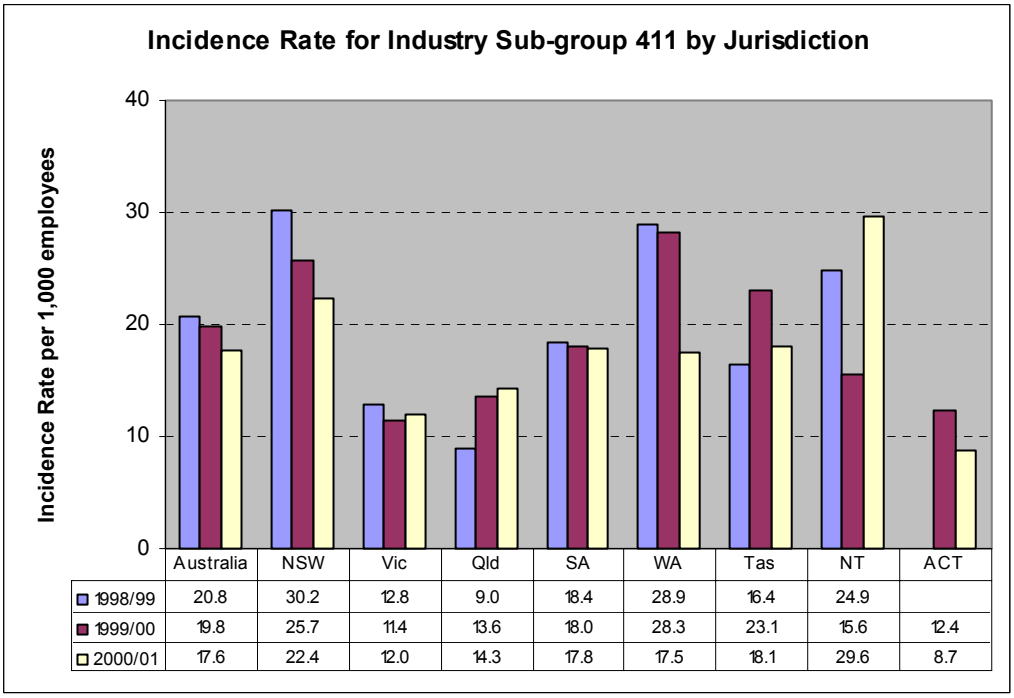
Chart 19: Incidence rate 60+ days by industry sub group



	Overall	411	412	421	422	423	424	425
1998/99	7.3	5.5	11.0	9.5	12.1	5.0	7.6	7.7
1999/00	7.2	5.4	8.9	9.7	12.5	5.0	8.3	7.0
2000/01	7.8	5.0	12.3	11.7	13.8	5.8	9.2	7.0

In the next section incidence rates for each industry sub group and jurisdiction are shown. Chart 20 breaks down rates for 411: Building Construction for each jurisdiction and shows 411 is low across all jurisdictions, with even NSW and WA peaking at or below 30. Victoria, ACT and Queensland have the lowest rates.

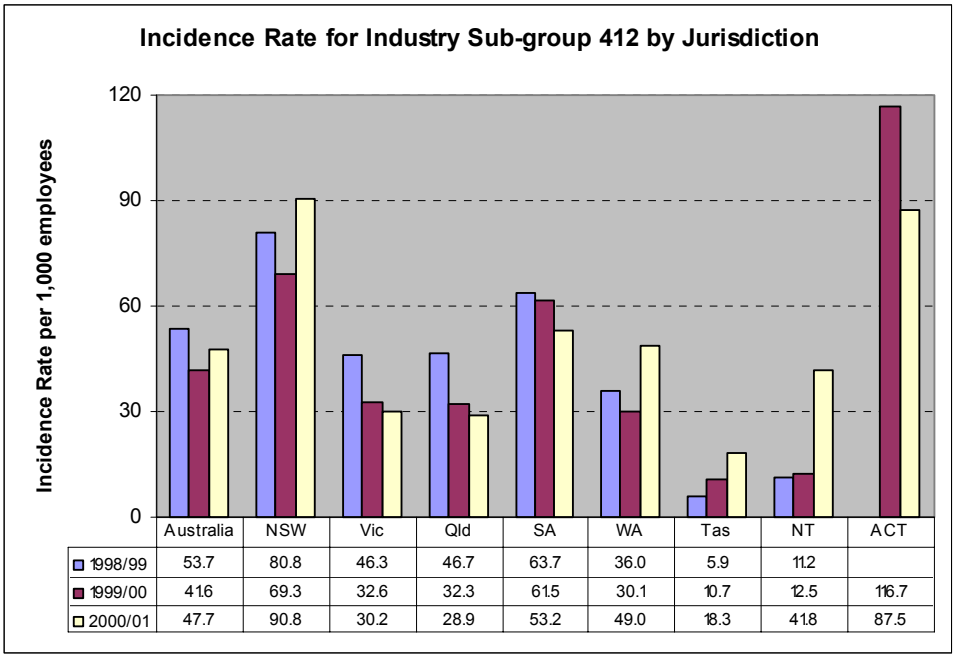
Chart 20: Incidence rate by industry sub group 411



	Australia	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	20.8	30.2	12.8	9.0	18.4	28.9	16.4	24.9	
1999/00	19.8	25.7	11.4	13.6	18.0	28.3	23.1	15.6	12.4
2000/01	17.6	22.4	12.0	14.3	17.8	17.5	18.1	29.6	8.7

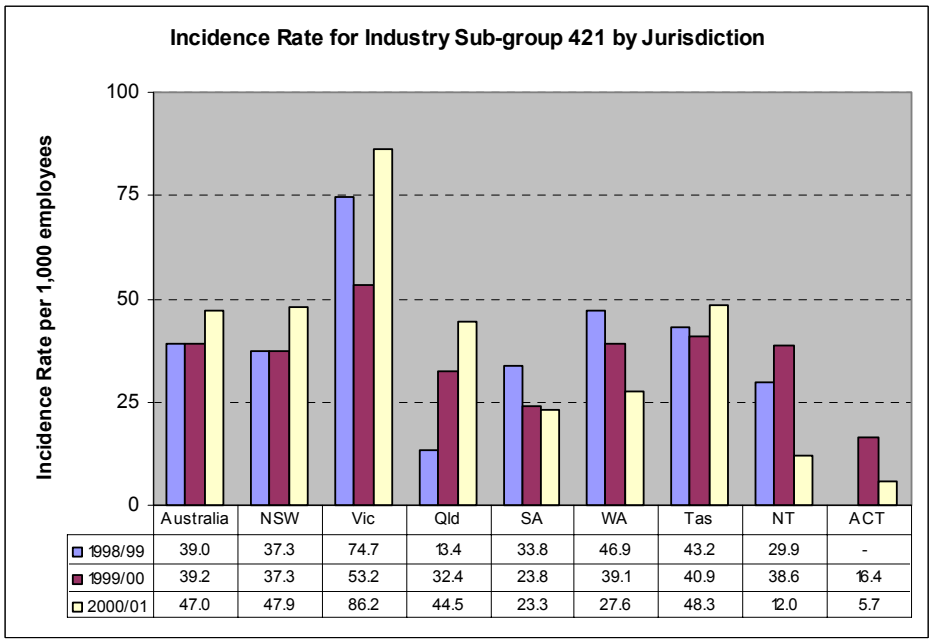
Chart 21 for 412: Non-Building Construction shows much higher incidence rates than 411 across all jurisdictions. The overall rate is driven by NSW at 70-90, compared to Victoria at 30-45. SA is relatively high with WA below its usual high level. Chart 22 for 421: Site Preparation Services shows that against all other trends, Victoria's poor performance is driving the incidence rate in this industry. WA and SA are improving and the other jurisdictional relativities are stable which suggests that Victoria is performing worse and not that all other jurisdictions are better. 2000/01 has also been worse than previous years.

Chart 21: Incidence rate by industry sub group 412



	Australia	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	53.7	80.8	46.3	46.7	63.7	36.0	5.9	11.2	
1999/00	41.6	69.3	32.6	32.3	61.5	30.1	10.7	12.5	116.7
2000/01	47.7	90.8	30.2	28.9	53.2	49.0	18.3	41.8	87.5

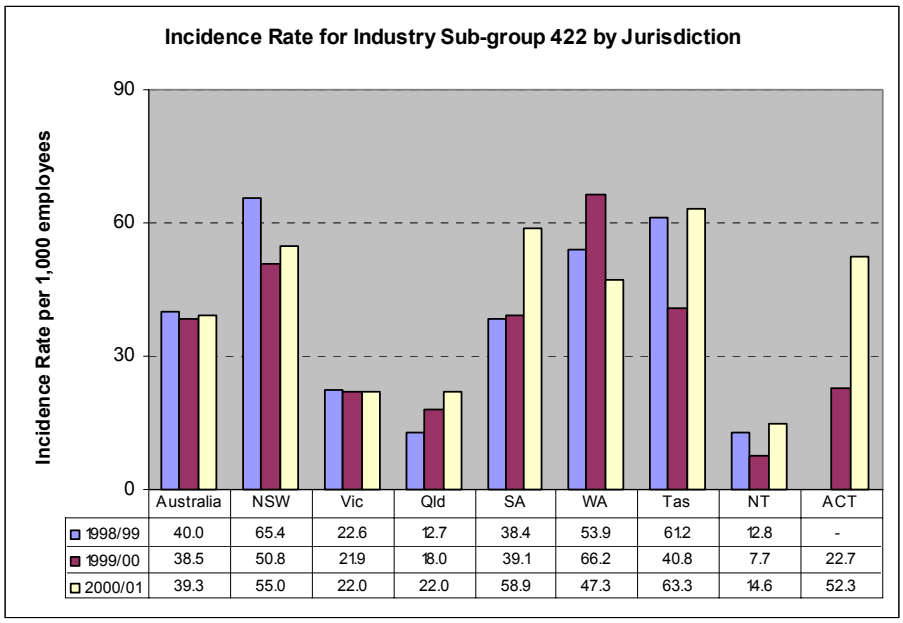
Chart 22: Incidence rate by industry sub group 421



	Australia	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	39.0	37.3	74.7	13.4	33.8	46.9	43.2	29.9	-
1999/00	39.2	37.3	53.2	32.4	23.8	39.1	40.9	38.6	16.4
2000/01	47.0	47.9	86.2	44.5	23.3	27.6	48.3	12.0	5.7

Rates for 422: Building Structure Services are shown in Chart 23 and confirm the standard profile. Queensland is very low but increasing and SA had high rates in 2000/01.

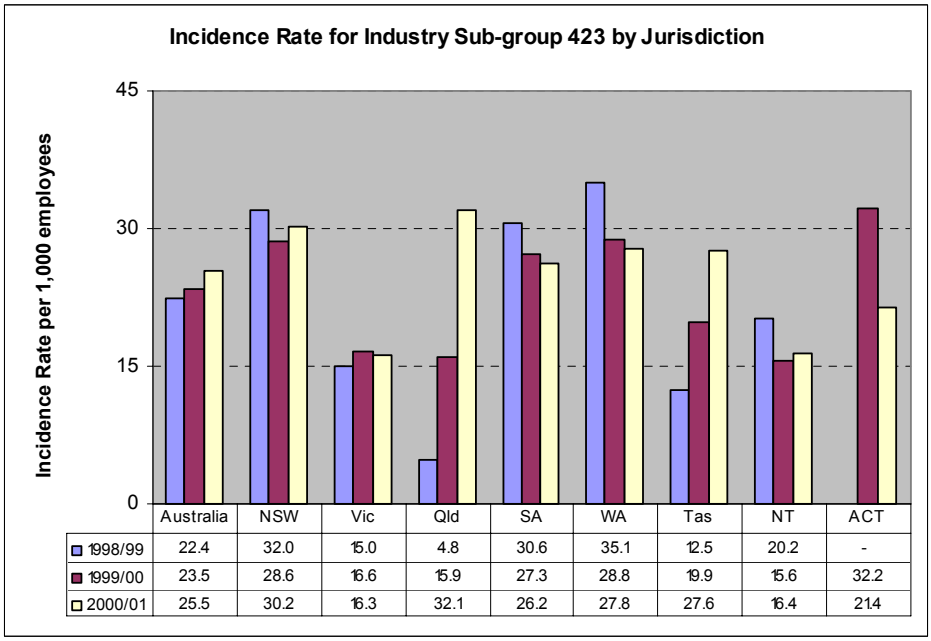
Chart 23: Incidence rate by industry sub group 422



	Australia	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	40.0	65.4	22.6	12.7	38.4	53.9	61.2	12.8	-
1999/00	38.5	50.8	21.9	18.0	39.1	66.2	40.8	7.7	22.7
2000/01	39.3	55.0	22.0	22.0	58.9	47.3	63.3	14.6	52.3

Chart 24 shows rates for 423: Installation Trade Services. The dramatic change in Queensland over the review period is the highlight. There has been significant contraction of the Queensland industry (employee numbers have reduced from 14,584 to 10,629 over the three year period) yet claims are up from 70 in 1998/99 to 340 in 2000/01.

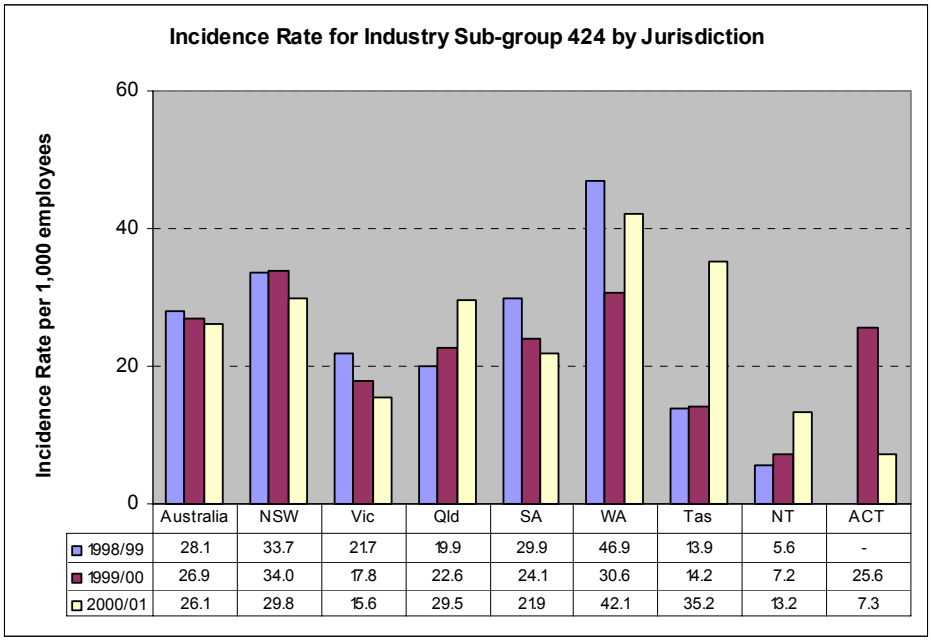
Chart 24: Incidence rate by industry sub group 423



	Australia	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	22.4	32.0	15.0	4.8	30.6	35.1	12.5	20.2	-
1999/00	23.5	28.6	16.6	15.9	27.3	28.8	19.9	15.6	32.2
2000/01	25.5	30.2	16.3	32.1	26.2	27.8	27.6	16.4	21.4

424: Building Completion Services in Chart 25 shows some improvement at the national level driven by NSW, Victoria and SA. Queensland is increasing against the trend, and as for industry 423 there is claims growth despite a contracting industry.

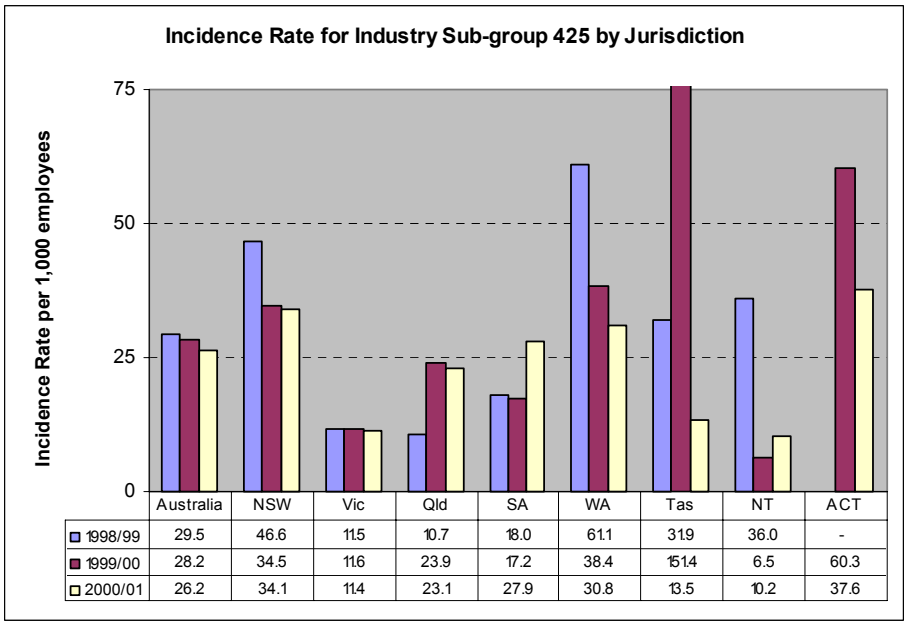
Chart 25: Incidence rate by industry sub group 424



	Australia	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	28.1	33.7	21.7	19.9	29.9	46.9	13.9	5.6	-
1999/00	26.9	34.0	17.8	22.6	24.1	30.6	14.2	7.2	25.6
2000/01	26.1	29.8	15.6	29.5	21.9	42.1	35.2	13.2	7.3

Chart 26 for 425: Other Construction Services shows that Victoria has low rates and that Tasmania experienced a six fold increase in rates in 1999/00.

