

WHO WILL USE CLAIMS DATA FOR THE PREVENTION OF OCCUPATIONAL TRAUMA?

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If claims data from the public fund workers' compensation system is merged with the relevant census data, the relative distribution of occupational injury risk in the system can be calculated. A reconstituted occupational code, made from combining the present occupational and industrial codes, can be used to differentiate occupations in relation to hazards. A four-part injury severity index, generated in the claims settling process, can be used to further differentiate occupations, tasks and activities in terms of priorities for intervention.

Occupational injury incidence and severity in Victoria between 1992 and 2000 were analysed. Among large and small occupational groups the combined criteria of high annual injury incidence and extreme injury severity identified the occupational groups which represent the top priorities for occupational trauma prevention counter-measures in Victoria (Larsson & Field, 2002a, 2002b). All claims for over-exertion and soft tissue injury ("sprains and strains") between 1996 and 2000 (45% of the total claims volume) were analysed with specific control for age and gender. Detailed information on accident processes and exposures commonly involved were retrieved from the claims files. The top priority groups in terms of counter-measures were identified with a combination of the variables industry, occupation, age, gender and hazardous activity associated with the trauma (Larsson et al, 2001).

However, the development of systematic and detailed prevention information does not necessarily generate any prevention activities or interventions actioned by the combined public fund workers' compensation and industrial safety inspectorate system. In fact, it seems that systematic injury information is not commonly used for prevention by the public fund workers' compensation system and this might be due to a number of factors like:

- actuaries determine policies in the insurance and prevention is not properly defined,
- no proper agents for injury prevention exist in the system,
- legislation and regulation is built for prosecution, not prevention,
- safety and health is seen as commodities to be left to market forces, demand and private investment,
- the only suitable workers' compensation insurance intervention is information (pamphlets, posters, advertising campaigns, etc).

The roles of public fund workers' compensation systems, unions and collective and individual employers in practical and applied occupational injury prevention needs to be critically appraised. To move from statistics and dinner speeches to measurable reduction of clearly identified work-related injury problems, the methods and the appropriate agents for cost-efficient and systematic intervention against occupational trauma must be credibly defined.

1. BACKGROUND

A basic requirement for the promotion of occupational health and the prevention of injury is reliable and detailed information about occupational injuries. Prevention requires knowledge about where hazardous exposures create problems and in which ways workers are exposed to trauma risks. The logical areas of investigation are

- Who are at risk? Which are the typical risk occupations?
- Where are the risks? What are the typical risk situations?
- How are injuries sustained? Which are the typical accident processes?

The public fund workers' compensation system represents the main information source on occupational trauma. The definition and collection of data in the workers' compensation scheme is based on the settling of claims for compensation; the bulk of information available to the scheme concerns the consequences of injury. But the scheme also contains background information on individuals and establishments and information regarding activities and accident mechanisms related to the way in which injuries are sustained.

Potentially, certain parts of the claims information system can, together with complementary demographic data, be used to assess and monitor risk in different industries, for different jobs or activities. Based on such assessments, and through the development of systematic technical, organisational or social counter-measures, work-related risks can be reduced or eliminated and occupational injuries be prevented. Workers' compensation data, in conjunction with suitable exposure data, provide the key criteria for regulatory intervention, the selective development of safety standards, and the monitoring of severe occupational trauma.

1.1 Use of insurance and workers' compensation data in assessing occupational risk

Most national and public fund workers' compensation insurers publish annual injury and compensation statistics, but few of these publications are based on analytical and scientific approaches.

However, a number of scientific studies over the last 15 years have used workers' compensation data to describe and analyse the varied and biased distribution of occupational risk in relation to

- gender and age in relation to occupational trauma and disease (e.g. Marcinowski et al, 1988; Gluck & Oleinick, 1998; Schober et al, 1988; Miller & Kaufman, 1998),
- regional and occupational priorities for applied injury prevention activities (e.g. Rabi et al, 1998; Leigh & Miller, 1998), and;
- specific types of exposures, activities and industries (e.g. Klein et al, 1984; Feuerstein, 1998; Silverstein et al, 1998; Daniell et al, 1998; Demers & Rosenstock, 1991; Beaumont et al, 1995; Park et al, 1992).

