Aftermath

The Social and Economic Consequences of Workplace Injury and Illness

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Acknowledgements

The research team would first and foremost like to express their deepest appreciation and gratitude to the participants for sharing their stories and experiences. Without the generosity and honesty of the fifteen participants of the study as well as their families, friends, employers, and others who were involved, the study could not have taken place.

We also take the opportunity to thank the members of our Expert Group who contributed their experience, time, and advice at the various stages of the research. Their inputs have helped make this report the result of a robust and rigorous research process and therefore, a better product.

OSH field staff from the various Regional Offices provided their experience, information, and time, and their involvement at the different stages of the research was a source of support and assistance for the team. We would like to acknowledge our appreciation of their co-operation and involvement.

Two members of WEB Research were a part of the research team and we would like to thank them for their inputs which manifested in a range of different activities from helping conduct the interviews to participating in the analysis (and thereby adding rigour to it), to providing review for the various drafts of the report.

The team expresses a further note of thanks to the Accident Compensation Corporation (ACC) for their administrative assistance and the additional financial input for the printing of this report.

Last but not least, the team would like to take this opportunity to thank both OSH and LMPG staff, and, in particular, Graeme Cahalane and Julian Silver for their continual support, encouragement and guidance through the process of the research and the writing of the report.

Disclaimer

This study summarises qualitative research conducted during 2001, and reflects the views and perceptions of individuals affected by the consequences of workplace injury occurring between 1992 and 2001.

Researchers have taken all care to accurately reflect the views of individuals while maintaining their privacy. Wherever possible within the limitations of the research, where those views were about factual circumstances, data that bears on those views has been gathered to establish their accuracy.

In publishing the views and recollections of participants, the Department of Labour reminds readers that the views and recollections expressed by participants are not necessarily those of the Department or of other organisations, institutions or individuals discussed by participants.

Published jointly by the Department of Labour and the Accident Compensation Corporation.

Wellington

New Zealand

www.dol.govt.nz

November 2002

ISBN 0-477-03669-4

FOREWORD

As a country New Zealand has long ago (or so it seems now) rejected the idea that accidents on the road are always just accidents. There is now no societal tolerance for drunk driving or speeding. Our expectations of a safety culture on the roads, the safety of vehicles and of roads themselves are improving and as a result the number of fatalities is falling.

The same cannot be said yet for accidents in the workplace. Accompanying the passage of the Health and Safety in Employment Amendment Bill through Parliament over the past year has been a lot of political posturing and noise about who is to blame and who is responsible for workplace accidents and invariably it is not the group posing the question.

What this study demonstrates so clearly is that we are all, one way or other, directly or indirectly, responsible for the prevention of harm at work or for the care of those harmed. This is a community issue and requires all those involved in workplace health and safety (workers, employers, their families and government) to approach each other with a community of interest in better prevention and care.

The stories in this study tell us about the sometimes-horrific human impact of minor slip-ups. They are at times harrowing, with expressions of grief and loss that cannot but move the reader. They are also at times full of hope, courage and determination, as those harmed, their families and workplaces express how they struggled to overcome the severe consequences that the injury or illness wreaked on their lives. At a distance from those directly involved, I would like to thank those who participated in this study for the honesty and courage they showed in telling their stories.

But as a whole this study does more than express individual experience. There are fifteen individual stories from widely different industries, with very different injuries or illnesses; they express, however, a collective burden. The weight of the suffering and loss can be seen for what it is to the community as a whole – a drag on growth, a brake on success and happiness. Multiply the stories literally hundreds and thousands of times and you can begin to understand the level of waste, suffering and loss that unnecessary occupational illness and injury produces.

We owe it to each other to act to change the culture and work practices in workplaces and the community so that the number of like stories that can be told in the future diminishes.

Hon Margaret Wilson

Minister of Labour

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EXECUTIVE SUMMARY

Introduction

No one person experiences, sees or accounts for the full consequences of a workplace injury or illness. Consequently, the full depth and breadth of costs and consequences are often not measured or recorded in any official statistic. Often they are not recorded anywhere.

Employees who are harmed will inevitably bear much of the consequences of what happens to them by themselves, as others simply will not experience or fully understand the degree of pain or isolation that they may experience. Likewise, the costs and consequences to family, friends, or work colleagues often goes unrecorded and unobserved, although they are nonetheless real. Many consequences are unable to be measured directly as an economic cost or some other cost, such as a loss of intimacy between spouses, or the breakdown of a family unit due to an unexpected death. The experience of being harmed at work can be devastating, with profound emotional consequences for all those involved. People may become isolated, estranged from their community and depressed. Isolation and estrangement can become permanent. The widow in the study expressed the profound and lasting impact of her husband's injury on her:

> There was never a point to say goodbye to a marriage and that of all things of the whole lot I feel I have lost. I have lost my marriage… I always feel I live in the shade, I no longer live in the sun. (Ian's wife)

To explore these wider costs for society the Social and Economic Consequences of Workplace Injury and Illness Study aimed to gain an understanding of the full range of consequences of workplace illness and injury. It attempted to do this by examining the costs through the experiences of the affected participant in the study, their family, friends, their colleagues, employers and supervisors in the workplace. As much as is possible the study tried to gain a depth of understanding of each case and chart the intangible effects on society. The following report presents the study's findings.

Context

Prior research in 2000, focussed on the potential costs to the business sector arising from complying with the Health and Safety in Employment Act 1992 (HSE Act). It found that these costs were hard to quantify and specifically identify. In 2001 the Department of Labour and the Accident Compensation Corporation (ACC) undertook research into the effectiveness of health and safety legislation through case studies.

Other research by the Ministry of Economic Development examined the effect of the costs of compliance on employers. Although these costs were seen as part of business, there were concerns about the nature and amount of these costs. Small-to medium-size enterprises were particularly affected. There were concerns over the impact on competitiveness, innovation and investment. As regards the HSE Act, businesses while supportive, described the act as resource hungry. Both pieces of research have provided only indirect insight into the social consequences of injury and illness in the workplace.

The government will shortly be consulting on the New Zealand Injury Prevention Strategy (NZIPS). This is to promote a co-ordinated approach to injury prevention across government. One of the identified strategies of the NZIPS that the government wants to develop is a workplace injury strategy. Another solution is to focus government and business attention on the costs of non-compliance through legislative change. The Injury Prevention, Rehabilitation, and Compensation Act

2001 (IPRC Act) and Health and Safety in Employment Amendment Bill (HSE Amendment) currently before Parliament are integral parts of producing a more co-ordinated strategy for injury prevention and rehabilitation.

Background

This study was initiated by the Occupational Safety and Health Service (OSH) of the Department of Labour (the Department). Because of the wider interest that was shown internal and external to the department, OSH invited groups with interests in injury prevention, such as the Labour Market Policy Group and ACC to participate. So, in 2001 the Department and ACC undertook case study research to obtain a deeper understanding of the consequences of injury and illness. While employer's understanding of the costs of compliance are well documented, the costs and consequences of avoidable occupational injury and illness are not. Further, how non-compliance affects the community is to a greater degree unknown. How costs are distributed beyond the employer and the experiences of those who bear them need investigation. Because of their nature, the full breadth and depth of costs of workplace illness and injury are not recorded in any official statistic.

Objectives

To explore the social and economic consequences of workplace injury and illness, three objectives were identified:

- to explore the social and economic consequences of workplace injury and illness for injured and ill employees, their families, and the workplace;
- to identify key characteristics that determine social consequences; and
- to inform investment in health and safety in the workplace.

Methodology

To achieve the purpose of the study, four research questions were drawn from the study objectives. These were:

1. What are the main social consequences of workplace injury and illness and how can they be identified and avoided?
2. What are the key characteristics (for example gender, ethnicity, age, family status, injury or illness type, and location) that shape the social consequences and economic costs following occupational illness or injury?
3. What is the nature and extent of the financial costs (for example loss of income, medical costs) of workplace illness and injury and how can these be valued in economic and social terms?
4. What are the links between social consequences and economic costs of workplace illness and injury?

The unit of analysis for these questions was the ill or injured employee and their relationships in the home, workplace and community. A case study approach, with both quantitative and qualitative methods was utilised. This involved triangulating data from a number of sources including; existing ACC and OSH research, analysis of stakeholder views, and case studies interviews with the affected person their family, workmates, and if appropriate OSH and other health professionals.

An iterative research process was used. The research objectives, the questions, the case study framework, and a participant selection process were developed. From this a literature review was completed, semi-structured interview questions developed, workshops on the analytical framework for data analysis conducted, and a report writing process established. A framework for data analysis

for the interviews within a case was created and this led to cross-case analysis. From each interview the key themes were drawn out using the interview transcripts, OSH and ACC information. When two cases were completed a formal stocktake was done to determine whether the process was working correctly. Once all the interviews had been conducted the themes from all cases were then analysed and cross-case analysis performed.

Fifteen cases were selected using a number of criteria including age, family status, socio-economic status, occupation, gender, nature of workplace injury or illness or conditions/environment. All but one of the cases had been the subject of an OSH investigation and were, in the opinion of the inspector involved, characterised by causing serious direct consequences to the participants. As such, they should not be seen as 'average', but were selected to represent what happens when things go seriously wrong. Therefore, while the cases were representative of ordinary people in common industries, they also represented the potential for serious consequences when things go wrong.[1]

The research team was made up of seven researchers from the Department of Labour, two independent researchers, and a researcher from ACC. The team was from a wide range of academic disciplines and backgrounds (nursing, law, community development, and social sciences). An external virtual group was set up to provide extra input by electronic mail. Information and comments were available to the whole group. It helped to keep those outside the project up to date with the research, provided different perspectives, gave additional information and access to international knowledge.

We attempted to measure economic costs. We divided economic costs into two types:

- unknown economic costs – costs which are known to exist but for which dollar values were not known.
- known economic costs – specific dollar costs.

Costs were viewed in terms of which person or organisation bore them. These costs were worked out from both documented and secondary sources.

Social consequences were not given a dollar value, but we sought a detailed understanding from participants, families and workplaces and others in the interviews.

Research Findings

Seven principle findings

The research produced seven principle findings from analysis of the case studies:

1. Minor mistakes cause big consequences

   Workplace injury or illness often resulted from minor failures in workplace systems or practices. Gaps in systems or practices that may have seemed minuscule or insignificant prior to an injury or illness often turned out to have huge consequences for the affected person and others.

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[1] The Literature Review Part I: Macro Studies includes an explanation of total loss control theory of accidents. This theory, first developed by Heinrich in the 1950s, aims to express a rule of distribution of the consequences of a particular type of work accident. Heinrich analysed 1,500 enterprises in 1931 and concluded that the invisible part of accidents was four times the visible part. Thus, behind one visible case of major injury, there were 29 cases of minor injuries, and 300 no injury accidents. Numerous researchers have subsequently argued for different ratios based on the same triangular model. (For example, see Health and Safety Executive (1997)). The Literature Review also contains information on other studies which discuss the amount of cases hidden from Workers' Compensation data, such as ACC data.

2. The consequences ripple out

Injury or illness had huge consequences not just for the participant but for their family, their workplace and their community. The effects rippled out from the participant to touch the whole community.

3. Costs were enormous, non-recoverable and ongoing

The social and economic costs of a workplace injury or illness are non-recoverable and ongoing. They include both quantifiable and unquantifiable costs, and they continue to mount long after the injury or illness event.

4. In spite of common characteristics between cases, consequences varied greatly

Although there were commonalties between the cases in the study, each injury or illness there were also unique individual or situational factors. Other influences to be considered were personal, social, organisational and environmental variables. These all affected the consequences of the injury or illness.

5. Relationship between cause and consequence

This research indicated that if a company has good health and safety systems that were an integral part of the work environment, then their support systems for injured or ill employees were also better. A full commitment to health and safety by an employer was more often than not reflected in rehabilitation and support structures. There was in effect, a health and safety culture.

6. Over-arching cost determinants

A number of over-arching cost determinants emerged from analysis of the data. These determinants included isolation, suffering, responsibility, blame, power and understanding. The cost determinants were most often linked and inter-dependent and influenced the recovery and coping ability of the affected.

7. Support

Support, in whatever form, and whether from family, friends, colleagues, workplace and/or community, was again a major factor in the recovery and the ability of the injured or ill person to cope, as well as for others affected. Better support resulted in better rehabilitation outcomes and an easier return to working and community life.

The Findings

The research process and analysis produced findings in five areas of society. These areas were the participant, the participant's family and friends, the participant's workplace, the medical sector and the government. The principal findings kept reappearing in each of these specific areas in the study.

Individual

Past research indicates that injured employees bear about 30 percent of the total costs of workplace injury and illness, which include loss of income, pain and suffering, loss of future earnings, medical costs and travel costs. The share of costs borne by injured employees rises sharply with the severity of the outcome while the share borne by their employer falls.[2] There was a varied range of social and economic consequences for the participants in the study. These were influenced by a number of

[2] Australian Industry Commission (1995). p18.

factors, such as: the participant's personality, the understanding the participant had of their condition and the availability of support.

The importance of understanding of the participants and by their family and friends was highlighted in the study. Participants were keen to understand what was wrong with them. This related to finding appropriate rehabilitation, how long the recovery took, if they recovered completely, and what they should have done. There were differing levels of understanding of conditions and treatment, which influenced recovery. With gradual process conditions, it was harder to diagnose and for the affected to recognise that there was a problem (Lisa, Julia, Murray, John, Philip). Relationships with family and friends were strained through emotional stress, financial pressure or physical isolation. Family and friends were deeply impacted, leading to either deeper bonding or disintegration of the relationship. In a number of cases the injury or illness resulted in temporary or permanent loss of sexual or other intimacy between partners (Brian, Keith, Peter, Thomas). Thomas' wife commented on the effects of his injury on his relationship with his children:

> [The kids] stayed away from him. He couldn't lift his kids up, he couldn't cuddle his kids… (Thomas' wife)

Support and its presence or absence was of considerable importance in the study. Participants often felt isolated from support structures. These included sources of information, support groups, and often, infrastructural support.

This affected their ability to cope and their recovery. Related to this was the attitudes they encountered in their workplace. Attitudes and support received from the workplace affected the psychological and physical recovery process of individuals, as well as their ability to understand and handle their condition (Lisa, Grant). In certain cases it impacted on the participant's family's ability to deal with the aftermath (Ian).

Participants' careers were affected directly as result of their condition. This included shifting to other jobs, retraining, and being unable to continue what they had been doing and actually doing nothing (Murray, John, Peter, Julia). It also included those who returned to the same job, but felt that career options had been lost (Grant, Thomas):

> It's narrowed my options down something shocking really, and its quite scary sometimes to think about it and think about where you, because everybody likes to think they can do whatever they like. And I have, I have been able to up until now. (Grant)

Participants whose jobs were disrupted by injury or illness suffered financial losses. These costs included ongoing medical costs, direct income loss, transport costs, and losses related to lifestyle changes.

Participants' experiences with dealing with government agencies such as OSH and ACC differed. In dealing with OSH, in two of the cases mention was made about the negative affects that OSH staff had on the participant (Grant, Murray). This affected the recovery and rehabilitation in one of the cases (Grant). A number of the participants found ACC frustrating to deal with (Murray, John, Julia, Lisa, Barbara). This was particularly apparent with occupational illness where individuals can find it hard to establish an occupational cause for their condition. A number of participants were involved in legal proceedings, either prosecution of an employer for breaches of the HSE Act or review or appeal of ACC decisions.

Participants' personality had an observed effect on the presence of certain social consequences, and their severity. Some took charge of their situation, made changes and felt more positive as a result (Paul, Lisa, Thomas). Other personality traits impacted negatively on the consequences suffered by participants. They became withdrawn, internalising their problems and worries (Martin, Peter). This led to pressure within their personal relationships. As a result of their condition, some became suicidal, depressed or violent. This affected their relationships (John, Murray):

> I just hate living like this, eh. I really do. The main focus I've got in life is with most of the guys in relationships is to make sure that their partner is well-catered for when they die sort of thing. That's my focus,

> I want to make sure that [the] mortgage is paid and everything like this, then I don't mind doing something, disappearing or whatever... (Murray)

Some participants' labour market status was such that they did not feel secure in their job (Thomas, Grant). Labour market factors for these participants meant it would have been hard to be re-employed elsewhere. This has meant staying in their former occupation. Others have chosen to retrain (Peter, John), and others have yet to find alternative employment (Julia, Murray).

> Who wants to hire a crazy? (Murray)

The total documented costs borne by the 15 participants themselves were $56,952.00. These do not include the potential estimated income loss as far as Philip is concerned, of $105,833 that he would have earned had he completed his training and specialised as he had planned to do. Also not included is the $225,000.00 spent by Elizabeth on a house that would accommodate Brian's special needs. The potential income loss to the individual and their family is not included, as this is unreliable and difficult to quantify. Other financial costs are also not included, due to the limitations of participant recall. This figure also does not include the undocumented costs to each individual, which would be considerably higher. Note that this also includes costs to the immediate family of the participants.

Friends and Family

In all the cases the family suffered emotionally, mentally and financially. Family relationships were affected, mostly negatively. This impact rippled outside the immediate circle of the participant touching the workplace and the community.

The initial reaction to an injury or illness was shock and disbelief. This was affected by the severity of the injury or illness, the degree of information and support available, when it was provided, and the amount of follow-up care that was offered. Lack of awareness or information about the injury or illness contributed to the initial shock. The degree of shock and trauma varied, but was present to some extent in all of the cases. Because of the sudden nature of injuries, it was generally more pronounced in these cases. Shock was exacerbated by the lack of clear communication between family, workplace, and medical professionals, and inability to access good information and support (Brain, John, Murray, Ian, Peter, Mark, Sarah):

> The doctors... are a bit cavalier with relatives, y'know... [they said] he's stuffed... we've taken out X amount of his brain, the rest of it's like a bowl of jelly dropped from a height. It's just shattered. He will be no good. They really push you to [turn off] the ventilator. (Brian's wife)

Communication, information and support continued to influence the families' and friends' experiences long after the initial reaction to the injury or illness.

Within family relationships partners were in most cases severely affected. The injury or illness strained the relationship through emotional stress, financial pressure or physical isolation in five cases (John, Murray, Peter, Philip, Thomas). An important factor was whether there was understanding of the effects upon the individual, and whether they understood the impact on their partner, particularly so for illnesses where symptoms appeared gradually (John, Murray):

> We separated... the reason was that she said I had changed that much and I was, just that I was a harder person to get along with... Which I was. (Murray)

The strain resulted in a separation or redefinition of the relationship in four cases. In two cases, the pre-injury relationship was lost permanently and irrevocably (Ian, Brian). Intimacy was frequently severely affected, often further impacting the relationship. Beyond the affected person and their partner the relationships with their families; children, parents, and siblings were impacted in all cases. For young children, the effects of an illness or injury on an individual could substantially change the way that person was able to interact with them, sometimes resulting in physical and/or emotional isolation (Brian, Sarah, Thomas, Paul, John). Where the individual had adult children, the injury or illness and its aftermath profoundly affected their relationship with them, though not always negatively (Mark, Grant):

> For a long, long time, every time I thought about the accident, I was, I think I started to realise how close he was to dying, I mean, if it had been a foot the other way, he'd be dead, and, just how lucky we were... you just realise how quickly things can change…I sort of, took things for granted a bit before the accident, things that I don't take for granted now…you might not be around to say things later. I think a lot more like that now. (Mark's son)

Not unsurprisingly, in some cases, family members expressed some animosity to the individual's workplace (Paul, John, Ian, Brian, Thomas, Peter, Mark). This varied from concerns about workplace safety, to anger at workplace responses to the injury or illness:

> I was angry. I was so angry at the firm. How can they have done that to me. (Ian's widow)

Suffering rippled beyond the immediate family to friends, workplaces and communities. A serious injury or illness isolated the participants and their families. Close friends were often unable to relate to the participants' new circumstances (Brian, Murray, Julia, John, Ian). Isolation was on occasion self-imposed. The major reasons for self-isolation appeared to be others' lack of understanding, self-consciousness about injuries or, in the case of solvent induced neurotoxicity, inability to cope with mood swings (Murray, John, Brian, Peter). Brian's wife described their life after the injury :

> I really don't have a social life anymore. We don't go fishing, we don't go for trips away anymore. (Brian's wife)

The temporary or permanent removal of an injured or ill worker from the workplace impacted not only on their career, responsibilities, and lifestyle but also on those around them. Many families found that their domestic and family responsibilities altered (Julia, Sarah, Mark, Ian, Brian, Peter). The changes were either directly related to caring for affected, or assuming their normal responsibilities when they were unable to perform them. In some cases this was temporary, in others it was a permanent change. Employment and study prospects were also altered. Partners gave up employment or study to become the major caregiver following the injury or onset of illness (Brian, Peter). These revisions in income and career led to, in almost all the cases, changes in the affected persons' lifestyles. This varied from being a comparatively temporary change during recovery, to being massive and permanent. It depended on the nature and severity of the injury or illness, but was also affected by the pre-injury situation, and financial considerations. For some participants, even with ACC entitlements, there was a considerable drop in income:

> They had no money, I remember something that really hit home to me was the fact that they had no money for their twins' first birthday. Thomas was so upset because [he saw] himself as the provider and was very, very adamant that it was his job to provide for Karen and the girls. And he just, he couldn't cope with the fact that he couldn't give his girls a birthday, he couldn't, they couldn't go and buy a cake. (OSH Inspector - Thomas)

The extent and degree of family support available to the affected person was important in rehabilitation outcomes. In three cases, the family played an active role, becoming involved in the medical treatment (Brian, Peter, John). This involvement varied, depending on the medical knowledge of the family member. In three cases, friends offered considerable help (Brian, Julia, John). Often families found there were barriers to providing the support they wished to offer (Brian, John). This related to the availability of support structures or information, or the difficulties experienced in dealing with government institutions. There was also a lack of support for partners of injured and ill workers.

Family status and in particular those who had dependants were affected in the way they reacted and the consequences faced after their injury or illness. The age of the individual affected the social and familial responsibilities that the individual had to assume. Younger participants cared for young children, while older participants were caring for elderly relatives (Thomas, Paul, Julia).

Rehabilitation and recovery (physical and mental) was aided when there was good support from both family and friends. For family members to offer appropriate support, they needed to understand the condition, and its effects on the individual. This understanding was generally more apparent in injury

cases. Where participants lived largely determined the extent of the support structures that were available to the families.

Workplace

The social and economic consequences of injury and illness impacted on the workplace, not just primary actors such as the employer and the affected employee but employee representatives, workmates and other staff. The effects of an injury or illness rippled through the workplaces in the study. An injury or illness highlighted systems' adequacy or inadequacy within workplaces.

The employment relationship between the employer and employee is important in understanding the consequences for the workplace. The key components of this relationship, for the injury or illness and its outcomes, were influence and responsibility. Who held influence and how it was used was important. Its use affected work processes and health and safety in a workplace. Perceptions of who had responsibility and influence, and workplace roles, often determined influence. In five of the cases (Barbara, Peter, Thomas, Julia, Martin) employers did not believe themselves to be influential or able to influence unsafe behaviours. Conversely five of the workers (Philip, Brian, Peter, John, Thomas) felt unable to refuse work which proved to be dangerous. The approach taken to the injury event by the supervisor or employer impacted on the rehabilitation outcomes for the worker in two cases (Lisa and Grant). The most successful outcomes for both the worker and workplace were when the employer took an active role with the worker and appropriate responsibility for what occurred. This is the most evident in the case of Lisa, whose manager supported her and gave evidence at an ACC hearing. Lisa said:

> My manager has been really good in supporting me. She was part of my review… gave supporting evidence for me. (Lisa)

In four of the cases unions played an important role in the aftermath of the injury or illness(Barbara, Ian, Lisa, Julia). The union was able to redress imbalances between individuals, workplaces, and government organisations. They did this by providing resources, mediation, knowledge of government systems and support. For Julia the union was of great importance,

> …[the union official] gave me hope that something could be done. (Julia)

Workmates were both affected by an injury or illness, and had important effects in their attitude to the participants and their predicament. Reactions of workmates differed, ranging from hostility through indifference to minimisation, inability to support, guilt and support. Where the injury was visible greater sympathy and understanding was shown to the participant (Sarah, Brian, Mark). There were doubts over occupational illnesses diagnoses in all but Lisa's case. When a popular colleague was badly injured in a workplace, the workmates experienced grief, anger, and frustration (Ian, Brian, Julia). The availability of counselling was important in Brian's case. For colleagues no matter whether the relationship with the injured person was positive or negative, illness or injury had an impact. A workmate of Thomas' commented on the immediate and graphic nature of his injury,

> I picked up the first finger by the pile of wood inside the Dry-end shed. Then I saw the second finger by the small shed. Blood was everywhere. (Thomas' workmate)

The health and safety systems in the workplaces were on occasion shown to be deficient following OSH prosecutions in six cases (Mark, Grant, Brian, Peter, Ian, Thomas). Even where these deficiencies appeared minor at first glance they often had larger ripple effects for worker safety and the workplace. These deficiencies included: a lack of knowledge; incomplete procedures and inadequate equipment; impractical health and safety systems; non-existent policies and procedures, and failures of supervision. The deficiencies were linked and cumulative. For health and safety systems to function effectively there had to be both responsibility from the worker and the workplace. Unfavourable outcomes resulted when systems were incomplete and workers within the workplace did not feel empowered to ask for change, such as in the cases of Peter and John. In Peter's injury a faulty light caused an explosion and burns to forty percent of his body. He commented:

> It was, it was supposed to be a sealed halogen light but apparently somebody had put an extension cord on it, a longer extension cord and left out the sealing boot around where the wire goes into the light, omitted to put that back in. And apparently one of the screws inside was loose. According to the OSH inspectors. And that caused a spark and the fumes got into the light and it exploded, yeah. (Peter)

Five workplaces in the study cited communication as a problem in dealing with government agencies (the employers of Julia, Murray, Mark, Barbara, and Peter). The employers of Julia and Murray found it hard to access information from ACC on the affected employee and how their situation affected the workplace. Similar comments were made in regard to OSH by the employers of Mark, Barbara, and Peter.

Economic costs to the workplace centred on lost production and morale in the workplace, extra health and safety compliance work, damage to plant and equipment, loss of business due to public odium, legal costs resulting from fines and prosecutions (including preparing for cases) and staff costs. Staff costs were made up of hiring and training new staff, paying out redundancy and over-employment (creating a new job while the worker recovered).

Companies who had good health and safety systems had good support systems for injured and ill workers. When an employer could and did assist there were better outcomes for the affected person. More generally in the workplace the importance of relationships was apparent. If the worker was able to return or remain within the workplace, they experienced better rehabilitation outcomes (Grant, Lisa).

The total documented costs to the fifteen workplaces in the study was $477,830.78 plus six months, two days, and 12 hours of company time (not costed). This did not include undocumented costs, such as lost production, which would add considerably to the total.

Medical

With all the occupational illness cases there was debate over diagnosis and whether the illness was work-related (Murray, John, Barbara, Lisa, Julia, Paul). Debate was considerable because enforcement or compensation was involved. Non-work related conditions might have had the same symptoms. Results of diagnoses were often inconclusive and healthcare providers were the ones caught in the middle. An injury , which resulted in a visible injury, was more readily accepted. Injuries were generally obvious, and their work-relationship indisputable.

Many of the occupational disease cases experienced delays in getting a diagnosis. While those with occupational disease were diagnosed slowly or inaccurately (Murray, John, Martin, Julia) there was also a case of incorrect diagnoses of physical injuries (Sarah). Late diagnosis impacted on recovery time (Martin, Julia, Murray, John). In some cases there was insufficient communication between treatment providers, which had implications for recovery (Thomas, Brian, Sarah). Health professionals did not always have the training, expertise or resources to deal with occupational diseases (Murray, John, Martin):

> I went to see my GP and my GP goes 'I don't want to know about it'. I went 'you're kidding? You're joking?' I mean I had sort of gone in there with different sorts of things from time to time and he'd been alright. [GP said] 'I don't want to know about this'. (Murray)

Delays led to increased pain, delayed recovery, adverse psychological and emotional reactions, and medical complications because of delays in treatment for participants.

Several of the cases commented on how over-worked medical professionals (particularly in hospitals) seemed to be (Barbara, Sarah, Brian, Ian, Mark, Grant). This was central to Philip's case, illustrated by his description of being paged to attend to patient needs:

> On the pager it fills up after twenty beeps and you have to clear to get rid of them so that the next lot can come through. So my first Sunday I cleared it twenty times. That's four hundred times I was paged in the space of sixteen hours. (Philip)

In three cases family and friends had medical knowledge and wanted to be involved in the care. Similarly, some of the affected wanted to be involved in their own treatment. Involvement varied, as did the opportunities for involvement, and the consequences of doing so (Peter, Brian, Martin, John).

Overall the cases revealed there was a lack of knowledge and resources in relation to occupational health medicine. General practitioners had a lack of exposure to occupational illness cases. This delayed diagnoses and treatment. Consequently suffering was increased and recovery delayed.

Government

Government agencies have a range of statutory functions that impact on the social and economic costs of injury. The government sector administers a range of laws to enable and enforce sound health and safety practices in the workplace. In this study, the relevant organisations and their role were: OSH/the Department administer health and safety legislation; OSH and the Police enforce legislation relating to public safety; the Department/Labour Market Policy Group develop policy advice for health and safety and ACC legislation; and ACC which is responsible for the policies and administration of ACC. These organisations had both direct and indirect impacts on the consequences of workplace injury and illness. Direct impacts covered such actions as enforcement, investigation and payment of compensation/rehabilitation while indirect impacts included education and prevention programmes.

Costs for the government could be both direct and indirect. There were costs related to infrastructure and services. For instance provision of the justice system, such as courts and the collection of fines. Less obviously, there were costs to the economy through the loss of paid and unpaid work. The government lost taxation revenue. Loss of income through workplace illness and injury can lead to reduced taxable income for the government.

ACC's and OSH's costs were considerable in the study. ACC economic costs were wide-ranging, including anything from the funding of acute health care to rehabilitation to income replacement, and the costs of administration. Various cases included medical costs that were not documented in the ACC or OSH notes, such as the cost of particular medical procedures. ACC pays for most public health costs of injured employees through bulk payments to the Ministry of Health. The total cost of entitlement claims for ACC does not represent the total cost of ACC's financial contribution to injury. OSH's quantifiable economic costs arose from investigations. These were calculated on direct costs, and costs were assigned according to the hours worked, based on staff salaries. The full costs on all OSH overheads could not be calculated. There are also social costs in administering legislation. OSH and the ACC are obliged to perform particular functions that are not always well understood or appreciated. ACC staff are required to make difficult cover decisions. OSH investigations, where prosecution is a possibility, can be unpleasant. Public responses can be negative:

> [The OSH inspector] was a woman and she said she was quite, quite convinced if she had been a man she would have had her lights punched out several times. Y'know the attitude to OSH in some places. (H&S officer, Thomas' case)

There were considerable social consequences for government employees. These centred on the extreme stresses that resulted from difficult and occasionally hazardous jobs. These social consequences were difficult to quantify. They centred on stress and fatigue occasioned through having to deal with fatalities, serious injuries, catastrophic situations, and distressed and injured people:

> I have been to several fatal accidents with various [inspectors] in the past... at least two where the other [inspectors] have gone back to the car. In fact one of them walked... left the site and started walking back to the office. And he walked something like 12 kilometres before I actually caught up with him. (OSH Inspector – Brian's case)

Mention was made by some participants of a lack of information on ACC's entitlements and services, both before and after a claim was accepted, and during the review process (Lisa, Murray, John,

Barbara). OSH was seen as supportive by the participants (John, Sarah, Thomas, Julia); but over-reactive by the employer:

> [The OSH inspector] wrote a letter back to me and more or less had to find something wrong which she did by saying I need to show them the exercises instead of just putting a poster up. Something about something in my first aid kid being expired which I found absolutely ridiculous, sticking plasters or something. (Julia's manager)

Most participants were, however, satisfied with government services. The professionalism and support of OSH and ACC staff alleviated the participants' suffering. The costs associated with the provision of care and support minimise the injury costs.

Of the eight occupational illness cases one did not make a claim as he had no entitlement (Philip), two were initially unsuccessful and required review (Julia and Lisa), and compensation for four claims was delayed due to difficulties in establishing work-relatedness (John, Murray, Martin, Barbara). Two claims remained unsettled at the time of the interviews (Barbara, Julia). The occupational illness claims were administratively difficult; there was a lack of evidence and therefore stress came with making a claim.

Documented costs for the government (excluding ACC), including OSH costs and sickness benefits (Barbara) were $46,488.89, plus over 390 hours of inspector time. This did not include undocumented government costs, which would have been considerably greater.

The documented costs for ACC and the private insurer for the 15 cases in the study were $585,400.17. The cost of medical treatment or public health acute services received under ACC's bulk funding of the health sector have been estimated. It does also not include any time or administration costs.[3] Projected future costs for these cases are expected to be $3,985,989.00

Conclusion

Key messages in identifying the consequences

Minor mistakes (a series of oversights, failures, assumptions) can cause large consequences. Gaps in systems or practices that seem insignificant on their own can create huge far-reaching consequences. These consequences ripple out. From the injured or ill employee, these impacts ripple out to the people closest to them, others they are in contact with, rely on, or whose job it is, to the wider community. The consequences may change but a common feature is that the effects are overlapping and compounding.

These cumulative costs are incalculable and only incomplete records are kept of some costs. This study sought to uncover as many of the costs as we could identify. Costs are absorbed into the bottom line, not compensated and in many cases, are permanent. Unique individual or situational factors influenced the outcomes depending on the presence and influence of cost determinants in personal, social, organisational and environmental (government, medical) variables.

The total documented costs for these 15 cases are $1,167,471.84.

The total projected future costs of the seven cases that are still receiving ACC and, in Brian's case, payments from a private insurer, is expected to be $3,985,989.00.

This does not include the time of OSH inspectors, ACC case managers, workplaces, individuals, and their families. Costs of emergency medical treatment are estimated. It also does not include the loss of income borne by individuals and their families as a result of their injury or illness. The actual costs for these 15 cases would far exceed this figure.

[3] Please refer to the Methodology section for information on the projected future costs.