Chart 26: Incidence rate by industry sub group 425

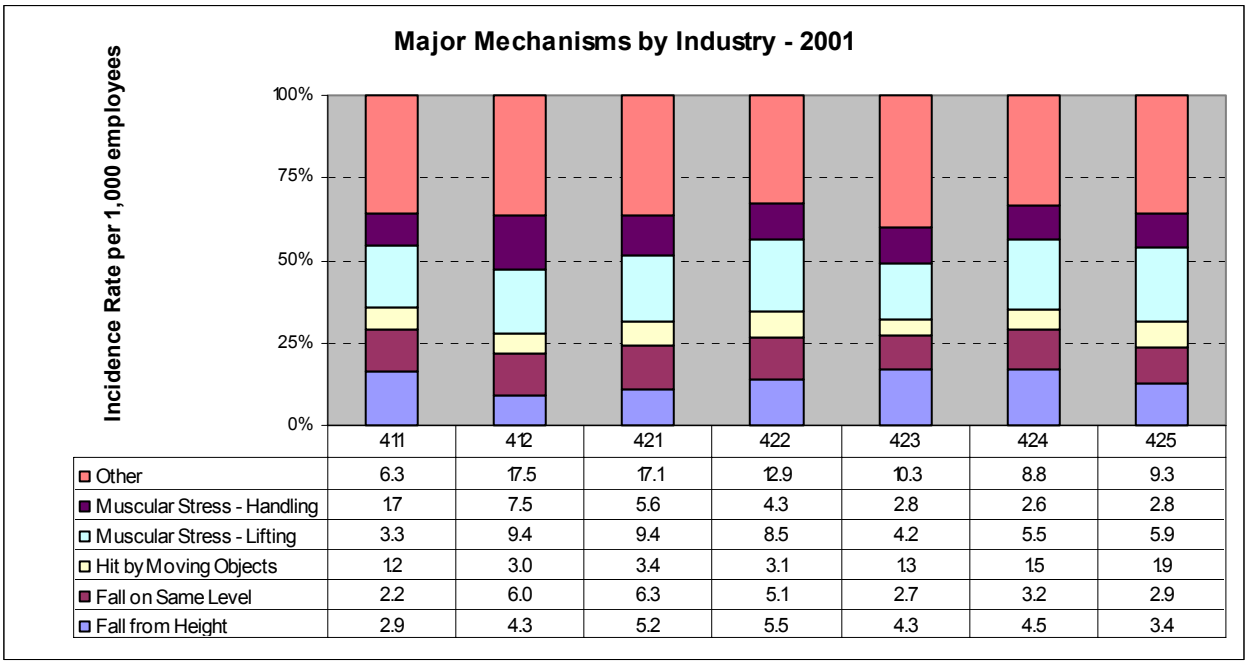


	Australia	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1998/99	29.5	46.6	11.5	10.7	18.0	61.1	31.9	36.0	-
1999/00	28.2	34.5	11.6	23.9	17.2	38.4	151.4	6.5	60.3
2000/01	26.2	34.1	11.4	23.1	27.9	30.8	13.5	10.2	37.6

4.2.2 Mechanism and Agency of injury across industry sub groups

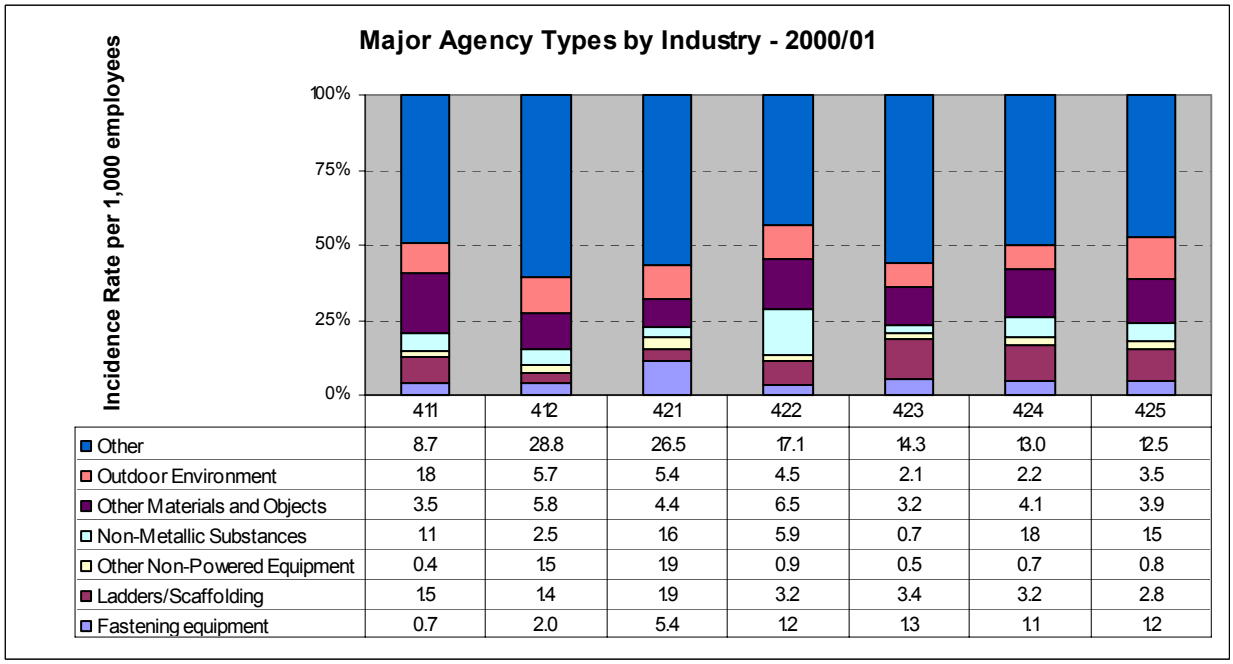
Chart 27 on mechanism of injury across industry sub groups (2000/01) does not highlight major differences although 412 and 421 are low on lifting claims. Falls from heights are constant throughout, although marginally lower among 423 (e.g. plumbers and electricians). Falls on the same level are proportionally higher in 421 and 422, but not much.

Chart 27: Mechanism by industry sub group (2000/2001)



	411	412	421	422	423	424	425
Other	6.3	17.5	17.1	12.9	10.3	8.8	9.3
Muscular Stress - Handling	1.7	7.5	5.6	4.3	2.8	2.6	2.8
Muscular Stress - Lifting	3.3	9.4	9.4	8.5	4.2	5.5	5.9
Hit by Moving Objects	1.2	3.0	3.4	3.1	1.3	1.5	1.9
Fall on Same Level	2.2	6.0	6.3	5.1	2.7	3.2	2.9
Fall from Height	2.9	4.3	5.2	5.5	4.3	4.5	3.4

Chart 28: Agency by industry sub group (2000/2001)



	411	412	421	422	423	424	425
Other	8.7	28.8	26.5	17.1	14.3	13.0	12.5
Outdoor Environment	1.8	5.7	5.4	4.5	2.1	2.2	3.5
Other Materials and Objects	3.5	5.8	4.4	6.5	3.2	4.1	3.9
Non-Metallic Substances	1.1	2.5	1.6	5.9	0.7	1.8	1.5
Other Non-Powered Equipment	0.4	1.5	1.9	0.9	0.5	0.7	0.8
Ladders/Scaffolding	1.5	1.4	1.9	3.2	3.4	3.2	2.8
Fastening equipment	0.7	2.0	5.4	1.2	1.3	1.1	1.2

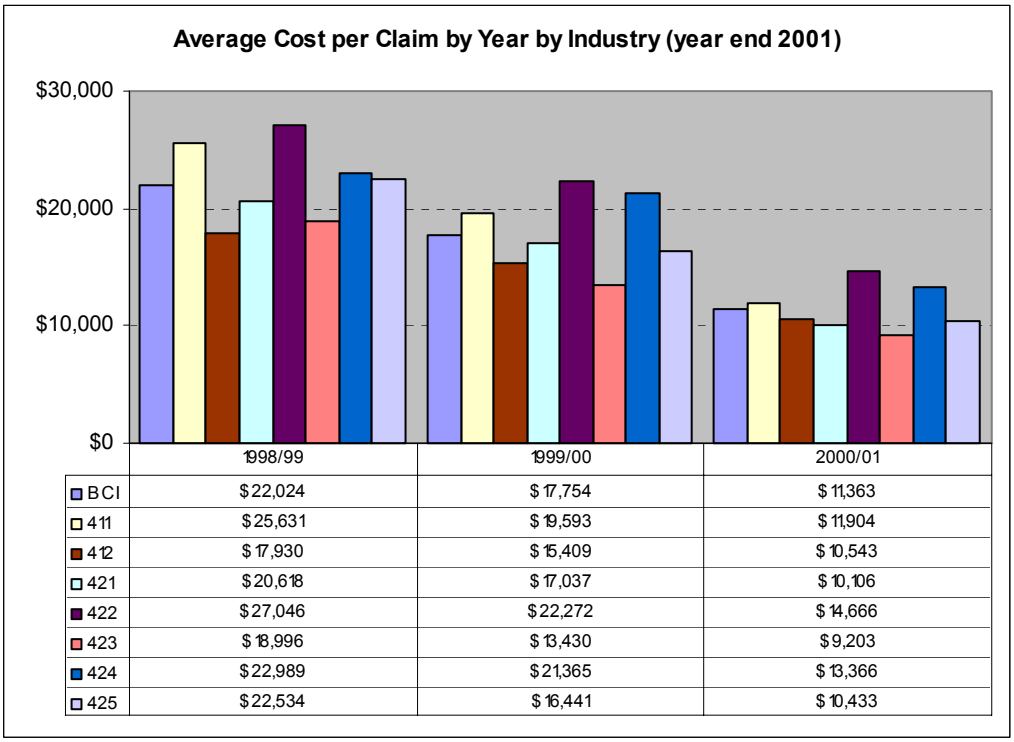
Comparisons of agency of injury across industry sub groups are shown in Chart 28. Notably, although 411: Building Construction has a much lower incidence rate than other industries, the distribution by Agency of Injury does not show a disproportionately low level of any type of agency (from those 50% listed). This suggests that the reason for 411's low incidence rate is not related to Agency of Injury. However, 421 has a high % of fastening, packing and packaging equipment and 422 has high levels of non-metallic substances (e.g. timber, bricks, glass).

4.2.3 Cost of claims

Chart 1 showed that the average compensation cost per claim for 1998/99 was around $20-25,000 as at the end of 2001. This figure is increasing as claims mature.

Chart 30 shows that average compensation costs by industry are also consistently around $18-25,000 in 1998/99. Industry sub group 422 is generally higher than other industries (driven by NSW) with 423 lower (linked to Queensland and the growth in claims in that industry in later years).

Chart 30: Cost of Claims by Year by Industry sub group

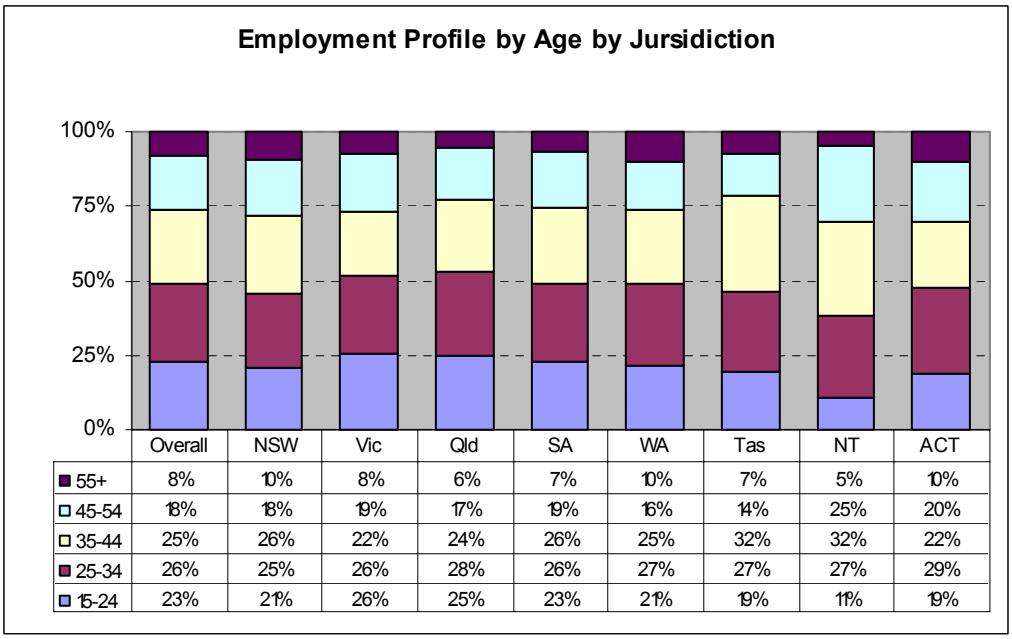


	1998/99	1999/00	2000/01
BCI	$22,024	$17,754	$11,363
411	$25,631	$19,593	$11,904
412	$17,930	$15,409	$10,543
421	$20,618	$17,037	$10,106
422	$27,046	$22,272	$14,666
423	$18,996	$13,430	$9,203
424	$22,989	$21,365	$13,366
425	$22,534	$16,441	$10,433

4.2.4 Age

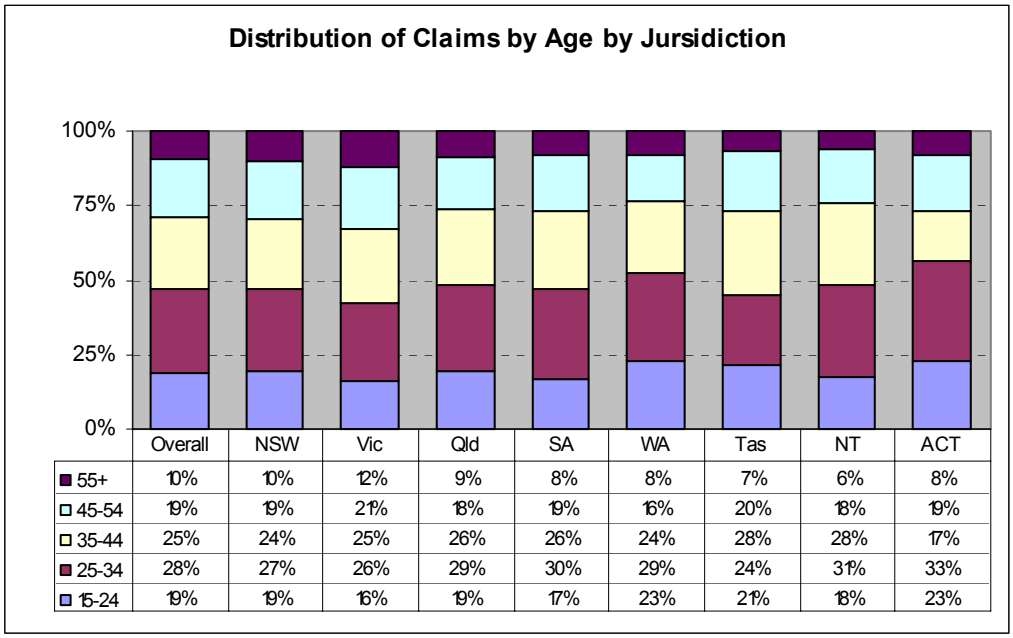
The overall age distribution within the construction workforce is shown in Chart 31.

Chart 31: Employment by Age (2000/2001)



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
55+	8%	10%	8%	6%	7%	10%	7%	5%	10%
45-54	18%	18%	19%	17%	19%	16%	14%	25%	20%
35-44	25%	26%	22%	24%	26%	25%	32%	32%	22%
25-34	26%	25%	26%	28%	26%	27%	27%	27%	29%
15-24	23%	21%	26%	25%	23%	21%	19%	11%	19%

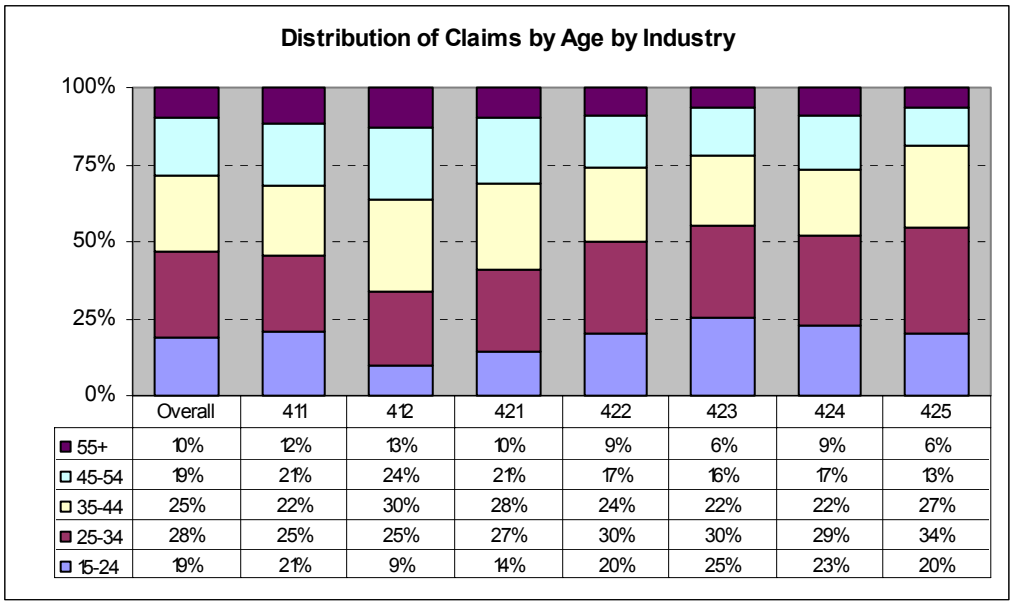
Chart 32: Claims by Age by Jurisdiction (2000/2001)



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
55+	10%	10%	12%	9%	8%	8%	7%	6%	8%
45-54	19%	19%	21%	18%	19%	16%	20%	18%	19%
35-44	25%	24%	25%	26%	26%	24%	28%	28%	17%
25-34	28%	27%	26%	29%	30%	29%	24%	31%	33%
15-24	19%	19%	16%	19%	17%	23%	21%	18%	23%

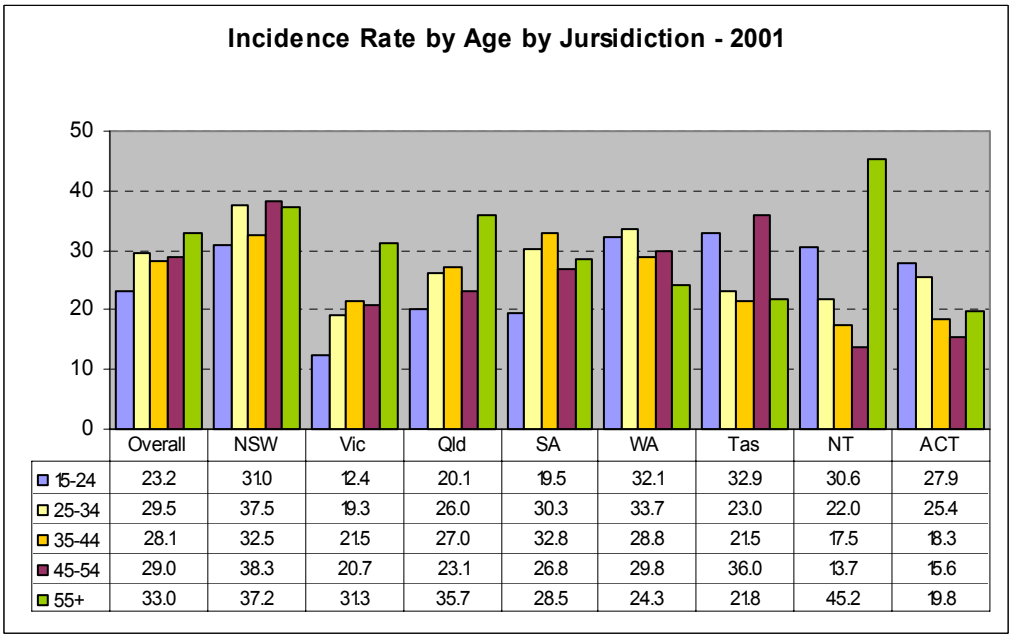
Using the claims data base the following charts show age trends. Chart 32 shows Victoria has the oldest claimant profile (i.e. highest % of claimants 55+) and Western Australia the youngest profile which is opposite to the overall employment age profile. In Chart 33 showing age by industry sub group 412 has a significantly older claimant profile and 423 and 424 have younger profiles.