Based on development work with extended and detailed injury information in the claims settling procedure at the Swedish workers' compensation system (Larsson, 1990a), a number of applied studies have linked comprehensive sets of claims data and measurements of injury severity to occupations, exposures, activities, tasks, equipment and environments

- in relation to high-risk occupational groups like metal workers and farmers in order to indicate suitable prevention measures (Larsson, 1990b; Larsson, 1990c);
- to assess counter-measure priorities among different occupations and activities in the Australian coal mining industry using the industry-fund workers' compensation data of the New South Wales Joint Coal Board (Mitchell & Larsson, 1994);
- to measure, with the additional help of census data, the relative incidence of permanent impairment among workers under the age of 21 injured in 1984 and 1985 in Sweden, targeting 16-19 year old wood industry workers with a risk of permanent impairment 7 times higher than the average risk among all workers in this age group (Persson & Larsson, 1991a);

- in a matched comparison between male and female metal and wood industry workers based on permanent disabilities 1987-89, where female wood industry workers were found to get caught and drawn into contact with machine parts significantly more often than their male colleagues (Persson & Larsson, 1991b);
- by merging compensation and census data, and show that females in traditionally male-dominated high-risk occupations are exposed to much higher risks of impairment from work-related strain and overuse trauma/disease than their male colleagues (Larsson, 1993);
- to analyse the regional priorities for occupational injury prevention in the Swedish region of Umeå (Larsson & Björnstig, 1990; 1995) and, with similar methods, in the Australian region of Ballarat (Rechnitzer et al, 1997).

The different examples highlight the potential use of compensation data as decision support tool for applied prevention activities. Severe occupational injuries are well described by comprehensive (public fund) workers' compensation insurance systems, which store extensive economic and medical information on injury consequences and rehabilitation. The main scientific problems in applying these large databases have to do with reliably assessing exposure (demographically and industrially), to sort out the often complicated and dynamic issues in relation to coverage and representativity, and to define valid and credible indicators of injury severity.

However, examples of applied use of workers' compensation data to support actual selective and targeted prevention interventions, by the statutory authority of workers' compensation or industrial safety inspectorate, with quantifiable outcomes and effects measured, are very hard to find. Why is this, we wonder.

1.2 Limits to the workers' compensation information

Clearly, claims for workers' compensation only reflect part of the occupationally related trauma and diseases sustained every year in the jurisdiction. The analysis of occupational risk based on claims data must be done with a number of caveats, e.g:

- the majority of occupational injuries sustained generate a disability time of less than the commonly applied excess in the scheme and are thus normally not reported to the workers' compensation insurance;
- some groups in the work force (e.g. sole traders and partnerships) are not covered by workers' compensation insurance;
- several large employers are self-insured and do not report their claims in detail to the public fund workers' compensation system;
- certain occupational groups are insured under separate schemes (e.g. seafarers),
- an unknown number of people in the system are employed, partially or fully, in black market jobs where no workers' compensation insurance applies;
- unknown proportions of the social, medical and economic consequences of work related injuries are met by public health insurance, by private health funds, by employers, by families and by the trauma and disease victims themselves (Larsson & Betts, 1996);
- diseases which might be wholly or partially related to occupational exposure (eg. respiratory, allergenic, ischemic, cancerogenic) cannot be reliably measured by the workers' compensation insurance, partly due to controversies surrounding the aetiology of certain diseases and disputes over the influence of certain occupational hazards on degenerative medical problems, and partly due to the fact that they tend to show up after retirement, at which time the worker no longer is covered by an employers workers' compensation insurance and often treated by medical specialists unable or unwilling to make the aetiological and epidemiological link between occupational exposure and disease.

However, it is clear that the public fund workers' compensation system is the best available information source for severe work-related traumatic injury. If the system aims to undertake targeted and systematic prevention activities with measurable outcomes, such activities should be based on reasonable and representative decision support information. If the priorities for prevention are based on injury severity

and social, medical and economic losses to society, the public fund workers' compensation information is the potentially most relevant.

2. TARGETS AND PRIORITIES FOR OCCUPATIONAL TRAUMA PREVENTION: THE CASE OF THE VICTORIAN WORKCOVER AUTHORITY

Between 1994 and 1997, Monash University Accident Research Centre (MUARC) and IPSO Australia developed a Strategic Occupational Injury Prevention Program for the Victorian Workcover Authority (VWA), the public fund workers' compensation insurer in the Australian state of Victoria. To do this, it was necessary to secure, through available data sources, comprehensive and valid measurement of occupational trauma, credible assessment of exposure to occupational injury risk in the working population, means of accessing and structuring information relevant for regulatory, technical and ergonomic counter-measures, and means for continuous monitoring of the incidence and severity of severe occupational trauma.

The program established a selective approach to analysing workers' compensation data with the help of a severity index, identified occupational injury "black spots" in the Victorian industry and described the outcomes of a pilot regional intervention project in Ballarat called Operation Safety (Larsson et al, 1997a; Rehnitzer et al, 1997; Larsson et al, 1997b).