Acknowledgement and support from the workplace was more common in cases where the health and safety was an integral part of the working system, a commitment to health and safety in the workplace alleviated the outcomes for all concerned (Grant, Lisa). Acknowledgement and support included appropriate treatment and compensation, thus lessening the burden on family and friends. Participants cited involvement in this study as an important validation for them. Participants were able to reflect on their experiences and understand some of their actions and reactions. Participants also commented they hoped others would benefit from their understanding and experience by avoiding the types of consequences detailed in this report.

Identifying the consequences

We found examples of costs that arose directly from the injuries or illnesses and those that flowed indirectly from their consequences, which affected the worker, employer, and community. These are largely uncalculated in cost studies and by the participants and in workplaces of this study.[4] Because many costs are largely uncalculated, economic incentives alone provided a very blunt means for workplaces coming to understand the full consequences of poor health and safety practice.

One set of indirect costs that were considerable arose from family separations, both physical and emotional. In four cases relationships were broken, with a further two cases losing their pre-injury relationships permanently. In addition, there were major lifestyle changes for many of the families, with many participants changing their careers, beginning or stopping study, and giving up hobbies to care for the family member.

Employers' costs included lost production, negative impacts on staff morale, negative publicity, and the costs of replacing workers or equipment; and in some cases, legal costs. For the workplace, costs included the loss of a friend and colleague, the immeasurable impact of feeling responsible for an injury or illness or fatality and possible animosity towards the injured or ill employee.

Factors that impacted across all parties involved

The visibility or invisibility of a participant's injury or illness was highlighted time and again. Injured participants, who could prove a demonstrable link to the workplace, received more prompt support from their workplaces, health providers and ACC. The more obvious and visible the injury, the greater the sympathy and recognition it received. Diagnosis was much more likely to be accurate and prompt. Conversely, for the ill participants, it was hard to prove work caused their illness. There was doubt over the diagnosis of the illness, especially where there was the possibility of being more than work factors involved (John, Murray, Barbara, Julia). These problems for participants had serious implications for treatment and recovery. Fast and appropriate treatment, and acknowledgement of the causes, led to a quicker recovery and return to work.

We found socio-economic status had an important impact on social and economic consequences. One of the factors that prevented or alleviated adverse social or economic consequences, was being in a high socio-economic group, having a higher level of education, and having ample social and/or workplace support. Participants from low socio-economic groups had fewer choices and support following their injury or illness to prevent economic consequences in particular reaching into and harming their home and family life. Thomas and Barbara lived in small towns, with limited employment opportunities and unskilled, insecure jobs. Their choices were a lot fewer than Philip's – who, although he did not receive much (if any) workplace support, still had the unstinting support of his family and the financial reserves to change careers and still earn a high salary.

[4] Examples of international studies which have attempted to quantify indirect costs, or specifically exclude them from cost calculations are discussed in the Literature Review Part I: Macro Studies.

The links between social consequences and economic costs

The study demonstrated the close relationship between social and economic costs. Many social effects had an economic outcome, and economic costs led to or impacted on the social effects. We found six overarching determinants of the extent or presence of adverse consequences. These determinants were: **isolation; understanding; responsibility; blame; suffering; and power or powerlessness.** These determinants were inter-related and affected both social and economic costs.

Isolation from support structures could severely impede recovery. Participants' rehabilitation and recovery (physical and mental) were aided when there was good support from both family and friends. In six cases isolation from partners was permanent. For family members to offer appropriate support, they needed to understand the condition and the effect that it had on the individual. This understanding was generally more apparent in injury cases:

> It's just the wrong type of injury. I mean if he had ripped a leg [off] it would have, probably would have got the whole support and sympathy and everything else, but... (Company OHN – Grant's case)

Understanding could be further constrained by the presence or otherwise of appropriate support and information for the individual, family, friends, workplace and employer.

When an injury or illness occurred, a common reaction was to apportion **blame**. Employers blamed employees and employees blamed employers. Supervisors, workmates and families blamed themselves or the injured or ill participant. Failure to accept **responsibility** or culpability affected everybody's ability to recover from an injury or illness. Often it was unclear as to who or what was 'to blame'. ACC and OSH's roles sometimes produced conflict with participants and workplaces over who or what was responsible or to blame for the injury or illness. Ian's widow initially believed he was responsible for his own injury , until the OSH investigation revealed the employer's responsibility. She commented that when she believed Ian was to blame she thought:

> You love somebody that much and they did it to themselves. And it's horrible and how they dare do it to themselves. (Ian's widow)

Taking responsibility allowed participants to move on with their lives. When workplaces admitted appropriate culpability, they were able to make positive changes in their health and safety culture. For the individuals in the study, some made choices or were forced by circumstance to make a new career, change their lifestyle or go back to study. This could lead to something totally different. One participant, John said:

> I guess it's a new career now, a new start, something different. (John)

In all cases there was a degree of **suffering**, in some suffering was extreme for both participants and their families. The suffering wrought by an illness or injury caused, on occasion, unexpected results. Some positive lifestyle changes resulted, such as giving up smoking or taking a new approach to life (Mark, Martin, Barbara). One participant, Martin, was more willing and able to express himself. Others felt they had gained considerable understanding of themselves through the progress they made in recovery and comprehending their situation (Murray, Julia, Mark).

The **understanding** of participants and others, or lack of it, of an injury or illness contributed to the social and economic consequences. In general in the case studies, there was a lack of knowledge and resources in occupational health medicine. This resulted in delays in diagnosis and treatment. These delays in diagnosis and treatment increased suffering and delayed recovery. Further, it caused ongoing debate between treatment providers, claimants and government departments over diagnoses. If a diagnosis was unclear and specific treatment was dependent on compensation cover, this negatively affected the participants and meant increased investigation costs for government.

Participants' **power or powerlessness** affected their ability to control the risks in their workplace (and therefore their chances of being harmed) and subsequently their rehabilitation. Being able to access specialists, remain in their workplace, get advice and receive compensation was affected by the

amount of power they possessed. Power also involved participants taking charge of their own situation or have changes forced upon them.

Closing Comments

The consequences of workplace injury and illness ripple out and affect all of us. International estimates of the costs to GDP of injury and illness at work lie between three and five percent.[5] We all pay, even if not directly, for occupational illness and injury. Consequences may be temporary or permanent; or sometimes fatal. To understand the total social and economic consequences requires going beyond statistics and recording economic costs. Gaining a human perspective of costs incurred allows us to understand the non-economic 'costs' and the complex inter-relationship between economic and non-economic consequences.

Understanding how the social and economic consequences apply increases our understanding of the impacts on people of policy and legislation. But importantly, it also contributes to our understanding of how to minimise the aftermath of occupational injury and illness, and plan appropriate preventative measures and support systems. The fifteen case studies illustrated common experiences of employers, working people and their families, but they also showed how certain factors are likely to alter the outcome in a positive or negative way. This study highlights the debilitating effect of not minimising workplace injury and illness; for the injured or ill worker, their friends and family, workplace, and the substantial costs to government and its agencies.

[5] WHO and ILO. National and International Strategies to Improve the Work Environment and Worker's Safety and Health: Report on a WHO Planning Group, Prague, Czech Republic, 7-9 December. EUROPE/ICP/OCH152 RB (2) (A). Unpublished report.)

Part 1:Purpose and Context

PURPOSE OF THE STUDY

Purpose

The Social and Economic Consequences of Workplace Injury and Illness study aimed to gain an understanding of the full range of consequences, including economic costs, of workplace injury and illness. In particular, the study aimed to explore the costs through the employees' own experiences and perspectives, as well as through those of their social, work and family groups.

Prior Research into Health and Safety Costs

The study was initially a response to earlier studies undertaken into the costs of compliance for businesses. These pieces of research also provided indirect and tantalising insights into some of the social consequences of workplace injury and illness, and the impacts on employers. They also raised questions about the cost, both economic and social, of non-compliance.

In 2000 the Department of Labour and the Ministry of Economic Development undertook research in response to ongoing concern from the business sector that the HSE Act was imposing unnecessary and/or excessive costs, particularly on small-to-medium sized companies.[6] The main findings of the study were that:

> … the companies visited tended not to consistently quantify the costs of compliance and were generally unable to provide specific and detailed information on costs, and that how a company perceived the costs of compliance (e.g. whether or not they were excessive) depended on that company's perception of the seriousness of the risk of its particular operation, and/or the extent to which benefits from investment in health and safety were recognised by the company.[7]

Over a similar period, the Department was also undertaking an evaluation of the effectiveness of health and safety legislation through case study research examining, in particular, employer responses to the ACC legislation.[8]

In 2001, the Ministry of Economic Development published a study looking at the cost of compliance to employers for various pieces of legislation.[9] According to the report, high compliance costs affect a number of areas in New Zealand's economy. They have negative impacts on innovation, competitiveness, investment, and compliance, and result in firms being reluctant to expand or employ more staff. The report concluded these costs are particularly high for small- to medium-sized enterprises, and concluded that money spent on compliance diverts resources away from investing in the business, and can affect New Zealand's international competitiveness.[10]

With regard to the HSE Act, business supported the intent of the Act, but described it as 'resource hungry'. Some primary cost areas were:

> … learning about the Act's requirements; training staff; monitoring compliance; developing health and safety plans; and the administrative costs of having a health and safety officer and maintaining a register. The costs of

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[6] Occupational Safety and Health Service and Ministry of Economic Development (2000). The Costs and Benefits of Complying with the HSE Act 1992. Department of Labour, New Zealand

[7] OSH (2000a). Executive Summary.

[8] Department of Labour and WEB Research (2001). The ACC Reforms. Department of Labour, New Zealand.

[9] Ministerial Panel on Business Compliance Costs. (2001). Finding the Balance: Maximising Compliance at Minimal Cost. Ministry of Economic Development, New Zealand.

[10] Ministerial Panel (2001). Executive Summary.

directors insuring themselves against exposure to the Act were also considered compliance costs. The costs were often recurrent rather than one-off costs.[11]

Current Initiatives to Reduce Health and Safety Costs

Successive governments have attempted to reduce the 'compliance cost burden' on business. The government will shortly be consulting on the NZIPS. This is to promote a co-ordinated approach to injury prevention across government. One of the identified strategies of the NZIPS that the government wants to develop is a workplace injury strategy. Another solution is to focus government and business attention on the costs of non-compliance through legislative change. The IPRC Act and HSE Amendment, currently before Parliament, are integral parts of producing a more co-ordinated strategy for injury prevention and rehabilitation.

The lack of high quality data on the incidence and costs of work-related injury and illness has been recognised both in changes to the ACC legislation, where Part 8 of the IPRC Act provides for the establishment of an Injury Information Manager, and in research funding.[12] The Foundation for Research, Science and Technology has provided cross-departmental research funding for the development of a model of the cost of injury in New Zealand.[13]

The Social and Economic Consequences of Workplace Injury and Illness Study

In 2001 the Department and ACC decided to undertake exploratory detailed case study research to obtain a deeper understanding of the consequences of workplace injury and illness. The study used fifteen case studies involving the employee and their social, work and family groups to provide a range of experiences and perspectives.

Employer concerns that resources spent on health and safety in the workplace, and in particular, compliance with the legislation diverts money, energy and time away from investing in the business are well documented. However, costs and effects of non-compliance, such as work-related injury and illness, and the potential savings from prevention strategies, are not. In addition, the extent to which these effects 'ripple out' into the community, and what circumstances may cause or exacerbate these effects is also relatively unknown.[14]

The Australian Inquiry into Occupational Safety and Health calculated that employers bear approximately forty percent of the average cost of a workplace incident.[15] This raises an important issue regarding the remaining sixty percent of costs paid for by the employee, their family, their community, and society as a whole. What is the nature of these costs, and what are the experiences and perspectives of those who bear them?

Because no one person experiences, sees or accounts for the full consequences of a workplace injury or illness; the full depth and breadth of costs and consequences are often not measured or recorded in any official statistic. Often they are not recorded anywhere.

Employees who are harmed will inevitably bear many of the consequences of what happens to them by themselves, as others simply will not experience or fully understand the degree of pain or isolation

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[11] OSH (2000a). Section 5.3.2.

[12] Statistics New Zealand has been appointed Manager; tasked with establishing a comprehensive data set of injury in New Zealand, drawn from administrative data held by government agencies such as ACC and LTSA.

[13] This work is being led by DoL with the support and collaboration of other government agencies with an interest in injury prevention.

[14] These and other related issues are discussed more fully in the Literature Review.

[15] Australian Industry Commission (1995). Work, Health, and Safety: Inquiry into Occupational Safety and Health. Report no. 47 Volumes I and II, Canberra. p102.

that they may experience. Likewise, the costs and consequences to family, friends or work colleagues often goes unrecorded and unobserved, although they are nonetheless real. Many consequences are unable to be measured directly as an economic cost, such as a loss of intimacy between spouses, or the breakdown of a family unit due to an unexpected death. The experience of being harmed at work can be devastating, with profound emotional consequences for all those involved. People may become isolated, estranged from their community and depressed.

Employers will generally observe the cost of their ACC levies and the cost to their sick leave budget. They may observe the impacts on the morale of their staff or the injured or ill worker, particularly in smaller sized workplaces. They may also have to count the cost of employing new staff and the loss in productivity as a result of any injury. Sometimes there are legal costs where they face prosecution, or replacement costs for damaged equipment or property, but generally, some of these costs go unobserved by employers. Dorman argues that employers frequently use accounting methods that obscure the cost by counting them as overheads and not specifically attributable to the illness or injury itself.[16]

Often entirely forgotten are the costs to government of simply investigating, processing and otherwise dealing with workplace injury and illness, such as administration costs incurred by ACC or OSH.

While it is virtually impossible to objectively quantify these costs, it is still of great value to attempt to isolate and identify them. Ringen explains that presenting data with humanity attached to it can be a powerful stimulus for change:

> Research that holds out the consequences of our failure to prevent injuries and illnesses from occurring is a powerful stimulus for change. Prevention results from change, and change results from our ability to influence decision makers in industry, unions, and government... This is research that decision-makers can understand. Statistical methods are important, but they are not an end... [17]

Study Objectives

The objectives of the Social and Economic Consequences of Workplace Injury and Illness study were:

- to explore the social and economic consequences of workplace injury and illness for injured and ill employees, their families and the workplace;
- to identify key characteristics that determine social consequences; and
- to inform investment in health and safety in the workplace.

While this study is an initial, exploratory investigation into work-related injury and illness, it goes some way to illustrating a range of outcomes, some of which are:

- the impact of workplace hazards on the lives of workers and their families;
- the adequacy of workers' compensation benefits;
- the effects of illnesses and injuries on productivity, competitiveness, labour-management relations and employer costs;
- the factors that affect return to work;

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[16] P Dorman (2000). Three Preliminary Papers on the Economics of Occupational Safety and Health. www.ilo.org/public/english/protection/safework/papers.ecoanal/index.htm. Dorman discusses this theory throughout the three papers.

[17] K Ringen (1999). 'Where do all the Injured Workers go? Or, how about a little humanity in Research'. American Journal of Industrial Medicine: 36. p88.

- the barriers to reporting of workplace illnesses and injuries to workers' compensation and other systems; and
- the extent and diversity of social and economic consequences.[18]

In addition, Boden states that an improved understanding helps frame discussion about the appropriate level of resources that society should devote to injury and illness prevention and to the lessening of their impacts when prevention efforts fail.[19] This study was undertaken to help provide that understanding.

[18] L Boden (2001). 'Social and Economic Impacts of Workplace Illness and Injury: Current and Future Directions for Research'. *American Journal of Industrial Medicine*: 40. p400.

[19] Boden (2001). p400.

CONTEXT STATEMENT

A wide range of statistics has been used to quantify the incidence and costs associated with workplace injury. For example, OSH and other agencies have used figures of 3 billion dollars as the cost to New Zealand every year of workplace injury and illness.[20] Other figures, such as the 73 fatalities recorded by OSH in the 2001/2002 year, or the 92 recorded by ACC for 2000/2002, do not capture the enormity of the problem.[21] This is partly due to figures not accounting for deaths due to occupational illness, and also because of the acknowledged difficulties of measuring the incidence and costs of occupational fatalities, injuries and illnesses.[22]

Using a range of data sources, it is possible to estimate the magnitude of work-related injury and illness both world-wide and for New Zealand. This provides a context within which the fifteen case studies occurred.

Measuring the Incidence of Occupational Injury and Illness

The World Health Organisation (WHO) and the International Labour Organisation (ILO) state that accurate measurement of the global burden of occupational illness and injuries remains difficult because of a lack of reliable data due to under-diagnosis and limited reporting systems.[23] Issues surrounding the measurement of occupational injury and fatalities have also been well documented in various large-scale studies, including Australia, the United Kingdom and the United States. These studies have found that incidence data provides an inaccurate picture, for reasons such as Workers Compensation data underestimating the total amount, and death certificates undercounting work related deaths by 10-40percent.[24]

Similarly, there are problems accurately measuring the incidence of occupational illness. Dave McLean at Massey University states that by its very nature this is difficult to measure.[25] He explains that this is because:

- most diseases caused by workplace exposures are multi-causal;[26]

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[20] Occupational Safety and Health Service (2000b). *State of the Nation Report*. Department of Labour, New Zealand.

[21] OSH website. http: www.osh.dol.govt.nz. ACC (2002). *Launch Highlights Consequence of Accidents*. (ACC media release. 2 September 2002).

[22] These issues are discussed more fully in the Literature Review.

[23] The WHO estimates that in Latin America, for example, only between 1 and 4 percent of all occupational illnesses are reported. (source: WHO and ILO. *National and International Strategies to Improve the Work Environment and Worker's Safety and Health: Report on a WHO Planning Group*, Prague, Czech Republic, 7-9 December. EUROPE/ICP/OCH152 RB (2) (A). Unpublished report.)

[24] Workers' Compensation data: for example, a recent survey by the Australian Bureau of Statistics found that only 47 percent of people with work-related injury or disease apply for Workers Compensation (cited in G Foley et al (1995). 'The cost of work-related injury and disease'. *Journal of Occupational Health Safety – Aust NZ* :11(2): 171-194.p191). Undercounting of work related deaths: JP Leigh et al (1997) 'Occupational Injury and Illness in the United States: Estimates of Costs, Morbidity, and Mortality'. *Archives of Internal Medicine* 157: 1557-1568. p1558.

[25] D McLean (2000). 'The Hidden Hazards: Occupational Health and Working in a Large Business'. Paper presented at *Building Safer Workplaces: a conference on the reform of health and safety law and practice*. Wellington. pg 2.

[26] One of the few exceptions is malignant mesothelioma, often caused by exposure to asbestos. For more information, see Tord Kjellstrom's article on the upcoming 'epidemic': T Kjellstrom (2000) 'Increased mesothelioma incidence in New Zealand: the asbestos-cancer epidemic has started'. *New Zealand Medical Journal*. November 2000: 485 – 490.

- the early effects are subtle, with a long period of latency between onset of exposure and presentation of clinical disease;[27]
- under-diagnosis is very common and the link with the person's work is simply never made.[28]

In New Zealand, the exact number of people killed at work is not known. There are numerous reasons for this. No single agency is responsible for counting work-related deaths, and many are not reported or identified as work-related. However, injury fatalities are relatively well reported in comparison to the reporting of occupational illness fatalities.[29] A recent study by the Otago Injury Prevention Research Unit found that ACC figures accounted for approximately 63 percent of the total, while OSH figures accounted for approximately 40 percent. Together, ACC and OSH figures accounted for 73 percent of all the work-related fatalities identified.[30] The ACC Regulator undertook a similar review for the year ending 30 June 2000 and reported similar results.[31]

Consequently, the available evidence on the incidence of occupational injury and illness presents only a 'best estimate'. A range of data sources may be used to present as comprehensive picture as possible of the occupational injury and illness 'burden'.[32]

Measuring the Direct and Indirect Costs of Occupational Injury and Illness

Measuring the economic costs of workplace injury and illness is, like measuring the rates of incidence, fraught with data problems. For example, a major study in the United States concluded that when measuring costs, other studies often omit factors such as the cost of pain and suffering, costs to innocent bystanders, and may not allow for recurring injuries.[33] However, it is possible to again use a range of sources to present a 'best estimate' of the direct (or 'tangible') economic costs. A common method is to use a certain percentage of a country's Gross Domestic Product (GDP).

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[27] For example, the average latency period for chemical toxicity is six months to five years, exposure to solvents ten years, and hepatitis causing liver cancer takes twenty five to thirty years. (source: OSH health data).

[28] This is mainly because the disease which is caused by the workplace exposure is often indistinguishable from disease from by other causes. For example, the Australian Industry Commission found that only 5 percent of the known cases of mesothelioma are in the National Data Set for Compensated Injuries. (Australian Industry Commission (1995) p8).

[29] All work-related deaths on land are required to be reported to OSH; those on water are reported to the Maritime Safety Authority; and those in the air to the Civil Aviation Authority. Similarly the Land Transport Safety Authority investigates road deaths while ACC and the Accident Insurance Regulator of the Department of Labour hold data related to accident insurance claims. (Department of Labour (2002). Workplace Accident Insurance Statistics Report 2000/01, p19. See also reference to the Injury Information Manager, Purpose Statement, for further information.

[30] This study by the Otago Injury Prevention Unit examined coroner's files for a ten year period (1984-94) but excluded fatalities due to traffic crashes and occupational illness (J Langley et al (2000). 'Work-related fatal injuries in NZ: can a reliable electronic work-related fatality register be established?' Journal of Occupational Health Safety - Aust NZ:16(2): 145-153). The problems in identifying potential work-related cases and collecting accurate data discussed in the Langley et al article are also established in international studies.

[31] The study found that OSH data included 47 percent, and ACC 55 percent of fatalities within these files. Department of Labour (2002). Workplace Accident Insurance Statistics Report 2000/01. New Zealand. p21.

[32] Leigh et al comment that any single source of data about occupational illness and injury underestimates the numbers of illness and injury and is heterogeneous, hence multiple data sources must be combined for comprehensive and reasonably accurate estimates. JP Leigh et al (1997). 'Occupational Injury and Illness in the United States: Estimates of Costs, Morbidity, and Mortality'. Archives of Internal Medicine 157 (July 28). p1564.

[33] JP Leigh et al (1997). p1565.

International Statistics

The Incidence of Occupational Injury and Illness

The ILO believes that work-related injury and illness annually kill two million workers, including 12,000 children.[34] ILO figures for 2000 show a daily occupational death toll of over 5,000 with an additional 500 to 2,000 injuries for each fatality, depending on the job involved. Agriculture, fishing, logging and mining are among the world's most hazardous industries, with the agricultural sector claiming more than 50 percent of occupational fatalities, injuries and diseases.

Approximately 32 percent of workplace deaths are caused by cancer, while circulatory disease and injurie s are responsible for 23 and 17 percent respectively. The ILO also states that although there has been a decrease in work-related injuries for industrialised countries, the number of new hazards is increasing, such as musculoskeletal disorders, stress, mental problems and asthmatic and allergic reactions.

The Direct and Indirect Costs of Occupational Injury and Illness

The WHO and the ILO state that work-related harm to health imposes a considerable burden on national economies. During the past few years, they have consistently estimated that occupational fatalities and injuriess, as well as work incapacity, can cause losses of 3-5 percent and 10-15 percent of the Gross Domestic Product, respectively.[35] In a 2002 statement, the ILO stated that:

> While it is impossible to place a value on human life, compensation figures indicate that approximately 4% of the world's gross domestic product disappears with the cost of diseases through absences from work, sickness treatment, disability and survivor benefits.[36]

When assessing costs to the United States, the WHO and ILO found that the total direct and indirect costs associated with work-related injuries and illnesses surpassed those of AIDS and were almost equal to those of cancer and heart disease.[37]

New Zealand Statistics

The Incidence of Occupational Injury and Illness

Bearing in mind the caveats outlined in the previous section on the validity of workplace injury and illness data, the following gives an indication of the occupational injury and illness 'burden.' ACC recently stated that for 2000/2001, there were 73 recorded fatalities at work, and for 2000/2002, there were 92.[38]

A major study by the Otago Injury Prevention Research Unit analysing statistics from New Zealand, Australia, and the United States found that New Zealand had the highest average annual rate (4.9/100 000) of fatal occupational injuries. Australia had an intermediate rate (3.8/100 000), and the United States the lowest rate (3.2/100 000). The study found there were 817 work-related injury deaths in New Zealand for the 10 year period studied. The authors comment that:

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[34] United Nations (2002). 'Occupational Hazards: ILO Says 2 Million Die Annually'. http: www.unfoundation.org/unwire/current/asp.

[35] WHO and ILO (1996).

[36] ILO Director General Juan Somavia (UN 2002). This estimate agrees with a WHO and ILO estimate which quoted international reports that showed the global economic losses were estimated as 4 percent of the world's GDP. (WHO and ILO (1996)).

[37] ILO and WHO (1996).

[38] ACC (2002). Launch Highlights Consequence of Accidents. (ACC media release. 2 September 2002).

> Much of the difference between [these three] countries was accounted for by differences in industry distribution. In each country, male workers, older workers, and those working in agriculture, forestry and fishing, in mining and construction, were consistently at higher risk. Intentional fatal injury was more common in the United States, being rare in both Australia and New Zealand. This difference is likely to be reflected in the more common incidence of work related fatal injuries for sales workers in the United States compared with Australia and New Zealand.[39]

The study also reported that machinery, being struck by falling objects, and falls were the leading causes of work-related injury death. These findings upheld those reported from each country's internal comparisons and from earlier international comparative studies.[40] David McLean of Massey University argued that occupational illnesses generally number four or five times, and possibly up to ten times, the number of deaths resulting from workplace fatal injuries.[41] Using the estimates from the above study, this suggests there are between 320 and 800 deaths from occupational illness each year in New Zealand.

Measuring the fatality rate of occupational cancer, the Australian Industry Commission considered the most credible range is that based on the work of Doll and Peto (USA) who estimated that between two and eight percent of all cancer deaths were attributable to work-related causes.[42] In 1999, this translated to between 153 and 614 work-related cancer deaths for the year in New Zealand.[43]

Ministry of Health data supports this general range, estimating that occupational exposures cause approximately 490 cancers per year in New Zealand. In fact, the Ministry suggests that using Doll and Peto's estimates may undercount the incidence of occupational cancers because they used conservative assumptions that do not account for factors such as second-hand smoke exposure. They estimate the actual incidence of occupational cancers may be as high as ten percent of all cases.[44] Based on the above 1999 provisional data, this equates to 767 cancer deaths per year.

Ministry of Health injury data further shows that the number one cause of death among 25-34 year olds was unintentional injury (31.1 percent) followed by suicide. For all other age groups unintentional injury was ranked within the top five causes, alternating with cancers and heart disease as the main cause. Unintentional injury was also the fifth largest (8.3 percent) reason for hospitalisation for all ages, behind pregnancy, heart, digestive and respiratory.[45]

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[39] A M Feyer et al (2001) 'Comparison of work related fatal injuries in the United States, Australia, and New Zealand 1985-1994: method and overall findings'. Injury Prevention 7:22-28. p22.

[40] A M Feyer et al (2001). p22.

[41] D McLean (2000). p2.

[42] R Doll et al (1981). 'The causes of cancer: quantitative estimates of avoidable risks of cancer in the United States today.' Journal of the National Cancer Institute no.66, p 1196 – 1308. (Quoted in the Australian Industry Commission (1995) p25). [Commonly known as 'the Doll and Peto estimate'].

[43] Using Ministry of Health provisional data for the number of cancer deaths per year: There were 7673 cancer deaths in 1999 (4063 males and 3610 females). Source: Major causes of death - numbers and percentages by sex, 1999 (provisional). http://www.nzhis.govt.nz/stats/mortstats.html.

[44] Ministry of Health (2001c). Evidence for the Primary Prevention of Cancer 21 (draft). Chapter 12: Preventing Occupational Cancers (selected interventions).

[45] Injury Prevention Research Unit (2001). 'Injuries in relation to other health problems'. Fact Sheet no.24. http: www.otago.ac.nz/ipru. University of Otago. IPRU's Sources: Mortality and Demographic Data 1994-1998, NZHIS, Ministry of Health. Tables: Causes of death – NZ 1994-1998 and Causes of hospitalisation – NZ 1998/99. Further information on the burden of disease and injury in New Zealand may be found in the Ministry of Health publication The Burden of Disease and Injury in New Zealand. Although illness/injury sources are listed, there is no indication which are occupationally related.

The Direct and Indirect Costs of Occupational Injury and Illness

Few New Zealand studies have attempted to estimate the total costs of work-related injury and disease.[46] In one example, Mark Harcourt and Linda Head calculated the direct and indirect costs of occupational injuries and illnesses in New Zealand for 1995. They estimated the total direct costs as $913 million, and the total indirect costs as $315 million, a total of just over $1200 million.[47]

In a 1999 study, John Wren showed that the direct and total costs of workplace injury and illness are commonly estimated to be in the range of 2 – 3 percent of GDP; with indications the costs could be as high as 8.5 percent of GDP.[48] He concluded that:

> …commonly reported estimates by New Zealand officials of the costs of workplace injuries and illnesses as being approximately 2.5 percent of GDP, is far too low given our fatality rates are far higher than Britain's.[49]

The article suggests that the total and direct cost to the New Zealand economy is more likely to be 4 to 8 percent of GDP.[50] Using these estimates, workplace injury and illness cost the New Zealand economy between $4,334 million and $8,669 million for the year ending 31 March 2002.[51]

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[46] The Department of Labour, together with other agencies, is currently scoping a project which aims to create a methodological framework which measures the total injury cost to New Zealand. This project was first mentioned in the Context statement.

[47] M Harcourt et al (1998). 'The Direct and Indirect Costs of Work Injuries and Diseases in New Zealand'. Asia Pacific Journal of Human Resources 36(2) p46-58.

[48] The calculations used sources such the United Kingdom Health and Safety Executive, mortality and morbidity data from the United States, as well as Australian and Swedish data. J Wren (1999). 'More Money or More Effectiveness and Efficiency?' Employment Law Bulletin. July. p84.

[49] J Wren (1999). p87.

[50] J Wren (1999). p87.

[51] New Zealand's Real GDP was $108,360 million for the year ending 31 March 2002. Source: 'Hot off the Press'. Statistics NZ 28 June 2002. www.stats.govt.nz

Part 2: Case Studies

LIST OF CASES

Grant (page 36)

A New Zealand European in his forties, with two adult children, working in a heavy metal manufacturing workplace who suffered severe crushing injuries to his right hand when it was caught in a machine.

Murray (page 40)

A New Zealand European in his thirties who developed solvent-induced neurotoxicity after being exposed to solvent-based adhesives for over two years while repairing life-rafts.

Mark (page 46)

A New Zealand European in his forties and father of three who fell five metres and suffered multiple fractures when a rotten telegraph pole he was strapped to snapped at the base.

Julia (page 51)

A New Zealand European bank teller in her fifties and mother of two adult children who had worked in the finance industry for over 25 years before she developed a severe OOS condition. Her work had involved high levels of stress as well as repetitive movement.

Philip (page 56)

A New Zealand Asian house surgeon in his twenties, who suffered psychological harm due to stress.

Brian (page 61)

A New Zealand European middle-aged forklift operator who fell five metres on to a concrete floor and has permanent brain and spinal injuries. He was recently married.

Barbara (page 67)

A New Zealand European woman in her fifties and mother of two adult children, who developed occupational asthma after working with solvents in the manufacturing sector.

John (page 70)

A New Zealand European in his early twenties who developed solvent-induced neurotoxicity following four years of considerable exposure to resins, including epoxies and spray painting solvents inside boats.

Peter (page 75)

A New Zealand European boat spray painter in his thirties who suffered burns of varying degrees to forty percent of his body after the isocyanate in the paint he was spraying exploded.

Sarah (page 80)

A New Zealand European farmer in her forties and mother of four, who suffered multiple fractures following an ATV injury.

Paul (page 86)

A New Zealand European middle-aged panel beater with two young children who has noise-induced hearing loss after over 20 years exposure to loud machinery.

Ian (page 91)

A New Zealand European maintenance worker in his late fifties and father of four, who died after being crushed by heavy machinery in a metal manufacturing workplace.

Lisa (page 95)

A New Zealand Maori data entry worker in her early thirties who developed an OOS condition because of repetitive movement.

Thomas (page 99)

A Cook Islands Maori sawmill worker in his late twenties and father of four young daughters, who lost three fingers following a circular saw injury. One finger was subsequently reattached.

Martin (page 105)

A New Zealand European meat processing worker in his early fifties and father of two adult children, who contracted leptospirosis. He suffered renal failure and septicaemia and was off work for six weeks.

GRANT

Grant is a heavy manufacturing industry worker in his mid-forties. He had moved two years before the injury to a major centre so he could spend more time with his adult son. Grant suffered severe crush injuries to his right hand when it became caught in moving machinery, including three broken fingers, and extensive loss of tissue at the base of his thumb. Plates were inserted in the first segment and the base of his thumb. He has severe scarring and limited grip.

Sequence of events

The part of the plant that Grant worked in manufactured steel rod. Work was done in a rotating shift system, with morning, afternoon and night shifts. Grant was working the night shift. A bonus system encouraged workers to increase the productivity of the mill. In addition, there was a degree of competition between shifts:

> There's a lot of rivalry between the shifts. There's three shifts and we, we try to produce steel better than the last shift, or they, they try to outdo us. That's just the way it is. (Grant)

A couple of times a shift, the rollers in the machinery had to be checked to ensure that it was producing rod of the correct thickness. This process entailed stopping production, and running a small piece of metal rod through the equipment, which was then measured. An hour before the end of the shift, at about 6am, production was stopped so this test could occur. Safety procedures required that the test be conducted from a certain direction. However, because production had to be stopped while the testing was done, it was common practice to carry the test out in a way that was unsafe, but quicker.

While he was conducting the test with a colleague, Grant's glove became caught, pulling his hand into the rollers:

> By the time I realised that my glove was caught it seemed like eternity, it was only ten seconds or something like that. I had to wait for my hand to go through. I could hear the bones cracking as it was going through... I could actually physically hear it and there was nothing I could do. (Grant)

It was immediately obvious that the injuries were very serious. His thumb was almost severed from the hand, bones in two fingers were broken, and crush injuries to the middle finger had caused it to burst open. Grant walked to the shift manager's office (about 50 metres away), and requested that an ambulance be called. First aid was provided at the site. The ambulance arrived 15 minutes later.