Chart 33: Claims by Age by Industry sub group (2000/2001)



	Overall	411	412	421	422	423	424	425
55+	10%	12%	13%	10%	9%	6%	9%	6%
45-54	19%	21%	24%	21%	17%	16%	17%	13%
35-44	25%	22%	30%	28%	24%	22%	22%	27%
25-34	28%	25%	25%	27%	30%	30%	29%	34%
15-24	19%	21%	9%	14%	20%	25%	23%	20%

Chart 34: Incidence Rate by Age by Jurisdiction (2000/2001)



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
15-24	23.2	31.0	12.4	20.1	19.5	32.1	32.9	30.6	27.9
25-34	29.5	37.5	19.3	26.0	30.3	33.7	23.0	22.0	25.4
35-44	28.1	32.5	21.5	27.0	32.8	28.8	21.5	17.5	18.3
45-54	29.0	38.3	20.7	23.1	26.8	29.8	36.0	13.7	15.6
55+	33.0	37.2	31.3	35.7	28.5	24.3	21.8	45.2	19.8

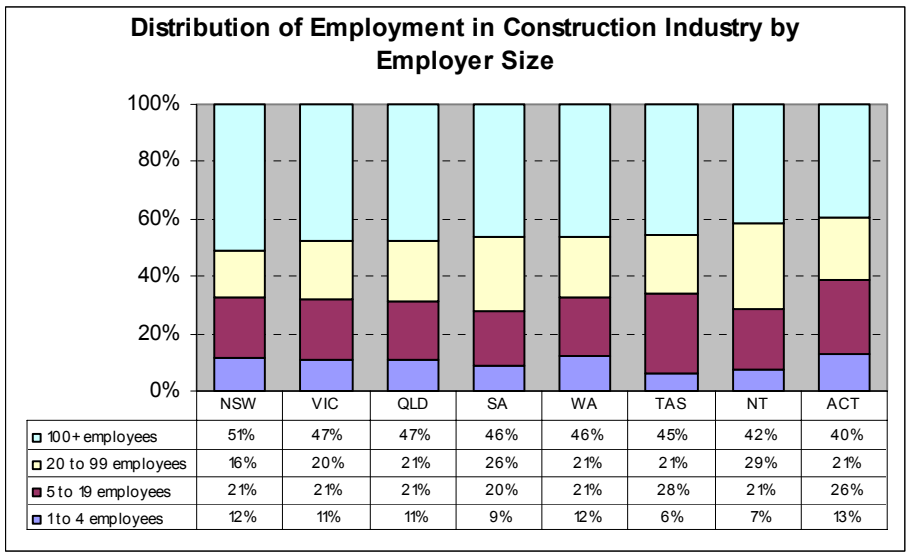
Chart 34 shows that in the larger jurisdictions incidence rates increase with age, a trend particularly noticeable in Victoria, Queensland and New South Wales. In WA, NT and ACT however incidence rates decrease with age. The trend in other years (1998/99, 1999/00) is similar although the rates for smaller jurisdictions vary considerably because of the small claim numbers. Not only are the incidence rates higher for older workers in the building and construction industry, the % of 60+ days claims are higher too. They have more claims and they are longer duration.

4.2.5 Size

Employment by employer size (Chart 35) shows that 40-50% of employed persons are employed in large employers (100+) with around 10% employed by very small employers.

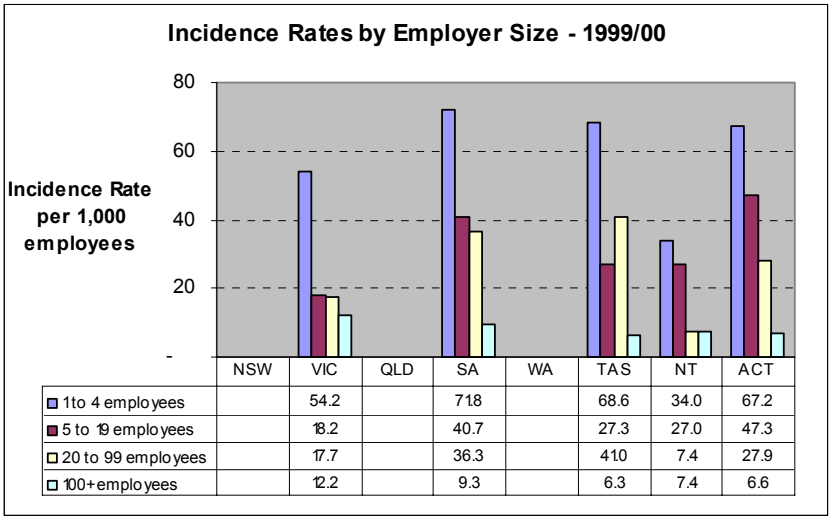
Chart 36 indicates that estimates of incidence rates by employer size show consistently higher incidence rates among small employers. Rates decrease with size of employer. NSW, Qld and WA do not report claims by employer size.

Chart 35: Employer Size by Jurisdiction (1990/2000)



	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
100+ employees	51%	47%	47%	46%	46%	45%	42%	40%
20 to 99 employees	16%	20%	21%	26%	21%	21%	29%	21%
5 to 19 employees	21%	21%	21%	20%	21%	28%	21%	26%
1 to 4 employees	12%	11%	11%	9%	12%	6%	7%	13%

Chart 36: Incidence Rate by Employer Size (1999/2000)

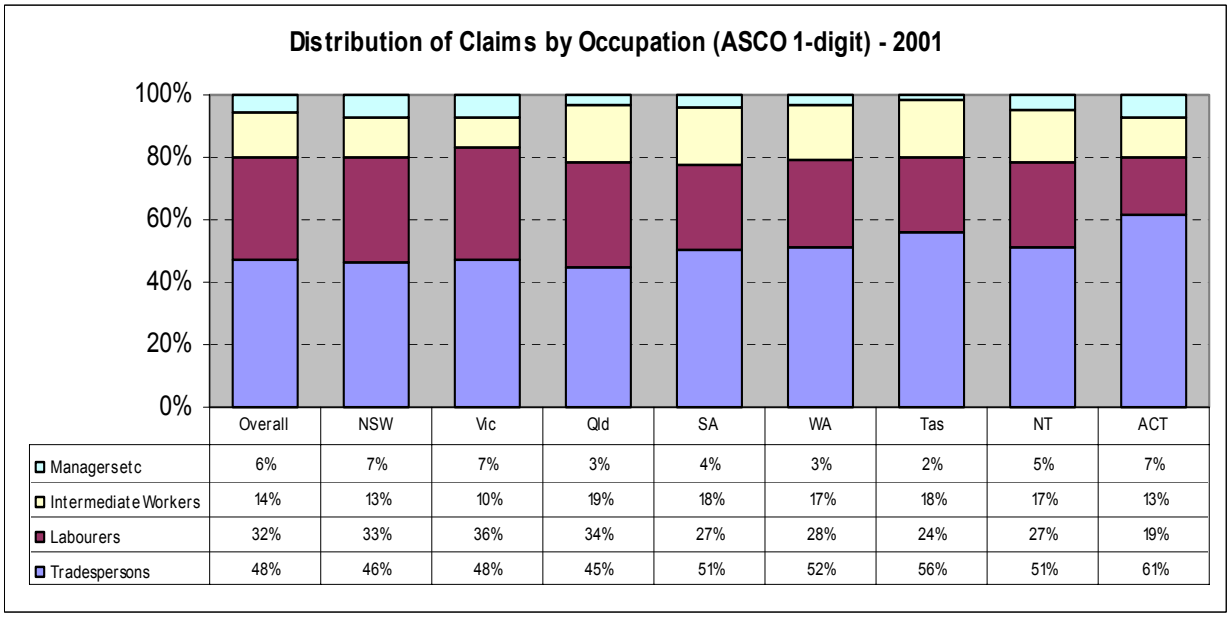


	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
1to 4 employees		54.2		71.8		68.6	34.0	67.2
5 to 19 employees		18.2		40.7		27.3	27.0	47.3
20 to 99 employees		17.7		36.3		41.0	7.4	27.9
100+employees		12.2		9.3		6.3	7.4	6.6

4.3 Occupation

The availability of occupational data is limited, which is unfortunate given the importance of this aspect in analysing industry performance. The study had access to ABS estimates of denominator data for occupation across all jurisdictions at 2-digit Australian Standard Classification of Occupation (ASCO), but not by industry. Therefore, while the number of Construction Tradespersons, for example, can be identified it is not possible to establish how many work in the construction industry and how many in other industries.

Chart 37: Claims by Occupation



	Overall	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
Managers etc	6%	7%	7%	3%	4%	3%	2%	5%	7%
Intermediate Workers	14%	13%	10%	19%	18%	17%	18%	17%	13%
Labourers	32%	33%	36%	34%	27%	28%	24%	27%	19%
Tradespersons	48%	46%	48%	45%	51%	52%	56%	51%	61%

Claims data at 4 digit ASCO was not available and is considered to be less reliable given the variability of coding within and between jurisdictions. Claims data by 1-digit ASCO only is available and Chart 37 shows the distribution of claims by jurisdiction. This data is of marginal value given the importance of being able to identify specific occupations such as plumbers, electricians, concreters, labourers, etc.

4.4 Further analysis of structural factors

One of the key differences between jurisdictions can be found in the different incidence rates across industry sub groups. To examine this in more detail an overview of performance in the study period showed that specific industry sub groups in specific jurisdictions were worthy of further analysis. Table 5 shows the range of rates.

Table 5: Comparative incidence rates by industry sub group

State by Industry Summary- All 3 years combined								
Incidence Rates								
	411	412	421	422	423	424	425	All
NSW	25.9	**79.7**	40.4	56.4	30.2	32.5	37.5	36.5
Vic	12.0	35.4	**68.8**	22.2	15.9	18.4	**11.5**	19.7
Qld	12.3	35.2	27.9	**17.5**	16.2	23.9	19.5	20.9
SA	18.0	59.7	26.0	43.6	28.1	24.8	20.3	29.0
WA	24.0	36.8	36.9	55.9	30.2	38.8	40.8	34.7
Tas	18.8	10.8	44.3	52.8	19.5	19.3	47.7	21.9
NT	23.0	16.7	27.1	11.8	17.5	8.5	15.0	17.3
ACT	10.5	101.1	11.2	38.7	26.0	12.8	44.7	25.0
Aust	**19.3**	**47.4**	**41.6**	**39.2**	**23.8**	**27.0**	**27.8**	**28.4**

To establish "outliers" for further analysis the threshold of 50% or more variation from the Australian incidence rate for that industry was used. Four cases in the larger jurisdictions presented themselves as candidates for further analysis. In smaller jurisdictions the variations were considered unreliable because of the small numbers.

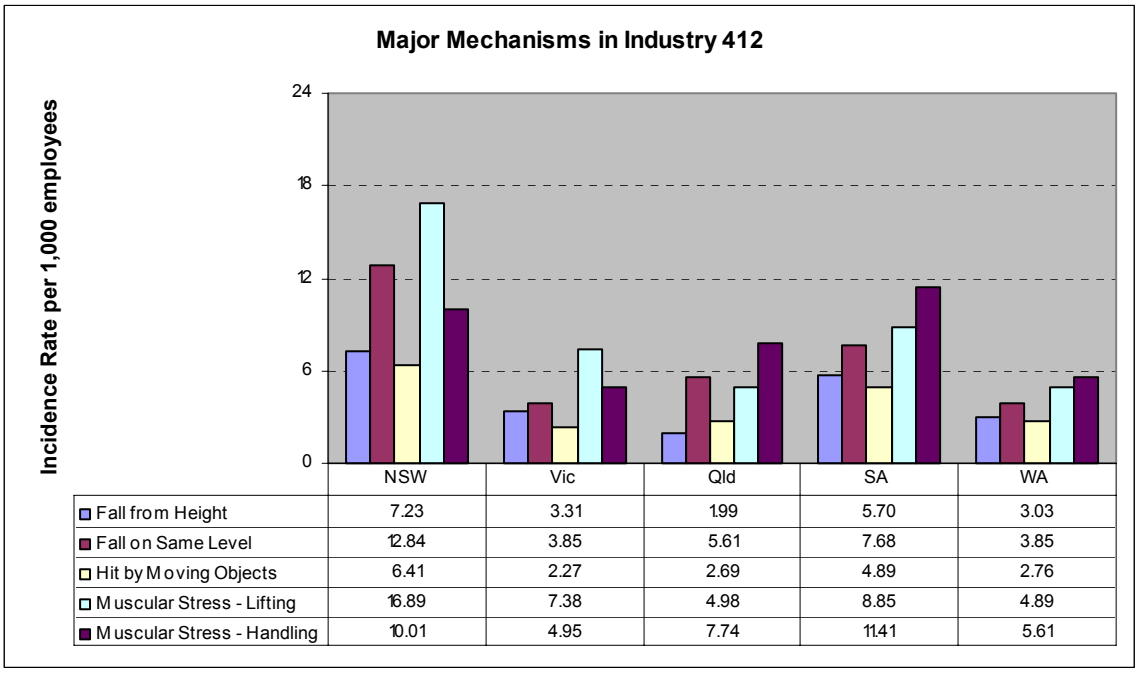
The cases for further analysis chosen were:

- NSW with a 68% higher rate in industry sub group 412
- Victoria with a 65% higher rate in industry sub group 421
- Victoria with 59% lower rate in industry sub group 425
- Queensland with a 55% lower rate in industry sub group 422

4.4.1 NSW and industry sub group 412

Non-Building Construction 412 covers major civil construction works such as roads and bridges. In order to identify any hazard specific factors mechanism and agency of injury data was used in further analysis. Chart 38 shows NSW and larger jurisdictions by major mechanisms of injury.

Chart 38: Major mechanisms of injury in industry sub group 412 over three-year period.



	NSW	Vic	Qld	SA	WA
Fall from Height	7.23	3.31	1.99	5.70	3.03
Fall on Same Level	12.84	3.85	5.61	7.68	3.85
Hit by Moving Objects	6.41	2.27	2.69	4.89	2.76
Muscular Stress - Lifting	16.89	7.38	4.98	8.85	4.89
Muscular Stress - Handling	10.01	4.95	7.74	11.41	5.61

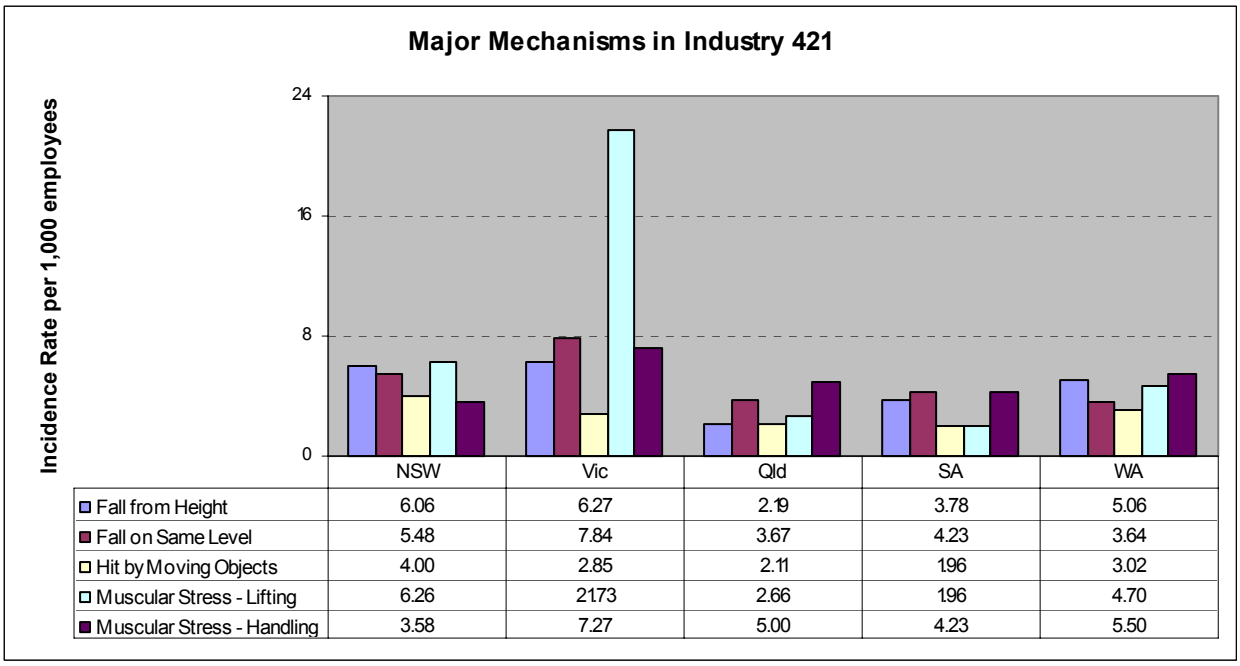
NSW ranks highest in all major mechanism categories except for muscular stress - handling (in which it is second). NSW is also clearly highest or high against all major agencies of injury. This suggests that there are no hazard-specific or practice-specific reasons for NSW to have an incidence rate 68% higher than the national average.

The agency of industry data did not indicate any patterns that diverged greatly from the normal spread of agency categories across all industry sub groups in NSW. Again this is supportive of a conclusion that it is industry structure and culture issues rather than specific risk exposure and risk management practices that influence these outcomes.

4.4.2 Victoria and industry sub group 421

Industry sub group 421 refers to site preparation services such as earthmoving and excavation. Whereas Victoria generally has low incidence rates against all industries, in Industry 421 it is 65% above the national average. Other than high to average outcomes against most mechanisms and agencies, this dramatic difference is driven by a disproportionately high rate of muscular stress - lifting claims, probably related to fastening, packing and packaging equipment. In these areas Victoria is up to 10 times higher than the rate in other jurisdictions.

Chart 39: Major mechanisms of injury in industry sub group 421 over three-year period



	NSW	Vic	Qld	SA	WA
Fall from Height	6.06	6.27	2.19	3.78	5.06
Fall on Same Level	5.48	7.84	3.67	4.23	3.64
Hit by Moving Objects	4.00	2.85	2.11	196	3.02
Muscular Stress - Lifting	6.26	2173	2.66	196	4.70
Muscular Stress - Handling	3.58	7.27	5.00	4.23	5.50

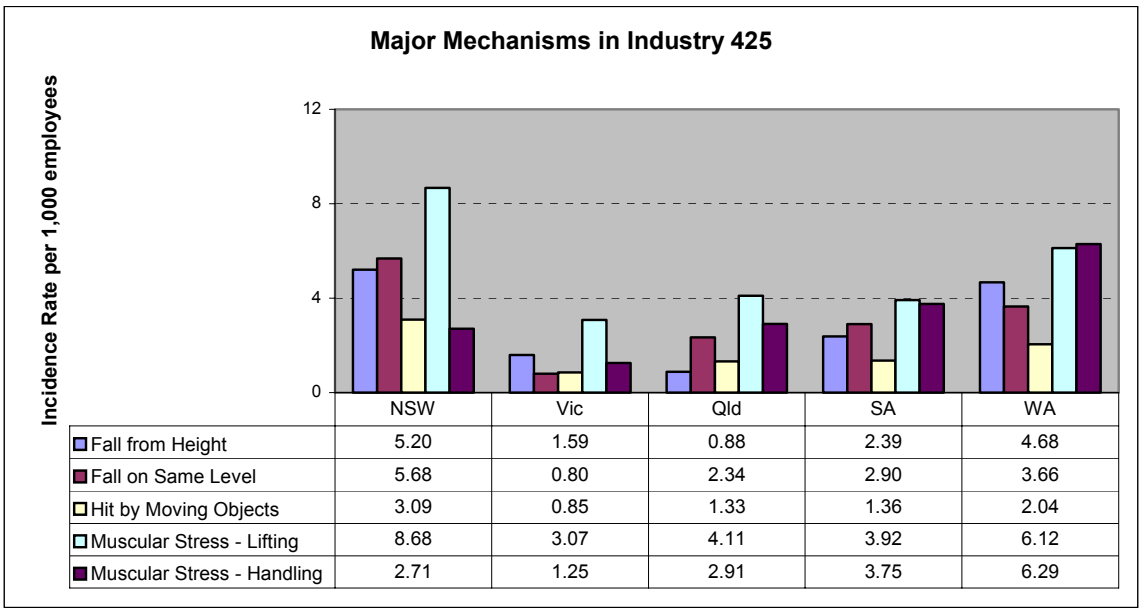
Agency of injury data shows that the packaging and fastening category is massively different in Victoria to other jurisdictions suggesting that this is the area where manual handling claims are being sustained.