2.1 Variables used

2.1.1 Claims

The central criteria variable in this program was *claims for compensation*. Included in the information database were all claims reported and incurred during the respective periods under study, which have generated an above the excess lost time (>10 days) or a medical cost above the excess (>AUD428.-). A series of consecutive observation periods were included in the information database, starting at the date of some major changes in the compensation scheme 1 Dec 1992.

2.1.2 Severity

Severity was expressed as *days compensated* (including the 10 days under the excess), *days spent as in-patient* admitted to hospital, *permanent impairment* indicated by an application or a payment for maim and whether a *fracture or amputation* had resulted from the injury. The severity index is the sum of days compensated, hospital costs, maims and fracture or amputation, calculated in such a way that the population average of each of the indicators is 1 and the population average of the index is 4. The index can be used to measure by how much (%) a certain group of claims deviate from the population average in terms of individual indicators or in terms of the cumulative four-part index (Larsson & Field, 2002a).

2.1.3 Occupation and industry

The Australian occupational code (ASCO2) was condensed from its 340 original four-digit values down to around 60. Certain occupations, which in the ASCO2 reside in wide and unspecific residual categories, were referred back to the physical and environmental exposure of their industries with the help of the Australian and New Zealand Standardised Industrial Classification (ANZSIC).

2.1.4 Census data

From the 1996 Census the Australian Bureau of Statistics provided information on all individuals in the State by age, gender, occupation, industry and region, and the variables were case-linked, ie. every individual is identified by these five variables down to the level of the Census data integrity rules. In this way, estimates of *relative and regional occupational trauma risks* can be calculated. In calculating the occupational risk figures the data has been adjusted for the 135,000 Victorians (around 7% of the workforce) who worked in companies under self-insurance in 1996 and who's injuries were not included in the injury databases of the program.

2.2 Study 1: Occupational injury risks in the State of Victoria

After analysis of claims and census data *seven occupational groups*, four small and three larger, were suggested as the top prevention priorities by being among the ten worst both in terms of average injury severity and average injury incidence (Larsson & Field, 2002a).

For these priority groups, the typical exposures and activities associated with injury were identified with the help of the injury information database, e.g. for *glass, clay, stone workers*, where 10% of the workforce sustain a severe injury at work every year, at a risk level which is at least 16 times higher than the average risk among gainfully employed in Victoria and with an average injury severity 50% higher than the average in the claims material, a large proportion of claims is related to heavy manual handling (n=60); above-average severe incidents include being hit by equipment, implements, stones, pipes, etc tipping or falling (n=23), and being caught and drawn into moving equipment, conveyors, or being crushed between moving equipment, vehicles or vehicle parts (n=12). Falls also represent an important risk problem (n=21).

Information included in the injury information system identified the following exposures as suitable for targeted intervention and prevention activities:

| | |
|---|--|
| <i>Miners, drillers (N=1,134)</i> | Falls prevention and operations of power tools and machinery. |
| <i>Forestry and logging workers (N=871)</i> | Improved felling techniques to reduce the number of workers being hit by falling trees and branches. |
| <i>Roof layers (N=1,133)</i> | Falls prevention and safe working on the roof, including reducing the injuries involving handheld power tools. |
| <i>Car and delivery drivers (N=15,295)</i> | Safe driving and technical and ergonomic improvements in cargo handling. |
| <i>Wood industry worker (N=12,044)</i> | Development of better and more functional guards and more functional materials handling equipment. |
| <i>Other construction workers (N=8,493)</i> | Improvement of scaffolding solutions and falls prevention techniques and equipment; ergonomics in the handling of power tools. |

2.3 Study 2: Occupational injury risks in the Victorian Construction Industry

The total number of employed in the Victorian construction industry in the census years of 1996 was 100,000, but the core activities in construction, which were sorted into eleven large occupational groups, included around 67,000 employees. A separate analysis to assess the occupational injury prevention priorities for this large industry sector identified a number of construction industry occupations with levels of injury severity above average. The injury blackspots for these eleven groups include:

| | |
|---|--|
| <i>Painters (N=7,696)</i> | Falls from height, especially ladders and stepladders. |
| <i>Crane, earthmoving operators (N=3,557)</i> | Falls and manual handling of vehicle attachments. |
| <i>Bricklayers (N=3,822)</i> | Falls from height, predominantly from scaffolding. |
| <i>Plasterers (N=3,629)</i> | Falls from equipment they stand on while working. |
| <i>Tilers, pavers, concreters (N=5,616)</i> | Manual materials handling. |
| <i>Steelworkers (N=1,254)</i> | Falls from height. |
| <i>Roof layers (N=1,133)</i> | Falls from roof, power tools. |
| <i>Plumbers (N=10,918)</i> | Falls from height. |
| <i>Carpenters (N=12,071)</i> | Power tools and falls from height. |
| <i>Electricians (N=11,236)</i> | Falls from height, electrical safety |

Other construction workers (N=8,493) Falls from height, power tools.