Medical treatment

Grant was taken straight to a major hospital for surgery. Metal plates were fixed in the first segment and the base of his thumb, and in one finger. A metal pin was also used in his thumb. He remained in hospital for two weeks initially, returning later for another 2 weeks for skin grafts. He received physiotherapy for a considerable period, as well as psychological counselling for the mental trauma caused by the injury. He returned to work on light duties four months after the injury, gradually building up to resuming shift-work three months later.

Impact on Grant

Grant was right-handed, and the injury had a major impact on his ability to perform normal tasks, especially while his hand was healing. Even after the injury had healed, Grant's grip and movement in the injured hand was limited and it continued to ache at the time of the interview, especially in cold weather. His thumb was very stiff and the middle finger was clawed. He was also very concerned

about what might happen in the future, and worried that his hand might get worse. He was likely to have problems with arthritis in his hand in the future.

The OSH inspector involved initially, explored the possibility of prosecuting Grant for breaches of the HSE Act, as well as the company, to drive home the importance for workers of taking responsibility for their own safety. Grant found this possibility extremely stressful, which affected his rehabilitation. OSH did not go ahead with this individual prosecution, but charges were laid against the company.

Although the company found other work for him since the injury, and was supportive, Grant was concerned about the security of his job at the time of the interview. He was unable to return to his pre-injury role, because of the psychological impact of the injury:

> Obviously I am very reluctant to go back to my old job....to tell you the truth, I don't like the turning rolls and all that sort of thing. It really freaks me out. (Grant)

He continued to have flashbacks to the injury. He was apprehensive about causing further injury or stress to his hand, and felt that his injury had severely narrowed his future employment options as well:

> It's narrowed my options down something shocking really, and it's quite scary sometimes to think about it and think about where you, because everybody likes to think they can do whatever they like. And I have, I have been able to up until now. (Grant)

His injury affected his ability to participate in recreational activities, in particular his passion for training horses. He was also unable to play rugby, which he used to do socially. He lost a considerable amount of self-confidence and was self-conscious about the appearance of his hand, especially in social situations.

Family

Grant's son Kevin was advised of the injury while he was at work, however, he was not aware of the severity of the injuries until he arrived at the hospital that evening:

> It was unreal, I got up there, and um, Dad was there and he was all half pie, all blanked out, y'know. And he was just vomiting the whole time I was there, anaesthetic and shock but um yeah, it sort of sunk how serious it was. I just sort of brushed it off all day and got up there and hell. (Kevin)

Kevin visited his father regularly during his stay in hospital, and was in close contact with him throughout his rehabilitation. Grant's adult daughter and his ex-wife, who both lived in a different city, also kept in touch.

The Workplace

The mill where Grant worked was one of a large number of subsidiary groups under the umbrella of a large company. The company had previously had some serious injuries occur at the site, including a fatality, and this had prompted them to put considerable resources into health and safety, including employing a dedicated compliance unit and having an in-house occupational health, safety, and environmental programme. The company was an accredited employer under the ACC accredited employer scheme. This meant that the company directly bore the costs of the injury, including paying Grant for the time he was off work, medical expenses, and costs of lost production, modification of equipment, and investigation of the injury. The company pleaded guilty to a charge of 'Failure to take all practicable steps to ensure the safety of an employee'. They were fined $15,000, with $3000 being awarded to the worker. The award may have been lower than normal as the Summary of Facts indicated to the Court that the worker was undertaking the activity in a manner that was likely to cause him serious harm.

The workplace had a definite culture (described by one of the interviewees as 'macho'), that seemed to be inherent in the industry. Associated with this was a 'hierarchy of injury', which resulted in

Grant receiving less support from his colleagues than might otherwise have been the case. A more visible injury had occurred not too long before Grant's injury, which resulted in colleagues feeling that his injuries were comparatively minor. The company occupational health nurse commented:

> I think he has been short-changed because of [the more visible earlier injury], definitely. It's just the wrong type of injury. I mean if he had ripped a leg [off] it would have, probably would have got the whole support and sympathy and everything else, but. (Company OHN)

Context

In the wholesale trade sector of the basic material wholesaling industry in the year 2000/2001 there were 212 new and 355 ongoing work-related entitlement claims. These cost ACC $692,000 and $3,662,000 respectively.[52]

For stationary machinery operators and assemblers (plant machinery operators) in the year 2000/2001 there were 1,434 new and 2,083 ongoing work-related claims. These cost ACC $3,050,000 and $24,822,000 respectively.

[52] ACC (2001). Injury Statistics 2001. 2nd Edition. Note: All subsequent claims contextual information is from this source, unless stated otherwise.

Grant		Total	Met by Individual/ Household	Met by Company (Accredited Employer)	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	Ambulance	500.63			500.63	
	Hospitalisation	9,770.00			9,770.00	
	Elective Surgery	4,038.75			4,038.75	
	Total	**14,309.38**			**14,309.38**	
Medical - Ongoing	Physiotherapy	302.52	100.00	202.52		
	Health care consultant	192.38		192.38		
	Occupational Therapy Visits	1,299.43		1,299.43		
	Prescriptions	41.55		41.55		
	Psychologist	350		350.00		
	Equipment (assorted)	12.00		12.00		
	Total	**2,197.88**	**100.00**	**2,097.88**		
Domestic	Homehelp	192.38		192.38		
Income	Net income loss/gain (before tax): 1st 3 months	No income loss/gain	No income loss/gain			
Company						
Company - Staff	Re-writing of procedures and retraining of staff	40 hrs		40 hrs		
	Compliance work	20 hrs		20 hrs		
	Rehabilitation of worker					
	Part-time and not working	6 mths		6 mths		
Company - Equipment	**Compliance/Modification costs**					
	Jog Switch Modification	50		50		
	1 trial guard	1,517.27		1,517.27		
	4 guards	5,965.21		5,965.21		
	Total	**7,532.48**		**7,532.48**		
Company - Administrative	HSE Fine	15,000.00		15,000.00		
Community						
OSH	Time	86 hrs				86 hrs
	Legal Fees	1,270.50				1,270.50
	Total	**86 hrs and 1,270.50**				**86 hrs & 1,270.50**
Community Costs	Loss of sporting involvement					
Total		**40,502.62**	**100.00**	**24,822.74 + 6 months and 60 hrs**	**14,309.38**	**86 hrs & 1,270.50**

Total Costs

Over a period of 1 year (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management, and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $100.00 + undocumented costs

Company: $24,822.74 + 6 months and 60 hours (Accredited Employer)

ACC: $14,309.38

OSH: $1,270.50 + 86 hours

Total: $40,502.62 + 146 hours and 6 months

MURRAY

Murray is in his mid-thirties and was working as a life raft repairer when he developed solvent-induced neurotoxicity after exposure to chemicals in his workplace. As a result of his illness, Murray had to give up his job. Since that time he has suffered ongoing anger, irritability and depression. His illness also contributed to the temporary breakdown of his marriage. His wife Jane had difficulties coming to terms with his illness. Murray is concerned about his employability and future prospects.

The sequence of events.

Murray worked in life raft survey for a small engineering company, checking the safety of life saving appliances. Murray's duties involved collecting the life rafts, checking them and repairing them if necessary, and then returning them. The repairs involved the use of an epoxy resin, and the area to be repaired was cleaned with solvents. Murray worked mainly in two rooms of the factory - one room for the boat and a smaller room for mixing the chemicals needed for the process.

The amount of health and safety equipment that was available was, in Murray's belief, inadequate. In the glue room there was a small extractor fan and to mix the glue he used kitchen gloves. A breathing mask with air supply was available but frequently in use in other parts of the company. Murray himself did not know, for the majority of the time he worked at the boat repairers, of the dangers of the chemical he was using.

Due to previous concerns an OSH inspector was sent to the company to do a compliance check. The inspector, having previously worked in the printing industry, noticed a distinct smell of solvents. There was little ventilation and the extractor fan in the mixing room was actually drawing contaminated air from the wider factory to the room. The inspector made a number of suggestions. He suggested that monitoring for vapour levels be done. Further, he asked that procedures be put in place to minimise any vapour that was there. The inspector also checked the extractor fan. He was concerned that it was both not adequate for the job and could possibly spark igniting any vapour that was present. In checking the breathing equipment Murray initially said that he knew about it and used it. Two months later he came back to the inspector saying that the equipment was not available and not used.

The inspector, concerned that Murray may have developed solvent-induced neurotoxicity, called in an OSH medical practitioner to investigate. A monitoring company was used to examine the vapour levels at the workplace. The results of the tests showed that vapour levels were actually below the exposure standards. The inspector had some doubts over the results as they were taken in winter and levels would be higher in the heat of summer. Also, less repair work was being done at the time of the check. Nevertheless, there was not enough evidence for prosecution. At the time Murray was not pleased with the result, and felt that the company was not made accountable.

Medical treatment

Initially, there was a long delay before there was medical help for Murray. The main treatment was visits to his local doctor and to a clinical psychologist. Murray was not prescribed medication due to possible concerns over adverse effects on his illness.

Impact on Murray

Murray began to notice changes in his health up to eighteen months before leaving his workplace. Initially the symptoms were not severe. They included pins and needles in his fingertips to rashes on his face and bad circulation. Often in the morning he would awaken smelling a glue residue. Murray remarked:

> It was probably about 18 months before, because my daughter used to come running in and give me a kiss before she went to school or I went to work in the morning sort of thing. She goes 'gees it stinks', my sheets, because I used to sweat at night. Even in the middle of the night in winter down here. And I don't have electric blankets on. It used to stink so much and [I'd] think 'what's going on here'. I didn't put it down to anything. (Murray)

As time went on Murray's symptoms began to increase in range and severity. He began to develop problems with his breathing. This culminated in what he and staff at his local hospital thought was a heart attack. At the same time he began to notice changes in his personality and memory. Increasingly, he became angry and irritable and experienced frequent mood swings. He found that his short-term memory suffered and he had to make notes to remind himself of what had occurred. He remarked:

> Initially, what I noticed mostly was short-term memory was going pretty bad… When my day planner was starting to get full of scribbles and things like that and clients were ringing up saying 'you didn't get back to me yesterday. Do you still want this or do you still want that?' And [I said] 'gee what was it? Who are you again?' Um sort of thing. Things like this. (Murray)

There were further changes in concentration and motivation. In his spare time Murray had been studying for a Bachelor of Commerce degree. Murray noticed that his academic performance began to decline, his grades dropping from As to Cs:

> It's been a big thing because I've never failed anything before in my life. (Murray)

These changes in Murray's personality began to impact his personal relationships both within and without his family. Within in the family he found he could no longer cope with his step-children. The marriage itself began to come under strain. Despite seeing a marriage counsellor for several months, Murray and Jane eventually separated. Murray moved out of the family home into a nearby townhouse. More generally, he became increasingly anti-social, giving up hobbies and sports. Having both played and then coached in several sports, Murray no longer had the urge or motivation to do this. His circle of friends declined. Social situations became difficult for Murray and he felt safer isolating himself from others:

> I feel safer, I feel like if I'm by myself and nobody is coming in to my world or something then nothing can go wrong. I can't get angry, I don't feel threatened or intimidated, all these sorts of things. (Murray)

Murray's plans since the illness revolved around trying to secure employment in IT and writing on solvent neurotoxicity. Murray hoped to present an idea to government on developing a licence, a qualification system and a database for using chemicals in the workplace. However, Murray had concerns for his future, particularly when his ACC rehabilitation plan ended. Murray commented:

> Yeah that's about, so I don't really know what the future brings or anything. Umm, probably the shit will hit the fan early next year. That's when rehab plan finishes, I dunno. (Murray)

He was concerned about his future employment prospects, in terms of both his ability to get and keep a job, and the likelihood that others would hire him:

> Who wants to hire a crazy? (Murray)

Although he was coming to terms with his illness, he still struggled with it on a daily basis:

> I just hate living like this, eh. I really do. The main focus I've got in life is with most of the guys in relationships is to make sure that their partner is well-catered for when they die sort of thing. That's my focus, I want to make sure that [the] mortgage is paid and everything like this, then I don't mind doing something, disappearing or whatever... But that's not the way to solve things. (Murray)

The family

Initially, when Murray began his job at the boat repairers, Jane noted that he seemed to enjoy himself. Over the time that he worked there she began to notice changes in him. This began with physical symptoms like a recurrent rash. Then Murray's personality began to change. Jane commented:

> And then he started to get really moody and lazy and yeah. He just changed from this placid person to this big monster. (Jane)

She observed that Murray was hard on the children and found it difficult to deal with them. The changes in Murray were hard for Jane to come to grips with. At times Jane attributed Murray's problems to laziness. Jane noted that Murray gave up his hobbies and their social life declined. Many friends no longer visited. As a result, they did very little as a couple. Jane still kept up her visits to friends and to the gym.

Of further concern to Jane was Murray's contribution to the household. She felt that it was unfair that he could receive more money through compensation than she did working full time. Nor did she feel that he made up for this by doing chores around the house. Overall, she was not interested in his illness. She had her own problems, including two nervous breakdowns.

All these pressures affected their relationship. Although they reconciled in June and July of 2000 after a separation, Jane was doubtful about the future of their marriage. She commented that they are more like flatmates now:

> Hmmm, yeah, we just sorta like, its not a marriage, we're sort of like in a flatmate y'know, we're just flatting together. That's what it's like. Yeah, half the time we don't even talk (Jane)

Jane's doubts extended to Murray's future as well. Specifically, these centred on his ability to find new lasting employment. Although Murray had returned to work at a computer firm he was not able to sustain working there.

The workplace

The workplace was a small business offering a variety of services which, at the time of the illness, included life raft survey and repair. The manager noted that Murray seemed to enjoy his job and the work he did. Murray had won his position against six others. The company recognised his competence and provided him with opportunities for extra training and certification.

When Murray began to notice symptoms and problems with his health, he reported them to the manager. They immediately decided to send Murray to a doctor. At this point it become apparent that OSH would have be to brought in to investigate the situation. Initially, Murray was not enthusiastic about this and did not want anything to be done. Management insisted that if there was a problem then it had to be dealt with. The result of the OSH investigation was that Murray had to be removed from the workplace for his own health.

For Murray's employers, there were a number of concerns arising from what happened. The manager could not understand how Murray had become affected. To the best of his knowledge Murray was the first worker to become affected by the chemical. The problem the company faced with Murray was that the job could not be done without the chemical. It was not something that they could have worked around. The company changed to a new solvent. Murray still could not be allowed to return to the job. Even though the new chemical was less reactive there was still the possibility that Murray would be intolerant to it.

Murray's employers had further concerns about the diagnosis of solvent-induced neurotoxicity. It did not seem to be clear-cut and there was no resolution resulting from the diagnosis. The manager thought it would have been much simpler if could be diagnosed with a single blood test. This lack of clarity made Murray's manager wonder if there were other factors involved, such as possible drug use.

Murray's manager believed the costs arising out of the incident for the company were minimal. The general morale of the other workers, in his belief, did not suffer from Murray's experiences or the OSH investigation. Overall losses from the incident were estimated to be 5-6 percent and a slight increase in the ACC levy. There were no increased costs from changing the chemicals they used in repair work.

Context

In the machinery and equipment manufacturing sector of the manufacturing industry in the year 2000/2001 there were 700 new and 886 ongoing paid work-related entitlement claims. These cost ACC $1,821,000 and $8,507,000 respectively.

Amongst building trades workers in the year 2000/2001 there were 1,892 new and 2,263 ongoing paid work-related entitlement claims. These cost ACC $5,593,000 and $25,054,000.

Amongst men in the 30-34-year-old age group in 2000/2001 there were 5,525 new and ongoing work-related paid entitlement claims, costing ACC $7,313,000.

Murray		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other
Individual/Household						
Medical - Ongoing	General Practitioner	365.26	160.00		205.26	
	Assessment	337.50			337.50	
	Occupational Medicine Practitioner	832.50			832.50	
	Occupational therapist	135.00			135.00	
	Psychologist visits	7,219.00	3,200.00		4,019.63	
	Consulting Professional	172.00	100.00		72.00	
	Total	**9,061.89**	**3,460.00**		**5,601.89**	
Rehabilitation	**Retraining/Education**					
	Courses at Polytechnic	608.10			608.10	
	Course at YMCA	421.87			421.87	
	Tutoring	100.00			100.00	
	CBC course	3,331.00			3,331.00	
	Certificate in Business Computing	220.00			220.00	
	Equipment					
	Course book	59.95			59.95	
	Chair and workstation	546.98			546.98	
	Computer	3,802.68			3,802.68	
	Access Card for SIT	20.00			20.00	
	Office 2000 Pro CD	713.07			713.07	
	Norton Anti-Virus	129.95			129.95	
	Stationery	310.00			310.00	
	Student writing desk	275.00			275.00	
	Printer Cartridges	154.90			154.90	
	Introduction to Computers Book	115.95			115.95	
	PC Consultant	86.40			86.40	
	Computer Services	50.00			50.00	
	Vocational counselling					
	PC Consultant	200.00			200.00	
	Training and employment Consultancy visits	1,157.18			1,157.18	
	Other (specify)					
	Membership of Support Group	15.00			15.00	
	Assessment for workstation and chair	135.00			135.00	
	Total	**12,453.03**			**12,453.03**	
Transportation	Air Travel	324.00			324.00	
	Taxi fare	101.80			101.80	
Personal	Clothing	199.95			199.95	
Income	Weekly income (before tax) before injury/illness	567.19	567.19			
	Net income loss (before tax): 1st 3 months	2,181.60	2,181.60			
	Sub-total	2,181.60	2,181.60			
	Net income loss/gain (before tax): 1st year	8,726.40	8,726.40			
	Sub-total	8,726.40	8,726.40			
	Net income loss/gain (before tax): Ongoing	8,726.40	8,726.40			
	Sub-total	8,726.40	8,726.40			
	ACC weekly compensation (per week)	493.67			493.67	
	ACC compensation (total)	77,013.71			77,013.71	
	ACC independence allowance (total)	396.50			396.50	
	Total	**77,410.21**	**8,726.40**		**77,410.21**	
Company						
Company - Production	Lost time	2 weeks		2 weeks		
	Total	**2 weeks**		**2 weeks**		
Company - Staff	Replacing workers	2 workers		2 workers		
	Total	**2 workers**		**2 workers**		

Company - Administrative	Rise in permanent disability premium			Cost		
<u>Community</u>						
OSH	**Time**					
	unofficial time spent	1 month				1 month
	official time spent	20 hrs 45 mins				20 hrs 45 mins
ACC	Projected Future Costs				(297,047)	
	Time			Cost		
Community Costs	Volunteer Work					
Total		**20 hrs 45 OSH time (&1 month unofficial) + 2 weeks company time & premium increase + 99,550.88**	**3,460.00**	**2 weeks lost time plus 2 workers & premium increase**	**96,090.88**	

Total Costs

Over a period of 3 years (rounded to maintain anonymity).

These include documented costs only. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $3,460.00 + undocumented costs

Company: 2 weeks lost time + 2 workers and premium increase

ACC: $96,090.88 plus costs (plus projected future costs of $297,047.00)

OSH: 20 hours 45 official time

Total: $99,550.88 plus costs + 2 weeks lost time + 2 workers and premium increase + OSH 20 hours 45 official time

MARK

Mark is a New Zealand European male in his late forties and is married with three children, two of whom lived at home at the time of the injury. In August 1999 he fell 4.5 metres and suffered multiple fractures. He continued to have some physical limitations due to his injuries at the time of the interview.

The sequence of events

At the time of his injury Mark worked in a pole reconstruction team for a telecommunications company. Over the previous month he had been involved in a complex employment dispute. His former position had been contracted out and he was in negotiation for a new job. In the interim he had been seconded to a temporary position and was having to ask for work to do. When the colleague of the foreman was taken ill, Mark moved to the pole reconstruction team.

On the day of the injury Mark and his co-worker were replacing poles in a suburban area. The morning had passed without event and they had installed several new poles. This involved putting in a new pole, removing the telephone wires from the old one and connecting the wires up to the new pole. At one site they installed a new pole next to what was suspected to be an unsafe one. Because they had to finish a job at another site, they left the wiring until later in the day.

In the afternoon they returned to complete the transfer of wires from the old pole to the new pole. Mark positioned a ladder against the new pole, climbed it and installed a new terminal. While this was happening his co-worker completed the jointing work on the underground joints of the cables. Now that the preliminary preparation was complete, he asked Mark to check which houses were working off the terminal of the old pole. This was to allow the original individual connections on the old pole to be fitted to the correct place on the new pole. Mark's co-worker then went to warn the customers whose telephones they were about to disconnect.

Mark then moved the ladder to the old pole, climbed it and made a note of what was connected where. His co-worker was between houses, and then told Mark that he should cut the wires in the terminal and they would fix it up later. Mark went to cut the wires and was trying to pull them out of the terminal when the pole broke at the base and he fell four and a half metres to the ground. Mark landed feet first but was attached to the pole by a safety harness and was dragged down with the pole landing on his right arm.

While waiting for the ambulance and the fire service to arrive his co-worker did what he could to assist Mark. Taking a large crowbar, he put it under the pole and lifted it to ease the pressure on Mark's arm. After that he secured the area as best he could and waited for the fire service and the ambulance to arrive.

Medical treatment

Mark suffered lacerations down the right side of his face, cracked ribs along the left side of his body and, most seriously, the fracture of the humerus bone in his right arm. He was taken to the nearest hospital where his arm was set. After staying there overnight he was given painkillers and released into the care of his wife and family, but was still in considerable discomfort. He wondered how someone in a similar situation without the support of family would have managed by themselves. He summarised the situation:

> But it was frustrating to be released from hospital. I could barely go to the toilet by myself. I couldn't get dressed by myself. I was in intense pain, [the] first [week] was the shocker. And the drugs I was taking, the codeine-phosphate stuff, while I would recommend it. But you know it was a shocker. [The hospital] just

> assumed that the woman taking him [will look after him], he'll be ok, we don't have to worry about him now. (Mark)

Impact on Mark

Mark was off work for ten months while his injuries healed. During this time he suffered considerable pain and discomfort. For the first three months, his movement was very limited, and physical activity was impossible. He lost fitness and gained a considerable amount of weight.

Mark was frustrated with the attitude of the company during his rehabilitation. The dispute over his employment situation continued, and although colleagues dropped in, his boss did not visit him after the injury. He felt that the company could have done better:

> It was just a bit of a shame, after nearly thirty years working for the place. . . . They were only prepared to do what they felt they had to. (Mark)

After he was given clearance to return to work, Mark gained new employment working for another company as a field engineer and enjoyed his new job. He did, however, still experience ongoing health issues and disrupted sleep:

> My shoulders are stuffed really. There are things I just can't do anymore. I haven't slept all the way through a night since the accident, there is not a night that goes past that, I get my arm in some sort of position and I wake up in pain. (Mark)

While being able to resume some physical activities he still could not lift his arm above a horizontal position or reach easily. This made participating in hobbies and sport either hard or impossible and affected his ability to do jobs around the house.

Most noticeably Mark had a change in his approach to life. Like his family, he considered that he was lucky not to have been killed. Mark tried to make the most of opportunities that were put in front of him. He described it:

> I sort have turned it around, I have a completely different attitude to life. I'm probably more, I've always been quite an honest person, but I guess I've realised that I could be easily dead and I realise how lucky I am. (Mark)

The family

At 2:30pm on the afternoon of the day of the injury Mark's wife, Allison, was working at her administration job at a local school when she received a call. It was from Mark's workmate who told her that there had been an accident and Mark was in hospital with a broken arm. Allison went immediately to the hospital and found Mark in the accident and emergency ward. She and the rest of family spent the afternoon and evening with Mark in hospital.

When he was released the next day, Allison immediately found that she had to begin caring for him. Fortunately, her employer was able to give her time off in the initial recovery period to help her husband. This was important, as Mark was not able to perform many routine personal care procedures in the early stages of his recovery, and Allison needed to help him with all of these tasks. The physical effort required helping Mark to a sitting or standing position was very demanding. For at least the first two months after the injury Allison had to return home from work at lunchtime to feed and check on him. Until he was sufficiently recovered to help, she had to do the housework of two people, in addition to the added work created by having to care for her husband. This was a considerable burden for her.

Friends provided support to Allison and Mark throughout this period. They would come in and keep Mark company during the day when Allison could not be there and ring her up to see how she was coping.

Mark's son Justin was shocked at how close his father had come to death:

> For a long, long time, every time I thought about the accident, I was, I think I started to realise how close he was to dying, I mean, if [the pole] had been a foot the other way, he'd be dead. (Justin)

As the recovery period wore on Mark became increasingly frustrated by his enforced inactivity. He was, in particular, keen to return to work. His irritation with his situation caused some tension within the family:

> . . . he drove everyone mental because he wanted so much to get back to work. And he was so relieved when he was told that he could, and he was so excited, and so positive about finding another job, he was actually quite fun to be around. There was such a big change, it was in the space of about two weeks . . . [my brother] was like 'let's go down to the park and kick a ball round, because Dad's home', and then two weeks later, it was 'Dad, do you want to come down to the park and kick a ball round?' (Justin)

In the long-term, Justin believed that the injury brought his family closer together. He also commented that his father's injury had also made him more safety-conscious in his own work.

The workplace

Both Mark's workmate and the workplace as a whole, were affected by his injury. His colleague suffered personal distress from the injury and no longer felt able continue in his job. He moved to a different area of work within the same company, resulting in a 7 percent pay cut. Six months after the injury he was made redundant. After this he found it hard to regain employment in his profession. He was concerned too that OSH and his employer blamed him for the incident. In his opinion, there were wider work process issues that had not been resolved. In reflecting on what happened, he thought that for a time he had lost all confidence in himself.

The company faced a range of costs and impacts arising out of Mark's injury. There was the immediate need to find replacement workers and address the morale problems stemming from the injury. With his colleague's reluctance and Mark's inability to return the work they had done previously replacements had to be shifted from another part of the business. Further, costs began to mount as there was an OSH and an internal company investigation into the incident. Five people were interviewed, taking eight hours to do so. Internally as a result of the health and safety officer's report, there were new procedures and training established. The OSH inquiry resulted in a prosecution against the company in which they pleaded guilty. They were fined $8,500 and had legal fees of $45,000. Extra health and safety procedures for ISO 9001 accreditation were instituted.

Context

In the communication services sector in the year 2000/2001 there was 225 new and 521 ongoing work-related entitlement claims. These cost ACC $695,000 and $7, 161,000 respectively.

Amongst stationary machine operators and assemblers (plant machinery operators), under which linespersons are classified, there were 1,434 new and 2,083 ongoing work-related paid entitlement claims for the year 2000/2001. These cost ACC $3,050,000 and $24,822,000 respectively.

For male workers 45 to 49 years old in the year 2000/2001 there were 2514 new and ongoing paid entitlement claims. These cost $7,236,000.

Mark		Total	Met by Individual/ Household	Met by Company (Accredited Employer)	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	Ambulance	388.12			388.12	
	Hospital Costs	837.50			837.50	
	X-ray	73.05	30.00		43.05	
	Orthopaedic Surgeon	163.57			163.57	
	Total	**1,462.24**	**30.00**		**1,432.24**	
Medical - Ongoing	Hospital Bills	544.12		544.12		
	General Practitioner	61.00	20.00	41.00		
	Orthopaedic Surgeon consultations	168.76		168.76		
	Personal Care Assessment	94.44		94.44		
	Physiotherapy Consultations	1,679.40	580.00	1,099.40		
	Prescriptions	83.94		83.94		
	Equipment					
	Grab rails	112.50		112.50		
	Shampoo and body spray	17.95		17.95		
	Other (specify)					
	Medical Report	150.00		150.00		
	Total	**2,912.11**	**600.00**	**2,312.11**		
Rehabilitation	Vocational Assessment and Resume Preparation	517.50		517.50		
Transportation	Travel to hospital	147.60		147.60		
	Petrol/Travel	88.88		88.88		
	Total	**236.48**		**236.48**		
Personal	Special Clothing	120.00		120.00		
Domestic	Loss of ability to do DIY	Ongoing cost	Ongoing cost			
	Total	**Cost**	**Cost**			
Partner/Dependants Time	Time off work (initial)	300.00	300.00			
	Time off work (ongoing)	150.00	150.00			
	Total	**450.00**	**450.00**			
Income	Net income loss/gain (before tax): 1st 3 months	2769.23	2769.23			
	Sub-total	2769.23	2769.23			
	Net income loss/gain (before tax): 1st year					
	Sub-total	12,000.00	12,000.00			
	Net income loss/gain (before tax): Ongoing	5,000.00	5,000.00			
	Sub-total	5,000.00	5,000.00			
	ACC weekly compensation (per week)	611.36				
	ACC compensation (total)	33,013.53		33,013.53		
Company						
Company - Production	Lost production due to decreased morale	Cost		Cost		
	Lost time due to investigation	8 hrs		8 hrs		
Company - Staff	Training of new staff	Cost		Cost		
	Lectures/ training sessions	1/2 an hour		1/2 an hour		
	Extra training and procedures	Cost		Cost		
Company - Equipment	Establishment of new procedures	Time		Time		
Company - Administrative	Legal costs (if prosecuted)	45,000.00		45,000.00		
	HSE Fine	8,500.00		8,500.00		

	Accident report **Total**	3 days **53,500.00**		3 days **53,500.00**		
Community **OSH**	Time Legal Fees	6 hrs 30 13,265.00				6 hrs 30 13,265.00
	Total	**13,265.00 + 6 hrs 30 OSH time**				**13,265.00 + 6 hrs 30 OSH time**
Community Costs	Limited in sporting activities		Can no longer participate in sport to same extent.			
Total		**105,476.86**	**1,080.00**	**89,699.62**	**1,432.24**	**13,265.00 + 6 hrs 30 OSH time**

Total Costs

Over a period of 2 years (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $1,080.00 + undocumented costs

Company: $89,699.62 (Accredited Employer)

ACC: $1,432.24

OSH: $13,265.00 + 6 hours 30 OSH time

Total: $105,476.86 + 6 hours 30 + costs

JULIA

Julia was a female financial services worker with over twenty years' experience in a competitive high stress industry when she developed an OOS condition. She was a high achiever and a highly regarded supervisor to other staff. She was formerly very active in her roles as homemaker, mother and wife, as well as helping her invalid father, and was very fit, enjoying swimming and gardening. Her mobility is now very limited and she is in constant pain.

Julia is married to Darren and they have adult daughters, both tertiary students in another city.

The sequence of events

Julia worked as head teller in a local branch of a large bank. Among her daily tasks was customer service, handling commercial customers and selling products within the bank. She loved the work and was part of a well-established team:

> I enjoyed my job, I enjoyed the customer service, I enjoyed the people I worked with, I got on with them all. (Julia)

The workstations at the bank were not adjustable and it was estimated she was reaching forward at her desk up to five hundred times a day, repeatedly twisting and lifting. During the day breaks were often not possible in such a busy environment where the focus was on weekly sales statistics. Julia commented that she felt 'burnt out' at the end of the day. Looking back, Julia reflected that the drive of achieving the top statistics meant she was going too fast:

> I had one … speed and that was fast. I always have had. (Julia)

The first signs of Julia's injury were a persistent sore neck:

> …and [I would get the pain] going down my lower shoulder as well. And I would complain to my co-workers – 'oh my back'. At the end of the day when I went to finish… it used to get more severe. I didn't take much notice. It would come and go... I thought 'Julia, you must have slept funny at night…' (Julia)

Other workmates were suffering from backache but Julia said she ignored the pain and kept working faster to keep up with the branch statistics and was in her words, 'running to time'. As the pain got worse she thought she was having heart problems as it now affected her chest, arm, shoulder and back:

> It was so severe I was walking around with a wheat-bag around my neck. The pain just down my arm was just something shocking. Oh it's hard to explain… it's like pins and needles but throbbing… (Julia)

Julia recalled that there was no change to her workstation at that time, but the pressure to sell more products, while keeping up with customer service, did not decrease. At the same time, the pain made sleep impossible.

> You are like that all day and all night and… I can only sleep in one position. So I have to be absolutely fatigued to sleep... (Julia)

Medical treatment

Julia did not seek medical help for a while. After a long delay Julia was diagnosed with a gradual process injury, a pain she described as 'radiating down her left side like throbbing pins and needles.' Because of constant severe pain down one side of her body, she was virtually immobile for almost a year and found it nearly impossible to sit for more than a few minutes at a time. A specialist told Julia that it would take eighteen months for the numbness to go out of her fingers. She was advised that

the best treatment was complete rest. To achieve this, she resigned from her job. Over several months the pain started to recede.

Impact on Julia

The first summer the pain was so severe, Julia was virtually immobile. She described how it felt to be unable to enjoy her usual summer activities of walking, swimming and boogie boarding:

> …and I never would be sitting like this, I would be out. I mean, we never used to be still, you know? Okay I was working full-time but I was a very active person… I never had one swim over summer. I got in the water… tried to go for a little paddle. And I tried to move my arm and I couldn't even move it… (Julia)

As time went on and treatment continued Julia felt the pain was slowly receding but she was largely confined to sitting in her chair, smoking. She could not do basic activities such as hanging out the washing or walking up stairs easily. Julia described her main pastime as 'sitting doing nothing'. Looking back, Julia reflected that her injury meant that:

> …for months there I couldn't even bend down to get lower things out of cupboards… I was just confined to an armchair and one space. Read books, boring. Absolutely changed my whole life around. (Julia)

Julia found the imposed lack of activity very frustrating.

> At this time I just keep saying to myself I have just got to get myself back to normal. I will go back to some sort of work because I am just an active person. Well I have been active person… I do not enjoy this and do not like this at all… no it's just not me. (Julia)

As a result of stopping work, Julia had also lost her financial independence and the social contact from working in a team. Her self-employed husband took on extra work to cover the bills. Julia's superannuation scheme from the bank had now gone.