Unlike the NSW case the data here suggests this pattern is influenced by specific risk exposure and risk management practices.

4.4.3 Victoria and industry sub group 425

Industry sub group 425 covers activities such as landscaping and special services such as sandblasting and scaffold construction. Victoria's incidence rate in Industry 425 is 59% lower than the national average. Victoria has low rates against all major mechanisms and agencies, suggesting an overall better approach to OHS rather than better performance on particular hazards.

Chart 40: Major mechanisms of injury in industry sub group 425 over three-year period

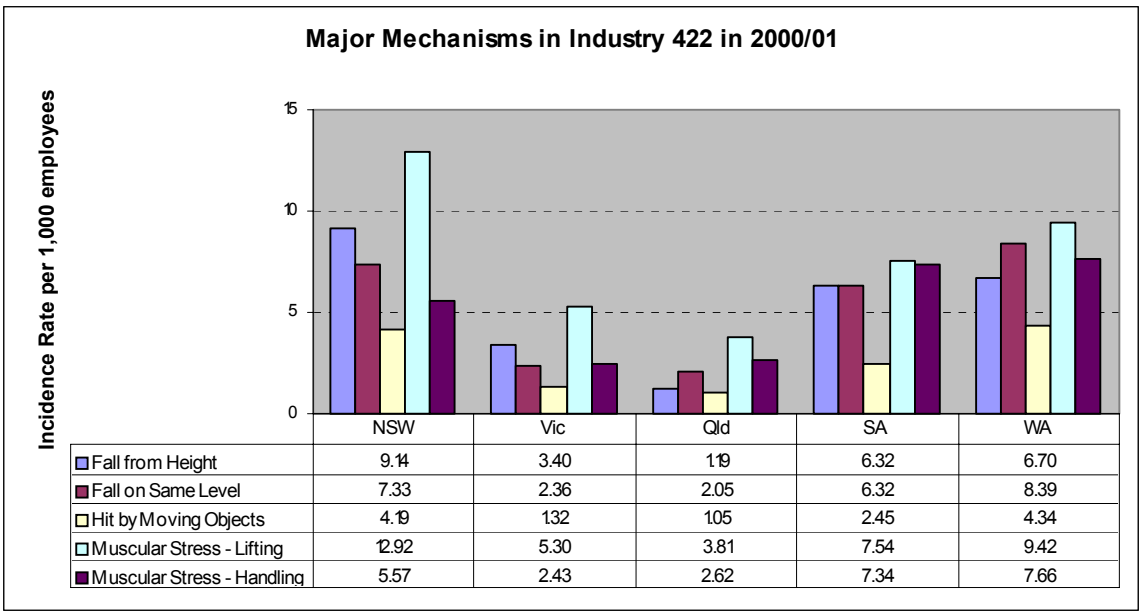


	NSW	Vic	Qld	SA	WA
Fall from Height	5.20	1.59	0.88	2.39	4.68
Fall on Same Level	5.68	0.80	2.34	2.90	3.66
Hit by Moving Objects	3.09	0.85	1.33	1.36	2.04
Muscular Stress - Lifting	8.68	3.07	4.11	3.92	6.12
Muscular Stress - Handling	2.71	1.25	2.91	3.75	6.29

4.4.4 Queensland and industry sub group 422

Industry sub group 422 covers activities such as bricklaying and concreting. Queensland's incidence rate in Industry 422 is 55% lower than the national average. In this industry Queensland has low rates against all major mechanisms and agencies, especially falls from height and falls on the same level where its rates are about one quarter of that in NSW, SA and WA.

Chart 41: Major mechanisms of injury in industry sub group 422 over three-year period



	NSW	Vic	Qld	SA	WA
Fall from Height	9.14	3.40	1.19	6.32	6.70
Fall on Same Level	7.33	2.36	2.05	6.32	8.39
Hit by Moving Objects	4.19	1.32	1.05	2.45	4.34
Muscular Stress - Lifting	12.92	5.30	3.81	7.54	9.42
Muscular Stress - Handling	5.57	2.43	2.62	7.34	7.66

The consistency of the agency and mechanism pattern in Queensland suggests that there is a lower risk exposure and better risk management practices that help explain this case.

4.4.5 Relationship between levels of construction activity and claims

The level of construction activity is a rough measure of exposure to risk and as such some relationship to claims outcomes could be expected. A number of jurisdictions, in their input to this project, proposed that there was a "lag" effect with activity and claims. Construction workers carried injuries through busy times and when activity levels reduced lodged claims. In other words injuries were saved up until workers could afford to lodge them.

In order to test this hypothesis the dollar value of construction work done was cross-tabulated with the number of claims made in the period. Clearly only certain kinds of claims can be deferred, gradual onset rather than traumatic claims. Consequently the analysis examined the patterns associated with manual handling claims in particular (Table 6).

Table 6: Value of Construction Work and Claims Patterns[31]

		Aust	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
Value of Construction Work ($M)	1999/00	60,149	21,719	13,971	12,172	3,249	6,774	652	670	933
	2000/01	51,797	17,378	13,426	10,706	2,760	5,652	604	482	786
	% change	-14%	-20%	-4%	-12%	-15%	-17%	-7%	-28%	-16%
Claims	1999/00	12,609	6,068	2,046	1,652	730	1,729	163	75	146
	2000/01	11,946	5,544	2,068	1,763	651	1,516	166	88	150
Claims per $Billion Work Done	1999/00	210	279	146	136	225	255	250	112	156
	2000/01	231	319	154	165	236	268	275	183	191
	% change	10%	14%	5%	21%	5%	5%	10%	63%	22%
Muscular Stress Claims	1999/00	3,797	1,761	633	568	245	494	40	21	35
	2000/01	3,712	1,658	678	633	207	444	39	20	33
Muscular Stress Claims per $Billion Work Done	1999/00	63	81	45	47	75	73	61	31	38
	2000/01	72	95	50	59	75	79	65	41	42
	% change	14%	18%	11%	27%	-1%	8%	5%	32%	12%
Falls Claims	1999/00	3,387	1,813	527	309	192	429	53	20	44
	2000/01	3,143	1,610	548	308	178	371	58	21	49
Falls Claims per $Billion Work Done	1999/00	56	83	38	25	59	63	81	30	47
	2000/01	61	93	41	29	64	66	96	44	62
	% change	8%	11%	8%	13%	9%	4%	18%	46%	32%

[31] Data drawn from Australian Bureau of Statistics, 8752, Building Activity, 2002; Australian Bureau of Statistics, 8755 Construction Work Done, 2003.

The overall results show an increase in claims per $billion work done - nationally 10%, driven by NSW, 14% and Queensland, 21%. At this level there is some support for the "saving up" hypothesis. The incidence rates using value of work mirror the jurisdictional relativities shown in the rates per 1000 employees shown in Chart 1.

Whilst the null hypothesis would be no change, in reality there should be a slight decrease to account for inflationary factors. To support a theory that claims are stored until industry activity levels decline, any increase should be found in non-traumatic claim types, as these can be 'stored'. The above tables compare 'falls' (from height or on the same level) with muscular stress claims (lifting or handling). Ignoring the three smaller jurisdictions, WA is similar, SA has falls higher than muscular stress and Victoria has falls and muscular stress both increasing at a rate above the average.

Notably, the two states where there is a relatively higher increase in the rate of muscular stress claims are NSW and Queensland, the two states where the overall result has increased markedly. In these states falls are up, but muscular stress claims are up to an even greater degree. Consequently there may be some validity to "saving up" hypothesis. However the construction activity cycle may need a longer period (e.g. 5 years) to fully test this proposition. Also over a longer period of time this phenomenon may even itself out.

4.5 Correlation and regression analysis

Initial correlations were run on structural factors (with the dependent variable being the claims incidence rate) in order to identify any statistically significant associations worthy of further analysis. Table 7 shows the results.

Table 7: Correlations with Incidence Rate

Variable	Pearson Correlation	Sig. (2-tailed)		Correlation
Fatalities	0.33	0.000	**	Very high
Agency 43 Claims	0.304	0.000	**	Very high
Mechanism 42 claims	0.303	0.000	**	Very high
Agency 71 Claims	0.295	0.000	**	Very high
Age 35-44 claims	0.294	0.000	**	Very high
Fatalities per 100,000 Employees	0.327	-	**	Very high
Fatalities per million Hours Worked	0.325	-	**	Very high

Variable	Pearson Correlation	Sig. (2-tailed)		Correlation
Frequency Rate	0.989	-	**	Very high
Frequency Rate for 30+ days	0.908	-	**	Very high
Frequency Rate for 60+ days	0.828	-	**	Very high
Incidence Rate for 30+ days	0.929	-	**	Very high
Incidence Rate for 60+ days	0.859	-	**	Very high
Incidence Rate for Agency 43	0.486	-	**	Very high
Incidence Rate for Agency 49	0.493	-	**	Very high
Incidence Rate for Agency 61	0.686	-	**	Very high
Incidence Rate for Agency 62	0.792	-	**	Very high
Incidence Rate for Agency 71	0.776	-	**	Very high
Incidence Rate for Mechanism 1	0.799	-	**	Very high
Incidence Rate for Mechanism 2	0.891	-	**	Very high
Incidence Rate for Mechanism 28	0.607	-	**	Very high
Incidence Rate for Mechanism 41	0.804	-	**	Very high
Incidence Rate for Mechanism 42	0.83	-	**	Very high
Age 45-54 claims	0.285	0.000	**	Very high
Mechanism 2 claims	0.283	0.000	**	Very high
Mechanism 41 claims	0.275	0.000	**	Very high
Age 55+ claims	0.265	0.001	**	Very high
Agency 61 Claims	0.252	0.001	**	Very high
Claims	0.248	0.001	**	Very high
Incidence Rate for Agency 46	0.252	0.001	**	
Mechanism 28 claims	0.238	0.002	**	High
Age 25-34 claims	0.227	0.003	**	High
Notices per '000 Employees	0.388	0.003	**	High
Total Compensation Cost	0.219	0.004	**	High
Claims Duration 30+ days	0.207	0.007	**	High
Claims Duration 60+ days	0.201	0.009	**	High
Agency 62 Claims	0.182	0.019	*	High
Value of Construction Work $M	0.162	0.036	*	High
Value of Work $M	0.16	0.038	*	High
% 45-54 claims	0.158	0.041	*	High
Value of Building Work $M	0.157	0.042	*	High
% 35-44 claims	0.141	0.068		Moderate
Mechanism 1 claims	0.141	0.068		Moderate
Age 15-24 claims	0.133	0.085		Moderate
Regulatory Intensity	0.129	0.094		Moderate
% 15-24 claims	0.118	0.129		Low
% 25-34 claims	0.102	0.188		Low
Agency 49 Claims	0.102	0.190		Low
Average Cost per Claim	0.07	0.376		Low
% 55+ claims	0.058	0.455		Low
Employee Numbers	-0.055	0.479		Low
Hours Worked	-0.048	0.534		Low
Notices	0.061	0.657		Low
Annual Hours per Employeee	0.031	0.692		Low
Agency 46 Claims	0.025	0.745		Low

Excluding variables that are incidence rates (as they tend to have very high correlations with the overall incidence rate), there are no factors that generate regression models of any significance. The highest correlation is with fatalities, which whilst significant in its own right, is not a level of correlation that will allow it to be used as an explanatory factor in analysis. The very significant category is only relative and in effect the strongest correlation is at 0.33, which is not a level at which further examination is warranted.

Regression analysis assists in identifying relationships between variables and the respective contribution they make to explain variation in a dependent variable such as the incidence rate. Use of a number of regression modelling techniques failed to produce a model that could be considered to sufficiently demonstrate any overall or meaningful explanatory relationships.

4.6 Note on Industrial disputes

The Cole Royal Commission and other inquiries into the building and construction industry have given significant attention to the role of industrial disputation and the use of health and safety as an industrial tool. For this project the key issue is whether industrial arrangements and disputes have any impact on OHS outcomes and whether they account for jurisdictional differences. The Royal Commission discussion paper on OHS noted that industrial disputes could have several impacts:

- Such actions trivialise the importance of health and safety and deflect attention away from the real resolution of safety problems on sites;
- The view that unions manipulate safety concerns inhibits the unions' capacity to effect constructive change;
- Accepting that manipulation occurs in a proportion of health and safety issues, the approach taken on sites may well be impacted in anticipation that manipulation may occur (whether or not it does);
- Time taken by health and safety regulators to attend and deal with less important issues detracts from their capacity to deal with more substantial issues elsewhere; and
- At an industry level, there is a tendency for issues to be dealt with at the lowest common denominator level, rather than seeking best practice.[32]

The paper also concluded it was not possible to quantify any relationship between industrial behaviour and OHS outcomes - a conclusion also drawn in this project. ABS data[33] shows that industrial disputation is indeed a disproportionate feature of the construction industry (accounted for 32% of all disputes and 23% of days lost in 2000).

[32] Royal Commission into the Building and Construction Industry, *Workplace Health and Safety in the Building and Construction Industry*, Discussion Paper Six, 2002, p.38.
[33] Australian Bureau of Statistics, Year Book Australia 2002, Construction Industrial Disputes, 2002.

In terms of jurisdictional differences working days lost per 1000 construction employees was highest in Victoria, Western Australia and South Australia, then lower in Queensland and NSW, ACT and lowest in the Northern Territory.

In order to establish the impact on OHS the proportion of disputes related to OHS can only be estimated using the ABS category "physical working conditions" which in national terms accounts for 13% of all days lost.[34] There are no published jurisdictional breakdowns for the study period.

The value of any quantitative analysis is likely to be limited given the jurisdictional relativities on both industrial disputation and OHS outcome dimensions. Victoria has a high rate of days lost but also has relatively good OHS outcomes whilst NSW has low rate of days lost but has relatively poor OHS outcomes. One interpretation is that attention to OHS through disputes is a sign of vigilance resulting in reduced claims. This might hold for one jurisdiction but not for another such as WA where there is a combination of relatively high disputation and claims rates. Consequently the possible relationships are considered to be too difficult to rigorously examine given the nature of available comparative jurisdictional data.

4.7 Note on Labour Hire

The increasing role of labour hire or on-hire workers has been noted in recent research with findings pointing to an association between labour hire employment and higher rates of more serious injury.[35] The triangular nature of the relationship between client (host employer), labour hire company and the on hire employee complicates legal responsibilities, makes it more difficult to coordinate and communicate decisions, and results in situations where hazards are more difficult to anticipate and control.

The recent study by Underhill analysing claims performance in Victoria and comparing labour hire and non-labour hire differences concluded that:

> "The pattern of claims by Victorian labour hire employees was found to match that evidenced in overseas research. They are more likely to be injured than direct hire employees, and their injuries appear more severe. They are more concentrated in semi-/unskilled high risk occupations, and younger workers are disproportionately represented."[36]

[34] Australian Bureau of Statistics, 6322 Industrial Disputes, 1999.
[35] Underhill, E., Extending Knowledge on Occupational Health & Safety and Labour Hire Employment: A Literature Review and Analysis of Victorian Worker's Compensation Claims, a Report prepared for WorkSafe Victoria by Victoria University, Melbourne, 2002.
[36] Ibid, p.5.

In order to examine this potentially important issue in this study data that would enable jurisdictional comparisons is essential. The Underhill study looked at the labour hire company performance and did not break down data to the industry of the host employer (data set unlikely to contain this information) but used variables such as occupation. Occupational disaggregation is still not reliable or specific enough to establish building and construction industry specific impacts.

The NSW Government Labour Hire Task Force[37] cite estimates of the level of labour hire employment in the construction industry at 19% and there appears to be greater use of labour hire in the industry. Jurisdictional data on the changing forms of employment for the study period was not available. More importantly the claims data base does not identify claimants by their employment by a labour hire company. Finally the long term existence of subcontracting arrangements would make it difficult to discern any specific impact a similar form of employment might have.

For these reasons the study can only rely on the current research findings as they apply to all industries.

[37] Labour Hire Task Force Final Report, Department of Industrial Relations, NSW, 2000.

5 INVENTORY OF POLICY INTERVENTIONS

The focus in this section is the range of policy interventions that may have impacted on OHS performance in the building and construction sector.

It is important to understand the wider context in which agency initiatives are undertaken and to have some understanding of the common strategic settings across jurisdictions. There are a number of common strategies that have been applied and these are important in trying to identify any distinctive impact that a specific jurisdiction may have had. The legislative environment, the role of information, training and awareness programs and the nature and impact of enforcement activity are compared and any distinctive features identified.

Specific initiatives targeted at the building and construction sector will also be examined to see if there is any connection with outcomes.

5.1 Legislative environment

The Royal Commission discussion paper on workplace health and safety noted that:

> "Generally speaking, and with only minor exceptions, OHS in the building and construction industry is regulated under State and Territory statutes of general application. These statutes owe their philosophical underpinning to the highly influential Robens Report."[38]

Each jurisdiction has a Robens style OHS Act that sets out general duties for:

- Employers, for the benefit of employees;
- Employers, for the benefit of non-employees;
- Self-employed persons;
- Employees;
- Occupiers of premises;
- Manufacturers and suppliers of plant and substances, erectors and installers of structures in workplace

[38] Royal Commission into the Building and Construction Industry, *Workplace Health and Safety in the Building and Construction Industry*, Discussion Paper Six, 2002, p.13.

The duties in the primary OHS legislation are the predominant instrument used to regulate the building and construction sector.

Queensland included a specific duty for principal contractors in 1989 to provide a means of managing the overall safety of the site. In addition to general duties a principal contractor must also:

- Appoint a workplace health and safety officer;
- Prepare a workplace health and safety plan;
- Provide site specific induction training;
- Ensure everyone has completed general induction training;
- Obtain a copy of every sub-contractor's work plan; and
- Keep a hazardous substance register

Some jurisdictions have incorporated specific building and construction references in subordinate legislation and Queensland and New South Wales have the most specific treatment of building and construction. The New South Wales OHS Regulation introduced in 2001 mirrored many of the principal contractor duties in the Queensland Act requiring induction programs and work plans. The regulation defines high risk construction work and sets out a range of construction specific hazards and controls. These provisions replaced a Construction Safety Act and a range of specific construction regulations.

Regulatory style has increasingly moved to a so called performance approach in which regulatory objectives are stated rather than prescription of the means to achieve the end. Clearly the risk management model has introduced a standard process into modern regulation but generally the continuing debate about prescription versus performance standards is ill conceived. For example, the old style construction regulations contained performance standards and so called performance regulations still contain considerable prescription, mainly in the form of prohibitions. Secondly, older prescriptive regulation was usually accompanied by exemption provisions leading to the development of a form of approved flexibility. It is the lack of certainty about compliance with modern performance regulations that is often the issue, not the lack of clarity. Consequently comparison of regulatory regimes is more complex than implied by the performance/prescription debate.

Apart from the style of regulation, differences between jurisdictions are apparent in the coverage of building and construction hazards. Table 5 summarises the coverage of hazards by construction specific regulation in each jurisdiction.