Fall risks are the absolute priority for injury prevention among the major occupational groups in the Victorian construction industry. However, fall risks appear in different ways to different trades and occupations at different stages of the construction process (Larsson & Field, 2002b) .

2.4 Study 3: Sprains, strains, age, gender & occupation

Over-exertion and soft tissue injury - sprains and strains - represent the most common diagnosis group among the claims to the Victorian Workcover Authority (Strategy 2000). The claims information available to the workers' compensation system in Victoria since 1985 shows that this proportion has been relatively stable over the life of the public fund workers' compensation in Victoria. An analysis of the risk of sustaining a sprain or strain injury conducted in 2001 according to type of industry generated the following priority list:

662 Services to Water Transport,
215 Flour Mill & Cereal Food Manufacturing incidence levels more than **800%** above the average;

412 Non-building Construction,
264 Non-Metallic Mineral Product Manufacturing incidence levels more than **700%** above the average;

262 Ceramic Product Manufacturing,
211 Meat & Meat Product Manufacturing,
263 Cement Lime Plaster Concrete Product Manufacturing incidence levels more than **600%** above the average;

226 Leather & Leather Product Manufacturing,
670 Storage incidence levels more than **500%** above the average;

213 Fruit and Vegetable Processing,
611 Road Freight Transport,
030 Forestry and Logging,
273 Non-Ferrous Basic Metal Product Manufacturing incidence levels more than **400%** above the average.

The analysis also presented 25 occupational groups, and the specific age/gender subgroups within these occupations, which have shown to be at increased risk of sustaining over-exertion and soft tissue injuries 1996 - 2000. These were the age/gender groups with an incidence figure more than twice the background risk (3.27 for women and 5.99 for men), with more than 150 identified in the occupation according to the ABS Census 1996 and at least 25 claims 1996-2000. For each of these groups, the relevant descriptions of harmful exposure from the claims information was accessed. In all, 3,900 claims descriptions were inspected and recoded, representing the complete information for occupations with limited numbers of claims and a representative sample from the occupational groups with in excess of 500 claims.

The specific prevention priorities available in the injury information systems on sprains and strains, age and gender is here exemplified by what the analysis generated in relation to the occupational group *Farmers, Nurserypersons, Gardeners, Shearers, etc:*

| Gender | Age | In the Census | Sprains claims | per 1000/year | Job/age risk |
|--------|---------|---------------|----------------|---------------|--------------|
| Female | 20 - 24 | 950 | 34 | 13.42 | 6.5 |
| Female | 25 - 29 | 1,217 | 25 | 7.70 | 3.3 |

Females under 30 years of age in this occupational group run risks of over-exertion or soft tissue injury which are 3.3 - 6.5 times the age average. One in three injuries are to the back; one in four injuries are due to falls, slips and trips; 20% of injuries are associated with heavy lifting and 27% with repetitive work; 15% of sprains and strains are sustained in contact with animals. According to the free-text information given in relation to the activities and exposures associated with injury, interventions should target work

practices, ergonomics, lifting equipment and facilities layout in farming, particularly fruit harvesting and animal husbandry (Larsson et al, 2001).

3. DISCUSSION

The merger of claims information with census data, after adjusting occupational codes to a common denominator, provides a measurement tool for occupational injury risk in the public fund workers' compensation system. The level of detail in terms of occupational exposure, accident process and mechanism, diagnosis, economic and medical consequences, together with census-based denominator data like occupation, industry, location, age and gender, can be used to intervene against, control and monitor occupational trauma.

The relative incidence levels, which seem reasonably stable over time, identify the same limited number of occupational groups exposed to more than five times the average trauma risks in the working population. The stability of trauma incidence and the distribution of severity among some of the highly risk-exposed groups can be confirmed by figures from other national workers' compensation systems (Torsteinsrud & Larsson, 1997; 1999; Forsblom et al, 2002).

The fact that recording of work-related mortality (trauma and disease) is imperfect in most systems and that the true and precise total incidence of work-related trauma and disease will remain unknown should not be used as an argument against systematic prevention activities.

So why does the public fund workers' compensation scheme seem so reluctant to undertake systematic, targeted, controlled intervention and risk elimination activities against well-known and well-documented occupational trauma risks with unacceptable levels of incidence and severity to identified groups of workers? There are a number of interesting and controversial aspects to what is required for shifting the perspective of prevention from theory and dinner speech bluster to budgeted, operational and physical interventions.