Julia's acceptance of her condition, and her self-imposed rest, were beneficial to her situation. She reflected that the pain had lessened and she had learned, although not by choice, to relax. This made her 'take a good look at herself'. Previously, her drive meant she enjoyed producing the top statistics at work, but her new priority was to slow down, 'right across the board' – at her future job and at home:

> I have got no pain in my arm… and I know my limitations. If I do the wrong thing I will pay for it. I will [go back to work] because I am not a person to sit around like this and do nothing. But I am not well enough, I know myself I am not right. And it's made me realise… how bloody stupid and how naïve, how I was just negative to the whole thing. (Julia)

The physical impact on Julia was heightened by a long struggle seeking compensation from ACC. Different medical specialists did not agree that the injury was linked to Julia's work. Despite evidence of repetitive movement and repeated twisting at high speed in a pressured environment, specialist medical advice provided to ACC suggested that the condition was degenerative in nature. On this basis, ACC declined Julia's claim for compensation. Her union organiser observed that this left her feeling tired and disheartened. Her union organiser commented that:

> … she seemed to think she wasn't worthy … She had lost her self-confidence entirely, [she thought] she wasn't worthy of being helped. (Union Organiser)

Family

Julia was aware that her family and friends felt some impact. As the condition progressed, she isolated family and friends:

> I just could not be bothered with people, what they wanted or why. The pain just took over the mind. (Julia)

Her husband, Darren was a great support. He took over most of the household duties and drove her to the holiday bach where she could relax and get better. Julia felt guilty that she could not do the same for him:

> I can't give him a hundred percent that I used to be able to. (Julia)

Her bouts of depression had also put a strain on the relationship. However, Julia felt that as she recovered this had improved.

Another support was Julia's best friend Margaret. Margaret was very aware of the effect of the injury on Julia and how the pain was wearying and frustrating for her. Margaret felt guilty that she was not able to help Julia more with household jobs, and was also angry that ACC did not cover Julia for things she could no longer do herself, or costs she incurred as a result of the injury:

> She's very disappointed because ACC didn't come to the party, like give… pay for housework or gardening… These things still go on in your life. (Margaret)

The workplace

Julia's industry had highly developed training procedures in place for risks such as armed robbery or fire. However, the staff in this particular branch had not been trained to look out for symptoms of OOS or stress, such as pain or tingling and numb fingers. Although Julia believed that health and safety was becoming more of an issue, at that time training was largely limited to reading manuals, which staff did not have time to read. The staff were largely expected to manage their own health and safety. As to her own responsibility for her staff member, Julia's manager reflected that:

> Who knows, maybe it was left too long before she physically went and did something. Maybe I should have written to her when she got told to take a week off by the doctor and made her take a week off. But you hope that adults are going to, you know. You can't do everything for them.

However, she was also very supportive at times, helping Julia later when she was confused about contact with her ACC case managers, often in her own personal time. She believed it was important to stay in touch with Julia, to offer support and encouragement after she had been a part of the team for so long. She felt the impact on Julia had been profound:

> … it's cost her, her way of life she had before this happened... Julia's not really the Julia we used to know. (Julia's manager)

There have been some improvements in health and safety at Julia's former workplace. Looking back, Julia felt that the people around her were more aware about the risks of repetitive and stressful work. She felt it was positive, for example, that her workmates were taking extra precautions, and that it had 'opened their eyes up'. Julia's manager agreed:

> … the tellers are more aware of looking after their bodies and all of the staff. … because they can see what happened to Julia and they know it can happen [to them].

Context

In the finance and insurance sector of the finance industry in the year 2000/2001 there were 95 new and 296 ongoing work-related entitlement claims. These cost ACC $115,000 and $3,025,000 respectively.

For customer service clerks (clerks) in 2000/2001 there were 230 new and 319 ongoing paid work-related entitlement claims. These cost ACC $194,000 and $3,882,000 respectively.

Amongst women in the 45-49 age group in 2000/2001 there were 1,073 work-related new and ongoing paid entitlement claims, costing ACC $2,093,000.

Julia		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other (specify)
Individual/Household						
Medical - Ongoing	General Practitioner	400.00	400.00			
	Specialist report	800.00				800.00 (union)
	Physiotherapist	152.00	152.00			
	Prescriptions					
	For voltaren	70.00	70.00			
	Paradex	40.00	40.00			
	Equipment					
	Orthopaedic Bed	1,600.00	1,600.00			
	Lounger	80.00	80.00			
	Total	**3,142.00**	**2,342.00**			**800.00**
Transportation/ Accommodation	Petrol	1,200.00	1,200.00			
	Petrol for medical treatment	50.00	50.00			
	Changes to Bach	Cost	Cost			
	Motel	75.00	75.00			
	Total	**1,325.00 plus bach modification**	**1,325.00 plus bach modification**			
Personal	Books	900.00	900.00			
	Plants and flowers	600.00	600.00			
	Total	**1,500.00**	**1,500.00**			
Claimant Administrative	Employment of a lawyer	Cost (Union)				Cost (Union)
Partner/Dependants Time	2 days per week over 6 months	**4,800.00**	**4,800.00**			
Income	Net income loss/gain (before tax): 1st 3 months	7,575.92	7,575.92			
	Net income loss/gain (before tax): 1st year	32,829.00	32,829.00			
Company						
Company - Staff	Wages	8,257.00		For six months		
	Medical Retirement			For three months		
	Advertising for new staff			1,500.00		
Community						
OSH	Compliance visits	6 hrs				6 hrs(OSH)
	Telephone calls	2 hrs				2 hrs(OSH)
	Official Time	1 hr 30				1hr 30(OSH)
ACC	**Total**	2,264.00			2,264.00	
Community Costs	**Loss of leisure opportunities**	Cost (intangible)	Cost (intangible)			
Total		**21,288.00 + costs**	**9,967.00 [1]**	**8,257.00 [2]**	**2,264.00**	**$800(union) [3] [4] [5]**
	Footnotes [1] Does not include bach costs (unknown) or loss of quality of life (intangible [2] Does not include 6mth wages that were paid and 3 mths retirement pay [3] Union paid for a lawyer & a report – cost + $800 [4] Health insurance covered prescription costs. [5] OSH time 1 hr 30 (official), 8 hours unofficial					

Total Costs

Over a period of 1 year (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $9,967.00

Company: $8,257.00

ACC: $2,264.00

OSH: 1 hour 30 official time

Other: Union - $800

Total: $21,288.00 + costs and 1 hour 30 OSH time

PHILIP

Philip is a New Zealand Asian in his late twenties. He was working as a house surgeon in the mid-1990swhen he suffered a stress-related breakdown after experiencing a long period of work without adequate levels of supervision, with a difficult manager and long hours of work. He was unable to return to work at the hospital, but after three months began practice as a locum GP. Philip's breakdown had a profound impact on the family. Philip's father still had concerns for his son some years later, and described the event as 'devastating'. The relationship that he was in at the time broke up. Subsequent to his breakdown he became engaged to Mary, who is also studying medicine.

The sequence of events

Philip was a very able physician, and he had received excellent appraisals of his round just two weeks before his breakdown. He worked as a resident and house surgeon in large hospitals and he hoped to specialise. Philip's father was a GP.

Medical school did not prepare Philip for what he encountered as a resident and then a house surgeon:

> But I don't think anything can prepare you for what it's going to be like when you start working as a... house surgeon or doctor in hospital... You hear the stories, but it's not until you actually do it and actually try and survive the on-call days that you realise what it's all about. And it's not a gradual thing, it's a baptism of fire. (Philip)

Working at busy urban hospitals, junior doctors are at the bottom of a hierarchical system undertaking relatively menial tasks under the direction of registrars and consultants, and very much needing the support of experienced nursing staff. House surgeons were nicknamed 'house dogs'. Philip had completed about two-thirds of his training as a house surgeon, around eight years through his medical training.

Hospitals in which Philip worked were very busy, and in Philip's view were understaffed. He often found himself in situations where, with little supervision, he had to undertake important diagnostic or other tasks where there were considerable risks to patients.

On one run Philip had up to one hundred patients under his care on a general ward. On one Sunday he recalled having 400 messages on his pager:

> On the pager it fills up after twenty beeps and you have to clear [it] so that the next lot can come through. So my first Sunday I cleared it twenty times. That's four hundred times I was paged in the space of sixteen hours. (Philip)

Amongst these were some that could have indicated life-threatening situations, such as a patient experiencing chest pain or suspected internal bleeding. One two occasions in one rotation Philip worked more than 140 hours in a two-week period.

There was no particular event that triggered Philip's breakdown. Philip was on rotation in the speciality that he wanted to pursue, and had just received an excellent rating for his work. The unit he was a part of was, however, understaffed with house surgeons and Philip found the registrar a difficult and at times aggressive person. Philip and others were commonly sworn at and Philip had things thrown at him by the registrar on one occasion.

Philip found that he increasingly doubted his ability to safely treat patients:

> I was drained, I was an emotional drain and wrecked… I realised that I was losing control… I didn't know what a nervous breakdown was, I had just read about these things. I was tearful. I was not sleeping well. I

> was getting anxious. I'd be worried about patients that I'd seen. I'd be worried about whether they were going to come back and blame me…(Philip)

Towards the end of his time at the hospital Philip became increasingly aware of the stress that he was under and anxious that he was putting patients at risk. Although he hid this from his immediate colleagues he phoned a psychiatric registrar in the hospital and disclosed his worsening state. The contact was unhelpful, as Philip felt that the registrar simply did not want to have to deal with the problem:

> I rang up the psychiatric registrar on call and burst out crying and said 'I am a doctor, I need help.' He didn't know what to do. It was the worst thing, he said 'I think that you have got the wrong person, you are going to have to call someone else...' I was in the department crying and saying that I just feel terrible and hopeless… And then he actually said – I could hear him whisper to another person 'There's some medical student who's losing it or something.' So here was the greatest irony, was that I was calling up a psychiatric registrar trained to help with such crises, and he was trying to flick me off. (Philip)

In the end Philip had a sudden and dramatic breakdown as a result of the accumulation of all these pressures. Philip could not go through the doors of the hospital one morning. He turned around and sought out the occupational health service in the hospital. He was fortunate to find experienced and sympathetic staff who undertook to provide the space for him to recover. Philip spent some time convalescing in his parents' home; after three months he returned to medicine as a part-time locum GP, to 'get back on the horse' before he completely lost confidence in his ability. Philip received counselling and other support after the breakdown, but the nature of that support remained confidential to ensure that his career was not adversely affected.

The impact on Philip

Philip withdrew from personal relationships other than the limited ones that he had with colleagues. He found that talking about others' concerns came to seem trivial. The life-and-death situations that he encountered in his eyes reduced the problems of others to being inconsequential:

> ...you'd be totally unsympathetic towards... anyone else's need or worries or anything like that, what can compete with someone spurting up blood and dying in front of you... how can someone's bad day compete with your bad day. (Philip)

His relationship with his girlfriend broke up as a result.

Returning to medicine was at times hard. He found on occasions that he could barely get out of bed, as he feared facing patients. At these times his relationship with his father was vital, as he could talk to him about his fears and was calmed because of it and could then work in a professional way. The advantage of locum work was that it did not require any investment in the practice other than the medical tasks of seeing one patient at a time. A number GPs offered Philip shares in practices, but he did not want that level of responsibility in medicine again.

The economic situation for Philip was never dire because of the resources that the family had. But the loss of his ability to earn a specialist's income represented a very considerable loss of potential earnings.

Philip became less outgoing than he used to be. He was more prone to moodiness. Some of Philip's generous and empathetic nature that he demonstrated at school and university, before his hospital training, was lost. Philip has lost confidence in his ability and his direction is now unclear. Having invested many years of his life and his expectations in becoming a specialist, that path has now gone, leaving him angry at a system that he felt regularly incurs very high levels of stress and fatigue on those in it.

The experience changed Philip as a person:

> I'm a different, stronger person. I grew up really fast. I went from a medical student who didn't know anything to a… nothing shocks me now. Nothing in terms of what I have seen, blood, guts, gore. Nothing shocks me… (Philip)

Family

Philip found that his family provided invaluable support during this period, both financially and emotionally. Philip's father described the breakdown as having been 'devastating' for the family. He said that he had become concerned about his son, and even several years after the breakdown he found that he was still anxious. His parents found it difficult to watch the impact on their son's illness on him:

> To see sort of your own child suffering, you know, anxious and then not being able to cope... (Philip's father)

In addition, Philip's father had a sense of guilt that he, a doctor, had been unable to recognise that his son was ill:

> I feel guilty sometimes, but I didn't recognise it as a sickness. I thought it was a stressful situation, [I thought] he's sort of learning to cope with it and one day... he will be all right. (Philip's father)

Mary is training as a house surgeon, also hoping to specialise. Philip naturally had concerns about Mary's future given his own experiences.

The workplace

The hospitals in which Philip worked faced budgetary constraints. There was considerable pressure on staff to cut costs and carry vacancies, but they faced increasing expectations from the public about the level of care that they were going to receive. There was a pervasive sense amongst the medical professionals interviewed that doctors now face considerable risks in being held responsible, rightly or wrongly, for the consequences of treatment given. There is as a result a culture of defensiveness that exhibited itself in a number of ways. Philip found that he was unable to share the difficulties that he faced because of the fear that things said to colleagues could be held against him.

Philip's manager threatened that if Philip did not return to work soon after his breakdown, he would not work again at the hospital. This exacerbated the situation for Philip. OSH intervened and the threat was removed.

The department was somewhat re-organised following Philip's leaving. A new manager was appointed, as well as an additional house surgeon. The hospital lost considerable sums because of Philip's departure; the cost of cover, recruitment costs and the loss of productivity were all considerable.

Context

It is not possible to provide a definitive number on the incidence of occupational stress in New Zealand. Despite large amounts of literature on the topic, 'occupational stress' is ill-defined, is difficult to identify, and has multiple causes. Therefore, there are no accepted diagnostic criteria for stress as a condition.[53] New Zealand is, however, likely to have similar problems to other industrialised countries. For example, the ILO states that while there has been a decrease in work-related injuries for industrialised countries, the number of new hazards, including stress, are increasing. In recent years there have been some high profile damages claims in New Zealand where

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[53] Briefing to Minister of Labour. 'Review of the Health and Safety in Employment Act 1992: Working Time/Occupational Stress'. 14 September 2000. http://www.osh.dol.govt.nz/hseamend/cabinet/HoursWork-stress000914.pdf.

hazardous occupational stress has been proved to be the cause of debilitating psychological and physical illnesses.[54]

[54] For example: An ex-Police photographer was awarded damages of over $200 000. (Judge McGechan: Brickell v Attorney-General, High Court, Wellington, June 2000 CP267/97). Also, in Gilbert v Attorney-General unreported, (Colgan J. 21 June 2000. AC 49/00) involved claims for breach of contract and an award of approximately $900 000. This was later reduced by the Court of Appeal, but the decision for liability in favour of Gilbert was upheld.

Philip		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other
Individual/Household						
Medical - Ongoing	General Practitioner Prescriptions Counselling/Mental Health Care	Undisclosed Undisclosed Undisclosed	Undisclosed Undisclosed Undisclosed			
Income	Net income loss (before tax): 1st 3 months Net income loss/gain (before tax): 1st year	90,833.33 15,000	5,833.33	85,000 15,000		
	Total	**105,833.33**				
Community **OSH**	Time	Cost				Cost
Total		Cost	Cost [1]			Cost (OSH)
		Income loss of 105,833.33				
	Footnotes [1] Costs were present but unknown					

Total Costs

Over a period of 3 years (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are not included. Opportunity costs, and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: Undisclosed. Potential income loss of $105,833.33 per annum

Company: Cost (undocumented)

OSH: Cost (undocumented)

Total: Cost. Potential income loss of $105,833.33 per annum

BRIAN

Brian, a 45-year-old man, fell 5.4 metres through a skylight while attempting to clean the canopy roof gutters at his place of work, and suffered brain and spinal injuries. From being a fun-loving, out-door person who enjoyed life both with friends and family, he became a completely dependent individual who appears to have no sense of recognition of those around him and needs constant and continuous care and supervision.

Brian's wife Elizabeth had been married to him just nine weeks before Brian's injury took place. She had to give up her job to become his full-time caregiver. Rose, a family friend, has known Elizabeth (Brian's wife) for the last sixteen years. She helped with Brian's care for four or five hours each day, reducing the number of hours she was able to work in her original job.

The sequence of events

Brian was a seasonal supervisor where his main roles included forklift driving, shifting and cleaning out the cool stores. But during off-season, supervisory staff were retained for maintenance. Cleaning of the gutters was normally done once a year and the task was noted in the maintenance schedule to be undertaken when time permitted. The canopy to which the gutters were attached ran the entire length of the cold store. In the middle of the canopy and running its length, was a row of skylights. The skylights were made of a profiled plastic material and were 3 metres long and 1.43 metres wide. Before the injury, the skylights had no means of support under or over them to stop persons falling through. Anyone walking across the roof would encounter the skylights. There was a gap of about 0.8 metres between each skylight where the solid roof continued. Access to the canopy roof was provided by way of a machine-lifted platform. When the garbage was cleaned from the gutters and the bins required to be emptied, the staff would have to walk across the roof and deposit the garbage in drums which had been raised up to the height of the roof with a small forklift. To do this, the staff had to negotiate the roof skylights by walking across the areas of solid roof that dissected the skylights.

On the morning of the injury, the depot supervisor received a phone call from a transport company advising that they would be calling for a load of cartons during the morning. The transport truck arrived just as the depot supervisor was raising Brian up onto the roof. It was then decided that the depot supervisor would deal with the truck, while Brian began cleaning the gutters. Ten minutes later, the depot supervisor heard a noise and saw Brian crashing through the skylight onto the concrete floor 5.4 metres below. The fall resulted in Brian fracturing his skull and damaging his spinal cord, leading to severe brain and spinal injuries and partial paralysis.

The depot supervisor stopped the forklift and ran over to where Brian lay and called for the truck driver to phone an ambulance. The engineer who was close by was also called on to assist. Brian was covered with a blanket and kept warm till the ambulance arrived. The depot supervisor then contacted his supervisor who notified OSH. It was later concluded that Brian was walking across the roof to empty his bin into the drums when he fell through the skylight.

Cleaning of the gutters was a task that was undertaken on an annual basis. Yet no formal hazard identification for this specific task had been carried out, no controls had been put in place and the skylights hazard was not discussed on the morning when the work was to begin. This was despite the fact that the previous week, the depot supervisor had nearly stepped through a skylight, when he had been on the roof investigating the guttering. It later came to light that Brian had been unwilling to go on the roof, and had discussed this with Elizabeth up to a week before the injury. Had this been known earlier, it would potentially have affected the outcome of the trial. However, by the time the OSH inspector found out about this, Elizabeth was in Christchurch with Brian and the OSH budget

for the investigation did not permit the inspector to travel to Christchurch to personally talk to Elizabeth.

Medical treatment

Immediately following the injury, Brian was admitted to the ICU where he underwent an urgent surgical burhole and the evacuation of a small subdural haematoma. He was then flown to the Neurosurgical Unit of a major hospital and underwent a left frontal lobotomy and craniotomy. A tracheotomy was also performed.

Elizabeth was upset with what she saw as the 'cavalier' attitude of the doctors there who, because of the extent and severity of Brian's injuries, advised her to take him off life support:

> You haven't given him a chance . . .He has not had a chance and they sort of tell me, we've taken out x amount of his brain, the rest of it is like a bowl of jelly dropped from a height. It's just shattered. He will be no good. They really push you to put off the ventilator.

Brian and Elizabeth then spent about ten months at the Brain Injury Rehabilitation Service at Burwood Hospital in Christchurch.

Impact on Brian

The injury left Brian highly dependent on others (mainly his wife, Elizabeth, and the caregiver and family friend, Rose) for basic daily functioning, where he could no longer enjoy any level of privacy. He became incontinent, had little control over the management of his bowel, and required full assistance with personal hygiene and toileting. He expressed no interest in food or drink and gave no indication of experiencing normal sensations of hunger, thirst or satiety. Food and fluid had to be administered through a tube directly into his stomach. Brian was, after the injury, unable to communicate through speech or writing. His speech was unintelligible and when he did attempt to articulate words, they made no sense. He was unable to recognise anybody who was not very well known to him as part of his post-injury life, and gave no sign that he recognised family members or friends known to him prior to the injury. He recognised his wife, Elizabeth only as someone who provided care for him now and was there constantly:

> So whether he reacts to me because I was there the whole time, every day and I was always the one there, the main one, or whether he remembers we were married, you never know. (Elizabeth)

Brian was now unable to fulfil any part of the roles he used to enjoy.

Months of intensive rehabilitation helped restore Brian's ability to sit and walk with assistance. He did, over a period of time, regain a degree of physical strength and 'wellbeing', meaning he could be expected to live a normal life span. However, the medical opinion was that no amount of further rehabilitation would restore his intellect, memory or ability to recognise his family and friends.

Family

Every member of Brian's family, as well as his friends, had to come to terms with the loss of the Brian they knew. Many were unable to cope with the damage the injury did to Brian. His daughters coped with the grief by simply not visiting and this was also the case with his colleagues:

> Brian's children don't have anything to do with him... I heard [his daughter] said that's not her father. So she doesn't bother to come and see him at all.

The grandchildren who Brian was so fond of and spent a lot of time with, did not recognise him any longer and did not know how to react to him. They treated him like a child, which annoyed Elizabeth:

> And the grandchildren don't know how to take it, and they don't know what to do round him. And they do stupid things that annoy me. They treat him like a child. (Elizabeth)

As a result of this injury, the course of life for Brian and Elizabeth changed irrevocably. The loss for the Elizabeth was tragic as they had only been married about nine weeks before the injury took place. They had enjoyed a satisfying marital relationship and a good sex life. Both loved the outdoors, including fishing, camping, boating and visiting friends. Brian and Elizabeth were both employed and able to enjoy their incomes. They could afford to dine out, go to the pub, play darts or go to the casino. They could have their grandson stay for the weekend. None of these things were now possible. Elizabeth became committed to caring for Brian since his injury and continued to assist full time with his rehabilitation. Her devotion meant a loss of income for the couple who now had to manage on forty percent of their previous income.

Brian's injury occurred during the time of privatised workplace insurance. After a considerable struggle, Elizabeth was able to persuade the company's private insurer to provide financial assistance so she could purchase a house that would accommodate Brian's special needs.

There was no support of any sort for Elizabeth and she and Rose had to cope entirely on their own working out physiotherapy for Brian. Elizabeth felt that her background in nursing was of some help but still she often did not know where to turn for help. Elizabeth and Brian were also socially completely isolated now as they lost contact with their old friends. Elizabeth's caregiving commitments meant that she was unable to participate in social events, or take holidays:

> I really don't have a social life anymore... We don't go fishing, we don't go for trips away anymore. (Elizabeth)

Neither she nor Rose felt they could take any sort of a break from caring for Brian, as they both felt that no one else (not even a professional) could care for Brian and understand his needs the way they could.

The injury also had an enormous impact on Rose. She gave up working full time, and began to devote four to six hours a day on week days (and when required, on weekends) to helping Elizabeth take care of Brian. She had a family of her own but made clear to them that her first priority was looking after Brian and helping Elizabeth whenever she needed the help:

> I basically sat my family down and said right from here on, if Elizabeth needs me, you kids... are old enough to look after yourself. If I have got to go, I have got to go. I have made this my number one. And my family my number two, sort of. To a degree. (Rose)

Her husband was a good friend of Brian's before the injury, but since could not cope with his condition, to the extent of not even going to visit. As Rose said:

> ... because he can't cope with it himself, he sort of makes that much more allowance for me to. (Rose)

The Workplace

Brian's workplace was deeply affected by his injury and reactions were varied. There was complete and utter horror and shock when the injury occurred. Managers and colleagues did what they could to help out with the house, mowing the lawn, etc. The company also helped financially with regard to initial hospital and ambulance expenditures, paying for the purchase of the car and paying Brian's salary.

However, over a period of time when the extent and permanency of Brian's injuries sank in, colleagues and friends stopped visiting (in fact, most have visited him only once). One co-worker thought the reason for this was not callousness or lack of caring, but that they were just not able to cope with the fact that the present Brian bore, in essence, almost no resemblance to the one they knew:

> I don't know whether it's, ah, trying to ignore it or what it is... I know a lot of the guys really want to go and catch up with Brian, it's the, it's a stupid thing really. He's still Brian at the end of the day. He's just not

> [what] we remember as [Brian]. I think a lot of the guys want to remember him the way he was. (Co-worker)

Most felt very guilty of this inadequacy in themselves but were unable to do anything about it. The manifestation of their inability to cope was to shut the whole thing out. However, it was apparent that the injury and its results at all times lay not far from everyone's minds:

> I mean, everybody's been so much aware of what happened to Brian, it could so easily happen to them. The thing is that he was a mate and that's the hardest part. (Co-worker)

The company was prosecuted by OSH for breaches in the HSE Act, and fined $20,000. Following the injury and the prosecution of the company by OSH, a number of health and safety measures were incorporated into the company's policy, including safety training. There appeared to be a definite increase in awareness of health and safety at work.

Context

In the transport and storage (storage) sector in the year 2000/2001 there were 53 new and 42 ongoing work-related entitlement claims. These cost ACC $91,000 and $467,000 respectively.

For drivers and mobile machinery operators (plant and machine operators and assemblers) there were 1,609 new and 1,408 ongoing work-related entitlement claims. These cost ACC $5,258,000 and $17,120,000 respectively.

At the time of this injury, for building and related workers (plant and machinery operators and assemblers) there were 1,326 new and 477 ongoing work-related paid entitlement claims. These cost ACC $3,936,000 and $6,513,000 respectively.

For male workers 45-to 49-years-old in the year 2000/2001 there were 2514 new and ongoing paid entitlement claims. These cost $7,236,000.

Brian		Total	Met by Individual/ Household	Met by Company	Met by Private Insurer	Met by Other
Individual/Household						
Medical - Acute	**Emergency Transport**					
	Ambulance	436.14			436.14	
	Air Ambulance	1,063.40			1,063.40	
	Rented Car	648.74			648.74	
	Hospitalisation (Acute treatment)	16,670.00			16,670.00	
	Specialised therapies and nursing care	75,835.00			75,835.00	
	Total	**94,653.28**			**94,653.28**	
Medical - Ongoing	**General Practitioner**	135.00			135.00	
	Subdural Haemotoma L big toe drained	54.70			54.70	
	Assessment, report & revisit	135.00			135.00	
	Medical care	685.04			685.04	
	Prescriptions	3,597.01			3,597.01	
	Equipment					
	Wheelchair	1,736.12			1,736.12	
	Cushions	489.37			489.37	
	Supercare Mattress	2,46.00			2,46.00	
	Linen	2,047.29			2,047.29	
	Spacesaver Stool	121.33			121.33	
	Delongi Multivac	449.95			449.95	
	Dryer	849.95			849.95	
	Easicare Manual Bed	1,280.00			1,280.00	
	Cotsides	600.00			600.00	
	Easicare Electric Hi/Lo Bed	1,749.00			1,749.00	
	Food Allowances	70.00			70.00	
	Counselling for wife and family	No info			No info	
	Gastro tube	100.00			100.00	
	Accommodation	6,547.50			6,547.50	
	Total	**20,758.26**			**20,758.26**	
Long Term Care	Home (paid caregiver) weekly	640.00			640.00	
Transportation	Travel to Nelson	1,250.00			1,250.00	
	Hire Car	2,978.62			2,978.62	
	Total	**4,228.62**			**4,228.62**	
Domestic	**Structural Alterations (e.g., handrails)**					
	Replacement/installation of new shower	246.00			246.00	
	Modification of gates	740.40			740.40	
	Supply/Installation of guide rails	245.18			245.18	
	House purchase[55]	(225,000.00)	(225,000.00)			
	Placing Ads to find a house	864.00			864.00	
	Furniture	450.00			450.00	
	Total	**2,545.58**			**2,545.58**	
Partner/Dependants Time	Payment for training and supervision of caregiver	960.00			960.00	
	Income before injury/illness per week	**690.30**	**690.30**			
	Current Income per week	**552.24 a week ACC**	**552.24 a week ACC**			
Income	Net income loss (before tax): 1st 3 months	1,656.72	1,656.72			
	Net income loss (before tax): 1st year	7,179.12	7,179.12			
	Net income loss (before tax): Ongoing	138.06 per week	138.06 per week			

[55] Brian's injuries meant considerable structural alterations had to be made to accommodation. Renting was no longer a viable option, and Elizabeth was required to purchase a suitable house. She saw this as a direct cost of the injury, as the couple had no plans to purchase a house prior to the accident. Consequently this has been included as a cost of the injury.

	ACC compensation: per week ACC compensation: Total				552.24 Ongoing	
<u>Company</u> **Company - Staff**	Health and Safety Training Program	3,000.00		3,000.00		
Company - Equipment	Fall Arrest System	20,511.18		20,511.18		
Company - Administrative	Legal costs (if prosecuted)					
	Gift from company HSE Fine	11,250.00 20,000.00		11,250.00 20,000.00		
<u>Community</u> **OSH**	Time Legal Fees	39 1/2 hrs 4,012.00				39 1/2 hrs 4,012.00
Private Insurer	Projected Future Costs Administration time Administration time (Insurance company)	 21 hrs 45 103 hrs			(3,100,000) 21 hrs 45 103 hrs	
Total		**252,950.62**	**Costs**	**54,761.18**	**194,177.44** **124 hrs 45 time spent**	**4,012.00** **OSH did 39 1/2 hrs**

Total Costs

Over a period of 3 1/2 years (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: Undocumented costs

Company: $54,761.18

Private Insurer: $194,177.44 (plus projected future costs of $3,100,000.00)

OSH: $4,012.00 and 39 hours 30

Total: $252,950.62

BARBARA

Barbara is a New Zealand European woman in her fifties, with two adult children. She was employed as dyer in a button manufacturing company. Over the course of her employment there she developed asthma. Her workplace had doubts over the occupational illness diagnosis.

The sequence of events

Barbara began working over five years ago at a button manufacturing company in a small town. She was primarily employed as a dye-person. This involved mixing the dyes and colours for the buttons. On a daily basis she worked with both polyester and casein dyes. The position itself was an important one for the company, requiring both skill and artistic sense.

The dye room where she worked was small, measuring four by five metres. On one side there were pots for boiling the dyes and the chemicals were stored on the other. There was ventilation opposite, but it would have pulled any fumes past her breathing zone. Health and safety equipment such as respirators was available but, due to its impracticality in a hot dye room, they were not used regularly.

Twelve months before she was diagnosed, Barbara began to notice her health declining. Tiredness, shortness of breath, and sick days became more and more common. Initially, she put this down to sickness but increasingly she found her daily activities curtailed. Disturbed at his mother's symptoms, her son insisted that she go to the doctor. After the first consultation Barbara's doctor said that she should have three days off work. Still feeling unwell after returning to work she went to the doctor again and was hospitalised for six days.

OSH was then called in by the doctor to investigate. The inspector performed a compliance visit and interviewed managers and supervisors at the company. After reviewing the evidence, OSH believed that Barbara's asthma was caused by her occupation but this could not be proved beyond all doubt. The main problem was that the potentially toxic chemicals that she had been using had been slowly phased out of the system. In the end, the proof for the inspector was that although she smoked for a long period of time, she improved away from work. This indicated an occupational relationship. The union also became involved on Barbara's behalf.

Impact on Barbara

Barbara faced a number of difficulties arising from her illness. These covered a wide gamut from ongoing health issues, financial issues, curtailed social life and conflict with her workplace.

As Barbara's asthma took hold, her symptoms became progressively more acute. Difficulties breathing, inability to engage in even light physical activity and recurring illness all affected her day to day life. Favourite hobbies such as bowls and dancing at her local RSA club were no longer possible. Even going out for a walk with her granddaughter proved difficult. She remembered:

> …with my little granddaughter, I'd like to, she says to me, 'Come on Nan, we'll go for a walk up to the park', but I just couldn't walk it. Well, not at the moment. (Barbara)

The financial situation was extremely stressful for Barbara. The drop in Barbara's income impacted on her ability to survive day to day. Bills and mortgage repayments accumulated. ACC took a long time to process her claim for compensation. In part, difficulties such as this stem from problems diagnosing occupational illnesses like work induced asthma and the need for ACC to ensure that these claims meet the test for work related gradual process illness. In the meantime, Barbara applied for a sickness benefit and began her claim with ACC. That the sickness benefit was considerably less than her income as opposed to ACC income replacement, imposed strict budgeting requirements:

> And the sickness benefit, too, is only $166.00 a week, that's all I was getting and by the time I paid my mortgage and power and telephone and everything, there was $28.00 left for food. (Barbara)

Proving that her condition was occupational and finding the requisite evidence for it were continuing concerns. Barbara felt aggrieved that the burden of proof was on her, as was the need to provide evidence. She found ACC's requests for further information frustrating and onerous. Barbara did recognise the difficulties in the process and commented:

> But apparently that's what happens, if it had been like an accident at work, like I'd injured myself at work, and you could see it, that was different. But because they had to prove, that it was industrial related... so that's why it's taking so long. (Barbara)

Where there is conflicting medical opinion, ACC may need to gather a considerable amount of evidence to establish entitlements. ACC accepted her claim for occupational asthma, but declined any entitlement to compensation because specialist medical advice provided to ACC suggested that the main cause of her inability to work was due to smoking. Since her illness, Barbara has moved to the sorting room in the same company. Barbara's symptoms began to recede but she still required medication to take part in sporting and social activities. In reflecting on what had happened and her feelings, she commented:

> I don't know, I mean what's done is done, there's no need to mope about it, I mean, you're only going to stress yourself out even more, aren't you, and it's not going to do you any good. … I've got to do something, you've got to do something in your life, you can't sit around and mope, because that doesn't do any good either.... You've got to keep on going, and that's it. (Barbara)

The workplace

Barbara's illness caused tension and worry for the managers and employees. The workplace at that time employed sixteen people including the managerial team. The company was working hard to stay afloat in a highly competitive international environment. It had been through a restructuring with several staff being made redundant.

The involvement of OSH and the union resulted in a further degree of uncertainty, with some in the company fearing that if further financial burdens were placed on the company, it might be forced to close and their jobs would be lost. Workers were insecure about the chances of finding another job in the depressed small town labour market. Some were openly hostile to Barbara. Several managers and employees doubted that her asthma was caused by her job and felt that it was more likely to stem from work and lifestyle factors. They suggested that smoking and the stress of the dye room were the more probable causes. Eventually, the manager of the company had to step in to resolve the situation.