Table 5: Regulatory coverage

	NSW	Qld	WA	NT	ACT	Tas	SA	Vic
Working at height								
Demolition								
Amenities								
Noise								
Manual handling								
Plant								
Hazardous subs								
Electrical								
Diving								
Excavation								
Construction work								
Falling objects								
Induction								
First Aid								
PPE								
Notification								
Asbestos								
Certification								

	General coverage
	Specific construction provision
	No regulatory coverage

In the certification category the load shifting area varies across jurisdictions with NSW, Queensland and the ACT covering excavators and other building and construction equipment.

There have been changes within the project period and the impact of some provisions could not be expected to show up in the data outlined earlier.

Each jurisdiction also has approved codes of practice to either support regulation duties or provide guidance on general duties under the Act. There are many building and construction specific codes and these are highlighted in Table 6.

Table 6: Code of practice coverage[39]

	NSW	Qld	WA	ACT	Tas	Vic	SA	NT
Amenities	■	■		■		■		
Safe Work on Roofs, Residential	■	■	■	■	■			
Formwork	■	■	■					
Excavation	■	■	■					
Safe Work on Roofs, Commercial	■			■		■		
Overhead Protective Structures/Falling objects	■	■						
Cutting and Drilling Concrete	■					■		
Mono-strand Post-tensioning	■							
Pumping Concrete	■					■		
Construction and Testing of Concrete Pumps	■					■		
Electrical Practices	■					■		
Low Voltage Electrical Work	■					■		
Façade Retention	■							
Induction Training	■							
Safety Line Systems	■							
Tunnels	■							
Abrasive Blasting		■						
Falls from Height		■			■			
Personal Protective Equipment		■						
Manual Handling		■						
Scaffolding		■	■			■		
Steel Construction		■		■			■	
Welding		■						
Safe use of Cranes						■		
Demolition				■		■		
Tilt-up Construction						■		
Trenching						■		
Australian Standards*								■

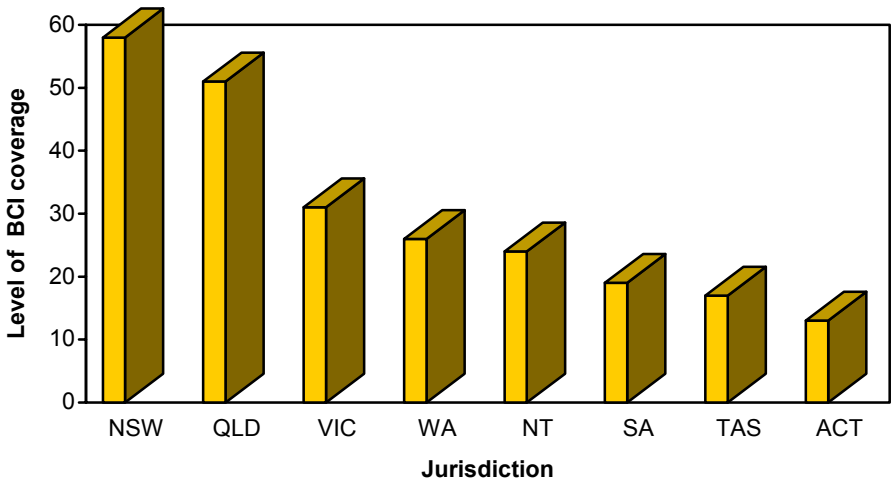
[39] Drawn from the list in the Royal Commission, Discussion Paper 6, op.cit.

*The Northern Territory has adopted the following Australian Standards as approved codes of practice:

- AS 1170, Minimum design loads on structures
- AS 1345, Identification of the contents of piping, conduits and ducts
- AS 1657, Fixed Platforms, walkways, stairways, and ladders – Design, construction and installation
- AS 2397, Safe use of lasers in the building and construction industry
- AS 2982, Laboratory construction

These two tables illustrate that almost unlike any other sector, the building and construction sector is subject to very specific regulatory and code based guidance. The tables also illustrate considerable differences between jurisdictions in the intensity and breadth of regulatory coverage. By simply counting the instruments used a profile of legislative intensity can be established. A weighting is given for specific regulatory and code coverage (2 points for specific regulation or a code and 1 point for general coverage).

Chart 42: Regulatory intensity in building and construction sector



NSW and Queensland have the most regulatory intensive approach to the sector. Of the larger jurisdictions the most obvious contrast is between Victoria and NSW. NSW has extensive legislation covering the sector whilst Victoria has no construction specific Act or regulatory provisions and has relied on a small number of codes of practice. South Australia has similarly relied on generic provisions rather than industry specific regulation. Apart from Victoria the chart shows a close relationship between size of jurisdiction and regulatory intensity.

5.2 Enforcement within the sector

Enforcement of legislation is one means of achieving compliance and this is most often carried out by issue of notices by inspectors or by prosecution of breaches in a court. The role that enforcement should play in a prevention strategy is subject to considerable debate but all jurisdictions maintain an inspectorate and in some cases have dedicated building and construction units. All jurisdictions undertake prosecutions as part of their regulatory role. In this section available data will be used to identify any jurisdictional differences in enforcement approaches to the building and construction sector.

5.2.1 Western Australia

Table 7 provides details of improvement and prohibition notices issued to the Construction Industry compared to all Industries over the period 1998-99 to 2000-01. During this period the Construction Industry has received an average of 25% of the total notices issued.

Table 7: WA Notices 1998/99 to 2000/01

Year	Construction	All Industries	Construction % of total
1998-99	2714	10338	26.3
1999-00	2487	10198	24.4
2000-01	1903	9200	20.7

Table 8 provides details of Construction notices by notice type (improvement and prohibition). There were about three times as many improvement notices (issued where there is a breach or potential breach and a timetable for rectification is set) as prohibition notices (effectively stop work notices issued where there is an immediate risk) issued in the period 1998-99 to 2000-01.

Table 8: WA Type of Notice (Construction) 1998/99 to 2000/01

Year	Improvement	Prohibition	Total
1998-99	2217	497	2714
1999-00	1958	529	2487
2000-01	1546	357	1903

Prosecutions are classified according to the industry of the defendant. Initiated prosecutions only are shown here and are classified by date of initiation.

Table 9 provides details of Construction prosecutions compared to all other industries over the period 1998-99 to 2000/01. Since 1998/99, where the proportion of Construction Industry prosecutions was 63%, Construction Industry prosecutions have been contributing an average of over 50% of the total industry figures.

Table 9: WA Prosecutions 1998/99 to 2000/01

Year	Construction	All Industries	Construction % of total
1998-99	41	65	63.1
1999-00	28	55	50.9
2000-01	15	37	40.5

5.2.2 Victoria

The enforcement of legislation is managed through a Construction and Utilities program team and the approach to enforcement has been reformulated in the study period. In late 1999 a "Zero Tolerance" enforcement policy was initiated such that any company to whom a Notice was served on the same issue was investigated with a view to an observation breach prosecution. Also within this period the general agency compliance model of "constructive compliance" was developed. Constructive compliance seeks to get the right balance of incentives between assistance/information and deterrence for poor performance. This has meant a refocussing of the enforcement and deterrence role of the inspectorate.

Table 10 compares construction industry notices with all notices and shows that while the proportion of notices dropped in 2000/01 this is more a function of a large increase in other sectors. Construction notices account for at least a quarter and up to 40% of all notices.

Table 10: Vic Notices 1998/99 to 2000/01

Year	Construction	All Industries	Construction % of total
1998-99	na	2794	na
1999-00	2172	5231	42%
2000-01	2465	9612	26%

Table 11 shows the number and type of notices issued in Victoria in the construction industry

Table 11: Vic Type of Notice (Construction) 1998/99 to 2000/01

Year	Prohibition Notices	Improvement Notices	Total*
1998-99	na	Na	
1999-00	1596	576	2172
2000-01	1550	915	2465

* A very small % of these notices are issued by construction inspectors on non-construction sites through emergency response rosters.

The ratio of Prohibition notices to Improvement notices has varied from about 3:1 in 1999/00 to about half that in the following year. This relationship is different for the "all other industries" notices ratio where improvement notices are issued more regularly than prohibition notices. The predominance of prohibition notices reflects the more immediate risks found on construction sites.

Table 12 compares construction prosecutions with all prosecutions. It also suggests that the reduction in the construction share of prosecutions in 2000/01 was more a function of increased prosecution activity in other sectors.

Table 12: Vic Prosecutions 1998/99 to 2000/01

Year	Construction	All Industries	Construction % of total
1998-99	21	105	20%
1999-00	11	97	11%
2000-01	19	210	9%

5.2.3 Queensland

There were 48 of 140 inspectors classified as construction inspectors identified in the Building and Construction Industry Taskforce Final Report[40] and the report noted:

> Most inspectors indicated that they preferred a "50/50" enforcement style that encompassed a mix of persuasion and punishment techniques. The specific techniques adopted were situational. However 75% of inspectors said that over 50% of their site visits in the last month had resulted in the issuing of at least one notice. Improvement notices were by far the most prevalent of notices issued[41].

[40] Department of Employment, Training and Industrial Relations, op.cit. p.55.
[41] ibid, p.55.

Table 13 shows that notices issued in the construction sector account for a quarter to a third of all notices.

Table 13: Qld Notices 1998/99 to 2000/01

Year	Construction	All Industries	Construction % of total
1998-99	1646	7455	22%
1999-00	3794	11578	33%
2000-01	1962	8672	23%

Table 14 shows that the ratio of prohibition to improvement notices has varied in the period and that improvement notices are issued between two to five times more frequently than prohibition notices. The increase in notices in 1999/00 is related to the number of blitzes carried out in that period.

Table 14: Qld Type of Notice (Construction) 1998/99 to 2000/01

Year	Prohibition Notices	Improvement Notices	Infringement Notices	Total
1998-99	272	1335	39	1646
1999-00	897	2816	81	3794
2000-01	547	1366	48	1962

Prosecutions of construction employers represent a smaller percentage of the overall profile than is the case with notices (Table 15)

Table 15: Qld Prosecutions 1998-99 to 2000-01

Year	Construction	Total	Construction % of total
1998-99	5	43	12
1999-00	7	55	13
2000-01	26	128	20

5.2.4 New South Wales

In New South Wales a construction team was established in1999 and the enforcement profile below is drawn from the activities of inspectors in this industry team.

Table 16 shows that NSW focuses its enforcement effort on the construction industry with about a third of all notices being issued to construction industry employers.

Table 16: NSW Notices 1998/99 to 2000/01

Year	Construction	All Industries	Construction % of total
1998-99	5,831	14,449	40%
1999-00	4,343	12,522	35%
2000-01	4,137	14,172	29%

In table 17 the ratio of prohibition notices to improvement notices is about 1:4 with improvement notices the most frequently used enforcement mechanism. It should be noted that NSW also issues infringement or on-the-spot notices, the vast majority in the construction industry[42], which adds to the enforcement profile in the sector.

Table 17: NSW Type of Notice (Construction) 1998/99 to 2000/01

Year	Prohibition Notices	Improvement Notices	Total
1998-99	1,116	4,715	5,831
1999-00	854	3,489	4,343
2000-01	840	3,297	4,137

The prosecution pattern in NSW is shown in Table 18. NSW undertakes significantly more prosecutions than any other jurisdiction. As with notices construction has a disproportionate share of prosecutions again either reflecting the actual performance of the sector or the results of targeting of the sector because of prior poor performance.

The number of prosecutions is only one way of looking at prosecution data as the type of offence and the levels of penalty achieved may be as, or more significant.

[42] Gunningham., N, Sinclair., D, and Burritt., P, On-the sport fines and the prevention of injury and disease: the experience in Australian Workplaces, report for the National Occupational Health and Safety Commission, 1999.

Table 18: NSW Prosecutions 1998-99 to 2000-01

Year	Construction	Total	Construction % of total
1998-99	na	422	Na
1999-00	220	496	44%
2000-01	119	404	29%

A further indication of enforcement patterns in NSW can be gained from research undertaken into the effectiveness of codes of practice[43]. The study examined the construction sector in some detail because of the large number of building and construction industry codes of practice.

The study cites a WorkCover NSW research project that reviewed one thousand Notices (PINs) from the construction industry randomly selected from the 1997/98 year. This time period is outside this project's time frame but nevertheless represents a rare example of analysis of enforcement data. The methodology was based on a list of 1170 hazards that was generated from the 1000 Notices. The majority of hazards were found in the non-residential building sector.

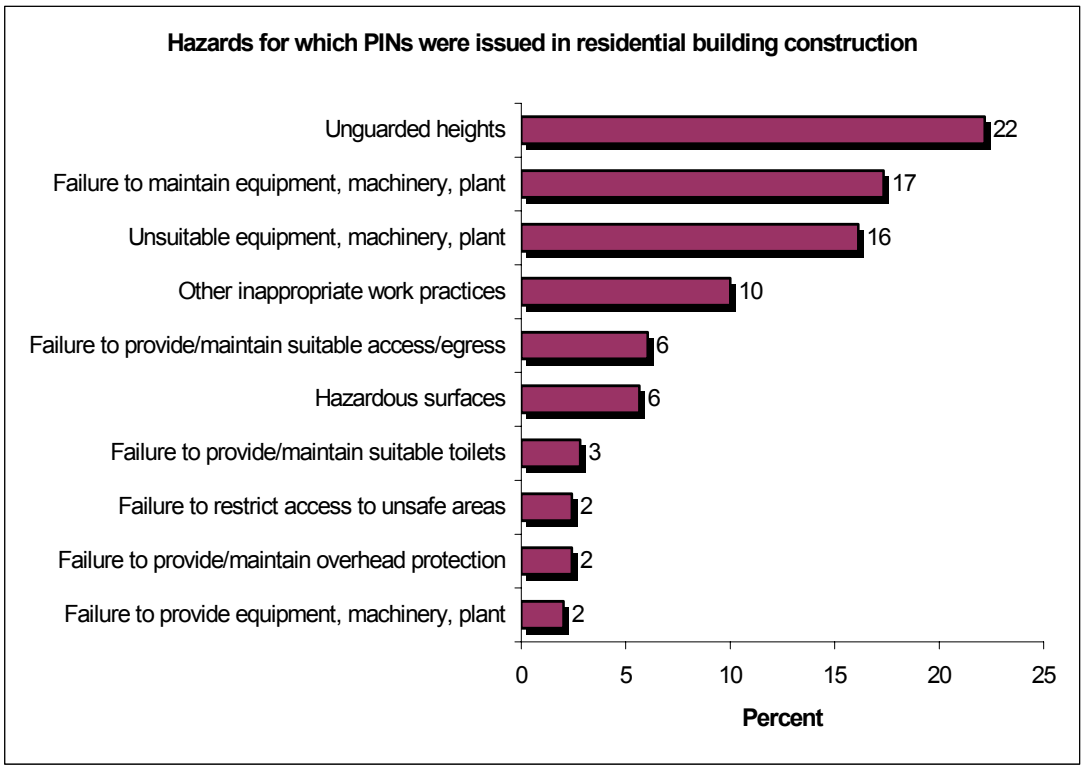
Residential building construction accounted for 21% of the hazards in the sample and house construction accounted for 6% of the hazards in the sample. In the residential building construction sector, the most common hazard for which PINs had been issued was unguarded heights (22%). Scaffolding represented 10% of the hazards referenced in PINs in the sector.

In the house construction sector unguarded heights was the second most common hazard referenced in PINs (16%) and Scaffolding accounted for 6% of all the hazards mentioned in the PINs. Hazardous substances, manual handling and induction training constituted a very small part of the hazards referenced in the sample. An induction training code blitz noted earlier was carried out after this sample was drawn.

[43] NE&A Pty Ltd, *Research Report, The Comparative Effectiveness of Approved Codes of Practice in Achieving Compliance with OHS Requirements*, (2000), Grant No: 98/0010, WorkCover NSW, Sydney.

Chart 43 below, drawn from the WorkCover sample and reproduced in the NE&A report shows the range of hazards cited in Notices.

Chart 43: Hazards referenced in PINS (extract from NE&A report)[44]



[44] Ibid, p.60.

5.3 Targeted Inspection programs

A number of jurisdictions have conducted targeted inspection programs or blitzes in the study period.

In Queensland targeted inspection campaigns have included:

- **Mobile Crane safety**
  Targeted at mobile cranes used on building and construction sites involved 394 inspections covering both equipment and safe systems. 458 Notices were issued.

- **Working at heights**
  Targeted at residential construction sites to improve compliance with legal obligations to manage working at heights. Levels of non-compliance were assessed at 44% and in a follow up blitz 483 sites were inspected and 376 Notices issued. Compliance levels increased in the second stage of the program. Earlier analysis highlighted the low level of fall claims in Queensland.

- **Abrasive blasting**
  Targeted at sites where abrasive blasting was undertaken the program sought to identify compliance with the Abrasive Blasting Code of Practice. Relatively high levels of compliance were found in the 49 audits undertaken resulting in the issue of 27 Notices.

- **Ultra-violet radiation**
  This project set out to establish the level of U-V risk exposure and did not involve the issue of notices. The results showed greater than expected levels of U-V exposure.

Blitzes covering plant and electrical safety were also conducted but construction was only part of the target group and disaggregation of Notice numbers is not possible.

In New South Wales a construction team was established in 1999. The major projects conducted by the construction team include:

- **Safe Work On Roads**
  Targeted at road work sites in Sydney metropolitan area to ensure appropriate practices were being followed. Inspections were conducted at 62 work sites and 36 Notices were issued with the major non-compliance being the lack of a Traffic Control Plan.

- **HouseSafe 2000**
  Targeted at high density residential construction sites to improve compliance with legal obligations covered 452 different contractors on about 400 sites. 390 Notices were issued.

- **OHS Induction Code of Practice**
  Targeted at principal contractors to identify the level of compliance with regulatory requirements for induction training to be provided. Covered 487 different contractors on 192 sites and resulted in the issue of 139 Notices. Code of Practice information kits were widely issued.

- **Excavation Code of Practice program**
  Targeted at employers to identify the level of compliance with the recently released Code of Practice. About half of the 148 sites visited (192 contractors) were in compliance and 195 Notices were issued to the non-complying employers.

- **Tilt Up panel program**
  Targeted at employers to identify the level of compliance with the relevant Australian Standard and covered 7 sites involving 21 contractors. 7 notices were issued to deal with identified non-compliance.

- **HouseSafe 2001**
  Targeted at single unit dwellings and duplex construction sites to improve compliance with legal obligations covered 330 different contractors on about 184 sites. 304 Notices were issued.

In the initial part of the study period there was no dedicated building and construction field team in Victoria. A new industry based team was reestablished in late 1999 and was fully operational and resourced under a new industry model by early 2001. Consequently inspection programs were not documented against an industry team. In the period the focus remained on four high priority risk issues, work at heights, plant safety, structural stability and electrical safety.

While outside the study period the construction program has gone on to conduct a range of targeted inspection programs that partly reflect these long standing priorities. These were:

- A bricklaying blitz during November and December 2001,
- A falls hazards blitz during February 2002,
- An electrical installations blitz during March and April 2002, and
- A plastering blitz during May and June 2002.

Two of these blitzes, bricklaying and plastering, were specifically targeted at housing construction and small commercial construction sites.

5.4 Stakeholder involvement

Each jurisdiction has developed various programs to better communicate and consult with industry and these are summarised below.