3.1 Prevention of occupational trauma

One of the conclusions from the successful intervention project "Operation Safety" in the Ballarat region 1995-96 (Larsson et al, 1997) was that intervention to reduce occupational trauma should be multi-factorial to be successful; activities on different levels - workplace visits, risk assessment activities, development projects targeting certain risks, print-media and electronic media campaigns, attitude surveys among the general public - need to be combined in order to influence claims incidence and assess changes in underlying occupational morbidity.

But in order to undertake prevention, the organisation socially responsible for this task must have defined what activities constitute prevention (and which do not), if applied prevention should be an operational responsibility for the organisation, what competencies and resources are needed to carry out successful prevention activities, and how such activities fit into the strategies and operational plans of the organisation. In this regard, the workers' compensation systems in the Australian jurisdictions have a few unresolved policy issues to cope with.

3.1.1 Actuarial, legal and moral perspectives

The merger of workers' compensation insurance and industrial safety inspectorate (1996 in Victoria) has meant that an actuarial, private insurance perspective, where *risk* equals *financial liability*, was combined with an inspectorial approach focusing on deterrence, compliance control and legal sanctions, albeit with rather limited resources. In a reversal of the no-fault principles implemented by a liberal government in 1997, the incoming labour government in 1998, with the strong support of the local union movement, concentrated its efforts in the workers' compensation area on re-introducing the right to litigate and pursue lump sum payments in the courts. The policy focus thus returned to compensation.

The legislative and regulatory framework in the Australian jurisdictions is built for prosecution and is not easily applied to the control of hazards, reduction of risks and the prevention of injury. Industrial operators seeking advice from the Inspectorate are told to do their own risk assessment in fulfillment of their legal obligation and duty of care. There is an underlying concern that the inspectorial police role might be compromised in terms of liability if actual practical advice on risk elimination is given.

In tri-partite local approaches to work environment standards the potential agents for occupational injury prevention in the system, the labour unions and the employer organisations, sometimes agree on “codes of practice” describing recommended routines, use of equipment and rules to follow in relation to hazardous tasks. Such agreements are as close as the system gets to applied prevention and risk control. However, no systematic or targeted follow-up activities in relation to the uptake and actual practice of these codes are conducted, leaving the codes as recommendations mainly used as reference material in prosecutions.

The industrial relations climate is frosty and weak and/or decreasing unions and employer organisations are mainly concentrated on competition, demarcation issues and political survival. Safety and health is sometimes used as a means to an end in negotiations, rarely as an end in itself. The unions view litigation lawyers as the workers best allies, and rely on prosecutions, “corporate manslaughter” legislation, and focused corporate liability to defend the safety and health of employees. Employer organisations are equally dependent on their legal advisers to handle the corporate duties and liabilities in relation to health and safety in the workplace. Since the dominant definition of the problem is legal – and thus a matter of conflict – cooperation, problem solving, and prevention of occupational injury does not happen.

At the national political level, positive safety and health outcomes in the work environment are seen as dependent on the individual employer, and are promoted by the national OHS body as the result of good management by morally committed business leaders.

In view of the strongly adversarial industrial and legal environment in which the injury problem needs to be addressed in Australia, it is not surprising that printing and distribution of information material represents the most common activity with the workers’ compensation system.

3.1.2 What needs to change in the Australian systems?

It is suggested that effective injury prevention can only be done if there is a viable consensus between involved parties – unions, employers and government – about the scope of the problem and the type of counter-measures needed. Industrial relations counterparts who don’t believe that injury prevention is possible will never actively contribute to the reduction of occupational injury.

Occupational injury prevention will always be a low priority in a legal system which feeds off the consequences of injury and has no use for injuries which were avoided. The stronger the influence of the litigation lobby, the less efforts will be spent in the system detecting risk, controlling hazards and avoiding injury. A workers’ compensation system needs to operate under the rules of no-fault, with fair and equitable treatment of all injured according to assessed loss, impairment, pain and suffering, and this has proven to be much better handled in systems which keep such decisions outside the adversarial court system.

Finally, the organisation which should be the strongest advocate for the rights of workers to a safe and healthy workplace – the union – needs to change its priorities radically. As increasing proportions of the workforce are working outside the large corporations – as sub-contractors, franchise holders, self-employed, or in small, family businesses – the relevance of the union movement in Australia will depend on its ability to define the crucial social, economic and medical issues for a majority of the workforce.

Health and safety at work is such an issue.

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