There were some costs to the company resulting from Barbara's illness. Another worker had to be brought in part time to replace Barbara in the dye room. There were also plans to improve the ventilation in the dye room. However, management did not consider that these costs were particularly high.

Context

Amongst stationary machine operators and assemblers (plant machinery operators) there were 1,434 new claims and 2,083 ongoing work related paid entitlement claims in the year 2000/2001. These cost ACC $3,050,000 and $24, 822,000 respectively.

In the petroleum, coal, chemical and associated product manufacturing sector (of which dye manufacturing is a part) of the manufacturing industry there were 7 ongoing paid work-related entitlement claims in the year 2000/2001 costing ACC $289,000.

Amongst women in the 50-54 year old age group in 2000/2001 there were 958 paid entitlement claims costing ACC $1,628,000.

Barbara		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	Hospitalisation	3,000.00			3,000.00	
	Specialist	500.00			500.00	
	General Practitioner	92.00	40.00		52.00	
	Total	**3,592.00**	**40.00**		**3,552.00**	
Medical - Ongoing	General Practitioner	460.00	200.00		260.00	
	Specialist	300.00			300.00	
	Prescriptions	200.00	50.00		150.00	
	Total	**960.00**	**250.00**		**710.00**	
Transportation/	Private Vehicle	cost	Cost			
Income	Net income loss (before tax): Sickness benefit	1,1722.56	1,722.56			
	Net income loss (before tax): ACC Weekly Comp	909.52	909.52			
	ACC compensation (total)	2,295.68			2,295.68	
	Sickness benefit (per week) – 8 weeks, $166 p/w after tax, $185.33 p/w before tax. (Pre- illness income $ 400.65 p/w before tax.)	185.30				185.33
	Sickness benefit (total)	1482.64				1482.64
Company						
Company – Staff	Hiring additional staff	Approx $200/month		Approx $200/month		
	Total	**Cost**		**Cost**		
Company – Equipment	Compliance/Modification costs	Yes				
Community						
OSH	Time	47 hours 30 minutes				
	Total	**8,530.32 + OSH Time: 47.50 hours**	**290.00**	**200.00**	**6,557.68**	**1,482.64**

Total Costs

Over a period of 1 year (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $290.00 + undocumented costs

Company: $200.00 + ongoing and undocumented costs

ACC: $6,557.68

OSH: 47 hours 30 minutes

Other: $1,482.64 (sickness benefit)

Total: $8,530.32

JOHN

John is a 28-year-old pakeha male who had constantly used chemical and solvents in his work in the boat building industry for five and a half years. John's personality began to change around June 1999. His symptoms gradually worsened and in September 2000 he quit work and moved back with his parents. Always very confident, outgoing and competent, John now finds it hard to be around people and to be motivated about life. He is not able to return to the boat building industry and has to retrain.

The sequence of events

John trained to be a cabinet maker, and began work with the company in 1995 when he was 23. He worked mostly on the construction side of things, dealing with fibreglass and glassing using glue and epoxy resin. The boats he worked on were mainly fibreglass with a foam core. Six months after arriving at the company John was offered the job of running a crew. This involved making sure everyone was busy, ordering materials and dealing with owners in addition to his everyday work.

John loved the work. He loved the responsibility he was given and he loved being involved. He tended to be good at organising things and thrived on having a team to work with. As his father said:

> He seemed to take it on himself, to, he tended to be good at organising things, organising the guys on the jobs and he felt responsible y'know? He, if [the owner] came and bawled one of the guys out for doing something wrong, he would go and see him and say look if I told them wrong bawl me out not the guy y'know. He was always like that. (John's father)

The health and safety standards of the company were not very good. There was no extraction, and no respirators were worn. John also did not wear gloves. This did not bother him, however, as he did not know why he needed to:

> You didn't know what could happen to you. Like some stuff used to give you a headache, but within a day or two the headache would be gone so you didn't worry about it. There is no real noticeable effect of what it would do to you, unless you ended up with epoxy rash. (John)

John used to come away from company meetings frustrated, as the workers would ask for certain equipment and protective gear that never eventuated. Initially, chemicals were stored in the factory which John thought was shocking but then they were moved outside. John worked long hours including weekends. In what seems to be inherent in the boat building industry, the pressure was always on as completion dates loomed.

In 1998, after he had worked for the company for three years, John began to have mood swings, headaches and he was unable to sleep. These symptoms intensified during the winter of 2000. He began to be worried about his mental health, saying:

> I thought I was going nuts. Because I couldn't explain a lot of the things like the non-sleep, just a lot of things I couldn't explain so I was starting to feel like a freak. (John)

His personality began to change and he began to be extremely cold towards his family, partner and workmates. His workmates began to call him Mr Anti-freeze. John would also feel nauseous and the side of his face felt numb. He used to throw up often and could not eat. His teeth, which had always been strong, also began to decay and John had to visit the dentist many times. Other symptoms were chest pains, shaking of the right hand and loss of sense of smell.

Things came to a head in August 2000 when, out of fear of what he was feeling and worried he may strike out at someone, he went home for four days and locked himself in his room until Monday. On the Monday he went to work and went back to his partner. Two weeks later, he could not sleep on a Sunday night, so he walked out of his house and went to stay with his parents.

It was mainly I 'spose just, I honestly feel I couldn't cope y'know if somebody came and asked me something um I would have either burst into tears or hit them or walked out so um I yeah I don't know why. I couldn't sleep that night, I got up and left. (John)

Medical treatment

Appropriate medical treatment was delayed for some time, as John's GP was initially unable to diagnose his illness, instead prescribing anti-depressants and a series of tests. He was finally diagnosed after John's parents read about the condition in a local newspaper.

Impact on John

The changes in John had a big impact on his life. He avoided his friends as he was unable to act normally around them:

> Well, a lot of my friends especially near the end I didn't really see because I wouldn't go out and if I did it was only for a few hours. Sort of I don't know perk up or try and liven up so they didn't really know anything was going on. And even now I do it cause you don't know about talking about what's going through your head or anything. So you sorta, well I do, I spose you'd call it a lie, I try hard not to show it. (John)

John's confidence was also shattered and any motivation John had to do anything ceased. John used to be quite sure of himself and knew where he was going and what he was doing. Now he no longer did. He did not look forward to anything, and felt like he was a totally different person. Derek, an ex workmate, who also left the company due to developing solvent neurotoxicity, said:

> John was a leader down there ok and you could see his confidence being shattered and in some ways you could see him like a little boy now. And you do, he has to start over again, but he has to get his confidence back. And I've actually asked him if he wanted to come here and just work. Just get his confidence up, to meet people and talk to people. Because you can see sometimes his moods change and like if he's going to snap. Yeah I try and bring the best out of him every time I see him. (Derek)

In the months leading up to leaving work and in the ten months since, one of the few activities which brought John any peace was driving:

> When I first left, the only place I'd actually find, I don't know, peace, would be, driving. So I'd probably spend anywhere from I don't know two to five hundred dollars when I first left a week on petrol. Like even now it's probably, it's a lot better now, probably anywhere from eighty to one hundred and forty. (John)

John was unable to return to an occupation that would require him to come into contact with solvents. John was not very happy with this given he loved his job and, at 29 years of age, had to come to terms with retraining:

> Well ACC has said they, my neuropsychologist has said that um they don't want to highly recommend me going back to anything related to boat building or furniture making or cabinet-making so I guess it's a new career now, a new start, something different. (John)

Ten months after leaving work, John was still unable to cope with any sort of stress or pressure. A recent Neuropsychological assessment suggested that he may be able to cope with part-time study or working, and John was contemplating beginning part-time study.

John felt frustrated in his dealings with ACC, particularly when his case managers kept changing. John found it took a long time to get compensation cover, in part because his employer took a long time to send in the required forms. Cover was granted in March 2001 and was backdated to September 2000. In the six months before cover was granted, however, John had to use his savings. John also asked his parents to ring ACC as John found he could not cope with dealing with the organisation. His parents found it difficult as John's case managers would ask why John was not on the phone. As Johns mother said:

> I mean for the first six months we had to initiate everything, he couldn't do it, we had to do all that. And they say why are you doing it, and then he'd start feeling guilty. I mean we were probably on the back foot too because we have never been involved with anything like this. We don't know the system. I mean I can understand ACC and that being cautious because you do hear some pretty horrific things of what people are doing because they know how to work the system. But it's very hard for us who have had nothing to do with it to know where to go and how to get help. (John's mother)

Family

John's illness had a major impact on his family. His relationship with his partner ended, and he moved back in with his parents, who had a substantial role in his care. John's parents were traumatised by what has happened to John. They first noticed the changed in John in the way he treated his partner. As John's mother stated:

> I was really quite horrified with the way he was treating her [John's partner], because it wasn't John and I thought I'd done a better job than that. (John's mother)

His parents also thought that John might be suicidal. Their distress was exacerbated initially by not knowing the reason behind John's personality change and more recently by the lack of support they received from services. John's parents found it very hard, especially before John was diagnosed, and they had no idea why he was acting this way. As his father said:

> …it sort of screwed me up for a while, because I'd sort of look at him. He looks good, why aren't you getting your act together, and you feel like shaking him and sometimes I found it hard, really hard. I have sort of got over it to a degree and accept it, but I still find it hard. (John's father)

John's illness also had a big impact on other members of the family. For a long time he was not able to be around his nieces and nephews. In fact it was his intolerance of his family that first indicated something was wrong. As John's father said:

> He'd been looking after the kids and he didn't know how to handle it. And that would have been about six months before he left his job… the signs were probably there then but we just didn't click'. (John's father)

However, his family was very supportive. An older sister lived down the road and the family made sure that someone was always around if John needed it. John's parents were self-employed so they had the flexibility in their professional lives to help John. They thought that if they were both working nine to five, however, things would have been a lot harder.

The workplace

The company John worked for was successful, and expanding rapidly.

On average, John worked 50 hour weeks although in busy periods the number of hours could easily top 70. He was not made aware nor advised of the risks associated with the chemicals used in the industry. All staff were issued with latex hospital type gloves. Organic respirators were only available two years after he started work at the firm. John only used these when he painted. Dust masks would otherwise be used. John was not aware of any extraction systems being present, especially during the first three years he was there.

Derek also got solvent neurotoxicity and left work about the same time John began getting sick. Neither Derek nor John knew the other had solvent neurotoxicity. About seven months after John left work, he went to see Derek at Derek's new job. The meeting helped both of them. As Derek said:

> He came round three months ago and I could see he was twitchy. So I thought aw yeah started talking to him about how I used to feel and what you used to think. And he thought some really crazy thoughts, and I opened up to him. He just went whew, I thought I was the only one. You're not the only one, the good thing is you do get better, but it takes you a while. (Derek)

At least five other employees at the company became sick and other existing staff seemed to have health problems. To date this does not seem to have had an effect on the employer, at least in John's case, as any costs due to John's absence were absorbed as the expanding company took on new employees. The employer also did not see the effects of solvent neurotoxicity on his employees as, at least in the cases known to us, they left before the illness was diagnosed or a work link established.

The manager also appeared to be ambivalent about the cause of John's sickness. He appeared to have a low awareness of the health and safety hazards at his workplace and displayed a lack of interest in John's case and his current health. He also maintained that while the company had some responsibility for John's illness, it was John's out of work activities (working on his own boat and for personal clients) that also contributed to his symptoms. OSH and an independent occupational physician however, found that John's symptoms were a result of his paid work activities.

Context

In the machinery and equipment sector of the manufacturing industry in the year 2000/2001 there were 700 new and 886 ongoing work-related entitlement claims. These cost ACC $1,821,000 and $8,507,000.

For building trades workers (trades workers) in 2000/2001 there were 1,892 new and 2,263 ongoing work-related paid entitlement claims. These cost ACC $5,593,000 and $25,054,000 respectively.

Amongst men aged 25 to 29 in the year 2000/2001 there were 2,082 new and ongoing paid entitlement claims costing ACC $5,148,000.

John		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	General Practitioner	150.00	150.00			
	Other	3,500.00	3,500.00			
	Total	**3,650.00**	**3,650.00**			
Medical - Ongoing	General Practitioner	300.00	180.00		120.00	
	Neuropsychological testing	800.00			800.00	
	Prescriptions	120.00	30.00		90.00	
	Total	**1,220.00**	**210.00**		**1,010.00**	
Transportation	Petrol	6,000.00	6,000.00			
Income	Income per week before injury/illness	815.95	815.95			
	Net income loss/gain (before tax): 1st 3 months	1,958.40	1,958.40			
	Net income loss/gain (before tax): 1st year	5,875.20	5,875.20			
	ACC weekly compensation (per week)	652. 75			652. 75	
	ACC compensation (total)	23,499.00			23,499.00	
	Total	**23,499.00**			**23,499.00**	
Company						
Company - Staff	Hiring additional staff - No quantifiable costs as company was expanding so loss is incorporated.					
Company - Administrative	Increase in insurance premiums	Yes, but not quantified		Yes, but not quantified		
	General administration costs	yes, but not quantified.		yes, but not quantified.		
Community						
OSH	Time	12 hrs				12 hours (OSH)
ACC	Projected Future Costs				(460,993.00)	
	Time				Cost	
Total		**$34,369.00 + 12hrs + cost**	**9,860.00**	**Cost**	**24,509.00 + cost**	**12hrs OSH**

Total Costs

Over a period of 1 year (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $9,860.00

Company: Costs but not quantified

ACC: $24,509.00 (plus projected future costs of $460,993.00)

OSH: 12 hours

Total: $34,369.00 + 12 hours + company costs

PETER

Peter is a New Zealand European man in his thirties who was employed as a spray painter at a boat building firm at the time of his injury. On the day of the injury Peter was spray-painting the interior of a large boat. Paint fumes built and with a spark from a halogen light there was an explosion and a fireball. Peter was engulfed by the fireball and suffered burns to forty percent of his body. He suffered considerable physical and psychological harm. The resulting stress of the injury and his recovery contributed to the breakdown of his marriage.

Nicole was Peter's wife when the injury occurred. They had been married just a few months. At the time, she was in the third year of a psychology and sociology degree. Her life was just as heavily impacted. She had to take time off to first care for Peter and then go back to work to support them both. Plans for further education and a family had to be set aside.

The sequence of events

On the day of the injury Peter was spray-painting inside a forty foot catamaran. He was working in and around a forward cabin. The space was quite small, with a six foot stud (floor to ceiling). The area was enclosed, there were no windows and no natural light. As a consequence, a sealed halogen light was being used to illuminate the work area. A longer extension cord had been placed on the light. The sealing boot where the wire went into the light had not been put back in correctly.

For protection Peter was wearing disposable overalls; under that he had shorts and a T-shirt and he was breathing through a positive pressure mask. Before the injury Peter had requested a portable extraction unit to draw the fumes out of the work area. However, the company had supplied a 150 millimetre diameter plastic hose, which in turn was connected to the extractor fan of a spray booth twenty metres away. It provided virtually no extraction of fumes.

After spraying a second coat of paint, he stepped out of the bathroom where he had been working and turned to climb the stairs. At that moment, the paint fumes ignited and he was engulfed in a fireball. Peter described the final moments before the injury:

> So I was downstairs, um painting, prime the inside front cabin, the bathroom and then the wall. And had the light looking round and making sure I hadn't missed anything, put the light down and there was a spark in the light and it just erupted. Everything around me erupted as I put the light down.

Peter then dropped everything and ran up the steps and out of the boat. Outside the boat there was panic and it was Peter himself who rang for an ambulance. One of the office workers came out and said that he needed to cool the burns with water. Since there were no safety showers in the company she took him outside to the toilet block and turned a fire hose on his burns, the water from which was hard and very cold.

Medical treatment

After the injury Peter was taken to hospital:

> They jammed me full of morphine. Cut my wedding ring off. Took all the bits of burnt clothing off. Picked all the bits out of my skin and stuff. (Peter)

His treatment in the hospital lasted eight weeks. Burns covered forty percent of his body, on his arms and legs. Fortunately, the mask he was wearing had prevented burns to his face and protected his lungs. In places, the burns reached the second and third layer of skin. For the majority of the time at hospital he was on intravenous morphine. Every second or third day his bandages were removed, the affected areas were cleaned, and then redressed. Because of the pain of these procedures he had to be placed under a general anaesthetic while this was done.

At three weeks Peter had recovered enough to walk. The hospital decided they needed to perform skin grafts on his legs. The hospital then suggested a second batch of skin grafts. Not wishing to repeat the process, Peter, in consultation with Nicole, decided to turn them down and accept extra scarring and a longer period of rehabilitation.

Impact on Peter

Physically, Peter had an extended period of rehabilitation with ongoing symptoms. Initially, Peter's pain was constant and, at times, excruciating. As time wore on he experienced trouble with mobility, maintaining body temperature and sensitive and tight skin. On release from hospital, he was unable to use his hands, and his ability to perform any physical activity was severely limited. He was required to wear pressure bandages on his arms and legs for nearly two years after the injury to ensure the new skin formed correctly and to aid circulation. There was physical scarring on his arms and legs. He had to work to maintain the condition and flexibility of his skin. His physical discomfort is ongoing.

Less obviously, Peter experienced psychological difficulties. He had continuing nightmares, claustrophobia and sleeping problems arising from the incident. He had post-traumatic stress counselling for some time after the injury. At times, he struggled with self-consciousness over the burn scars but found methods that helped him to cope with this situation.

Peter's injury in turn placed a burden on his relationship. Only recently married, the couple had planned for the future. These plans were impossible, which lead to tension between the couple. Eventually, from these pressures, the marriage broke down irreconciably. Socially he became isolated from friends and networks and he was no longer able to participate in recreational activities to the same extent.

A positive aspect was that Peter's career took a new direction. Since he was not able to return to spray-painting or heavy physical work, he went to university to retrain as an engineer. This gave him a sense of empowerment and a feeling of taking control of his life. The university was supportive providing assistance with study for him when necessary. However, this training was at his own expense and resulted in him having to take out a substantial student loan. Long term, Peter believed that the degree would enhance his life greatly.

Family

Nicole, like Peter, was immediately affected by his injury. She gave up university study to care for him, and later, to work to support them both. There were immediate issues of care, finances, future plans and relationship difficulties:

> We had no income, we couldn't have a family, we couldn't plan for the future. Peter had to completely retrain. I couldn't finish my study. (Nicole)

This was further complicated by Nicole's feelings of loneliness and not being supported.

On Peter's return home, Nicole had to care for Peter. Despite previous nursing experience she was disturbed by his injuries:

> I was absolutely revolted by these burns, they were just so horrific. They were third degree burns, so they were very deep and very raw and very pussy and just horrible. And all over somebody's body, it was just horrible. (Nicole)

Even with financial support from ACC there was considerable strain. Once Peter was able to look after himself Nicole looked for employment to help support them. Money had to be directed towards buying new appliances and other areas.

Just as significant were the effects Peter's injury had on their relationship. Nicole had to cope with his feelings of depression and anger over the incident as well as with trying to process her own reactions. As a new bride, she found it difficult and was surprised at her own reactions. Nicole felt also that she did not receive the support she needed. She felt isolated by their friends and relatives:

> Friends found it difficult to come and visit us because what happened was so huge and so horrific. And nobody really wanted to talk about it and yet it was so in [your] face that you couldn't ignore it. It was hard for friends I think, and hard for us too. We drifted apart from a lot of people, yeah, that's really the biggest thing. We became very isolated, I didn't have the same contact with my friends. (Nicole)

Her own family was unable to provide the support that she needed. She felt that her husband and government agencies involved did not acknowledge her role. The result of these pressures, she felt, led to their separation.

The workplace

Peter's employers made yachts for both local and overseas clients. Upwards of twenty people were employed at any one time with numbers varying, depending on the volume of work. There was anecdotal evidence that the company had a high turnover of employees with few people staying long term. There had been difficulties in the relationship between Peter's employers and OSH over a long period of time. Staff complained on several occasions over the company's health and safety systems. These complaints covered inadequate health and safety systems, hazard identification, and ownership of health and safety by the employer. Following Peter's injury, the employer was prosecuted by OSH under the HSE Act and fined $18,000.

Change had begun at the boat builders. This was instigated by Peter's injury and the resulting prosecution, plus a different approach from OSH towards the company's manager. For fellow employees at the workplace, Peter's injury made health and safety more real for them. Similarly, the employer was forced to take a more vigorous approach to health and safety systems.

OSH took a new approach with the employer. The employer felt, from previous experience, that OSH was the 'enemy' and felt pushed around by inspectors who had, in his opinion, little experience of boat building. A health and safety culture was now beginning to manifest itself at the company. This may have been influenced by an alteration in OSH dealings with the employer. This involved praising his successes and the changes he made. Where appropriate, further guidance in terms of advice and information was provided.

Context

In the machinery and equipment sector of the manufacturing industry in the year 2000/2001 there were 700 new and 886 ongoing work-related entitlement claims. These cost ACC $1,821,000 and $8,507,000.

For building trades workers (trades workers) in 2000/2001 there were 1,892 new and 2,263 ongoing work-related paid entitlement claims. These cost ACC $5,593,000 and $25,054,000 respectively.

Amongst men in the 30-34-year-old age group in 2000/2001 there were 5,525 new and ongoing work-related paid entitlement claims, costing ACC $7,313,000.

Peter		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	Emergency transport	450.00			450.00	
	Hospitalisation	28,000.00			28,000.00	
	ICU burns treatment	12,000.00			12,000.00	
	Skin graft	4,500.00			4,500.00	
	General treatment	95.40			95.40	
	Doctors assessment for ACC	200.00			200.00	
	Medical centres invoices	53.00			53.00	
	Total	**45,298.00**			**45,298.00**	
Medical - Ongoing	General Practitioner	45.00	45.00			
	Physio/Occ. Therapist/Chiropractor/Osteo etc	3,800.00	1,000.00		2,800.00	
	Impairment payment	248.17			248.17	
	Counselling/Mental Health Care	1,200.00	1,200.00		400.00	
	Specialist clothing	2,559.85	2,559.85			
	Vitamins & vitamin creams	2,042.00	2,042.00			
	Total	**9,895.02**	**6,846.85**		**3,448.17**	
Rehabilitation	Retraining/Education	888.00			888.00	
Transportation	Air Travel	1,026.00	1,026.00			
	Taxi	2275.05	45.00		2,230.05	
	Private Vehicle	1,388.00	1,388.00			
	parking	112.00	112.00			
	Total	**4,801.05**	**2,571.00**		**2,230.05**	
Personal	Replacement Clothing	2149.00	200.00		1,949.00	
	University study unable to be completed by wife	3000.00	3,000.00			
	Retraining	24,000.00	24,000.00			
	Vocational Services	702.19			702.19	
	Doctors assessment for independent allowance	200.00			200.00	
	YMCA fees for one year to assist 427 return to work	260.00			260.00	
	Report/photo fee	337.50			337.50	
	Total	**30,648.69**	**27,200.00**		**3,448.69**	
Domestic	Home help	693.75			693.75	
	Occupational therapy home action team	112.50			112.50	
	Dishwasher	250.00	250.00			
	Hand held shower	30.00	30.00			
	Furniture	540.00	540.00			
	Microwave	400.00	400.00			
	Kitchen taps	250.00	250.00			
	Lawnmowing	468.00	468.00			
	Increased electricity usage	1,800.00	1,800.00			
	Replacement shoes	150.00	150.00			
	Wedding ring	80.00	80.00			
	Total	**4,774.25**	**3,968.00**		**806.25**	
Income	Income before injury/illness	30,000 before tax	30,000 before tax			
	Income during recovery period per week	187 a week ACC	187 a week ACC			
	current income per week	201 a week ACC	201 a week ACC			
	Net income loss (after tax): 1st 3 months	3,324.00	3,324.00			
	Net income loss (after tax): 1st year	14,010.00	14,010.00			
	Net income loss/gain (after tax): Ongoing	37,838.00	37,838.00			

	ACC compensation: per week				237.14	
	ACC compensation: total				55,016.48	
	ACC independent allowance total				19.09	
	ACC independent allowance				2,481.70	
Company						
Company - Production	Lost production due to post-injury procedures	two hour meeting by all staff with fire brigade.		two hour meeting by all staff with fire brigade.		
Company - Equipment	Polyester/cotton overalls purchased for all staff.					
	range of zone one lights bought					
	Four fire extinguishers and an extra fire hose bought					
Company – Administrative	Legal costs (if prosecuted)	415.00		415.00		
	HSE Fine	18,000.00		18,000.00		
	Reparation for items paid by claimant as a direct consequence of the injury.	4,715.85		4,715.85		
	Total	**23,130.85**		**23,130.85**		
Community						
OSH	Time	106.5				106.5
	Legal Fees	Cost				Cost
ACC	Projected Future Costs				(42,483.00)	
Total	**Total**	**167,370.44**	**30,585.85**	**23,130.85**	**113,653.74**	**106hrs 30 + cost**
	minus reparation for costs incurred by company		4,715.85			
		162,654.59	**25,870.00**			

Total Costs

Over a period of 4 years (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $25,870.00

Company: $23,130.85

ACC: $113,653.74 (plus projected future costs of $42,483.00)

OSH: 106hrs 30 + cost

Total: $162,654.59 + 106 hours + costs

SARAH

Sarah is a dairy farmer in her mid forties. After the sudden death of her husband two years before the injury, she was left to manage their 300 hectare farm. She has four children, aged between 26 and 15 at the time of the injury. Three days before Christmas Sarah's four wheel all terrain vehicle (ATV) collided with a ute driven by her son, causing lacerations to her left knee and fractures to both thumbs, as well as the left middle finger.

At the time the injury occurred, Sarah's children were all at the farm for Christmas. The family was also preparing for the wedding of one of her daughters in January. Her two daughters, both in their twenties, normally worked in major cities, but had returned home for Christmas. William, the eldest son, (17) was studying at Auckland University, and at the time of the injury was home for the holidays. He was driving the Ute that collided with the ATV. Gordon, the youngest son (15), was still living at home and attending a local school at the time of the injury.

Sarah employed two farm workers. Bruce had been working for her for some time, and had a considerable amount of responsibility. The other worker was temporary.

The sequence of events

The day of the injury was to be a busy one for Sarah. It was three days before Christmas, and the last day both her farm workers were to be there. Bruce was due to go on holiday the following day, and it was the temporary worker's second to last day. The milking was completed and they were all in the house having their morning meal. Sarah admitted they were all feeling rushed and pressured to get things done and she felt annoyed that they were running behind schedule.

The house and farm buildings were connected to the road by a tanker track. This track was fairly narrow (although two vehicles could pass, it was a tight squeeze), and had trees growing alongside it, limiting visibility on the corners. Sarah asked William to go down the tanker track in the ute to get the mail while she made some phone calls. Once the calls were completed she went to the cowshed to load up the ATV with weighing, neutering and drenching equipment. She then headed off down the tanker track to deliver it to the stockyards. The yards were down the tanker track and across the road. By now, she assumed that William would have returned to the house with the mail. However, he was coming up the tanker track in the ute as she was going down in the ATV. Sarah cut the corner and was on the wrong side of the track when she encountered the ute. When they saw each other they were only 2-3 metres apart and had no time to break or take evasive action. The vehicles collided, and Sarah came off the bike and was thrown past the ute onto the track:

> And we just, I think just the both of us just saw each other when, there was no time to avoid each other, so we, I flipped over the passenger front and then went flying off, I think... (Sarah)

Bruce was following William up the tanker track on a two-wheel farm bike and witnessed the injury. He ran to help Sarah and, after discovering that there were no head or spinal injuries, he and the other employee carried her to the house. Gordon, hearing the impact, ran out of the house to the injury scene. He then called for an ambulance. William, having ascertained that his mother was not critically injured, ran back to the house where, in shock, he shut himself in his room.

Medical treatment

Although the farm was geographically isolated, the ambulance arrived in 16 minutes as it had been in the area. The driver assessed Sarah's injuries and contacted the air ambulance as he did not believe she should be transported over the bumpy country roads for the hour it would take to reach the nearest hospital. She was given intravenous drugs in the air ambulance.

The emergency department staff then assessed her and diagnosed a lacerated left knee, a fractured left wrist and fractured right thumb. She had her both hands put in plaster but when the left hand was being done, Sarah could not understand the intense pain she experienced, particularly when her finger was touched or knocked:

> And when they had been setting [my left wrist] they had to give me oxygen because every time they knocked my fingers I just about fainted. (Sarah)

The following day, she had repeat x-rays done and it was found that it was not her wrist that was fractured but her middle finger which accounted for the pain she was experiencing. The cast was removed and a slab put on in its place. She was in hospital for two days before being discharged home with both arms in plaster.

Ten days later she went back to the hospital to have the plaster on her left arm removed and replaced with a bandage, and six weeks after that the bandage was removed. Sarah went in before her follow-up appointment was due as she was experiencing intense pain in her left thumb. It was found that the bone was chipped. The hospital advised pain relief only for this injury. Four months after the original injury an x-ray showed a clearly visible fracture line in her hand. There was a suggestion that Sarah may have to have surgery involving a bone graft, but she was adamant that she did not want that and opted instead to go back into a cast.

While the original injuries diagnosed were as recorded above, the actual injuries were a lacerated knee, fractured left middle finger and thumb, and fractured right thumb. She had the cast on her right hand removed five months after the injury. Sarah did not have physiotherapy during her rehabilitation period because of her geographical isolation from a treatment provider.

Impact on Sarah

When she was released from hospital, Sarah was physically very limited:

> Initially I couldn't even walk, and I had one good leg, I came home from hospital after two days and I could go to the toilet by myself if I had a skirt on, but that was all I could do. Absolutely nothing else. (Sarah)

Her injuries meant that she was completely unable to participate in farm and home activities, and was dependent on others throughout her recovery period, which she found very difficult:

> [The family] would leave the house to shift stock, or do something on the farm, and I'd think, 'I can't get a drink of water, I can't get anything to eat, because I can't even get the fridge door open, and even if I could, what could I do with it?' As far as being dependent on people it was a very difficult time. (Sarah)

Initially she was unable to have any physical contact with her children, as they could knock her hands when they hugged her. By the time of her daughter's wedding, a month after the injury, she was still only able to endure limited physical contact.

The worst result of the injury for Sarah, however, was the degree to which she became isolated, both from the physical work on the farm, and from those around her. Sarah was self-employed. She worked long hours on the farm but loved it despite it being physically demanding and tiring. Following the injury she felt incredibly isolated and frustrated at not being able to actively run the farm:

> …because my whole life revolved physically being on the farm, I actually really, really missed that. Because I wasn't working or interacting with anybody… So like Bruce was hardly likely to bowl in to talk to me for half an hour. Whereas we may have talked while shifting stock or whatever… I have never felt so alone and isolated in my life. (Sarah)

Sarah continued to be unable to work for several months and this was incredibly frustrating for her. She loved to be out on the farm and instead she was confined to the house with little or no social interaction. Six months after the injury Sarah was still only fifty percent recovered and was still unable to do farm activities such as riding the bike and putting the cups on for milking due to the weakness and pain in her hands.

Family

For Sarah's children the injury had both a physical and an emotional impact. The emotional cost for William was particularly severe, as he held himself responsible. The impact was also heightened by the attitude of the police, who were called on the advice of the ambulance driver and arrived shortly after the injury. Sarah recalled that:

> He locked himself in his room, the police arrived, and he didn't want to talk to them. And the policeman went up there and said to him, 'If you don't come out we'll knock the door down and drag you out and it will make things worse'. So obviously he came out... They asked what sort of relationship [he] had with me. And basically the police said, 'Do you want to kill your mother', or something like that. (Sarah)

Although the police took no further action their response to his involvement caused him considerable stress. He became physically sick soon after the injury and became more withdrawn, which Sarah attributed to the event.

Sarah's children were all home immediately after the injury and she relied heavily on them to keep things running. She assumed that the children would manage without difficulty, but they were incredibly upset by the injury, particularly as it had been just two years since their father had died and they felt very vulnerable:

> The reality was that they were incredibly upset by it from the fact that it was nearly two years since my husband had died. And the fact if anything like this happened it showed how vulnerable everything was. (Sarah)

Because Sarah carried most of the information for running the farm in her head the family found it difficult to manage and were unsure about what was required. This resulted in a lot of pressure on the family.

> It made me realise that to get two people to milk cows 7 days a week is actually quite an undertaking. When you do it yourself 14 times a week, you don't even think about the fact to get out of bed and milk the cows. But when you are asking people to get up at 4.45 in the morning and who are not used to it and basically you have got to go down there and milk cows. (Sarah)

The workplace

The farm was in an isolated location halfway between two cities. It was 300 hectares of which half was run as a dry stock unit and the other half as a dairy unit. When Sarah and her husband first came to the farm they engaged a share milker and focused on developing the farm. After Sarah's husband died she took over the milking of the cows. She had two employees at the time of the injury. One was due to go on leave and the other was due to finish his employment that day.

At the time of the injury Bruce had been working for Sarah for two years. They had a very good working relationship and enjoyed working together. After the injury Bruce remained on the farm instead of going on his planned two-week holiday. He took over the management of the farm as Sarah was unable to do anything. Initially, the children helped him with the milking and Bruce felt it got too much for them and noticed that they got more and more tired. He also observed that it was difficult to be milking alongside the children as he and Sarah were used to working as a team. Within four weeks of the injury he and Sarah organised another worker to help. Farm production was noticeably down for the period of Sarah's rehabilitation.

Context

In the agriculture, forestry and fishing section of the agriculture industry in the year 2000/2001 there were 4,212 new and 3,009 ongoing work-related entitlement claims. These cost ACC $10,611,000 and $19,441,000 respectively.

For market orientated agriculture and fishery workers in the year 2000/2001 there were 5,779 new and 3,661 ongoing paid work-related entitlement claims. These cost ACC $14,882,000 and $31,031,000 respectively.

There were 782 new and 2,410 ongoing paid entitlement claims in the year 2000/2001 involving a driver or a passenger on the road. These cost ACC $3,454,000 and $33,332,000 respectively.

Amongst women in the 45-49 age group in 2000/2001 there were 1,073 work-related new and ongoing paid entitlement claims, costing ACC $2,093,000.