- NSW Construction Industry Reference Group: established in 1999 and has overseen the development of a range of assistance and information products.
- South Australia SAfer Industries program initiated in 1998 to focus on high risk industries. A Building Construction and a Civil Construction Safer Industry committee was established.
- Victoria Foundations for Safety forum established in 1998 as the primary stakeholder forum. Has facilitated agreements on induction training, rigging of tower cranes and independent assessment of mobile cranes. Endorsed Industry Standards for Concrete Cutting & Drilling, and for Precast & Tilt-up Concrete for Buildings.
- Queensland Construction Sector Standing Committee provides a forum for key stakeholders and oversights a range of advisory and regulatory initiatives.
- Western Australia Construction Industry Safety Advisory Committee established in 1999 and produced the report on industry referenced in section 2.3.5.

5.5 Industry guidance

Each jurisdiction produces a multitude of publications including alerts, industry bulletins, industry guides and guidance notes. The full range of information cannot be captured here but a selection of key publications produced in the study period is listed below.

NSW

- Subby Pack
- CHAIR: Safety in Design Tool
- Hazard Profile: Identification Tool for Metal Roofing
- Identification Tool for Electrical Hazards on-site
- Identification Tool for Formwork
- Identification Tool for Aluminium Mobile Scaffolds
- Identification Tool for Steel Reinforcement Fixing
- Identification Tool for Concrete Placement
- Identification Tool for Demolition
- Supervisor Manual: OHS Training Tool
- Safety Meter: Positive Performance Measurement Tool

Tas

- Play it SAFE Working at Height

WA

- Noise Management in the Construction Industry: A Practical Approach
- Noise Control Case Study - Reduction of Noise from a Reciprocating Compressor Through Maintenance
- Noise Control case studies
- Construction Work and the Public

Vic

- Provision of amenities on construction sites in the cottage industry
- Personal Protection Checklist for Builders and Building Trades Contractors
- Guidance note on the prevention of falls in construction work
- Industry standard for Precast and Tilt-up concrete for buildings
- Series of 19 Checklists for Builders and Building Trades Contractors
- Industry Standard for Concrete Cutting & Drilling

Qld

- Safety in the Civil Construction Industry
- Obligations of a Principal Contractor
- Silica Dust in Building and Construction
- Dealing with risks in Cabinet Making
- Workplans for a range of activities such as civil construction, bricklayers etc.

SA

- Industry Guide, Safe Work at Heights: Evaporative Air-Conditioning Systems
- Building Construction Industry: Safe work on roofs, industrial and commercial buildings
- Industry Guideline: Electrical Practices for Construction & Demolition Sites
- SA Building Construction Industry Common Safety Induction Course Handbook CivilSafe Employee Health & Safety Handbook

5.6 Other industry initiatives

5.6.1 NSW Construction Industry Memorandum of Understanding (MOU) on OHS

Signed in 1998 between the NSW Government and the Chief Executives of the industry's principal contractors, the MOU involved 17 companies who accounted for about 25% of the industry. Measures of the success of the MOU included:

- A 25% improvement in the period 1998 -2000 in the way signatory contractors manage OHS&R as shown by WorkCover NSW OHS&R management system audits

- A 32% decrease in the claims incidence rate of MOU signatory contractors. For the same period the NSW construction industry's overall incidence rate per 1000 workers fell from 43.7 to 39.9; a nine per cent decrease

The evaluation of the MOU concluded that:

> "The improved implementation of contractors' OHS management systems aligns with a decline in the incidence rate of workplace injury and occupational disease for the NSW construction industry from a ten-year high of 58 per thousand workers in 1995/96 to 39.9 in 1999/00; a reduction of thirty one per cent. It also corresponds with a decline in the subcontractor incidence rate since 1998. The rate of decline in the NSW construction industry incidence rate has been greater than other jurisdictions in Australia over the past three years".[45]

5.6.2 South Australia

The SAfer Industries committee developed the Construction Industry Common Safety Induction Course (or "Greencard" as it is widely known). It is a 4-hour training course, with the objective of providing participants with a basic knowledge of OHS issues. Each participant has a small test on course completion and receives a "Greencard" ticket (with identification photo) which remains valid for two years.

In partnership with the Construction Industry Training Board, the course entitled "The Construction Industry Common Safety Induction Course" was accredited by the industry Accreditation Registration Council.

The course was introduced in early 2001 with 5 initial Registered Training Organisations approved by the joint SAfer Industries Committees. To date there are close to 12,000 construction workers who have undergone the course.

An evaluation of the Greencard system[46] was generally positive about the impact of the training but thus far relationships to reduction in injuries have not been established.

5.6.3 Victoria

A Construction Safety Circulation Service email based information service was established in 1999 and had 163 subscribers at end of 2001(up to 2,120 at June 2003).

[45] WorkCover NSW, Safely Building NSW, op.cit., p.7.
[46] Andrew Marshall, "A Review of the Common Safety Induction (Greencard) Course in South Australian Building Construction", A building research project submitted as partial fulfillment for the award of Bachelor of Construction Economics (Honours) Degree, School of Geoinformatics, Planning and Building, University of South Australia, 2002

The service provides information such as:

- WorkSafe Victoria Alerts, Guidance Notes and other publications;
- Alerts, guidance material and reports from interstate and overseas authorities;
- WorkSafe and interstate authorities' news releases on construction issues;
- Updates on Victorian and interstate construction OHS prosecutions;
- Compilations of media reports dealing with construction incidents around the world;
- Publications from construction industry stakeholders;
- Information about new products that may provide solutions to health and safety risks;
- Interviews with a wide variety of leaders in construction safety; and
- Links to useful construction safety websites.

A Construction industry web page was established to provide a better channel for information.

The web page covers information including:

- WorkSafe news releases dealing with the construction industry;
- A section listing all Foundations for Safety member organisations, their contact details and hotlinks to their websites;
- Information relevant to the Program's fatalities prevention focus;
- A summary of the key Australian Standards of most relevance to construction, Safety, hotlinks to the WorkSafe Codes of Practice or other WorkSafe publications in which they are referenced, and a hotlink to Standards Australia to purchase Australian Standards on-line;
- Hotlinks to the websites of interstate OHS authorities, Victorian regulatory authorities of relevance to the construction industry, and other not- for-profit organisations (such as Dial Before You Dig); and
- Access to all WorkSafe construction-related publications via an alphabetical list of topics.

5.7 Relationship between policy interventions and OHS outcomes

The previous analysis in section 4 looked at the potential impact of structural variables on OHS outcome data. Factors such as industry sub sector, size and age were examined to establish any basis for better understanding intra and inter jurisdictional differences in outcomes. In this section the impact of policy interventions introduced by jurisdictions are considered. The availability, quality and scope of data able to be used to assess policy interventions are limited as evaluation of OHS policy interventions is rarely undertaken.

In 2001 the Health and Safety Executive (HSE) in the UK completed a review of the evidence of the impact of their work, including the development and management of health and safety regulation[47].

[47] Institute of Employment Studies, *Impact of the HSC/E: A Review*, Contract Research Report 385/2001. (2001), Brighton, UK.

The review concluded that whilst there is some evidence to show that the HSE does positively influence (aspects of) the chain of impact that can lead to improvements in health and safety outcomes (e.g. workplace behaviour) there is very little documentary evidence on outcomes. The chain of impact model is shown over (Figure 2).

The HSE impact chain is consistent with the approach to understanding OHS performance within and across jurisdictions used in this study. Recognition and understanding of hazards is related to awareness raising, information, education and training strategies used by OHS agencies and briefly described in this report. Employer adoption of good health and safety practices can be motivated by the legislative framework and supportive inspection and enforcement strategies. The HSE study found it difficult to draw conclusions about the "soft" interventions such as education and information but did draw some conclusions about "hard" interventions such as legislation and enforcement.

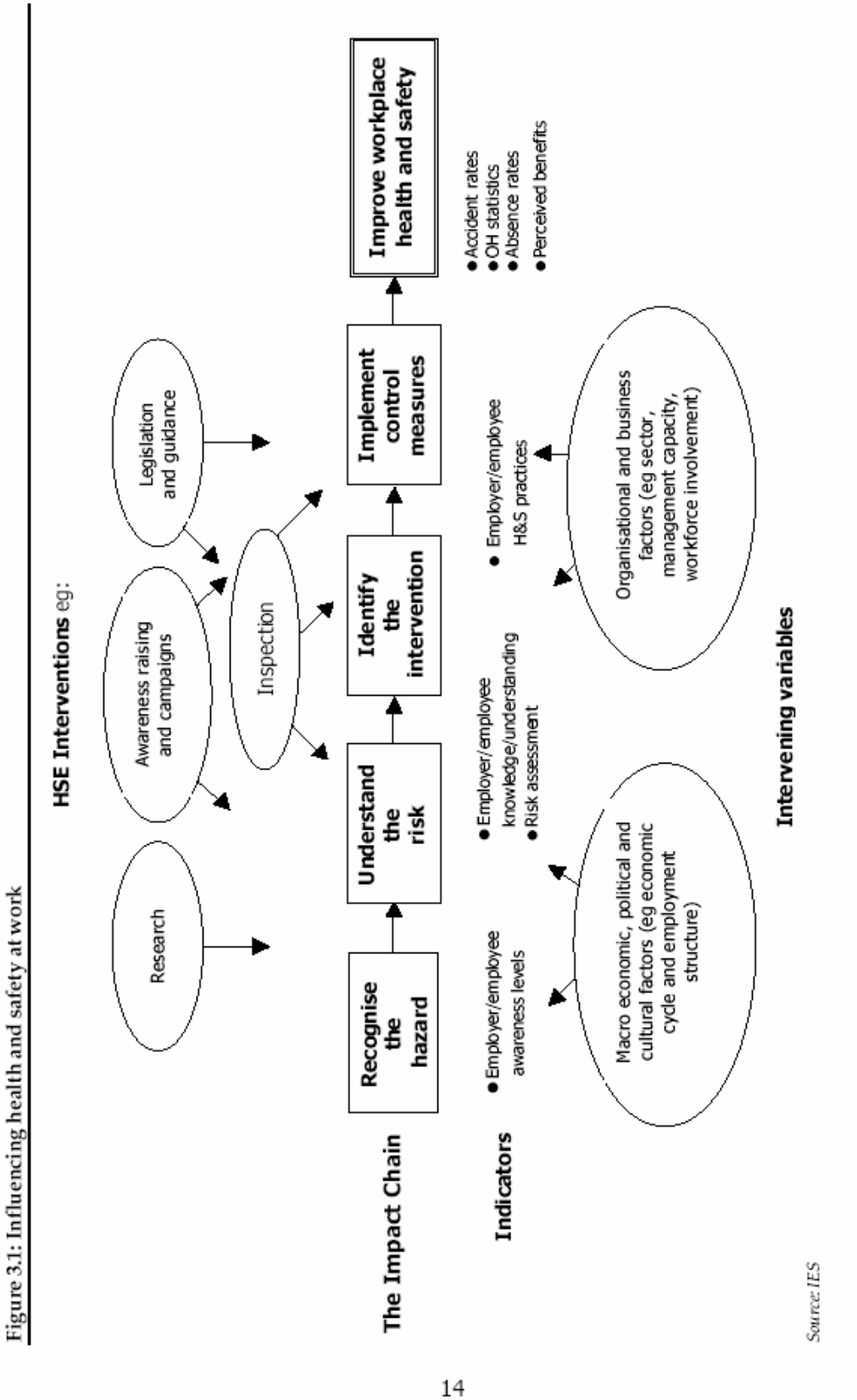
The HSE Review found that:

- "Legislation and associated guidance is a major form of leverage over employers in terms of bringing about change in their health and safety policies and practices. Most employers are motivated to change their practices to comply with the law.
- Awareness of the legislation is a key initiator of action. Not surprisingly, the evidence suggests that the more aware employers are of a piece of legislation, the more likely they are to put in place relevant control measures.
- In these circumstances lack of awareness is a key indicator of lack of impact. Evaluations suggest that 20 to 30 per cent of relevant employers have not heard of regulations that apply to them. The evidence is that these are the employers that are also least likely to have appropriate control measures in place and are therefore those with the 'furthest distance to travel'.
- Those least aware tend to be smaller organisations – they are least likely to know what they should be doing in terms of monitoring and controlling hazards.
- There is some evidence to suggest that when control measures appear to be in place, there can be a significant dissonance between policy and practice with measures not implemented on the ground.
- Inspection is an effective means of securing employer compliance. If targeted at key groups, it can bring about significant improvements in health and safety performance, both in terms of ensuring control measures are effective and, at least according to the general literature (rather than specific HSE literature), securing improvements in employees' health and safety."[48]

Similarly in this project it is difficult to evaluate the impact of "soft" interventions because of lack of data although some analysis of the limited enforcement data is possible.

[48]Institute of Employment Studies, op.cit, p.x.

Figure 2: HSE Impact Chain[49]



[49] Ibid, p.14.

The three part model used in the NOHSC report Data on OHS in Australia noted earlier found major gaps in data sources for this kind of relational analysis. The report noted that on "prevailing conditions"[50] there is little research on compliance, some research on enforcement and limited estimates on costs. The assessment of the data sources for each of the categories is essentially that there is much outcome data (although with various consistency problems) and little or no national level data on prevailing conditions or relationships.

5.7.1 Impact of different legislative regimes

In section 5.1 the differences in regulatory regimes were outlined using a simple index of regulatory intensity that indicated the breadth and specificity of regulatory coverage of the building and construction industry. Whilst the index is based on a crude weighting system it is one way of looking at the differences between jurisdictions and examining whether the regulatory regime is a source of variation in explaining claims outcomes.

Correlation of the regulatory intensity index with other structural and outcome variables showed that regulatory intensity is highly correlated with most of the volume measures. That is the number of claims total or by type (be it agency, mechanism, age, etc.), volume of work, fatalities, hours, etc. This reflects NSW's high regulatory intensity and a subsequent step down through the states by size (i.e. Qld is high, Tas/NT/ACT lower). As in most cases, Victoria is the outlier but this is not enough to drag down the correlation. However, regulatory intensity does not correlate with the rate measures. This suggests that regulatory intensity is itself a 'volume' measure. That is, the level of regulation is related to how big the jurisdiction is.

5.7.2 Impact of different enforcement profiles

Inspection data is potentially the richest source of data on the impact of legislation and associated work practices. Inspectors' observations and subsequent action can provide a basis for estimating levels of compliance and levels of risk exposure. The NOHSC OHS data report states that there is no consistent or coordinated collection of inspection data in Australia.

[50] National Occupational Health and Safety Commission (2000), op.cit, p.91.

> "Although data on enforcements and prosecutions are collected by the jurisdictions, the databases are primarily designed to support operational processes and functions and are not really intended for other purposes (such as research). Furthermore, the data can have a number of significant limitations. For example, most inspections are not done at random, and particular industries may be targeted because they are perceived as being high risk. As a result, such industries may be over-represented in terms of inspections and penalties."[51]

The latter problems are addressed in this project because the focus is on a specific industry and a comparison can be made with all other industries.

The inspection data collected for this project confirms the problems identified in the NOHSC report. Only a few jurisdictions were able to provide inspection data and others with some data did not believe it to be reliable enough to use in any analysis. Given the number of state and national inquiries into the industry and the findings and recommendations made about levels of compliance and enforcement it is unfortunate that there is not a reliable national inspection data base capable of tracking changes in enforcement.

Using the available data from NSW, WA, Queensland and Victoria a series of correlations were run to establish if there was any association with outcome data. Correlations were run using the number of notices and the number of notices per 1000 employees. It was not possible to use numbers of employers as the denominator as the skewed distribution of small firms would have made any notion of enforcement coverage meaningless.

The correlations revealed a range of significant associations but there was no discernible pattern warranting further examination.

From a comparison of the inspection data each of the jurisdictions directs about a quarter of its notices based enforcement effort to the construction industry. Considered in relation to the industries share of claims (about 10%) this suggests the industry is subject to greater enforcement action than other industries. This in part may reflect the risk based targeting of industry hazards rather than claims based targeting. The industry is exposed to visible risks (falls, falling objects, structural integrity, equipment use and suitability etc.) and has a public risk exposure and consequent public awareness and scrutiny element that may attract this level of enforcement. Secondly, the high severity of injuries in the sector also attracts closer scrutiny by OHS agencies.

[51] National Occupational Health and Safety Commission, (2000), op. cit, p.102.

In relation to the nature of notices used the major difference is in Victoria where Prohibition notices are used at a much greater rate than in other jurisdictions (and within Victoria in all other industries). This may reflect a more stringent enforcement regime. A breakdown on the nature of issues covered in notices would assist in making such judgements but such data was not available. The other difference to note is the use of infringement (on-the-spot notices) in NSW, Queensland and NT which may also have the effect of heightening the awareness of legislative obligations.

A study of the impact on the spot fines prepared for NOHSC [52]concluded that they have considerable potential to prevent workplace injury and disease. However the experience in the construction industry was much less positive. The report notes:

> "In contrast to the generally positive attitude of industry respondents in general, respondents from the construction industry were far more sceptical about the preventative role of on-the-spot fines. Even those construction companies that professed a strong corporate commitment to OHS issues did not regard on-the-spot fines as having a positive preventative effect. Given that the overwhelming majority of fines, in both NSW and the NT, are issued to the construction industry, this is an issue that should be of concern to policy makers."[53]

A number of industry features such as high labour mobility and turnover and sub contracting make it difficult to establish a culture of care and systematic OHS practices. In addition the report noted criticisms of the infringement notice system particularly inconsistency of inspector decisions, the technical and minor nature of breaches and the problem of assigning accountability to the appropriate duty holder. The report further concludes:

> "These adverse perceptions, whether factual or not, have led to a hardening of attitudes and the growth of regulatory resistance. Many of the construction industry respondents interviewed, although not all, and less than an overall majority, had resigned themselves to the fact the on-the-spot fines had simply become a cost of doing business, and rather than leading to long-term preventative improvements, merely resulted in a proportional increase in the price of tenders."[54]

The prosecution data collected in this project indicated that construction attracts a disproportionate level of prosecution activity in relation to industry share of claims. This is especially the case in WA. Despite this the critical metric is the actual numbers of cases and the likely impact on industry.

[52] Gunningham., N, Sinclair., D, and Burritt., P, op.cit.
[53] Ibid, p.37.
[54] ibid, p.37.

There are a tiny number of cases in relation to the size of the industry and this reflects a number of variables including prosecution policy, available resources and other enforcement strategies used as alternatives to prosecution. The time to prepare a prosecution on a death or serious injury is considerable and can also be tied to requirements for Coronial inquiries. The deterrence value of some prosecutions may be compromised by these long lags between incident and any penalty imposed by a Court. In terms of utilising prosecution data to investigate jurisdictional differences the data is too limited to warrant further examination.

6 FINDINGS AND CONCLUSIONS

This project afforded the opportunity to examine in more detail broad changes in OHS performance as measured by claims data. There were some data limitations experienced in comparing performance at the industry sector level such as the lack of occupational data and incomplete inspection data. The approach to setting out the study findings is to briefly summarise results in answer to key questions the study sought to investigate.

6.1 Were there significant differences in claims outcomes?

Injury incidence rates have been reducing in the building and construction industry although the pattern across jurisdictions is mixed. There are significant differences between jurisdictions with NSW and WA having the highest rates and Victoria and Queensland the lowest. NSW and WA are improving off relatively high rates and Queensland and Tasmania are deteriorating off relatively low rates. The deterioration in performance in Queensland and Tasmania is contrary to the overall trend for all industries indicating issues specific to the building and construction industry.