Sarah		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by other
Individual/Household						
Medical - Acute	Emergency Transport	1,228.50			1,228.50	
	Acute treatment	1,500.00			1,500.00	
	Outpatient visits	450.00			450.00	
	Total	**3,178.50**			**3,178.50**	
Medical - Ongoing	Pain relief	72.00	32.00		40.00	
	waterproof plaster	154.00	40.00		114.00	
	Bandage	15.00	15.00			
	Total	**241.00**	**87.00**		**154.00**	
Long Term Care	Home (paid caregiver)	324.00			324.00	
Transportation	Bus and car to hospital	83.90			83.90	
Personal	Expenditure on easy prepared food	150.00	150.00			
	Additional costs to daughters wedding	100.00	100.00			
	Total	**250.00**	**250.00**			
Domestic	Homehelp Assessment	113.75			113.75	
	Homehelp	3,239.69			3,239.69	
	Total	**3,353.44**			**3,353.44**	
Partner/Dependants Time	Income before injury/illness per week	258.98	258.98			
	Income during recovery period per week	227.22	227.22			
Income	Net income loss (before tax): 1st 3 months	381.12	381.12			
	Net income loss/gain (before tax): 1st year	2,667.84	2,667.84			
	ACC compensation: per week	227.22			227.22	
	ACC compensation: total	**4,544.40**			**4,544.40**	
Company						
Company - Production	Lost production due to post-injury procedures		Lost production costs.			
Company - Staff	Hiring additional staff	2,240.00		2,240.00		
		8,000.00		8,000.00		
	Time	21/2 hours a day		21/2 hours a day		
	Total	**10,240.00**		**10,240.00**		
Company - Equipment	Plant/equipment damage	500.00		500.00		
Community						
OSH	Time	11 hours				11 hrs(OSH)
ACC	cost				Cost	
Total		**22,715.24**	**337.00 + costs**	**10,740.00 + time**	**11,638.24**	**11 hrs(OSH**

Total Costs

Over a period of 1 year (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $337.00 + costs

Company: $10,740.00 + time

ACC: $11,638.24

OSH: 11 hours

Total Cost: $22,715.24 + 11 hours

PAUL

Paul, a man in his mid-forties, suffers from noise-induced hearing loss. In the early 1990s his gradual hearing loss was exacerbated by a battery exploding in his workplace. He trained as a panel beater and owned a successful business until his occupational injury became so acute that he was forced to sell it to his brother-in-law after 27 years in the panel beating business. He now owns a second-hand dealership.

Paul is married with two teenage children. His family was all employed in the vehicle repair business – one brother was a panel beater, the other was a mechanic. Paul's father and many of his parents' friends were also panel beaters. Paul's mother described the effect on his family and friends over the years as gradual and immeasurable.

The sequence of events

Paul began panel beating as an apprentice in 1973 in a large business, which at its height employed 32 panel beaters and painters. It was a situation with a very high noise level in an industry that, at the time, did not have a culture that encouraged the use of personal protective equipment such as earmuffs. Paul became self-employed and eventually ran his own panel business, employing up to 15 staff. He worked hard to make the business viable; as his former co-worker observed, Paul was out on the floor 'day and night' until the company was financially secure.

Although it is likely that some gradual hearing loss was occurring throughout his earlier employment, it was exacerbated when a car battery exploded close to Paul in 1990. At this point, Paul became aware of his hearing difficulties, although OSH was not notified until some years later through the Notifiable Occupational Disease System. Following a series of tests, one specialist noted Paul had previously had exceptional hearing and that 34 was a young age to be suffering from hearing loss:

> … in other cases there has been a period of years to adjust to gradually increasing acoustic damage; but where acoustic trauma occurs suddenly the readjustment is a greater challenge. This is particularly so when the victim is a young man unprepared for the accompaniments of old age. (Specialist)

Paul was diagnosed with bilateral hearing loss. Paul found it difficult to have a conversation, especially if there was background noise; whether on the telephone, in a crowded room or when there was machinery noise present. He also suffered from tinnitus. The OSH Guidelines on NIHL describe tinnitus as having various descriptions:

> …either as a high pitched ringing, hissing or whistling, or a low-pitched rushing or buzzing. Short periods of high-pitched whistling can be experienced before NIHL is established and can be taken as a warning sign of impending hearing damage.[56]

It also had other impacts on his health, including considerable loss of sleep, and a high degree of stress.

Paul began having conflicts with his workmates, largely because of misunderstandings. His relations with co-workers became strained, and there were times they mistook his actions for arrogance or a lack of concern about the business. In reality, Paul was finding it harder to cope at work due to fatigue and increasing job dissatisfaction. Looking back, Paul says that he lost his confidence and the job held no real joy for him anymore. Paul recalled that he quickly became frustrated at being limited to clerical work in his own business.

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[56] Occupational Safety and Health Service: 'Noise Induced Hearing Loss of Occupational Origin: a Guide for Medical Practitioners'. 1st edition April 1994. P. 13.

> Well you are working with your hands, and then all of a sudden you've got a pen in your hand. It was as though you had lost a part of your life. You think you've got it wrong. No bloody good at it, who am I any good to? I am not doing anything. What am I accomplishing? I'd like to see a car come in, she's all bashed up and I do the whole job - paint it, the whole thing and she bowls out the door. And you see, you can take a bit of pride in your work… there's no job satisfaction writing the jobs. So you lose, it's a big part of your life, it's gone. (Paul)

He was also feeling the pressure of having to bring in extra work to pay for the additional staff he employed to replace him on the shop floor. Eventually, the negative impact of the panel beating environment on his hearing, combined with lack of job satisfaction, and other associated problems, resulted in Paul making the decision to sell the business:

> I just got that depressed, I had to take three weeks off. I couldn't do the job properly, things were festering at work, festering at home. The whole thing in the end just blew up. And [I thought] I've got to get out of here, otherwise something drastic is going to happen. (Paul)

He bought a second-hand dealership, a working environment with substantially less background noise, in which it was easier to communicate with customers and staff.

Impact on Paul

Paul still suffered from a constant ringing in both his ears. In addition to this, he sometimes got a piercing scream in his ears, usually twice a month but occasionally twice a day. The tinnitus was a permanent condition, which became worse when he used loud machinery. He was taking sleeping tablets but he still had problems:

> …[last week] I was up from one to half past four. And then you're really tired… then you wake up and you feel absolutely shattered now, you haven't had enough sleep and you feel grumpy. (Paul)

Paul's mother agreed that the constant ringing was difficult for Paul to cope with:

> …it's something I don't think you can explain to anybody. It's something you can't run away from. Well you don't even have half an hour off from it, from what I can understand. You just constantly live with it. Someone with a migraine headache can take something to ease it, but I believe with this Paul can't do anything. (Paul's mother)

Paul still had difficulty hearing if there was background noise. He needed a quiet environment to talk. This had an effect not only on his business, but also his social and family life. The OSH inspector remarked that the social consequences of hearing loss were acute, as people became more isolated as their hearing degenerated. The problem is especially noticeable among large groups of people. Paul agreed, saying that in social situations he tended to miss out on a lot. But he believed that friends and family had adapted to his hearing loss:

> In my circle of friends they make sure they speak clearly. And… they make sure I hear things. If you are in a social thing, I was standing probably against the wall so no-one can stand behind me. (Paul)

Paul's community participation also suffered. He gave up sport refereeing and playing music. His mother did not think Paul will ever take these hobbies up again. Later Paul took up running and swimming to keep fit.

NIHL is an invisible injury, which means it is not readily apparent to others. His mother commented that :

> ...if they could wear a head bandage around their head they would get all the sympathy in the world… it's visible. But because… you can't see anything, I'm afraid it is invisible. (Paul's mother)

Paul remarked that he got some satisfaction in his new workplace as it was 'hands on' but he missed not doing the job he trained for. It also meant adjustments to how he worked. However, Paul was still frustrated that while permanent, his NIHL was preventable:

> …because I know I have got this for the rest of my life and I've got to live with it. That's the… hard bit. (Paul)

Paul believed that a major benefit of what had happened was his increased awareness of noise as a hazard, which had extended into his family life:

> If the kids want to do the lawns or anything like that, don't start up unless you have got earmuffs on. Anything like that I tell people… because I'd hate anyone else to get it. (Paul)

The family

Paul's hearing loss placed a considerable strain on his family. Paul remembered he would growl at his children more, and became irritable and withdrawn. He was aware of the extra burden on his wife when the children misbehaved, or when his hearing loss caused family arguments. In a letter written at the time, he stated that:

> At home my wife and children are constantly repeating themselves, they are frustrated and so am I. Socially we do not attend any functions with any amount of noise as the headaches and ringing are not worth it. Before the accident I rarely suffered from any headaches, now they are a constant reality. I am awake at least three to five hours every night with continual ringing. I take sleeping pills as a last desperate measure. (Paul)

Paul's family moved home to be by sea, because they found the sound of the sea helped him sleep. He was now spending a lot more time outside.

Paul's mother experienced temporary hearing loss after an injury at home. She said this made her appreciate more what her son was going through. She recognised the symptoms in her husband and in many of their friends from the panel-beating business. This experience, together with what she observed in Paul, made his mother determined her grandchildren would not enter the panel beating business:

> If I had known today how it was going to affect panel beaters, there is no way I would let my son take up one of those jobs now. (Paul's mother)

The workplace

Paul and his mother both mentioned a few ex panel beaters with chronic hearing problems. His mother commented:

> Their hearing is absolutely shot. Because in those days there were no earmuffs. There was no control whatsoever. And even if you did in those days, even then they first started to come in, you could tell the panel beaters to wear them. But they didn't always wear them. (Paul's mother)

The inspector also believed tinnitus was common in the industry.

The inspector noted that Paul's former workplace was still operating, although with improved health and safety equipment (such as hearing protection) and increased awareness (for example, they were now monitoring noise levels).

Context

In the motor vehicle retailing and services sector of the retail trade sector in the year 2000/2001 there were 719 new and 779 ongoing work-related entitlement claims. These cost ACC $1,879,000 and $8,007,000 respectively.

Amongst metal and machinery trades workers in the year 2001/2001 there were 1,032 new and 1,650 ongoing paid entitlement claims. These cost ACC $2,746,000 and $17,069,000 respectively.

For male workers 40-to 44-years-old in the year 2000/2001 there were 2,759 new and 2,449 ongoing work-related paid entitlement claims. These cost ACC $7,735,000 and $35,262,000 respectively.

Paul		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	Specialist	331.25	50.00		281.25	
	Doctors assessment for ACC	90.00			90.00	
	Audiologist	225.00			225.00	
	Total	**646.25**	**50.00**		**596.25**	
Medical - Ongoing	General Practitioner	1,200.00	1,200.00			
	Prescriptions	90.00	90.00			
	Equipment	2,574.00			2,574.00	
	Other (specify)	146.25	146.25			
	Total	**4,010.00**	**1,436.00**		**2,574.00**	
Rehabilitation	Retraining/Education	Ongoing cost	Ongoing cost			
Transportation	Private Vehicle	Cost	Cost			
Claimant Administrative	Review Costs	Cost			Cost	
Domestic	Ear muffs for home use	30.00	30.00			
Financial Benefits	Payments (e.g., awarded fine)	6,190.00			6,190.00	
Company						
Company - Production	Lost production @ time of injury	Cost		Cost		
	Lost production due to decreased morale	Cost		Cost		
	Lost production due to post-injury procedures	Cost		Cost		
	Lost productivity (other staff)	Cost		Cost		
Company - Staff	Sick Leave	Cost		Cost		
	Hiring additional staff	60,000 / year		60,000 / year		
	Retraining	Cost		Cost		
Community						
OSH	Time	Two hours				OSH 2 hours
ACC	Time	Cost			Cost	
	Review Costs	Cost			Cost	
	Projected Future Costs				(19,579.00)	
Community Costs	Loss of leisure opportunities	Cost	Cost			
	Sports involvement	Cost	Cost			Community
Total		**70,876.25 total OSH time: 2 hours**	**1,516.00**	**60,000.00**	**9,360.25**	**2 hours**

Total Costs

Over a period of 10 years (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $1,516.00

Company: $60,000.00

ACC: $9,360.25 (plus projected future costs of $19,579.00)

OSH: 2 hours

Total: $70,876.25 + 2 hours

IAN

Ian was an employee of a large heavy industry manufacturer where he worked over a period of 28 years. He was a fitter and turner by trade and he worked in this capacity during his first period of employment with the mill, then came back after a period of time away to work in maintenance. He had been involved in the military and served in both Northern Ireland and Vietnam. Following Ian's injury, in which he sustained severe crushing injuries, Ian spent a month in the intensive care unit before dying of complications from his injuries.

Jenny was Ian's wife of nearly thirty years. Craig, the eldest, was 25 at the time of the injury. He was flatting but spent a lot of time at home. Tony was 22, and living at home. He suffered from epilepsy. Luke was 16, and the youngest son, Daniel was 14. Both were living at home.

The sequence of events

On the day of the injury Ian was working an afternoon shift. That morning he had been cleared of prostate cancer by his doctor and he and his wife were planning a weekend away to celebrate.

Over the previous days Ian had overheard his fellow employees discussing a problem with the plant. The shift engineer had noted a lack of air pressure in the plant, which had occurred on other occasions and was still causing problems. Ian had been determined to fix the problem even though it was not in his work area and used his own initiative and previous experience to work out a solution over a period of days. When he arrived at work that day he went into the area to fix it.

Before entry into the area, a register had to be signed and there was a requirement to report to the operator at the far end of the plant. However, there was no system to stop the operation upon entry into the area nor was there a system to warn the operator working in that area of the plant. The controls for lockout in this area of the plant were non-existent and Ian was able to gain entry without the knowledge of the operators.

It was unclear exactly what happened at the time as the only witness to the injury was Ian and he could not be interviewed about the injury. However, it was ascertained that he entered the area to fix the problem, was crushed by heavy machinery, and then managed to crawl back up to the top of the stairs where he was found by an electrician who came to fix a problem in the area. How long he was there before being found is unknown. Ian sustained massive internal injuries and died one month later in hospital of complications from his injuries.

Medical treatment

Ian was in ICU for one month, receiving treatment for his injuries, which included a crushed pelvis and a lacerated liver and kidney, before he died of multiple organ failure. Throughout his time in intensive care he was in immense pain. During this time he also experienced night psychosis, causing him to experience flashbacks of his service in Vietnam.

After two weeks Ian's condition appeared to stabilise and he began to show signs of improvement. He was taken out of his medically-induced coma, and was able to have short conversations. However, his condition worsened:

> Even then the doctors thought he would survive, everybody thought he would survive. And it was the smallest thing that killed him off. He had a cyst in his back... they were treating it, but they didn't realise how bad it was. It was growing in the arteries... The hospital was good, they allowed us to be there when he died and they did everything to save him and they were very discrete. Because, he, I mean he just bled and bled and bled. And we saw the covers when he died, the covers got more bloodied... [Being there when he died] gave us closure... But overall if Ian had died in the first week it would have actually been easier. (Jenny)

Family

Jenny and Ian had been married for nearly thirty years at the time of the injury and Jenny found his loss almost overwhelming:

> There was never a point to say goodbye to a marriage, and that of all things of the whole lot I feel I have lost. I have lost my marriage. (Jenny)

> I always feel I walk in the shade, I no longer walk in the sun. You live, you survive, but the joy's gone. (Jenny)

Ian's death was, for Jenny, the loss of thirty years of companionship, and having her husband there to talk to:

> [I miss] the conversation and all the kisses and cuddles... It is companionship... your life entirely changes because you don't, you can't do things together. (Jenny)

The company initially laid the blame for the injury on Ian, and it was not until the trial, a year later, that Jenny discovered he was not at fault. Up until that time she had been blaming him for his death. This made it harder for her to come to terms with the injury:

> You love somebody that much and they did it to themselves. And it's horrible, and how dare they do it to themselves. (Jenny)

Ian's sons' struggled without their father. They all felt very angry towards the company for a long period. Jenny described Ian as the boys' friend as well as their father. They developed a range of problems after his death, including depression and substance abuse. Tony's epilepsy became worse, exacerbated by grief and stress. Craig began to drink heavily and use drugs. Luke became suicidal and eventually moved to Australia. Jenny spoke of the impact on her sons:

> [After Ian's death] my son came back [to live with me], the oldest son. Back on the booze and drugs. Drink and driving. So I had problems with him. Tony, he was epileptic. He was having seizures left, right and centre. I had to get him put into a hospital …because it was quite bad because of the stress, the fits were from the stress. It takes months to get him an appointment to get his drugs changed. And my other son, the year before he was fifteen, form five, suicidal. [Ian and I] had spent the whole year with him…keeping him alive…He was suicidal, we got him right…He was actually a lot better, but he went back to being suicidal [after Ian died]. (Jenny)

Daniel, the youngest son, was also hugely affected by his father's death, having to take two months off school after the injury. At the time of the interview, three years after Ian's death, he spoke about the loneliness associated with loosing his father unexpectedly:

> [I miss] just like talking to him, yeah, 'cause he was the one I could always go to. And yeah, we were just becoming friends. (Daniel)

Ian's death resulted in a total change of lifestyle for Jenny. Theirs had been a traditional marriage with Ian providing for the family. She now had to assume responsibility for a number of things he had always taken care of. Jenny now had to plan for a very different future from the one and Ian had planned for:

> And she's had to be [strong] because now you see her whole life has completely changed, I mean, as we say I mean Ian would have been retired this year. I mean she's still a fairly, she's still a fairly young woman. She had a lot more to go before her and a lot of the ideas and the things she wanted to do, they are never going to materialise now. (Company OHN)

The stress led to health problems and also resulted Jenny taking up smoking again.

One of Ian's brothers had also worked at the company and was a union delegate there. He had lived with Ian and Jenny, but there had been a falling out and he had moved away. Contact was renewed following Ian's injury. Ian's brother advised Jenny on the OSH report, which she could not understand. Ian's other brother came over from the States. He was very like Ian, and he and Daniel

formed a very close relationship after Ian's death. Both Daniel and his uncle found their relationship with each other helped in recovering from Ian's death.

Jenny and her sons received compensation but there were considerable delays, complications and obstacles in them doing so. They received this compensation initially as three lump sums, and then in ongoing weekly payments, which they found difficult to budget. When Luke received his lump sum, he was just 15 years old and still grieving for his father. Jenny recalled that he spent all of it in a short time, much of it going on alcohol.

The workplace

The company was one of a number of subsidiaries. There was a heavy emphasis on production, and the nature of the industry presented a number of risks. The company's occupational health nurse noted that:

> [There] were times when I think production over rode a lot of things. I think the general consensus was most people at some stages used to feel unsafe about doing certain things. (Company OHN)

The company OHN was very supportive to Jenny during Ian's hospital stay and after his death, providing her with information and support. The OHN was very angry with the unit manager when she heard that he had stated to Jenny on the night of Ian's admission that the injury was all Ian's fault. She felt irreparable damage was done in relation to the relationship with Jenny and the company after this statement.

She visited the hospital every day and was there when Ian died. Like Jenny she never really believed that he would die and was even having thoughts about how she would help him with his rehabilitation back to work. His death had a considerable impact on her personally.

The company pleaded guilty to breaches of the HSE Act. They were fined $35,000 and $25,000 of this went to Jenny. As a result of the injury, the company employed a dedicated compliance team to cover health and safety. They also developed a good working relationship with OSH, commenting that:

> But what we've got is a relationship where we've both got exactly the same intent, and that is to make the workplace... safer. (Site manager)

There were substantial financial costs to the company, as well as costs to worker morale, and of bad publicity. The intangible cost to the company of being found to be responsible for the death of one of its employees was huge:

> He had gone through Northern Ireland... He had gone through Vietnam. And we bloody killed him. (Company OHN)

Context

In the basic material wholesaling sector of the wholesaling industry in 2000/2001 there was one new and four ongoing paid entitlement claims for fatalities. These cost ACC $1,821,000 and $8,507,000 respectively. Amongst metal and machinery workers (trades workers) in 2000/2001 there were two new and twenty-five ongoing paid entitlement claims for fatalities, costing ACC $34,000 and $448,000 respectively.

ACC data indicates that for 2000/01 and 2001/02, there were 73 and 92 work-related fatalities, respectively. For information on fatality statistics and the caveats associated with the data, please refer to the 'Context Statement'.

Ian		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other (specify)
Individual/Household						
Medical – Acute	Emergency Transport	450.00			450.00	
	ICU for 30 days	60,000.00			60,000.00	
	Two surgical procedures	3,600.00			3,600.00	
	Total	**64,050.00**			**64,050.00**	
Fatality	Funeral expenses	3,611.05		3,611.05		
	Company Retirement Plan	45,791.00		45,791.00		
	Survivors Grant	8,862.08			8,862.08	
	Total	**58,264.13**		**49,402.05**	**8,862.08**	
Income	Income before injury/illness per week	1,417.29	1,417.29			
	Income during recovery period per week.	1,133.83	1,133.83			
	Net income loss (before tax): 1st 3 months	3,401.50	3,401.50			
	Net income loss (before tax): 1st year	14,740.05	14,740.05			
Company						
Company - Production	Lost production due to decreased morale	Cost		Cost		
Company - Staff	Hiring of compliance manager and compliance team	Cost		Cost		
	Implementation of H&S site programme	Cost		Cost		
Company - Administrative	HSE Fine	35,000.00		35,000.00		
Community						
OSH	Investigation	50 hrs 30				50 hrs 30 (OSH)
	Legal Fees for Time/DOL	1,267.50				1,267, 50 (OSH)
ACC	Projected Future Costs				(32,097.00)	
Total		**183,581.63**	Cost	**109,402.05 [1]**	**72,912.08**	**1,267.50+ 50hrs 30**
	Footnotes [1] Company hiring 7 staff, implementation of H&S site programme					

Total Costs

Over a period of 3 years (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: Cost to family (undocumented)

Company: $109,402.05 + cost

ACC: $72,912.08 (plus projected future costs of $32,097.00)

OSH: $1267.50 + 50 hours 30

Total: $183,581.63 + cost + 50 hours 30

LISA

Lisa is a 34-year-old New Zealand Maori woman who was employed as payments officer in a large multinational insurance company. While employed there she developed an occupational overuse syndrome condition (OOS condition). The clinical diagnosis was Medial Epicondylitis.

The sequence of events

Lisa began working for the insurance company three years earlier in a large city. She was primarily employed as a payments officer. This entailed investigations as well as data entry of cash and cheques that came into the company and that needed to be applied to an insurance policy. She was also studying part time.

Lisa developed pain when working in about the month of September. It started as stiffness and sensitivity in her elbows. She received some massage treatment for her arms and this provided some relief, but did not totally relieve the 'niggling' discomfort. The discomfort became constant about a month later, a time at which she was doing a lot of data entry, working on a specific project that was not her usual work. In this work, she was putting information into a spreadsheet resulting in about 80 percent of her day involving keyboarding activity. The discomfort became worse over the October and she went to the doctor in November. By this time the pain had become progressively worse and extended to her fingers, wrist, and forearms, as well as the elbow and the whole arm:

> It was pains in fingers, in the wrist and in the forearms. It was getting a lot tighter. It was no longer just [the elbow], it was more the whole arm right through the fingers. (Lisa)

She reported her condition to her manager. The employer then contracted a health and safety advisor from the Employers and Manufacturers Association to assess her work, work station and work habits. The manager also responded by reducing the amount of data entry work Lisa was to do and reshuffled it amongst the other members of her team. Lisa was allowed to self-monitor – to identify when she was feeling pressure and reduce her data processing.

Lisa's ACC claim was initially declined, because the diagnosis (which was later confirmed by a second doctor) did not fit ACC's criteria for a gradual process injury under ACC legislation. Specialist medical advice provided to ACC considered that keyboard activity alone did not cause or contribute to her injury. Although the work was repetitive, this diagnosis usually stipulates that some force would also need to be involved and this was absent in Lisa's work. Both the doctors who saw Lisa accepted that her work contributed to her condition.

Lisa consulted a lawyer and took the case to review. Having to undertake the process was time consuming and unsettling:

> When the claim was declined and I decided to go [to review] it was really stressing. I wasn't sure whether or not my claim would come through and it was the expense of getting a lawyer and all the... just trying to get together all the information that would be helpful to my case. And not understanding why my claim was declined... (Lisa)

Bringing the review also had the potential to be expensive for Lisa if, for instance, she elected to represented by a lawyer and did not recover any costs. However, the review was successful, the original decision was overturned and her claim covered by ACC. ACC were able to pay costs for the review, including part of Lisa's legal fees.

Medical treatment

Lisa began massage therapy on her own initiative in the early stages of the condition. She saw a doctor two months later. The doctor initiated an ACC claim in November for the diagnosis of

Medial Epicondylitis and advised her of the delay in having the claim actually accepted by ACC and the process for acceptance of OOS conditions as ACC claims. This meant she had to pay the cost of physiotherapy as well as her massage costs for up to two months. No medication was prescribed. Lisa continued with the massage therapy herself. She did not take any time off work. She also saw a second doctor who immediately recommended physiotherapy.

Impact on Lisa

The main impact for Lisa was the effect of the pain. She chose not to let this interfere with her day-to-day life, her studies or social activities. She felt well supported in her workplace and did not take time off or sacrifice any of her usual activities as a result of her discomfort. She was still able to continue with most light physical activity and usual activities. She was able to cook and clean, but some actions such as lifting an item like a heavy pot caused strain.

ACC taking a long time to accept her claim impacted on her finances as she had to repay the physiotherapy costs and be in a position to be able to pay her legal costs.

Proving that her condition was work related and finding the requisite evidence for it was a concern. Lisa felt confused but accepted that the burden of proof was on her and she was confident she could provide evidence. Both doctors agreed that her work would have contributed to her condition. She found the ACC procedure confusing as she had to deal with different people and all her letters from ACC came from and went to Dunedin. The reasons for this were not apparent to Lisa.

This episode of OOS caused additional concern due to the career decision she had made to pursue a future in the IT industry. She was worried that this was threatened by her OOS condition.

Lisa also had to come to terms with her condition and accept that it would be ongoing. She was putting in a lot of effort at work to do her exercises, take her breaks (as prompted by the software programme) to make sure the problem did not recur:

> I'm trying to get this in a manageable state because I know that it's not going to clear up in a few months. It's going to take longer... The problem was that [I thought] ok, I'm healed, and I stopped doing all of that. I slowed down and I didn't realise that that was the worst thing to do. So I've had to kind of come back again and start doing that... (Lisa)

The workplace

Lisa was given a 'health and safety' handout as part of her employment package with pictures of exercises to do and how to set up her workstation and things to keep in mind. These included seating advice and the correct angle of hands when keyboarding. There was also a software programme installed that introduced micro pauses, breaks and prompted exercises. But staff could switch off this programme.

Lisa's OOS condition caused both concern and uncertainty for her manager. Her employer paid for her workplace assessment and the second medical opinion. Her manager arranged for the purchase of a new mouse and a new keyboard. The manager felt limited by inadequate funding and relevant information on the risks associated with the work.

The manager had not been given any occupational safety and health training until after this problem developed and she was unhappy that she was not adequately trained earlier. She subsequently undertook training. In fact, the health and safety representative in Lisa's team taught the manager how to fill in the forms. This representative was very experienced and very active in her role. She identified that this employer was supposed to monitor for early signs of discomfort and fatigue, but they did not. Lisa's colleague claimed that they all had some signs of discomfort.

Lisa's manager was very helpful:

> My manager has been really good in supporting me. She was part of my review…gave supporting evidence for me. (Lisa)

The manager took this situation seriously and found it very hard emotionally. She felt out of her depth with the legal paperwork and knowing how to manage OOS. She commented that her and Lisa's involvement meant a considerable loss of productivity in a division where productivity was closely monitored.

Lisa praised her colleagues as well, as they took on extra work and were supportive of the changes the manager had introduced in the workplace as this meant the workload did not actually increase for them.

After this incident, this workplace had clear procedures for identifying and managing OOS, although the manager reflected:

> Well the problem with Lisa's issue is that we did all the things after the horse had bolted... It was very reactive on our part. So I think what the team has seen is reactiveness rather than preventative measures. (Lisa's manager)

Context

In the services to finance and insurance sector of the finance and insurance industry in the year 2000/2001 there were 76 new and 68 ongoing paid work-related entitlement claims. These cost ACC $119,000 and $1,206,000 respectively.

For other associate professionals (technicians and associate professionals) in the year 2000/2001 there were 782 new and 518 ongoing paid work related entitlement claims. These cost ACC $1,491,000 and $6,710,000 respectively.

Amongst women aged 30-34 in the year 2000/2001 there were 793 new and ongoing paid work-related claims, costing ACC $1,211,000.

Lisa		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	General Practitioner	288.00	288.00			
Medical - Ongoing	Physio/Occ. Therapist/Chiropractor/Osteo etc	1,372.00	579.00		793.00	
	Alternative Practitioner	1,750.00	1,750.00			
	Equipment	1,125.00	1,125.00			
	Total	**4,247.00**	**3,454.00**		**793.00**	
Claimant Administrative	Review Costs	288.00			288.00	
Income	**Total**	No change				
Company						
Company - Staff	Lost time (wages)	3,240.00		3,240.00		
	Other (specify)	665.00		665.00		
	Total	**3,905.00**		**3,905.00**		
Community						
ACC	Time	cost			cost	
	Review Costs	cost			cost	
	Projected Future Costs				(8,042.00)	
Total		**8,728.00**	**4,030.00**	**3,905.00**	**1,081.00**	

Total Costs

Over a period of 1 year (rounded to maintain anonymity).

These include documented costs only. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $3,742.00

Company: $3,905.00

ACC: $1,081.00 + costs (plus projected future costs of $8,042.00)

Total: $8,728.00 + costs

THOMAS

Thomas is a Cook Islands Maori in his late twenties and was working as a contract worker at a large saw mill. He and his partner Karen have four small children, all under six at the time of the injury. In 1998, a skill-saw Thomas was using kicked back, amputating three fingers and partially severing the fourth. One of the amputated fingers was subsequently reattached. In addition to the permanent loss of two fingers, the remaining two have severe scarring and limited function.

The sequence of events

Thomas was employed as a contract worker in a large timber mill. His normal role involved working through stacks of timber, taking out the fillets that separated them and then re-stacking the timber ready for shipment. Workloads at the plant varied as the timber had to be processed first before this task could begin. On these occasions defilleting staff were expected to find other tasks to do until new work was available. Usually this was just a clean-up of the work area, such as sweeping floors.

On the morning of the injury, Thomas and other defilleters had been told by their supervisor that they had to find more to do in the down-time between defilleting jobs. Thomas decided to use this time to cut cardboard 'corners', used in packaging export timber. The corners were made by splitting a thick cardboard tube vertically, and then cutting the resulting half-round into sections. These were then used on the corners of packs of timber to stop the band used to hold the pack together from cutting into the wood. Although the company had not officially approved the process, it was common practice. To cut the cardboard rolls Thomas used a hand-held skill-saw. He placed the cardboard tube between two small stacks of timber to hold it steady. Holding the saw in his right hand, he had cut halfway down the tube when it began to turn. He placed his left hand behind the saw (on the section that had already been cut) to steady the roll. The saw jammed and kicked back severing the first two fingers and the little finger and partially severing the ring finger. He was initially unaware of exactly what had happened:

> I knew something had happened. I didn't know what had happened at the time, sort of had the saw in my hand, put the saw down and my mate was ... beside me when it happened and so he sort of [said] 'shit, shit, shit'... He saw it before I did, I knew something wasn't right, I saw [the saw] kick back or jam or make a funny noise and I knew it had come back. (Thomas)

Thomas and his colleague started to go to the site office to get an ambulance. Only getting halfway there they decided it was best to wait. With help from his colleague Thomas held his hand over his head to slow the bleeding. Other colleagues collected the severed fingers. Another colleague applied a tourniquet to staunch the bleeding and they waited for the ambulance to arrive.

Medical treatment

The ambulance took Thomas to the local medical centre for initial treatment. After assessing his condition and giving him morphine they sent Thomas to the nearest town hospital. The doctors there then assessed Thomas' fingers to see what could be saved. Describing the process he said:

> ...but a doctor came along starting prodding around with a needle, into the fingers, into the raw nerves, trying to find if the nerves were viable and that was when the pain really, excruciating, just, I was teary eyed and just ready to punch the doctors and like pain. (Thomas)

The doctors found two nerves and decided that it would be possible to save two fingers. Not having the facilities to perform such delicate surgery, they prepared to send him to the nearest large hospital. Later that day he was flown there by Cessna. His wife was not able to arrive before he left.

He was there six days. His mother-in-law minded their children while his wife came to be with him. Further medical treatment consisted of physiotherapy every second day during the first month of recovery, then every week, and finally every fortnight. As the injuries healed one finger rotated crossing over the middle finger. This prompted a second operation to straighten the finger. This had some success but it was limited as poor communication between hospitals resulted in a delay in commencing physiotherapy.

Impact on Thomas

Thomas was off work for three months while his injuries healed sufficiently to allow him to return on light duties. Physically, he had extremely limited hand function. For the first two months he could not wash half his body or do many normal everyday personal care activities. Household chores became impossible because of his wounds and stitches. These included simple things such as washing dishes and bathing his children. His hand could not get wet nor, because of the pain of the injury, be bumped. A lot more of the household chores were left up to his partner.

Day to day hobbies and social life were changed by Thomas' injury. Prior to having children Thomas had been a keen rugby player and he had planned to make a return to the football field. This was no longer possible. He also had to give up playing the guitar.

Although his hand had improved, Thomas still experienced problems at the time of the interview, more than two years after the injury. Function in his remaining fingers was very limited and he was at times self-conscious about the appearance of his hand:

> Still sometimes in public, umm, I might be paying money or collecting money and then people stare... Sometimes I do wear gloves or keep my hands in my pockets just so, the fact that people don't see, they can't know it's missing or that sort of thing. (Thomas)

Although he had some concerns about his future, in particular his employment prospects with an injured hand, he remained positive:

> ... they put two [fingers] back so there's no using crying about missing two, you know? I'm lucky to have two, I sort of made a goal of going ahead, moving forward. (Thomas)

Family

Not being able to work led to financial pressure on the family unit. Initial confusion between the company and ACC resulted in Thomas receiving $100 compensation a week. Even when this was corrected, weekly compensation is set in legislation at 80 percent of his pre-injury earnings, and the family struggled to meet their financial commitments on this amount:

> ...the bills were getting penalty rates on top of penalty rates. (Thomas)

Other activities that he used to supplement his income with, such as bartering and shearing, were no longer possible. He had to sell his shearing gear. This loss of income affected all facets of family life. Even celebrating his children's birthdays during this time was a struggle:

> ...they had no money for their twins' first birthday. Thomas was so upset because [he saw] himself as the provider and was very, very adamant that it was his job to provide for Karen and the girls. And he just, he couldn't cope with the fact that he couldn't give his girls a birthday, he couldn't, they couldn't go and buy a cake. (OSH Inspector)

These financial and emotional pressures mounted, straining the relationship with both his wife and children. The stress and frustration of the time built until Karen threatened to leave. Thomas, who was away at the nearest major hospital at the time having a second operation on his hand, returned early to deal with the situation:

> I just sensed something wasn't quite right with Karen and just talking over the phones and stuff, and she herself will tell you that she was just willing to umm get up and leave sort of thing. Cause I'm not sure if it

> [was all the] stress or frustration or just a number of things. … Yeah, come back and we just sort of had a heart to heart and a good talk and about the problems were and what the issues were and yeah. (Thomas)

Karen felt under extreme pressure. She remarked:

> But yeah it was a real struggle. It was a very trying time… I wanted to sort of pack up the kids and run away. I didn't want to deal with it… I was trying to um, yeah run away, so to speak from the whole situation, but yeah, it was a very trying time for us. We came through it, we've been together for eight years and we've actually got five children, we lost one, so yeah. I think we've come through that we're sort of weathered the storm. But yeah it was very depressing. (Karen)

She believed the company had not treated them fairly. There was, in her opinion, insufficient follow-up or contact with them after the injury. Overall she had concerns for Thomas' continued employment there. They both felt victimised by the company.

The workplace

The emotional effects of the injury were not merely confined to Thomas but also impacted on his colleagues and managers. The sight of severed fingers shocked and horrified the workforce. The health and safety officer at the plant observed how visible the injury was:

> Because it was the way it happened it was quite dramatic or whatever you look for. There was three fingers went flying all round the shed sort of thing. Like one guy was standing there watching, saw it happen, another guy had his back to him and was reaching up to get a bottle or drink on the shelf or something and a finger came flying over and plop on the floor in front of him sort of thing.

Thomas' supervisor noticed that morale was affected throughout the workplace. This affected those in the site office as much as those on the shopfloor. When OSH decided to prosecute and the case went to court, a further wave of apprehension went through the company. A meeting was called to discuss with the workers to allay their fears and encourage them to co-operate. After an investigation by OSH, the company were prosecuted for a breach in the Health and Safety in Employment Act. They were convicted and fined $8000. The fine was paid to Thomas.

For their part, the company felt dubious about the charges and the resulting conviction. They felt Thomas should not have been using a piece of equipment he had not been trained on or instructed to use. The health and safety officer commented,

> But OSH had four or five charges, and some charges were put in, in case the other ones missed, things like that. And there must have been four but we got off on three. We were found guilty on one and it was, it was things like no training, no supervision under different parts of the Act. And yeah so we got off, we got found guilty on one, one charge which we thought was totally unfair. (Health and safety officer)

The incident cost the company financially. During his rehabilitation period they supported Thomas with an interest free loan. Once he was recovered enough to resume some duties, they created a new position at the plant. At the same time wider questions over company systems arose from the prosecution pursued by OSH. New health and safety systems were instituted and internal reports were done on the injury. The company estimated the injury cost them between $80,000 and $90,000. The workplace felt that they were working hard to improve and maintain health and safety. As well as having new systems, they enforced them rigorously. When necessary they had disciplined workers over health and safety systems. They commented that while an injury may induce temporary change, often learning is forgotten and complacency results.

Context

In the forestry and logging sector of the agriculture, forestry and fishing industry in the year 2000/2001 there were 486 new and 502 ongoing work-related entitlement claims. These cost ACC $1,488,000 and $5,797,000 respectively.

Amongst men aged 25 to 29 in the year 2000/2001 there were 2,082 new and ongoing paid entitlement claims costing ACC $5,148,000.

Thomas		Total	Met by Individual/ Household	Met by Company	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	Emergency Transport - Ambulance	450.00			450.00	
	Emergency Transport - Air Ambulance	2,842.00			2,842.00	
	Hospitalisation	7,730.00			7,730.00	
	Total	**11,022.00**			**11,022.00**	
Medical - Ongoing	Hospitalisation	1,500.00			1,500.00	
	Specialist	4,829.00			4,829.00	
	Physio	1,670.63			1,670.63	
	Equipment	108.00			108.00	
	Independence allowance assessment	337.50			337.50	
	Additional Physio	1,100.00	380.00		720.00	
	Total	**9,545.13**	**380.00**		**9,165.13**	
Transportation	Air Travel	600.00			600.00	
	Private Vehicle	1,296.64			1,296.64	
	Airfares for partner	Cost [2]				
	Total	**1,896.64 + cost**			**1,896.64 + cost**	
Income	Net income loss/gain (before tax): 1st year		6,484.94			
	Non-earnings related loss (e.g., bartering)		Ongoing Cost [3]			
	ACC compensation (total)	6,180.47			6,180.47	
	ACC independence allowance (per week)				19.09	
	Loan from Company	2,000.00				
Company	Company estimation of cost of injury	90,000.00		90,000.00		
Company - Production	Lost production @ time of injury			Cost		
Company - Staff	Cost of over-employment	Cost [4]		Cost [4]		
	Equipment - pull on boots for worker	Cost		Cost		
Company - Administrative	HSE Fine (included in company estimation of costs)	(8,000.00)		(8,000.00)		
Community						
OSH	Time	4,720.00 (236.00 hours)				4,720.00
	Legal Fees	20,471.25				20,471.25
	Total	**25,191.25**				**25,191.25**
ACC	Projected Future Costs				(25,748.00)	
Total		**143,835.49 + time + cost**	**380.00**	**90,000 .00**	**28,264.24 + time + cost**	**25,191.25**
	Footnotes [1] Estimate [2] No exact cost [3] Loss of bartered labour for meat & firewood [4] Created a job for the injured					

Total Costs

Over a period of 2 years (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $380.00 + undocumented costs

Company: $90,000.00

ACC: $28,264.24 (plus projected future costs of $25,748.00)

OSH: $25,191.25

Total: $143,835.49 + costs + time

MARTIN

Martin is a meat worker in his mid-fifties who contracted leptospirosis from a pig chain. After three days of feeling ill, he was admitted to hospital with septic shock and renal failure. He had been an employee of the meatworks for almost thirty years.

Martin's wife Helen worked part time and took over most of Martin's jobs around their lifestyle block when he became sick. They have two adult children who did not live at home.

The sequence of events

Working on the pig chain entailed the removal of various organs from the pig, including the liver, heart, lungs and kidneys. It is likely that Martin contracted leptospirosis by being splashed with urine from the carcass during this process. It may have entered through, for example, a small cut in his hand. Although workers were issued with safety gloves and face masks, for some jobs Martin said fingernails were needed.

Martin described the day he began to feel ill:

> One [lunch time], I felt I had absolutely had it. And I went and had a couple of drinks of water and someone says 'have you been on the grog last night or something?' I said 'no, I'm dry you know' … and [at lunchtime] I knocked off, usually I'd have seen the day out. I was shaking. It's quite funny actually on the drive home my hands started shaking … (Martin)

There was no improvement, and that night he felt completely drained of energy. On his GP's recommendation, Helen took him to hospital, where he was put through a series of tests. He was sent home that night after being told to keep drinking water, but his condition became progressively worse:

> … that night he said that he wasn't hot and cold, [but] he had a funny sort of body heat. When you touched him it's not like your temperature is really hot, it [was] clammy. It was really weird to touch his skin, it didn't feel like normal skin. It had a funny cold sweat feel, it was horrible. (Helen)

Martin vomited for the following two nights. His wife took him back to hospital where he was immediately admitted to the ICU.

Medical treatment

Martin was given almost eight litres of fluid to reverse his severe dehydration. He spent four days in the intensive care unit until his condition stabilised, and then a further eight days in a general ward. At one point, there were indications his kidneys would permanently fail. Helen found the hospital experience quite daunting:

> … he was in intensive care, they had no idea what was wrong and what was going on. The heart monitors were going absolutely crazy. At one stage [when] we were in there … they made us leave … (Helen)

Martin was not given antibiotics until he was admitted to intensive care. This meant the leptospirosis had a chance to become quite established in his system, which made his illness more acute.

During this time Martin lost a lot of weight (his wife estimated he lost about twelve kilograms in this time). He did not eat solids for over a week; the only food he could keep down was milk. Once he was discharged from hospital, Martin spent two weeks at home completely resting, and keeping warm.

Martin found holistic treatments were beneficial. He went to an alternative practitioner and as a result he felt a lot more positive about his recovery. However, the lack of available information on

leptospirosis was frustrating so Martin resorted to searches on the internet to become informed about his condition.

Impact on Martin

Martin suffered from ongoing fatigue and had not recovered his energy levels. This meant staying on their lifestyle block was no longer an option. Martin commented that he could no longer cope with the amount of work required to maintain the property:

> It's never come right… I'm still convinced I am nowhere near as strong as I was before… I wouldn't even try and do some of the things [that I used to]. [I] definitely lost a lot out of it. (Martin)

The couple sold the block, and moved into town.

Martin was still sensitive to cold temperatures and remarked that his kidneys had suffered permanent damage. The OSH hygienist agreed. He commented that while leptospirosis should follow the normal progression of a disease by activating antibodies and making people resistant after one exposure, some people believed it was a chronic, ongoing illness.

Returning to work had been difficult. Martin had trouble getting clearance from his doctor, and the light duties he was assigned (working in the chiller) were inappropriate, as leptospirosis made cold temperatures very painful. Martin described the effects:

> I came home at night or even at dinnertime just in pain you know? Aching all over. (Martin)

Martin reflected that his personality had changed. He believed he was more prone to bad moods and his tiredness had meant a lack of patience when dealing with others, such as the staff of ACC:

> …it's just so frustrating especially… when you are not a hundred percent… basically everything was an effort… and then you get there and they turn round and say you haven't got a signature. You know what you feel like telling them, and you can't… (Martin)

Helen also noticed that Martin became tired a lot more quickly, and had less energy. However, one change she saw as positive was that Martin was more inclined to speak his mind about what was bothering him, instead of 'keeping it bottled up inside'. She thought that although he had been given the option of working somewhere else, Martin was generally happy at his job so he had chosen to return there after his illness.

Family

Helen found the experience quite traumatic, especially in the early stages when Martin was in ICU and a diagnosis had not yet been given. She remembered:

… lines and tubes and oh bloody hell, I was a mess … it was absolutely unreal. (Helen)

Fortunately, their daughter was a nurse and was able to provide explanations of what was happening, which both Helen and Martin found very helpful.

While Martin was recovering Helen had to take on additional work on the lifestyle block. She felt that there some positive results of selling up and moving closer to the city. They had more time to spend together:

> We've both got more spare time... we do more together since we've been here. (Helen)

The workplace

Martin's supervisor believed his staff felt some degree of indifference towards leptospirosis. He believed this could have been because many of them had already been exposed during the course of their work, or that the workers believed they were immune. He believed that while he was not totally responsible for the health and safety of his staff, it was a necessary task:

> It's just up to them to do it. I can't be going round wiping their bums for them. … [but] if it's got to be done, it's got to be done. (Martin's supervisor)

The OSH hygienist believed that many leptospirosis cases were not reported to OSH. He remarked that, for example, approximately ten percent of sheep have the infection, which meant a lot of animals going through the meatworks potentially were infected with leptospirosis. Martin agreed. In his opinion:

> ...there wouldn't be many in the pig house who haven't had it at some stage. (Martin)

Martin believed that the best strategy was to vaccinate the herds before they reached the meatworks, and for companies to refuse infected or unvaccinated stock:

> The only way they are going to do something is like with brucellosis in cattle is to get them vaccinated so they can't send them to the works like that. I mean it doesn't affect anything so they are not going to worry. … it doesn't affect the pig in any way. It's only a carrier of it, the farmer says there's no money [in vaccinating]. But that makes it hard. (Martin)

At the time of Martin's exposure, his workplace had tried various visors without success, and had an ongoing education programme. They used antiseptic wash creams and workers were instructed to cover all cuts and abrasions. The OSH hygienist believed the company was 'above average' when it came to protecting their workers.

Proving the link to work activity is difficult and time consuming. There are currently approximately eight different strains of leptospirosis in New Zealand, common to different animals. Two blood samples are required, at least three weeks apart. The test may take up to four weeks before specific antibodies have formed. This means that later tests may give more definite results.[57]

The workplace personnel officer was frustrated that that a newly diagnosed case of leptospirosis had a temporary positive impact on the workers' health and safety behaviour, before they fell back into old habits:

> All of the employees before they go into the pig house are warned about leptospirosis along with other things … when someone gets leptospirosis … it's like a wake-up call, you know? Give it six months after the event and I'll go into the pig house and I'll find somebody not wearing [personal protective equipment]. And so … I have to be the big bad ogre and … go through the process to get them to wear it. (Personnel officer)

Martin believed that preventing leptospirosis by vaccination was preferable to trying to solve the ongoing difficulties workers had with their personal protective equipment:

> They had some [face masks] but the trouble was, they're alright in the summer but in the winter time when it gets cold and all the steam … they just … fog up on you. They have never found a decent one yet … (Martin)

Following Martin's exposure, the workplace again made changes to the pig killing process. Goggles were issued for high risk areas and an alcohol hand wash was introduced. The company sent letters to breeders to confirm they vaccinated their sows. However, the OSH hygienist noted there had been no increase in the number of vaccinated pigs.

Context

In a study covering the period 1990-1998, of 1041 cases of leptospirosis 29.6 percent of these were involved with meat processing. Meat processing workers are injured at a rate of 165 cases annually per 100,000 workers.[58]

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[57] OSH (2001). 'Guidelines for the Control of Occupationally Acquired Leptospirosis', Wellington: Department of Labour. , pp. 12-13.

[58] OSH Leptospirosis Guidelines 2001.

In the food, beverage and tobacco section of manufacturing in the year 2000/2001 there were 1378 new and 1747 ongoing work-related entitlement claims. These cost ACC $2,767,000 and $17,938,000 respectively.

Amongst males aged 50-54 in the year 2000/2001 there were 2,373 work related new and ongoing paid entitlement claims, costing ACC $6,534,000.

Martin		Total	Met by Individual/ Household	Met by Company (Accredited Employer)	Met by ACC	Met by Other
Individual/Household						
Medical - Acute	Hospitalisation	8,800.00			8,800.00	
	Doctors assessment for ACC	350.00			350.00	
	Total	**9,150.00**			**9,150.00**	
Medical - Ongoing	Physio/Occ. Therapist	116.00	40.00	76.00		
	Alternative Practitioner	200.00	200.00			
	Other (specify)	150.00	150.00			
	Total	**466.00**	**390.00**	**76.00**		
Transportation	Private Vehicle	379.86		379.86		
Domestic	Lost Household Production	Cost	cost			
Partners Time	Time off work (initial)	Cost		cost		
	Time off work (ongoing)	Cost		cost		
Income	Weekly income (before tax) before injury/illness	31 048.66				
	ACC compensation (total)	841.48		841.48		
Company						
Company - Staff	Other (specify): information produced;	cost		cost		
	Company wage clerk time	1 hour		1 hour		
Company - Equipment	New safety gear purchased	375.00		375.00		
	Other (specify) tests for safety gear by consulting company	1060.00		1060.00		
	Total	**1,435.00 + 1 hour + cost**		**1,435.00 + 1 hour + cost**		
Company - Administrative	Investigations of injurys and claims	Approx 100 hours		Approx 100 hours		
	Other	180.00		180.00		
Community						
OSH	Time	7 hours				7 hours
Total		**$12,412.34**	**350.00**	**2,912.34 & company costs & 101 hrs**	**9,150.00**	**OSH 7hrs**

Total Costs

Over a period of 2 years (rounded to maintain anonymity).

These include documented costs only. Costs to ACC incurred through the bulk funding of acute medical services are estimated. Opportunity costs, costs of ACC case management and costs to individuals incurred through loss of income are also not included. Company and individual costs are subject to personal recall and can not be considered complete.

Individual: $350.00 + undocumented costs

Company: $2,912.34 + company costs and 101 hours (Accredited Employer)

ACC: $9,150.00

OSH: 7 hours

Total: $12,412.34 + costs + 101 hours company time + 7 hours OSH time

Part 3: Findings

INDIVIDUAL

Introduction

Past research indicates that injured employees bear about thirty percent of the total costs of workplace injury and illness, which include loss of income, pain and suffering, loss of future earnings, medical costs and travel costs. The share of costs borne by injured employees rises sharply with the severity of the outcome while the share borne by their employer falls.[59] There was a varied range of social and economic consequences for the injured and ill participants of the study. These were influenced by a number of factors individually or in combination. Factors such as personality, availability of support and the attitude of the workplace could have a major impact on the consequences for the injured or ill person. Although there were factors that could mitigate the cost to the individual, they still bore enormous and ongoing consequences from their injury and illness.

Response to the injury or illness

The participants responded to their injury or illness in a range of different ways. Responses varied due to factors such as personality, the degree of visibility and the amount of support and information available to them.

The personality of the individual made a considerable difference to the way they reacted to injury or illness, and to the speed and path of their recovery process. For some, it was a contributing factor in their injury or illness. Philip, partly due to his personality and partly to the nature of work he was doing, had an overwhelming sense of responsibility towards his work and his patients. This added to the burden of his inability to cope when he reached a breaking point.

For Ian, too, personality played a role in how he became injured. He had heard colleagues discussing a problem with some machinery and his personality, along with a combination of other factors (experience, enjoyment of a challenge, and job satisfaction, and company loyalty) made him feel he could fix the problem. Without telling his colleagues he went under the machine to try and rectify it. The machinery crushed him, causing massive internal injuries. Although both physical and mental strength enabled him to make initial progress toward recovery, he died a month after the injury.

Julia felt she worked too hard and was too much of a perfectionist. She believed that she made her condition worse because she worked through the pain for too long:

> It was getting her down, the pain but once again you know she just wouldn't go home. I'd say go home and rest, she, she just wouldn't. Aw it'll go away. Well it has just never gone away and she just kept trying to struggle on, but you could see it wasn't working. Yeah you could see that she was in pain. (Manager)
>
> And I just used to ignore it and got more severe and more severe. And I used to actually put up with it and not say anything because I am a bit of a hard old cookie. (Julia)

Julia, who was formally a healthy and fit person was, after the onset of her OOS condition, physically very limited and in great pain. She was unable to do housework, gardening, or to look after elderly members of her family. Her condition also caused her to withdraw from social interaction and what she went through made her realise, to an extent, her physical limitations. She began smoking excessively and had a difficult time maintaining her sense of self:

> She had lost her self-confidence entirely [she felt]… she wasn't worthy of being helped. (Union organiser)

[59] Australian Industry Commission. p. 18.

She had to give up favourite hobbies and pastimes such as photography and gardening, which she regretted greatly.

Peter who enjoyed the outdoors and activities like swimming, could no longer find the same pleasure in them because he was always conscious of his scars and the way people might react to them – although he tried to deal with this by telling himself that it was their problem and not his. The injuries and illness in the cases reviewed in the study resulted in mental and emotional suffering of the person concerned as well as those around them. Apart from the physical injuries and pain suffered by Peter, he also experienced claustrophobia and depression initially while he was busy just coping, and then anger.

Similar to Peter and Julia, who had to give up activities they enjoyed because of their injury or illness, Barbara was an outgoing, extroverted personality and her illness had impacted greatly on her future. Apart from having curtailed her involvement in activities she enjoyed (e.g. dancing, lawn bowling, etc.), she was aware of the difficulty in getting a partner in the future:

> I think, 'Oh, I'd like to have a nice man in my life', but then I don't know whether I could ask him to take on somebody that's not well. (Barbara)

Thomas' injury also impacted on his sense of self. Besides his obvious physical suffering, Thomas was self-conscious about the appearance of his injured hand and often wore a glove or kept his hand in his pocket in public:

> Still sometimes in public, I might be paying money or collecting money and then people stare... you shy away or put it in your pocket or that sort of thing. Sometimes I do wear gloves or put my hand in my pocket just so... people don't see. (Thomas)

He found it hard to cope with jokes about his hand even from friends and colleagues. In spite of his severe and very visible injury he did not consider the results of his injury as a disability. He proved this by adapting to his injury, and being capable of performing most of his pre-injury activities. In his case, the denial of his disability or limitation, at least in this aspect of it, was working in a positive way.

In common with Thomas, Mark found it very hard to cope with the teasing he got from friends when he could not work and was on ACC. For him it was a stigma that was difficult to deal with:

> I know he got really upset after the accident, people, 'cause he couldn't get back to work, people, and it was said jokingly, it wasn't meant to be anything more than a laugh, about him being lazy, and being on the benefit, and that really upset him. (Mark's son)

Similar to Julia who worked through her discomfort and pain, Martin, by nature, minimised his own discomfort and would not admit to himself or show outwardly that he was sick until it was unbearable and impossible to hide. It was therefore, hard to tell (even for his wife) how much he was actually suffering and she would know only when he was at his worst. Besides the acute sickness at the onset of his condition (vomiting, dehydration, renal failure, and septic shock), he had on-going symptoms including constant fatigue and low energy levels.

Sarah definitely suffered stress at the time of the injury, and shock set in both as a result of the emotional stress and the physical injuries. She was in extreme physical pain for several weeks after the injury took place. She found it difficult to cope even at the time the interview took place, and the fact that she was able to function at only fifty percent capacity and worried that this may take a long time to improve (if at all), caused her extreme mental stress and suffering. Her personality restricted her from making too many demands of her family and colleagues and she felt she was burdening them with her inability to cope.

Paul was, by profession, a panel beater and suffered from noise induced hearing loss. At its worst, the constant ringing in his ears kept him awake up to five hours every night, which affected his behaviour negatively by day. It also led to restriction in his social interaction with family and friends as well as in the professional sphere, which was ongoing.

> Well, I had to really... make myself clear. Or listen, and probably get people to explain it twice… Um and general communication with people. (Paul)

There was, for him, the sheer frustration in the realisation that it could so easily have been prevented, and that now it was a constant, intrusive condition which would always remain – it was a gradual but permanent process:

> I don't think for a moment that he thought it would happen to him. (Paul's mother)

Paul also had to give up leisure activities like playing in the pipe band. He felt that his was a condition that was difficult to understand unless experienced personally.

> He wouldn't feel hearing loss until [he couldn't] hear. (The OSH OHN/inspector)

Pain and suffering

For all the participants, the most immediate consequence of their injury or illness was pain and suffering. This was an overwhelming and ongoing cost, which was at its worst during the recovery period, but not limited to that.

Throughout his time in intensive car Ian was in immense pain. In addition, he suffered from night psychosis causing him to experience flashbacks of his service in Vietnam. Peter was so badly burned over almost half his body that he was in 'excruciating pain' during his eight weeks in hospital despite the intravenous morphine he received:

> I just felt so sorry for him. There was so much pain and suffering that he went through. It was just awful. And no one else can relieve it for you. They can give you pain killers and tell you you are going to be all right. But you have just got to suffer on your own really. (Nicole)

Changing the dressings on the burns was particularly difficult:

> Every time they took the bandages off they put him under general anaesthetic... Because the pain, you couldn't cope with it, with morphine. That was how bad it was. (Nicole)

For Thomas too, initial medical treatment was immensely painful:

> ...but a doctor came along starting prodding around with a needle, into the fingers, into the raw nerves, trying to find if the nerves were viable and that was when the pain really, excruciating, just, I was teary eyed and just ready to punch the doctors and like pain. (Thomas)

Even after his hand had healed, his reattached fingers sometimes ached severely:

> And if I do lifting and I come to use my fingers, after a day or half a day, my fingers just ache, basically get to the stage were I want to cut them off, they are that bloody sore. (Thomas)

Grant too continued to experience pain in his injured hand after it was healed. Mark also commented that even after recovery, pain is ongoing:

> I haven't slept all the way through a night since the accident, there is not a night that goes past that [I don't] get my arm in some sort of position and wake up in pain. (Mark)

Mark's experience was common among the participants, most of whom mentioned loss of sleep and ongoing fatigue resulting from physical pain.

Pain and suffering was not limited to those with clear physical injuries; it was also present in the four participants who acquired occupational illness, and the two participants with gradual process injuries. Julia was in pain so severe as to be quite obviously noticed by others, and on a scale of one to ten put her pain at its worst on ten. Her extreme physical pain could only be lessened with heat and medication. She would soak in the bath for 'hours on end'.

> Well I knew it was physio because I had been to physio and really brought this. I mean I was eight of ten pain. I was ten out of ten pain then and it just got worse and worse. So I kept doing this physio, I kept going to him. It didn't help at all down my arm. (Julia)

> It is not notable that when the physiotherapist stretched her head backwards and clicked it in some way, there was a sudden increase in pain which lasted some time. She was then only able to get relief by putting a wheat pack on her neck and soaking in a hot bath. She still needs to do this and can only sleep with her head extended lying on her back. She cannot sleep on either side unless she takes about 4 Paracetamol. She then manages to get a broken sleep totalling 6 or 7 hours now. Fatigue is less since she has been sleeping better. (ACC Notes - Medical Report)

Martin acquired leptospirosis and was severely ill, suffering vomiting, dehydration, renal failure and septic shock. For the three participants with psychological illnesses the nature of the pain and suffering was different, but its presence was just as overwhelming. Philip recalled when he first broke down:

> And I was crying and I kept on crying and I couldn't stop and I was just sitting there crying and saying I can't cope, I don't want to go back there. Please take me away from this terrible place... (Philip)

For Murray and John, their mental suffering was exacerbated by the isolation that their illness imposed:

> I used to unplug the phone, pull the curtains and lock the doors and be like that. [There were] two suicide attempts too. (Murray)

Understanding medical conditions and treatment

A fundamental issue for a person who is injured or ill is a need to know what is wrong with them. This relates to wanting information on what can be done to help them recover, how long the recovery process is likely to be and if they will recover completely. Different people had different levels of understanding of their medical conditions and treatment and this could have a substantial influence in their recovery process.

For those participants suffering from a gradual process injury or an occupational illness, understanding what was wrong was particularly important. Difficulties with diagnosis in these cases resulted not only in delays in treatment and compensation, but also in the individual's recognition and understanding of the problem. Neither John nor his family, nor his GP initially had any idea of what was wrong with him or any understanding of chemical poisoning initially. This caused him and his family a high degree of stress, as well as delaying appropriate medical treatment. For a long time after John developed symptoms and got sick, neither he, his doctor, nor his family knew what was wrong with him. His lack of knowledge and understanding of his condition added to the terrible physical (nausea, lack of sleep, fatigue) and mental (irrational thoughts, mood swings, loss of confidence) symptoms and strain he was experiencing. The same was true of Murray whose GP, he felt, did not want to deal with his illness as it was too much trouble:

> So I went to see my GP and my GP goes, 'I don't want to know about it... I don't want to know about this'. He was comparing me to another person from another place that had the same sort of thing. And he said, 'I had that much of a fight and drama with ACC. I just don't want to know.' (Murray)

Murray took it upon himself to do research to help him to understand his illness so he could do something about it. He also used to talk to others with the same conditions via the Internet.

Martin lacked, for a long time, the knowledge that he had contracted leptospirosis. He wanted to know what was actually wrong with him and what had happened to him. He had to resort to looking on the internet to understand, as there appeared to be a dearth of information from other sources. The range of treatment providers involved in his care also initially had difficulty in understanding his condition:

> [The specialist] basically sat us down and said, 'Look, he's got a really severe infection, we don't know what it is, his kidneys have failed...' (Martin's wife)

The ongoing care and recovery programme is determined largely by a good understanding of the condition. Martin felt that it was extremely important to have knowledgeable people dealing with the

disease as this would have great implications on the diagnosis, prevention and cure, and would also help people who are in an at risk industry to recognise symptoms early. Martin also felt that his clearance to return to work could have been handled better by his GP. He believed he was 'rail-roaded' into returning to work before he was ready:

> Well, I was angry and frustrated cause I knew he wasn't really up to the job. But your hands are tied, there is nothing you can do. (Martin's wife)

Barbara was similarly unclear as to the understanding of her condition, in particular the distinction between occupational asthma and Chronic Obstructive Respiratory Disease due to smoking, which was also present. Confusion over symptoms was also a factor in Julia's case. Julia thought she was having a heart attack because she did not know what OOS signs to look out for. She ignored the initial signs of the illness and blamed herself for them. If she had understood or diagnosed it earlier, it might have been easier to manage. This can be contrasted to Lisa's case, where a clear understanding of her condition was present, and so it could be treated and managed at an early stage. Lisa began her treatment before her diagnosis based on her understanding of the symptoms she was experiencing.

In all the cases in this study, injuries were easier both to diagnose and understand than illnesses. However, in cases where there were problems with the diagnosis, or miscommunication occurred, the consequences for the individual could be serious. Sarah was misdiagnosed at first resulting in her being in immense pain. She was diagnosed as having a broken wrist rather than a broken finger. The resultant ongoing pain of the untreated finger and her being unaware of the misdiagnosis made her feel she was perhaps over-reacting when she should have been in more control.

In Thomas' case a lack of communication between two hospitals where he was being treated, may have led to delay in his receiving timely physiotherapy, which caused his hand to stiffen and could have had longer-term implications.

Mark, though satisfied overall with the medical treatment he received, felt he had been released from hospital too early and with insufficient back up – he only had his wife to help and she had to take time off from her own work to look after him as he was in intense pain and initially unable to do much for himself.

In Brian's case, he had had intensive and acute as well as ongoing medical treatment and had, over a period of time, regained a degree of physical strength and 'well-being', meaning he could be expected to live a normal life span. However, the medical opinion was that no amount of further rehabilitation would restore his intellect, memory, or ability to recognise family and friends – beyond a point, the medical system was powerless to do anything for him. In this particular case there was also the additional burden borne by Brian's wife of being pushed by doctors to turn off Brian's life support system soon after his injury took place. She had the decision-making power to refuse to do so. This was possibly enhanced by the fact that she had been trained as a nurse and so was more confident and knowledgeable to take action.

Understanding and attitudes of family and friends

In all the cases, family and friends were deeply impacted in one way or other and this generally led to either deeper bond or dissolution of the relationship with the individual.

A number of participants became isolated from their friends. Brian, being completely dependent for basic daily functioning on his wife and caregiver since his injury, was now naturally isolated from the world he had known all his life – his family, friends, colleagues and, to an extent, even from himself. This obviously impacted on his wife, Elizabeth who was dealing with the overwhelming and continual responsibility for Brian's care since his injury.

Paul found that friends and family could not relate to what he was going through unless they had had a similar experience. He received support and understanding from his mother, as she had experienced temporary hearing loss herself and was able to have a greater of understanding of his situation. Paul's

hearing loss resulted in a certain amount of social isolation, largely due to the difficulties in communicating in social situations:

> … I go out socially. I like doing that, but then sometimes I miss on a lot, because of that situation, and one on one, talking face to face, no problem. But when you get that someone talking over there, you don't see them, it makes it really difficult. (Paul)

This often caused tension in social or family situations due to miscommunication or frustration by others at having to repeat sentences and resulted in attitudinal changes towards Paul.

Julia found she could not be bothered with people due to the pain resulting from OOS. Julia's personality changed completely since the onset of OOS, and from being bubbly and full of life she tended to become depressed and grumpy. There were, however, continuous visits from family and friends who did the lawns, housework and so on and this she found was a help to her.

Self-imposed isolation was found among participants with solvent neurotoxicity. John and Murray found that the impact of the chemicals on their mental state (mood swings, depression, lack of concentration) meant they were unable to act socially around friends and would either isolate themselves or 'act up' in front of their friends. As John explained:

> Well, a lot of my friends especially near the end I didn't really see because I wouldn't go out and if I did it was only for a few hours. Sort of I don't know perk up or try and liven up so they didn't really know anything was going on. And even now I do it cause you don't know about talking about what's going through your head or anything. So you sorta, well I do, I s'pose you'd call it a lie, I try hard not to show it. (John)

Murray felt his wife was unsupportive and because this removed a key support system for him it made him further isolated.

> …To me he's got lazy, just laziness. (Wife)

As he said,

> My wife is sort of standoffish, she goes, I don't want to know, I don't want to know. (Murray)

The situation contributed to their separating for a while and then getting together again, though with a strained relationship. It also strained his relationship with other family members and friends. People used to react to Murray's moodiness and anger so he would isolate himself.

John found driving long distances on his own, often for many hours in a single night, was the only way he could handle his mood changes.

> …the only place I'd actually find, I don't know, peace would be driving. So I'd probably spend anywhere from, I don't know, two to five hundred dollars when I first left a week on petrol. (John)

John also wanted to move out of his parents' house but was worried about how he would react to others. Derek, John's friend and former work mate who had also suffered from solvent neurotoxicity, also avoided other people. The stresses and strains John's sickness put on his relationship with his partner were such that they separated as a direct result of the manifestation of the sickness. Because of the changes in his personality and his resultant mood swings, and the fact that no one knew what was wrong with him, his parents, work mates and his girlfriend misunderstood John. John's parents dealt with ACC while he was too sick to do so. But when ACC questioned him about why he was not dealing with them himself, he felt guilty that he had not been able to and that his parents had had to do it for him.

Thomas was deeply upset by the fact that the injury affected his ability to adequately provide for his family. When he arrived home from the hospital and was in bandages, his daughters shied away from him. This was something that upset Thomas a lot as they were a close family and he has always had a warm relationship with the girls. He was initially physically unable to lift the children, which limited his ability to show affection. The strain the injury and its aftermath put on the relationship between Thomas and his partner almost resulted in their separation, but they were able to overcome this. In fact, the relationship actually strengthened after Thomas' injury:

> I think we've come through, that we've weathered the storm. (Karen)

One of the positive outcomes of Thomas' injury was that he was more aware and conscious of safety around his home.