There were a number of scheme changes in Queensland affecting coverage that may play some part in explaining recent performance. In 1998/99 the scheme had the most restricted coverage, in 1999/2000 more injuries were compensable, and in 2000/2001 more workers were covered. These changes may have increased claims within an unchanged risk profile. The "saving up" hypothesis may be applicable. The restriction on compensable injuries and coverage may have caused workers to 'carry' injuries during the restriction period, and then as the definitions were relaxed, claims were made for 'new' injuries, or aggravation of previous injuries. This could be especially pronounced for injuries which are difficult to attribute to a single 'event', but rather, develop over time, eg muscular stress injuries.

6.2 Were there significant differences in injury trends?

Fall and manual handling injuries dominate the industry. The number of fall and muscular stress claims has not changed appreciably in the study period and the share of claims in the major categories has remained stable with a slight increase in the share of muscular stress claims for lifting and handling.

In the important category of falls from heights some jurisdictions have seen slight increases in their share of such claims but the low share of claims in Queensland is the strongest jurisdictional difference. Contributing factors suggested by Queensland include consistent inspection and education effort put into the industry, two 'work at height' blitzes conducted during the study period, and the impact of Advisory Standards on 'Falls from Heights' and 'Work on Roofs'.

Scheme based changes noted earlier could also be relevant. The most 'at risk of falling' industry subdivisions (e.g. 4223 Roofing Services) could be selected out by being largely self-employed, thus not covered by the definition of 'worker' in 1998/99 and 1999/2000.

The proportion of muscular stress-handling claims is reducing in some jurisdictions (WA, NSW, NT, ACT) and increasing in others (Qld, Vic, SA, Tas) while muscular stress-lifting claims are increasing in NSW, Vic, Queensland and SA while other jurisdictions are stable or reducing in proportion.

The improvements being shown in other industries with high levels of manual handling injury are not evident in the building and construction industry. In the study period there was no concerted manual handling blitz or intervention initiated by OHS agencies. Most hazard based interventions address visible and immediate hazards such as fall from heights and issues such as manual handling are considered too difficult to address through policy interventions. Combined with the industry culture that seems to accept gradual onset injuries as a cost of doing business the prospect of significant reductions in the incidence and cost of manual handling injuries is unlikely.

There is an encouraging reduction in the fatality incidence rate in the three year study period. The volatility in fatality data makes conclusions about smaller jurisdictions difficult to make. However, in the larger jurisdictions NSW and Victoria are showing reductions. Over the three year period from 1998/99 the annual fatality rate in the construction industry across Australia has fallen by 40% from 9.8 per 100,000 employees to 5.8. Queensland has an increasing rate influenced by a jump in fatalities in 2000/2001.

6.3 Were there differences in the impact of structural factors?

An overview of recent research into OHS in the building and construction industry and a range of recent Australian task forces and inquiries highlight the complexity of factors that may explain differences in outcomes. These studies and inquiries have identified a range of structural and cultural features of the industry that are important in understanding OHS outcomes.

Many of these features, particularly organisational (e.g. supervision style) and direct site conditions (e.g. access, egress, traffic flows) are not variables able to be included in a data series able to be matched with claims data sets.

The structural factors used in this project were industry sub group, age, employer size and occupation. The industry sub group factor is perhaps most important because it captures a range of issues. Non-Building Construction for example is partly a proxy for public sector involvement and Installation Trade Services is partly a proxy for trade occupations such as plumbers and electricians.

There are clear differences in incidence rates across industry sub groups. 411: Building Construction has the lowest rate and 412: Non-Building Construction has the highest incidence rate along with 421: Site Preparation Services and 422: Building Structure Services. When looking at the duration and severity of claims Building Structure Services has the highest rate for 30+ day claims and 60+ day claims.

When industry sub groups are compared across jurisdictions a number of clear differences emerge. Building Construction 411 is low across all jurisdictions, while Non-Building Construction 412 shows much higher incidence rates than 411 across all jurisdictions. The overall rate is driven by NSW at 70-90, compared to Victoria at 30-45. SA is relatively high with WA below its usual high level.

Site Preparation Services 421 shows that Victoria's has the highest incidence rate while WA and SA are improving. In Building Structure Services 422 Queensland has very low rates but are increasing and NSW, WA, SA and Tasmania had higher rates.

The dramatic change in Queensland's rates in 423 Installation Trade Services over the review period is the highlight of this industry sub group.

In 424: Building Completion Services there is some improvement at the national level driven by NSW, Victoria and SA while Queensland's incidence rate is increasing from a low base rate. A very mixed picture is evident in 425 Other Construction Services where Victoria has low rates and there is high volatility in the smaller jurisdictions.

A more specific examination of industry sub group trends was undertaken by choosing several "outlier" cases where variation from the Australian average incidence rate was more than 50%.

In the NSW 412 Non-Building Construction case there are no hazard-specific or practice-specific reasons to have an incidence rate 68% higher than the national average. The evidence suggests that it is industry structure and culture issues rather than specific risk exposure and risk management practices that influence these outcomes. By contrast, in the Victoria 421 Site Preparation Services case it is clear that Victoria has had exceptionally high levels of muscular stress, a pattern influenced by specific risk exposure and risk management practices.

In the case of Sub industry 425 Other Construction Activities Victoria has low rates against all major mechanisms and agencies, suggesting an overall better approach to OHS rather than better performance on particular hazards.

In the Queensland 422 Building Structure Services case Queensland has low rates against all major mechanisms and agencies, especially falls from height and falls on the same level where its rates are about one quarter of that in NSW, SA and WA. The consistency of the agency and mechanism pattern in Queensland suggests that there is a lower risk exposure and better risk management practices that help explain this case.

Apart from industry sub groups the other structural factors considered were age, employer size and occupation.

Victoria has the oldest claimant profile and Western Australia the youngest profile which is in contrast to their overall employment age profile. Industry sub group 412 has a significantly older claimant profile and 423 and 424 have younger profiles. Within jurisdictions, there is a clear relationship between age and claims with the incidence rate higher for older age groups. Furthermore, not only are the incidence rates higher for older workers, the % of 60+ days claims are higher too.

The analysis of size of employer revealed a clear association between larger firms and lower incidence rates. NSW had the biggest proportion of larger employers suggesting its relative poor claims performance may be found in smaller firms within the non-building construction sector.

Occupation is an important aspect of the labour force make up and previous research has highlighted the importance of identifying occupation distribution of risk.[55] Unfortunately the data set did not enable any analysis to the two or three digit ASCO level. Consequently the industry sub group data has had to assume greater prominence.

Two other potential factors, the level of industrial disputes and the impact of labour hire are noted but the lack of comparative data did not allow for these variables to be introduced although it is thought they may be of some significance.

6.4 Which structural factors are most likely to explain differences?

The structural variables were included in correlation analysis to see if any patterns that might explain jurisdictional differences emerged. The highest correlation between incidence rates and structural factors was with some age categories, but the variables such as employer size did not reveal any strong associations. A stepwise regression using all the variables covered in the study was unable to generate a model of any statistical significance.

The lack of strong associations means that the measurable structural factors available in this study are of limited use in explaining differences between jurisdictions and indicate that other factors are more important.

[55] Monash University Accident Research Centre, op.cit.

6.5 Have OHS agency policy interventions had an impact?

In the study period jurisdictions have initiated or continued interventions to improve the health and safety performance of the industry. The information, training and awareness initiatives carried out have not been subject to any formal evaluation and it is not possible to draw conclusions about their impact.

The MOU in NSW designed to develop a cooperative program to improve performance has been evaluated and is attributed to achieving significant improvement. This intervention appears to have brought parts of the NSW industry from the "outer limits" of high incidence rates to levels still above the Australian average. This intervention also demonstrates the range of long term interventions that will be required to bring, in this case, NSW closer to other jurisdictions.

Because the building and construction industry has historically, by its risk profile, its poor performance and by its demands for industry specific treatment, been covered by specific legislation administered by dedicated inspectorates, the role of legislation and enforcement is considered worthy of particular examination.

Using a simple weighted scale NSW and Queensland have the most regulatory intensive approach to the sector and Tasmania and the ACT the least intensive. Apart from Victoria the scale is almost directly related to the size of the jurisdiction. Use of this variable in correlation analysis found some associations but no discernable pattern.

The enforcement data available showed that the jurisdictions placed disproportionate enforcement effort in to the industry. The share of notices and prosecutions was greater than the industry's share of claims. This is not surprising given the history of dedicated building and construction inspectorates.

It is likely that compliance activity by employers that ultimately reduces risk and reduces injury is linked to cost and supply chain pressures in the building and construction industry. Thus, despite the disproportionate enforcement focus on the industry, the industry's competitive pressures overwhelm even what is considered to be targeted enforcement efforts

by jurisdictions. It may be that the level and style of inspection and enforcement may require enhancement to achieve a greater impact[56].

6.6 Is it possible to develop an explanatory model for the industry?

In a previous CPM project on the aged care industry[57] an indicative model was developed that was able to translate some of the research findings into a more generalised model for interpreting comparative performance. The model was developed around the three levels of intervention that are likely to influence outcomes in any sector:

- **Institutional level**: covers workers' compensation schemes, OHS legislative framework, policy interventions etc.
- **Industry level**: covers structural factors relevant to sector, industry networks etc.
- **Workplace level**: covers management system and approach, communication and consultation arrangements etc

In the building and construction sector the institutional level mechanisms are confronted by a number of barriers to achieving the full impact of institutional policy instruments. The incentives for good performance provided by the operation of premium rates sensitive to individual firm and industry performance are challenged by the large numbers of self-employed and small contracting firms.

With such a complex and diverse industry structure the ability of compensation schemes to capture everyone is difficult as is the capacity to ensure that injuries and claims are able to be logged against the industry rather than dispersed in other classifications (e.g. labour hire). The adequacy of OHS legislation to meet this complex industry structure has also been questioned.

At the industry level operational and competitive pressures are clearly major drivers of performance. Interventions such as the NSW Memorandum of Understanding have achieved

[56] The Cole Royal Commission recommended an increased inspectorial presence in response to reported widespread non-compliance and abuse of OHS processes. Royal Commission into the Building and Construction Industry, *Final Report-State and Territory Overviews*, Volume 12, 2003.
[57] Comparative Performance Monitoring, Case Study on Performance Outcomes in the Aged Care Sector, Second report on the Health and Community Services Industry, Workplace Relations Ministers' Council, Commonwealth of Australia, August, 2002.

some success by setting industry level standards and encouraging better practice. Government purchasing practices and industry codes of practice are other measures that apply an industry standard to motivate improved performance. Again however the diversity of industry sub sectors makes a cohesive industry approach difficult. The analysis of the markedly different claims performance across industry sub sectors highlights the need for interventions to recognise these differences.

Finally, the workplace level picks up the kind of issues identified in the research outlined in section 4.1 such as site level management systems, supervision and consultation arrangements, project management style and the level of upstream safety planning. These factors are not able to be easily quantified except by the Influence Network type methodology outlined in section 4.1. The addition of some reliably scaled data on these workplace and organisational issues is likely to fill in many of the gaps identified in this study.

REFERENCES

Access Economics, *Pilot Study: Interpreting CPM Outcomes- Property and Business Services*, 2001.

ACT Government, *Building and Construction in the Australian Capital Territory-2001*

Australian Bureau of Statistics, 8755 Construction Work Done, 2003
.
Australian Bureau of Statistics, 8752 Building Activity, 2002.

Australian Bureau of Statistics, 6322 Industrial Disputes, 2000.

Bomel Ltd, *Improving health and safety in construction: Phase 1 Data collection, review and structure*, Contract Research Report 387/2001, HSE. UK (2001

Construction Industry Safety Advisory Committee to the WorkSafe Western Australia Commission, *Occupational Safety and Health in the Construction Industry In Western Australia*, 2002.

Department of Employment, Training and Industrial Relations, *Health and Safety in the Building and Construction Industry, Building and Construction Industry (Workplace Health and Safety) Taskforce – Final Report*, 2000.

Entec. UK Ltd, *Construction health and safety for the new Millennium*, Contract Research Report 313/2000, HSE. UK (2000)

Gunningham., N, Sinclair., D, and Burritt., P, *On-the sport fines and the prevention of injury and disease: the experience in Australian Workplaces*, report for the National Occupational Health and Safety Commission, 1999.

Human Reliability Associates Ltd, *Research into management, organisational and human factors in the construction industry*, Contract research report 45/1992, Health and Safety Executive. UK, 1992

Institute of Employment Studies, *Impact of the HSC/E: A Review*, Contract Research Report 385/2001, (2001), Brighton, UK.

Larsson., T and Field,. B, *The Distribution of Occupational Injury Risks in the Victorian Construction Industry*, a report prepared for the Victorian WorkCover Authority, 2001

Marshall., A, *A Review of the Common Safety Induction (Greencard) Course in South Australian Building Construction*, A building research project submitted as partial fulfillment for the award of Bachelor of Construction Economics (Honours) Degree, School of Geoinformatics, Planning and Building, University of South Australia, 2002

Monash University Accident Research Centre, *Reducing serious injury risk in the construction industry*, a report prepared for the Victorian WorkCover Authority, 2001

National Occupational Health and Safety Commission, *Data on OHS In Australia: An Overview*, (2000), Sydney.

National Occupational Health and Safety Commission, *Evaluation of Queensland Construction Safety 2000 Initiative*, report prepared by Richard Johnstone, February 1999.

NE&A Pty Ltd, *Research Report, The Comparative Effectiveness of Approved Codes of Practice in Achieving Compliance with OHS Requirements*, (2000), Grant No: 98/0010, WorkCover NSW, Sydney.

Royal Commission into the Building and Construction Industry, *Final Report, Reform-Occupational Health and Safety*, Volume 6, 2003.

Royal Commission into the Building and Construction Industry, *Final Report-State and Territory Overviews*, Volume 12, 2003.

Royal Commission into the Building and Construction Industry, *Overview of the nature and operation of the Building and Construction Industry*, Discussion Paper One, 2002.

Royal Commission into the Building and Construction Industry, *Statistical Compendium for the Building and Construction Industry*, Discussion Paper Two, 2002.

Royal Commission into the Building and Construction Industry, *Workplace Health and Safety in the Building and Construction Industry*, Discussion Paper Six, 2002.

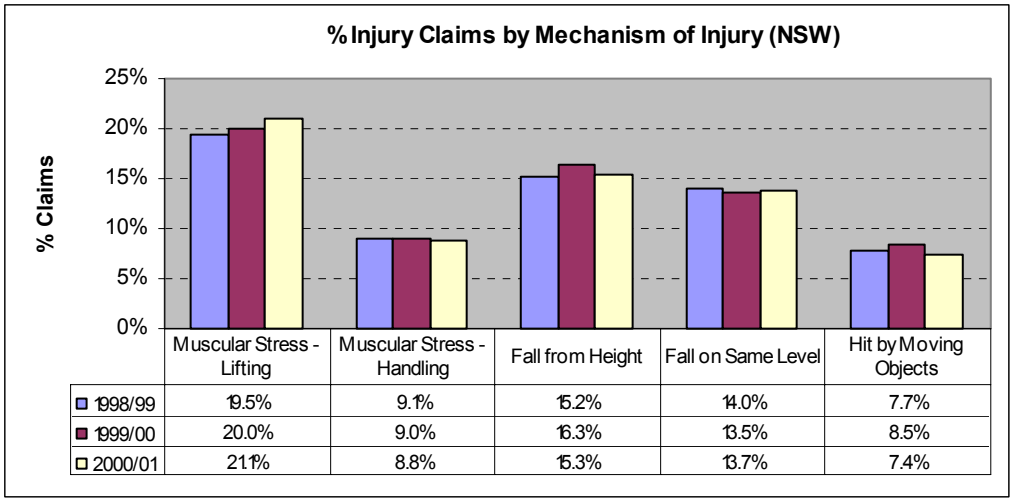
WorkCover NSW, *NSW Workplace safety summit-Communique*, July 5, 2002

WorkCover NSW, *Safely Building NSW: Priority Issues for Construction Reform*, 2001.

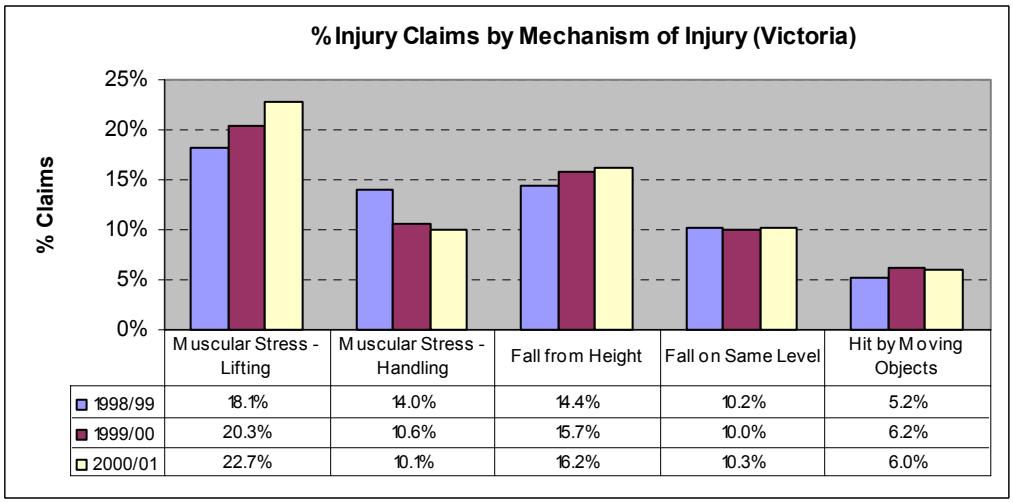
Workplace Relations Ministers' Council, Commonwealth of Australia, *Comparative Performance Monitoring, Fourth report, Australian and New Zealand Occupational Health and Safety and Workers' Compensation Schemes*, 2002.

Workplace Relations Ministers' Council Commonwealth of Australia, *Comparative Performance Monitoring, Case Study on Performance Outcomes in the Aged Care Sector, Second report on the Health and Community Services Industry*, August, 2002.

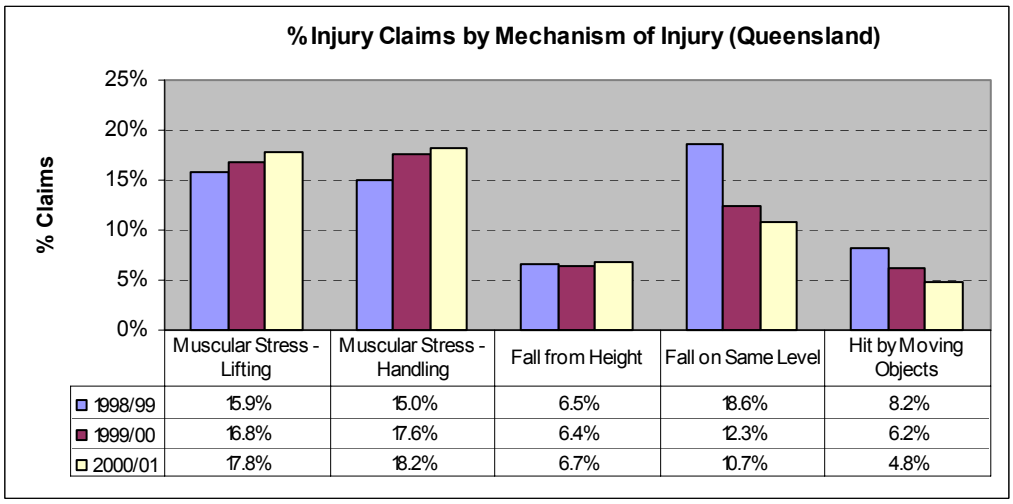
STATISTICAL SUPPLEMENT 1: MECHANISM AND AGENCY OF INJURY



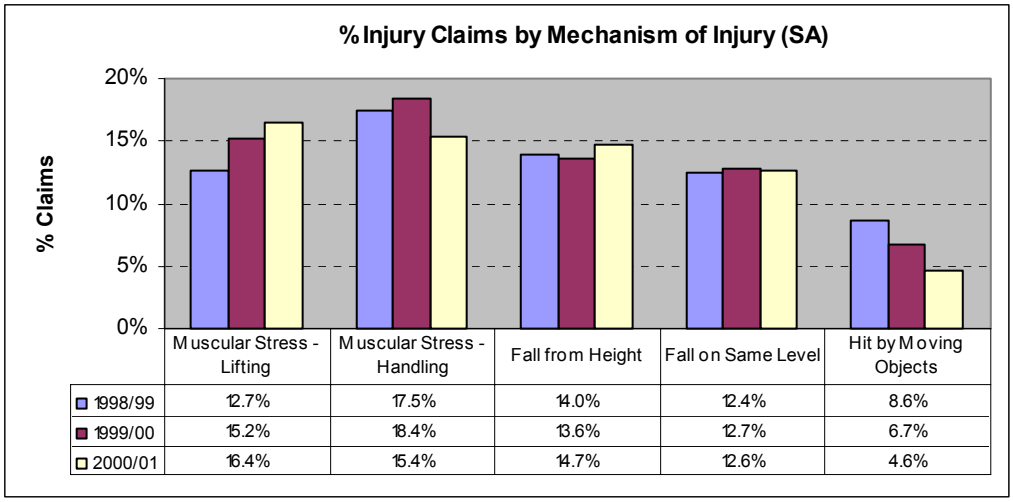
	Muscular Stress - Lifting	Muscular Stress - Handling	Fall from Height	Fall on Same Level	Hit by Moving Objects
1998/99	19.5%	9.1%	15.2%	14.0%	7.7%
1999/00	20.0%	9.0%	16.3%	13.5%	8.5%
2000/01	21.1%	8.8%	15.3%	13.7%	7.4%



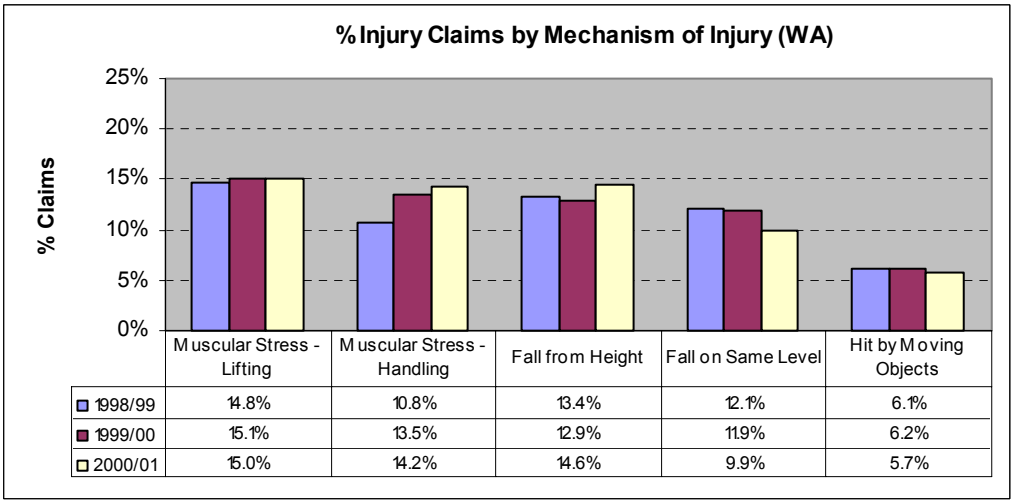
	Muscular Stress - Lifting	Muscular Stress - Handling	Fall from Height	Fall on Same Level	Hit by Moving Objects
1998/99	18.1%	14.0%	14.4%	10.2%	5.2%
1999/00	20.3%	10.6%	15.7%	10.0%	6.2%
2000/01	22.7%	10.1%	16.2%	10.3%	6.0%



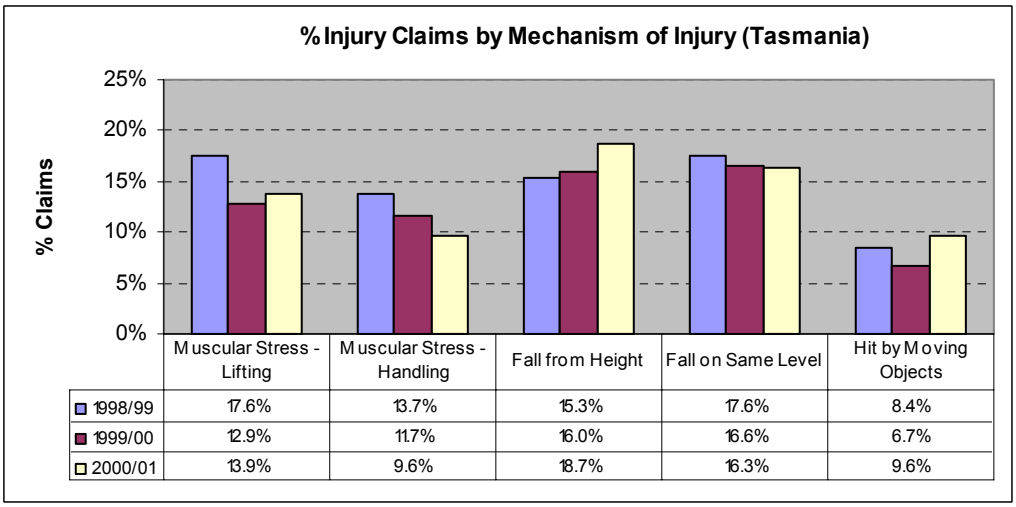
	Muscular Stress - Lifting	Muscular Stress - Handling	Fall from Height	Fall on Same Level	Hit by Moving Objects
1998/99	15.9%	15.0%	6.5%	18.6%	8.2%
1999/00	16.8%	17.6%	6.4%	12.3%	6.2%
2000/01	17.8%	18.2%	6.7%	10.7%	4.8%



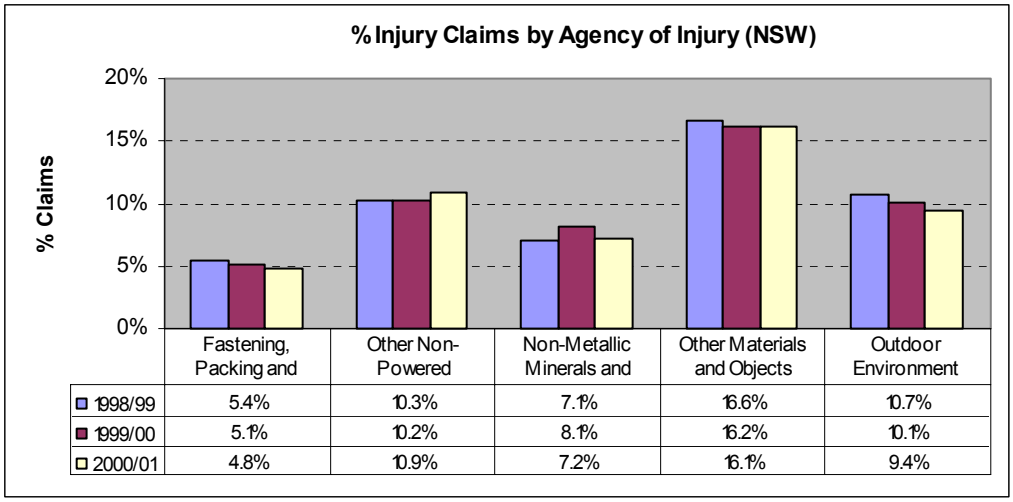
	Muscular Stress - Lifting	Muscular Stress - Handling	Fall from Height	Fall on Same Level	Hit by Moving Objects
1998/99	12.7%	17.5%	14.0%	12.4%	8.6%
1999/00	15.2%	18.4%	13.6%	12.7%	6.7%
2000/01	16.4%	15.4%	14.7%	12.6%	4.6%

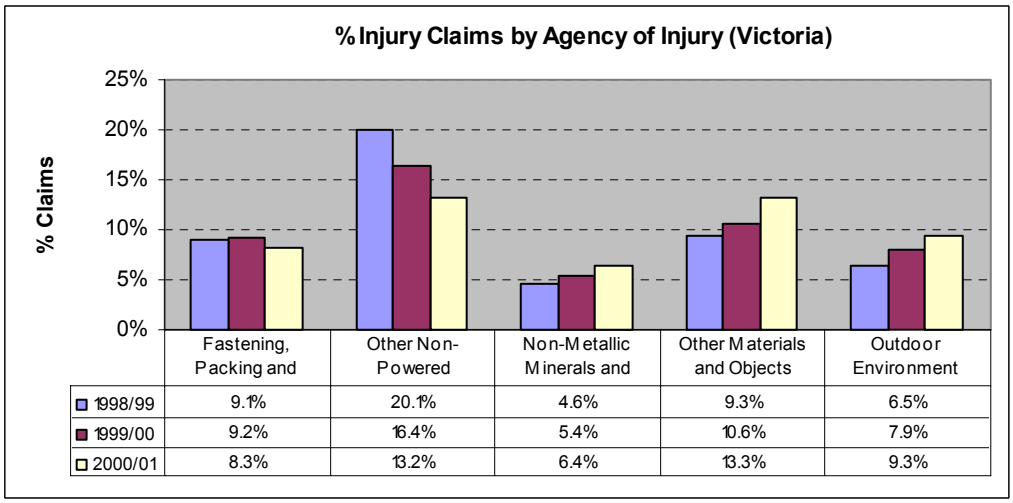


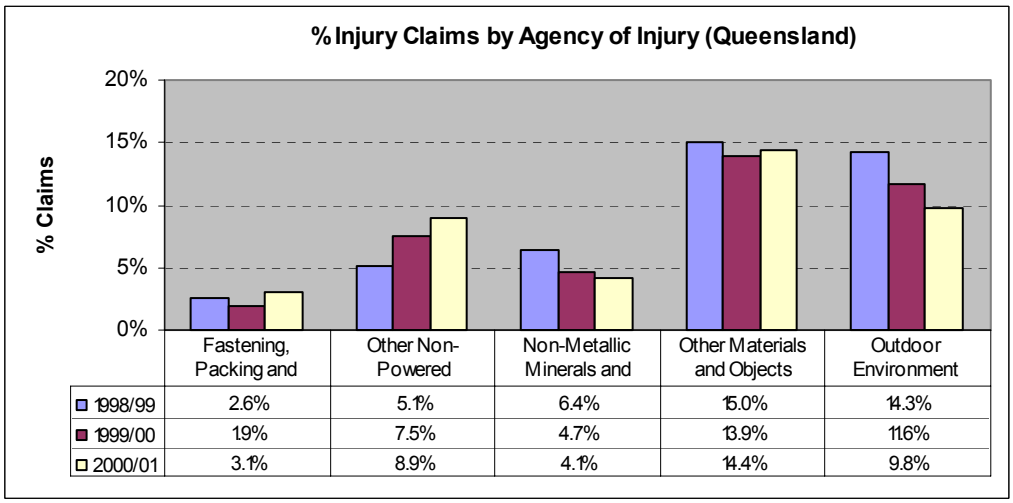
	Muscular Stress - Lifting	Muscular Stress - Handling	Fall from Height	Fall on Same Level	Hit by Moving Objects
1998/99	14.8%	10.8%	13.4%	12.1%	6.1%
1999/00	15.1%	13.5%	12.9%	11.9%	6.2%
2000/01	15.0%	14.2%	14.6%	9.9%	5.7%

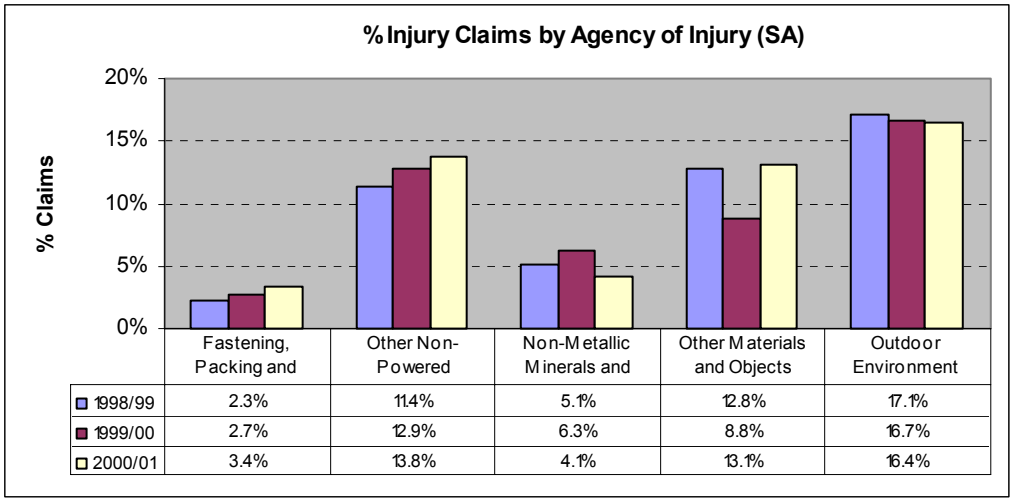


	Muscular Stress - Lifting	Muscular Stress - Handling	Fall from Height	Fall on Same Level	Hit by Moving Objects
1998/99	17.6%	13.7%	15.3%	17.6%	8.4%
1999/00	12.9%	11.7%	16.0%	16.6%	6.7%
2000/01	13.9%	9.6%	18.7%	16.3%	9.6%

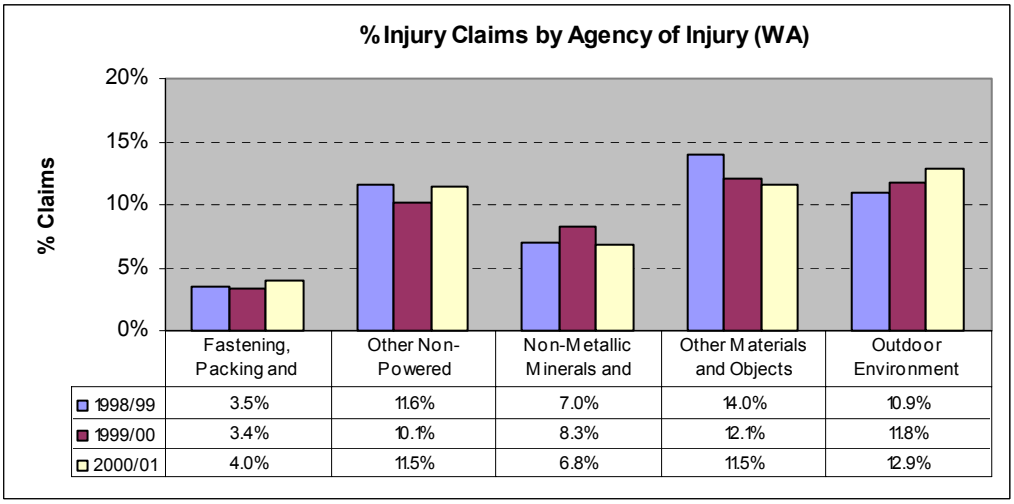

% Injury Claims by Agency of Injury (NSW)
% Claims
20%
15%
10%
5%
0%
Fastening, Packing and
Other Non-Powered
Non-Metallic Minerals and
Other Materials and Objects
Outdoor Environment
1998/99 5.4% 10.3% 7.1% 16.6% 10.7%
1999/00 5.1% 10.2% 8.1% 16.2% 10.1%
2000/01 4.8% 10.9% 7.2% 16.1% 9.4%


% Injury Claims by Agency of Injury (Victoria)
% Claims
25%
20%
15%
10%
5%
0%
Fastening, Packing and
Other Non-Powered
Non-Metallic Minerals and
Other Materials and Objects
Outdoor Environment
1998/99 9.1% 20.1% 4.6% 9.3% 6.5%
1999/00 9.2% 16.4% 5.4% 10.6% 7.9%
2000/01 8.3% 13.2% 6.4% 13.3% 9.3%

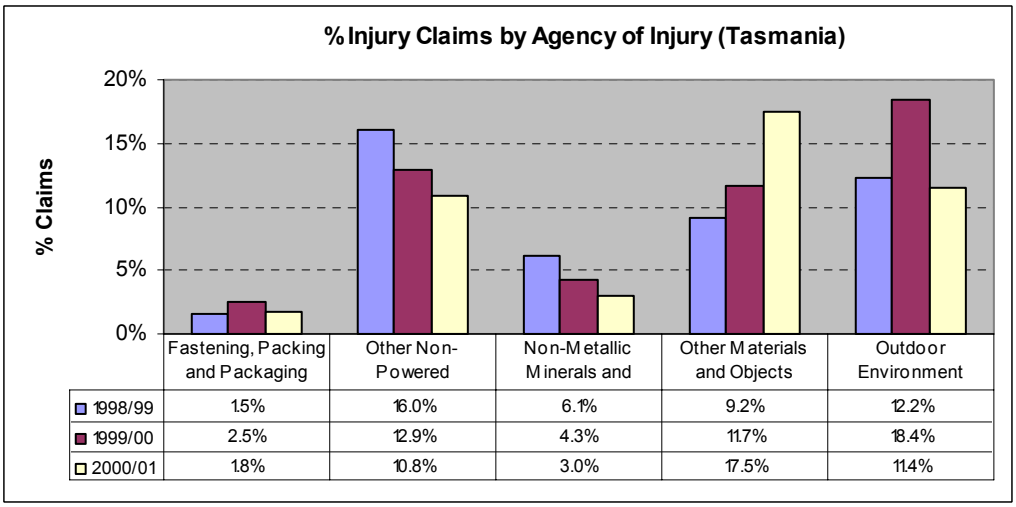

% Injury Claims by Agency of Injury (Queensland)
% Claims
20%
15%
10%
5%
0%
Fastening, Packing and
Other Non-Powered
Non-Metallic Minerals and
Other Materials and Objects
Outdoor Environment
1998/99 2.6% 5.1% 6.4% 15.0% 14.3%
1999/00 1.9% 7.5% 4.7% 13.9% 11.6%
2000/01 3.1% 8.9% 4.1% 14.4% 9.8%



	Fastening, Packing and	Other Non-Powered	Non-Metallic Minerals and	Other Materials and Objects	Outdoor Environment
1998/99	2.3%	11.4%	5.1%	12.8%	17.1%
1999/00	2.7%	12.9%	6.3%	8.8%	16.7%
2000/01	3.4%	13.8%	4.1%	13.1%	16.4%



	Fastening, Packing and	Other Non-Powered	Non-Metallic Minerals and	Other Materials and Objects	Outdoor Environment
1998/99	3.5%	11.6%	7.0%	14.0%	10.9%
1999/00	3.4%	10.1%	8.3%	12.1%	11.8%
2000/01	4.0%	11.5%	6.8%	11.5%	12.9%



	Fastening, Packing and Packaging	Other Non-Powered	Non-Metallic Minerals and	Other Materials and Objects	Outdoor Environment
1998/99	1.5%	16.0%	6.1%	9.2%	12.2%
1999/00	2.5%	12.9%	4.3%	11.7%	18.4%
2000/01	1.8%	10.8%	3.0%	17.5%	11.4%