Because Peter was unable to move around very much for the first few weeks, it increased the burden on his wife who had to help him in almost all his activities. His wife felt that he did not understand the effect his injuries had on her and that Peter denied his inability to cope with the situation and did not attend as much counselling as he should have. In coming to terms with coping with the other effects of his injuries, this lack of understanding led to them becoming isolated from each other. He also found he could not sit down for more then five minutes for the first four months as it was too painful. This and the pressure bandages he wore for two years following the injury made it difficult for him to socialise. He also found he needed time to come to terms with his injuries:

> …it was a bit of a major blow to a newly married couple. There's a lot to deal with, a lot of trauma, yeah. And also I believe, well, I needed a lot of time to sort myself out y'know? Personal time. (Peter)

In a number of cases, the injury or illness resulted in temporary or permanent loss of intimacy between partners. Some examples included Brian, Peter, Murray, Julia, Thomas and Ian.

Effect of lack of support

Some participants felt isolated from support structures. These included sources of information, support groups and, at times, infrastructural support. Elizabeth found there was little rehabilitation support in her local area for someone with her husband's injuries.

> So he gets no physio, so we'd have to think up, I'd buy... different shape balls, tennis rackets, just to... just for something to that's different. Rather than sit like he does. (Elizabeth)

Sarah was told not to bother with physiotherapy for her injured hands, because of her physical isolation and the length of time that would have been involved in travelling to sessions.

Family members as well as the affected people were also unable to get information on the injured or ill person's condition. John's parents felt they were given no information during the process to identify John's condition, and following diagnosis were not given any information on ways to help. This was also the case in the other solvent neurotoxicity case. Murray found there was not enough information about the illness and how to cope with it.

> Well yeah I mean they, if you try and get the information from ACC on this so called injury or whatever it is, I've got nothing. (Murray)

> Get educated a bit more about it, there's not enough help out there for these people. That's what I think anyway, even though I'm not interested. (Murray's wife)

Like Murray, Martin had to get information from the Internet once he had been diagnosed. Both felt that clear information and support at an earlier stage would have been beneficial to their rehabilitation.

Work/workplace attitudes

The attitudes of the workplace, and the degree of support received from employers, colleagues, supervisors and managers affected the psychological as well as the physical recovery process of individuals. The best vocational rehabilitation outcomes occurred in cases were the individual received support and encouragement from their workplace. Frequently, however, this support was lacking. Apportionment of blame, poor communication and lack of clarity over employment roles all contributed to poor post-injury or illness employment relations and consequently had a negative impact on the individual's rehabilitation.

Thomas' activity at the time of his injury was common work practice in his workplace and part of his understanding was the importance of 'keeping busy' in between the clearly identified and understood

aspects of his job. He had never been told not to do what he was doing at the time of his injury, but also was not trained to do it:

> No, never questioned, why we were doing it, or how, they knew the corners were there obviously they [were] needed for the packs. They never actually asked how they were made or who was cutting them or anything. They have seen us using the saw, they just turn a blind eye, or they assumed it was safe, yeah. I think we all sort of assumed that it was the going practice. (Thomas)

Thomas thought he was doing something constructive at the time of his injury, not understanding that this was not quite what the employer meant. Thomas' company pointed to drug charges to imply that he was using cannabis at the time of the injury, which made things worse for Thomas. The company denied all responsibility for the injury, pleading 'not guilty' in the OSH prosecution. They did not at any stage believe that they were responsible even after their prosecution.

Brian's case involved non-routine work (as in the case of Thomas) that he was doing off-season when supervisory staff was retained to do the maintenance of the plant, facilities, buildings, etc. There was the additional factor of the depot supervisor being aware of the hazard (an unsafe skylight) but failing to mention or notify it. He felt powerless to voice his views to his supervisor or management about not wanting to go up on the roof to clean it (although he had mentioned it more than once to his wife a week before the injury).

In the case of Murray (similar to that of Thomas), the employers claimed that the illness could have been alcohol or drug related.

> All of a sudden I was getting rumours back through a third party, this wasn't done through chemicals, I had a drug and alcohol problem. I was an alcoholic, I was a drug-user, I was this, I was that. And this was what, because [the company] felt intimidated that I was going to prosecute and felt threatened and this sort of thing. (Murray)

Or they felt that the illness could have been caused by something that the employee was doing outside of work time (as was the case with Julia, Martin and John).

In this case, there were contradictions in versions of whether Murray blamed the employer and wanted them prosecuted or not. Although Murray commented on there being poor health and safety in place at work and difficulty that employees faced in getting safety equipment, as well as a lack of knowledge and awareness of the illness in the industry, he said he did not bear the employer any ill will, nor want them to be prosecuted. He was (as was John) concerned about others in the workplace acquiring the same conditions.

> There was no safety equipment there on hand for the guy to use. The guy had never been monitored, never had things like this. Just the layout, the lack of ventilation. All these sort of things. All these things weigh up y'know. I can't understand why something more positive wasn't done. I don't even know what was done. And that was the other bad thing that was done. They kept me in the dark after they dragged me out. (Murray)

In Martin's case also he was blamed for contracting illness. It was difficult to establish the work-relatedness of the illness and the employers suggested that the infection might have been due to personal hygiene, domestic animals and wild animals. Martin believed that if the company insisted, farmers would vaccinate cattle and illness would be prevented.

> Interviewer: And from a competitive point of view I guess they feel like they can't turn away pigs that haven't been vaccinated because then they'll just go to their competitors.
>
> Martin: Yeah, so, so they won't. But then again they reckon …they are not even tested.…if they tested each one at least you knew, you knew that the mob had got it. But they are not even doing that.

There was a high degree of frustration for Martin as, although it was the best preventive measure, because farmers were not forced to vaccinate their animals and it was a highly competitive market, if Richard's employer refused unvaccinated animals, farmers would just take them elsewhere because of the high costs of vaccination. He believed that the delay in payment to him while the work-relatedness of his illness was established was due to the company being a part of the Accredited

Employer scheme, not because the company was 'holding back' money, but nevertheless, he believed he was badly treated. He also believed that the company, in come way, forced the doctor to force him to go back to work (albeit, on light duties) before Martin himself was ready to do so.

Ian's employers also blamed him for the injury, Ian's wife also had blamed Ian and had suffered until the court case a year later revealed that he was not, in fact, to blame.

Mark's employment history was complex, involving redundancy and re-employment. At the time of the incident in which he was injured he did not have a clear understanding of his role. This may have led to him undertaking tasks and work practices that he was not supposed to do. The lack of understanding was related to both roles and procedures.

> …And we started doing it and [employee] went up the pole... there was a bit of misunderstanding, just a bit of confusion... it just boils down to not enough supervision, there were two of us when there should have been three of us... normally you work two guys... and the two of you both have to work, one can't stand and watch another one, it doesn't work that way. You need two guys to work... Mark went up the pole when he shouldn't have, and it snapped. (Co-worker)

> …no chain of command. There never was, never worked individually, we worked together. Only one person got responsibility for the job… So somebody else would come and give him a hand. Whereas if somebody else comes you don't have authority over that person coming to help you. Next week you might go and help him on one of his jobs. Because they take it all down on all the pay slips [for different positions] and some of them get sole charge and some of them charged to someone else…Trainee, who couldn't work by himself and had to be supervised. Then you had a skilled who could work by himself but not supervise anyone else. Then you had a foreman – he's a supervisor who supervises people, he gets paid more. They could haul it out and call them technicians. (Co-worker)

The person whom the employer identified as Mark's supervisor at the time of his injury did not have a clear understanding of his role to undertake supervision and consequently he did not supervise properly. Mark blamed the company for not following procedures, which could have prevented the injury. He also blamed the company for the lack of training, which, he felt, may have been a factor in causing the injury.

> …if I was a bitter and twisted person I would lay the blame clearly and squarely on the area manager because he was the one who basically dicked me around right from the start. And basically if he had [sorted it out] I would never been in that situation. And quite likely if there were two people getting that job it would have been two trained people in that job. But everyone was well aware; one of my colleagues went in there and had a word. He told me after that the team manager that I had before I changed, did you hear that [name] has had an accident and this guy said that was an accident waiting to happen and that's what happens when you put untrained people up poles. (Mark)

Sometimes the nature of the employment relationship blurs responsibility lines and therefore power relationships. In Mark's case, he was working outside of his role and across employers. This led to gaps in the way that the relationship was perceived by Mark (and by his supervisor) that contributed to the injury occurring. Power in these post injury or illness situations is often associated with knowledge. Julia obtained power to recuperate through the intervention and knowledge of her union and one medical specialist.

The extent of isolation suffered by participants who remained at work depended on the cohesiveness and support of colleagues. Whereas in Lisa's case she had the support and co-operation of her colleagues, some participants who remained at work experienced some isolation due to reactions by work mates to their injury or illness, or due to a change in job due to their injuries. Barbara fell out with her work mates and suffered isolation from them as they did not believe she was genuinely ill with occupational asthma. There was the additional stress caused by the uncertainty of her employers regarding whether or not her condition was smoking related or work related. She did not have the difference in implications explained to her. Paul was also to some extent isolated because his colleagues did not understand the effect of his deafness; they did not realise he was deaf and thought his lack of communication was arrogance.

Sarah became very isolated as she could not participate in farm activities for over three months after the injury and remained alone in the farmhouse for most of the day. For her, this was one of the biggest impacts of her injury.

> My whole life revolved physically being on the farm, I actually really, really missed that. Because I wasn't working or interacting with anybody and people get very sick of people that can't do anything, so basically no-one, so like [farm worker] was hardly likely to bowl in to talk to me for half an hour whereas we may have talked while milking the cows or shifting stock or whatever. So I really wiped out completely with communication, I had visitors, but as far as interaction with anybody, I couldn't drive a car. I had to be taken places... I have never felt so alone and isolated in my life. (Sarah)

There was also understanding by others who had been through a similar experience that positively affected the injured or ill person, as in the case of John who suffered from solvent neurotoxicity arising out of chemical exposure in boat building. Derek, John's work mate, also had solvent neurotoxicity and offered John employment to help him get his confidence back again.

Lisa also had a colleague who suffered from an OOS condition and had some understanding of her condition. This understanding did not result in any particular support, but she was useful in assisting Lisa in seeking health care early. This person's own claim had been declined and she had not pursued an appeal as Lisa did as her understanding was that this would be costly. But her understanding of Lisa's condition was of help to Lisa. Lisa found her colleagues extremely supportive and did not experience the sense of isolation found by other participants. In her case, not only was she powerful in her relationship with her manager in the face of her injury, but her manager acted powerfully in responding to her needs within the context of her own limited influence which, in the longer term, helped Lisa in her recovery. She was able to self-manage her condition because she had the power to choose what she could or did not do.

Philip experienced both lack of understanding and understanding of his illness. His colleagues were experiencing a similarly stressful environment, but many did not initially understand his reaction. He was unable to cope and was temporarily unfit to work in the hospital setting but the manager was insistent that he return to work. His manager demonstrated a particularly blatant lack of understanding, threatening him if he did not return to work, even though he had medical certification entitling him to time off. Philip could not control the roster or the appointment of sufficient house surgeon staff, which was a problem all staff faced, leading to high levels of overwork. He could not change the medical system that produced the stress. He was able to recover in part as he came to appreciate the nature of the system that contributed so much to his breakdown.

Career

Longer-term careers of eleven of the surviving injured or ill individuals were affected directly as result of their condition.

Brian was completely unable to work. It is very unlikely he will ever regain sufficient mental and physical abilities to look after himself, let alone enter employment of any type.

Peter felt he had to retrain himself and started doing university courses towards that end. He had to work extremely hard and emotionally felt that it was a 'do or die' situation to help him get back on his feet. Mark was physically unable to return to his pre-injury job.

In Barbara's case, the illness resulted in the her having to shift to another job within the same organisation. While in two other cases, the result was having to retrain to move to other careers in spite of liking what they were doing (John and Murray). Julia had enjoyed her work and what she was doing and found she missed being part of a close-knit team. She was encouraged by her work mates to visit the office but she still felt left out. She was uncertain and insecure about her future and would probably not be able to continue in the field she was in. Philip gave up working towards a medical speciality, and instead took up locum GP work. Paul moved to a different kind of 'shop floor' (in a second-hand retail business). In his case, he 'took control' and left what he felt was an unsafe industry.

Some participants who continued to work for their pre-injury or -illness workplace were concerned their ongoing job security would be affected by their injury. Grant, although he was able to work in the same company in a different job, was insecure about his future and about prospects of finding employment elsewhere. Thomas wanted to change his job but felt that because of his injury, he would find it difficult.

Economic costs

Seven of the injured or ill participants suffered considerable financial loss as a direct result of their injury or illness. These costs included ongoing medical costs, direct income loss, transport costs, and losses related to lifestyle changes people had to make because of their condition.

Sarah, Paul, and Lisa reported ongoing medical costs. Transport costs for Peter and John (whose only form of solace and comfort during the acute phase of his illness was to drive long distances by himself through the night) were to the extent of $2571 and $6000, respectively. Thomas, Sarah, John, Barbara, and Philip incurred direct loss of income because of being on ACC compensation or on a medical benefit. Other costs incurred directly by injured and ill persons included home help, retraining and replacement clothing (incurred to the greatest extent by Peter).

In three of the cases, the injury or illness resulted in changes in lifestyle due to financial loss. Peter and his family suffered a distinct drop in the quality of their lives as both he and his wife were on ACC compensation. Julia's family were put under severe financial strain because of the drop in the household income – her daughters had to get student loans to continue studying, her husband had to take on extra work in order to keep the house running, and her elderly father had to become a beneficiary of the 'meals on wheels' scheme. She had lost her source of income and did not like being economically dependent on her husband. Thomas faced huge financial implications after his injury – ACC compensation provided only eighty percent of his income, which resulted in a great deal of financial stress. This also led him to attempt cannabis dealing (which led to subsequent prosecution) in order to supplement his income.

Name of Participant	Dollar Cost to the Individual
Barbara	290.00
Murray	3,460.00
Mark	1,080.00
Paul	1,516.00
Grant	100.00
Brian	Undocumented
Peter	25,870.00
John	9,860.00
Thomas	380.00
Sarah	337.00
Julia	9,967.00
Ian	Undocumented
Lisa	3,742.00
Philip	(Potential Income Loss = 105833.00)
Martin	350.00
TOTAL	**56,952.00**

The total documented costs borne by the 15 participants themselves were $ 56,952.00. These do not include the potential estimated income loss as far as Philip is concerned, of $ 105,833 that he would have earned had he completed his training and specialised as he had planned to do. Also not included is the $225,000 Elizabeth paid for a house that would accommodate Brian's special needs. The potential income loss to the individual and their family is not included, as this is unreliable and difficult to quantify. Other financial costs are also not included, due to the limitations of participant

recall. This figure also does not include the undocumented costs to each individual, which would be considerably higher. Note that this also includes costs to the immediate family of the participants.

In the study there were prosecutions in six of the cases (Mark, Grant, Brian, Peter, Ian, Thomas). Mark received $4,500 out of a fine of $8,500. Grant received $3,000 out of a fine of $15,000. Brian received $20,000 from a fine of $20,430. Peter received $15,000 from a fine of $17,000. Ian's widow received $25,000 from a fine of $35,000. Thomas received all of the fine which was $8,000. None of the participants who received a portion of the fines imposed considered that it came to close to compensating them for the financial losses incurred as a result of their injury.

OSH

In two of the cases mention was directly made about the affects that the behaviour of OSH staff had on the injured or ill person, and that the impact affected the recovery and rehabilitation in one of the cases. Grant went through a lot of stress when OSH identified his role in the injury and blamed him for it. Murray blamed OSH for failure to prosecute. He felt that OSH did not do enough and should have prosecuted the company.

> …but I'm fairly appalled at OSH's umm inactive part... (Murray)

He also wrote to OSH requesting information about why OSH had decided not to prosecute.

In most of the other cases where OSH was involved, however, the individuals found OSH helpful and supportive. Ian's widow was happy with OSH's intervention and prosecution of the company her husband worked for. John was able to initiate the diagnosis of his condition only after his parents read an article by an OSH inspector on solvent neurotoxicity.

ACC

The role ACC played and the influence it had on the severity of the consequences on the affected people was considerable. Eleven of the participants relied on ACC for financial support after their injury or illness (with two more in the process of have claims assessed), and consequently delays in approving claims or treatment could greatly affect recovery, both physical and financial.

In six of the cases the diagnosis determined whether compensation would be available. For those participants with occupational illness or gradual process injuries, it was necessary to prove that the condition was work related, and the burden of proof often fell on the individual. Martin had developed a condition that was not clearly diagnosed in the first instance. A specific diagnosis was required in order to determine entitlement to ACC. Not only was there a lack of understanding with respect to the diagnosis, there were many different medical assessments and a delay in diagnosis. This lack of understanding led to uncertainty in regard to the medical management as well as concern regarding income and ongoing medical costs, which caused stress and anxiety.

> …I would if they would agree if the test came back negative they'd have to pay the money back. They won't … Imagine a period of the length of time paying out four to five hundred dollars a week… its not lepto and because the symptoms of lepto are so much like the flu to begin with, we'd have every Tom, Dick and Harry going to the doctor getting the flu and I've got lepto pay me ACC…So I know Martin is pretty sour about that. As a matter of fact I had a round up in the pig house a couple of weeks ago with all the guys in there, um about the fact of them not wearing their protective gear. Um and Martin made the comment at the time you want us to wear the bloody protective gear but you won't pay us ACC when it happens…No I'm sorry as far as I'm concerned, a they should be wearing the protective gear to protect themselves. Nobody wants to get lepto for goodness sake… We have actually got OSH coming out next week and I have asked OSH to speak to them, directly to the men. (Health and safety representative/personnel manager)

Compensation issues were also a factor for Lisa. She had sought and received medical treatment for her condition at a reduced rate of payment. It had been made clear to her by the medical provider that the amount she was paying was the surcharge paid after the ACC payment to the treatment provider. If her claim for an OOS condition was subsequently declined, as it was, she would have to

pay for the full cost of treatment. This amounted to nearly $1,000. What she did not understand was why the claim was declined. The GP and the physiotherapist had diagnosed an OOS condition. It was stated by ACC that the diagnosis did not match the workplace activity (key boarding alone was not sufficient to warrant the condition) and therefore, the claim was at first declined. Lisa lodged an appeal against this decision. She sought legal advice and was ultimately successful in having the decision overturned. In this instance she was reimbursed the costs for treatment. However, she believed she did not receive full reimbursement, nor were the costs awarded sufficient to cover her lawyer's fees. She found the review process frustrating and expensive, and believed that without a lawyer her case would not have been successful. She felt that this would deter many claimants from taking their case to review. The review resulted in financial costs, and considerable time costs for Lisa, her manager, the lawyer, ACC staff and review staff, and also caused Lisa considerable distress. Lisa was fortunate in having full support of her manager in her claim.

A similar situation arose for Julia whose injury was also an OOS condition. Her case was subject to repeated review, multiple medical opinions and bureaucracy, resulting in loss of time and rehabilitation opportunity.

John experienced considerable delays in the entire ACC payment process while a work link was established. He had to bear the additional burden of his case managers changing constantly – he dealt with five case managers in all. Murray faced a similar situation – he was frustrated and angry with ACC and blamed them for not doing enough to help him.

In Barbara's case, the understanding of her condition also determined compensation. Again, this diagnosis linked to the employer's responsibility. They were uncertain as to whether her condition was occupational asthma or caused by smoking and no one explained the difference. This ongoing lack of understanding impacted on the level of support they offered Barbara. This was so in Barbara's case as well. As she said:

> I always understood that when you're working for somebody, that they should be finding out all the information, but they keep on ringing me up and asking me for the information... He kept on ringing me at work and everything. I don't know, I could be wrong, but I thought that that's the way it should work, isn't it? (Barbara)

> They've accepted my claim, and all I've claimed for is the two months of work. Which will be eighty percent of my wages, and it's still…there's been nothing yet. (Barbara)

Conclusions

The social and economic consequences and costs to the affected individuals were enormous, ongoing, and rippled out to family, friends and the larger community. A majority of these costs were non-recoverable. These were workplace injuries and illnesses of a common nature and nothing particularly out of the ordinary; they could and do happen everyday and to ordinary people. But most importantly, they were injuries and illnesses that happened due to failures and errors that could quite easily, and with relatively minor costs, have been prevented.

FAMILY AND FRIENDS

Introduction

The immediate family suffers emotionally, mentally and financially. In all the selected cases the members of the family suffered and relationships were affected, mostly negatively.

It was also seen through a number of examples in the selected study cases that the impact of an injury or illness does not limit itself to the individual and their immediate family, but does in fact have a ripple effect that can extend to parties outside this immediate circle (e.g. caregivers).

Early reaction

For families of the affected individual, the initial reaction was inevitably one of shock and disbelief, especially in the case of injuries. However, the extent of this reaction and the emotional trauma to the family was mitigated or intensified by a number of factors: the severity of the injury or illness; the degree of information and support that was available; the stage at which this was provided; and the amount of follow-up care that was offered.

Lack of awareness or information about the extent of the injury or illness often contributed considerably to the degree of shock suffered initially by family or friends. If the severity of the injury or illness had been underplayed when first reported to the family, the trauma of encountering the victim in hospital was correspondingly worse. This could be seen in a number of the cases.

Mark's wife 'got an awful fright' as the person who initially contacted her did not warn her of the state of Mark's injuries before going to hospital. Similarly, in the case of Grant, his son Kevin had only been told that his father was in hospital and had hurt his hand. He did not realise how serious Grant's injury was until he got to hospital and saw his father:

> It was unreal, I got up there and um, Dad was... all blanked out, y'know. And he was just vomiting the whole time I was there, anaesthetic and shock, but yeah, it just sort of sunk in how serious it was. I just sort of brushed it off all day and got up there and hell. (Kevin)

Elizabeth was told her husband had had an injury and was on his way to hospital. Because she knew he had been working on the roof that day she assumed that he had broken his legs. It was not until she arrived at the hospital that she discovered he had brain and spinal injuries.

Overly optimistic reassurances from medical professionals at this early stage could also make the situation harder to deal with in the long term. Jenny felt that it would have been easier for her to cope with her husband's injury if she had been given a realistic assessment of his chances from the outset:

> I was let down by one doctor... I sort of said, look, is he going to die, because he looked dreadful. And he was obviously in really dire, dire pain and [the doctor] said no, he's going to be alright... I honestly believed he was going to be alright. (Jenny)

A lack of clear communication could also have the effect of making a family member assume the worst about an injury . While Mark's wife was shocked to discover how serious his injuries were when she got to hospital, her son had the opposite problem:

> I was at work... and my boss came out and said he's just had a call from Mum, that your Dad's in an accident, can you go home... I mean, I've since found out that Mum didn't phrase it quite like the boss did, but it was the quickest trip I've ever made... I came [home], there was no-one here, and my immediate thought was, either he's in the hospital on life support or he's carked it. (Justin)

.... but the only thing I thought of, on the way to here was that he was dead, and that I'd been a wanker to him. (Justin)

The trauma to the family on discovering the seriousness of the individual's condition was not limited to injuries. Martin's wife Helen did not initially understand how critical her husband's condition was:

We didn't know how ill he was, we had absolutely no idea. (Helen)

Consequently, she was not prepared for what happened when she took him into hospital:

Lines and tubes and, oh bloody hell, I was a mess. (Helen)

It was not until her daughter, a nurse, explained what was happening that she was able to understand the seriousness of the situation.

At this early stage, the degree of support offered by both health professionals and the workplace could make a substantial difference towards how much the family suffered.

When Ian had his injury , his wife found out via a message the company left with her son. They had not asked to speak to her. The first contact she had with the company after the injury was when she met the site manager in the hospital, who 'completely yelled', telling her that Ian:

...did it to himself. He went somewhere he shouldn't have gone. (Jenny)

This made it much harder for her to come to terms with the injury :

On that first night, I honestly thought Ian had done it to himself. He had done something really wrong.... And I was angry at him for doing it to himself, and them I was angry at myself for thinking that. (Jenny)

For Elizabeth, although she was mostly very impressed with the treatment Brian received, the trauma of dealing with his injuries was exacerbated by the pressure from medical professionals to turn his life support off:

Elizabeth: The doctors... are a bit cavalier with relatives, y'know, he's stuffed.

Interviewer: So that's what they said to your face?

Elizabeth: Oh yeah, they say, he'll never survive this, you might as well turn him off now sort of thing. You've got the option.... I said to them you haven't given him a chance. He has not had a chance and they sort of tell me, we've taken out X amount of his brain, the rest of it's like a bowl of jelly dropped from a height. It's just shattered. He will be no good. They really push you to [turn] off the ventilator.

In the case of occupational illnesses, not understanding what was wrong (the symptoms displayed and the reasons for them) could be quite traumatic for both the ill employee and their family. This was especially noticeable in the case of solvent neurotoxicity where the first indications noticed by the family were alterations in personality and mood. John's mother noticed the change in her son some time before he left his job, when they visited him and his partner:

He was aggressive, his moods and manners were shocking, I was absolutely disgusted with the way he treated her this particular day...And I was really quite horrified at the way he was treating her, because it wasn't John and I thought I'd done a better job than that. (John's mother)

His parents were frustrated watching the slow change in their son's behaviour and not understanding why this change was taking place:

It's a gradual process, and it builds up for a while before you think there's something wrong.... You sort of think it's him and you feel like giving him a kick in the bum. (John's father)

A similar lack of understanding of what was wrong by family and friends was also present in Murray's case. For his wife too, the change in Murray's personality was hard to understand:

And then he started to get really moody and lazy and yeah. He just change from this placid person to this big monster. (Jane)

For the families in many cases, the initial impact of the injury or illness was compounded by a sense of isolation and helplessness. Two factors contributed to this. The first was a sense of loss of control, that the situation had been taken out of their hands and they were unable to do anything to influence events. The second was that they felt there was no one they could talk to or share the burden with.

Jenny was frustrated by her inability to help:

> I felt I had to do something and I couldn't. I felt helpless. (Jenny)

She tried to shield her children from the impact of the injury , increasing her own isolation.

Peter's wife said that on the night of the injury :

> I just remember being quite shocked, quite stunned. I went home that night and sat down, I didn't really have anybody I could talk to about it. I could talk to Mum, but it was such a huge thing you didn't really feel like burdening other people and I remember sitting here in the lounge... just thinking what's this going to mean? What're we gong to do? (Nicole)

Thomas' wife's initial reaction (resulting from shock) was to blame Thomas for the injury :

> …..she was sort of crying and ……. accusing me why did you cut your fingers off and sort of like why did you do this for. Sort of crying and that and sort of making me feel guilty… (Thomas)

For Thomas' wife, the shock was compounded by her physical isolation from her husband who had been flown out to a larger hospital before she could join him:

> I cried and cried because he had gone without me... (Karen)

This initial physical isolation also occurred for Sarah's children who remained on the remote farm when she was flown to hospital, and for Elizabeth who was unable to fly in the air ambulance with her husband.

Although the degree of shock and trauma to the families of the injured or ill individual varied from case to case and was subject to a number of factors, it was present to some extent in all of the cases. Because of the sudden nature of injuries as opposed to occupational illnesses, it was generally more pronounced in these cases. Shock could be minimised by the presence of clear communication between family, workplace and medical professionals, the provision of good information at an early stage, and the availability of support both practical and emotional. These factors continued to influence the experience of the families and friends of the injured or ill employees long after the initial reaction.

Impact on family relationships

Partner

The toll of the injury or illness on the relationship of the individual and their partner was severe in most cases. Injury or illness put strain on the relationship in a number of different ways through emotional stress, financial pressure or physical isolation. A further contributing factor was whether or not there was a clear understanding of the effect the injury or illness had on the individual, and whether they understood the impact it might have had on their partner.

In four cases the strain placed upon the relationship was too great causing the couple to either separate, or resulting in a redefinition of the relationship (John, Murray, Philip, Peter). For the two individuals suffering from solvent neurotoxicity, the greatest contributing factor in the strain placed on their relationship was the mood swings and personality changes that resulted from their illness. For John, the stresses and strains his sickness put on his relationship with his partner were such that he split up with her as a direct result of the manifestation of the sickness. He 'walked out' of his relationship and moved back in with his parents:

> So I walked [out] on [my job] and my house and my relationship and came home. Some dumb reason, but yeah. (John)

> He said she was the best thing y'know, and I've blown it. (John's father)

For Murray, the illness exacerbated existing issues within the relationship causing him and his wife to separate:

> We separated … the reason was that she said that I had changed that much and I was, just that I was a harder person to get along with, and things, you know. Which I was. (Murray)

Although they were back together at the time of the interview, the nature of their relationship had changed substantially:

> It's not a marriage, we're sort of in a flatmate, y'know, we're sort of flatting together. That's what it's like. Yeah, half the time we don't even talk. (Jane)

She blamed Murray for not getting on with his life and resented that he earned more on ACC than she did working:

> He does nothing, y'know. I'm the one that's got to go to work. I say to, they go, 'What's your husband doing?', 'Oh, he's on ACC', he gets more than me but I've got to go and work and he can sit at home on his bum and do nothing. (Jane)

Peter's injury and its aftermath put their recent marriage under more pressure than it was able to withstand. Nicole believed that, in part, Peter's inability to accept the fact that he was not coping (he went for very little counselling) was in part responsible for their separation. Nicole said that his personality changed in the wake of his injury while he was recovering from his injuries:

> He became much more self-centred and not able to give to other people, not wanting to have a family, making room in his life for the demands of having a wife or in-laws or anything like that. He became very self-centred, very selfish, very inward looking, very angry…It's part of being so injured, you need to look in at yourself in order to protect yourself… (Nicole)

Nicole also found Peter's inability to accept that the injury had affected her in any way frustrating, given both its emotional impact on her and the fact that she had given up university studies to care for him:

> No, no. And couldn't carry on. We'd been planning a family, couldn't continue with that. I felt very lonely, very unsupported, really like I had no support at all. (Nicole)

For Thomas and Karen the financial and emotional pressure from his injury placed enormous strain on their relationship, almost causing the couple to split:

> I wanted to sort of pack up the kids and run away. I didn't want to deal with it. (Karen)

While Thomas was away for the second round of surgery Karen rang him to tell him that she wanted to finish the relationship. Thomas left the hospital early and returned home. Although it was a very trying time for the couple and their children, their relationship survived the injury and its aftermath and they believed that it brought them closer together:

> I think we've come through that, we've sort of weathered the storm. (Karen)

> It's brought us closer. (Karen)

In two cases, Ian and Brian, the relationship was irrevocably lost as a result of the injury .

Jenny and Ian had been married for thirty years at the time of the injury . Jenny found the loss of her husband overwhelming:

> There was never a point to say goodbye to a marriage, and that of all things of the whole lot I feel I have lost. I have lost my marriage. (Jenny)

> I always feel I walk in the shade, I no longer walk in the sun. You live, you survive, but the joy's gone. (Jenny)

For Jenny, the loss of her relationship was the end of thirty years of companionship and having her husband there to talk to:

> Interviewer: That's what you miss the most, the conversation?
>
> Jenny: The conversation and all the kisses and cuddles, yeah.
>
> Interviewer: And it would be the world?
>
> Jenny: It is companionship….your life entirely changes because you don't, you can't do things together.

The trauma of her husband's death was exacerbated by her belief that Ian had been responsible for the injury , as this is what the company had told her:

> You love somebody that much and they did it to themselves. And it's horrible and how dare they do it to themselves. (Jenny)

It was not until the trial a year later that she found out that the injury had not been her husband's fault.

Elizabeth and Brian had been married just nine weeks at the time of Brian's injury . For both of them, it was a second marriage. Although Brian was physically present, Elizabeth's relationship with him changed from wife to caregiver. Elizabeth had overwhelming and continual responsibility for Brian's care. She could not be certain that Brian even recognised her as his wife:

> So whether he reacts to me because I was there the whole time, every day and I was always the one there, the main one, or whether he remembers we were married, you never know. (Elizabeth)

Elizabeth suffered each day of her life both for having to see what the injury has done to him and for no longer having a life of her own as he required around the clock care. She also had to deal with the change in Brian's personality and the physical manifestations of this:

> Every now and again he hit me. I wiped his mouth 'cause he can't control that. I wiped his mouth and he turned around and he hit me so I hit him with the flannel back. It was a dry flannel, he looked at me, but he's never done it since. (Elizabeth)

In a number of cases, intimacy between partners was severely affected as a result of the illness or injury, often further straining the relationship.

Elizabeth was no longer able to have any sort of physical relationship with Brian. Peter's skin was so sensitive following his injury that he was unable to even sleep in the same bed as his wife. Any sort of physical relationship was not possible:

> We couldn't sleep in the same bed anymore. We tried it in the beginning but every time I rolled over in the night and bumped him he would be in pain… sex was completely out of the question. So I moved into the spare room and I never moved back. (Nicole)

His wife found his physical appearance difficult to deal with:

> And I guess would feel totally different about his body. I certainly felt totally different about his body as well. But because our relationship was breaking down we weren't talking about it very openly either. It had huge repercussions. (Nicole)
>
> I was absolutely revolted by these burns, they were so horrific. They were third degree burns, so they were very deep and very raw and very pussy and just horrible…. So physically he didn't look very nice. And I found that quite difficult being a new bride to cope with… and I didn't like my reaction, that was hard. And it wasn't something I could really talk to him about either. You can't say to someone who's been injured that they look awful. (Nicole)

For Thomas too, intimacy was affected by his injury. Although it took Karen a little time to get used to his injuries, they stopped bothering her:

> When I have a quiet moment I sort of like rubbing the tips of his fingers where he's got nothing. But yeah, earlier on it [bothered me], I thought awww. (Karen)

Loss of intimacy was not limited to those individuals with injuries. Murray and his wife also spoke about this:

> Our sex life is zero. (Jane)

It is probable that loss of intimacy also occurred in other cases, but was not addressed directly by the participants.

Children

For young children in the family, the effects of an illness or injury on an individual could substantially change the way that person was able to interact with them.

John's illness impacted on his relationship with his nephews and nieces because he used to push them away and had trouble coping with them. John's parents felt that he could not be left with children:

> You wouldn't leave him with the kids, because you were scared of how he was going to react towards the child. (John's mother)

As John's condition improved so did his relationship with his nieces and nephews.

Brian was, in the perception of his children and grandchildren, no longer the person they recognised and could relate to. They suffered the loss of a father and grandfather while actually physically having him present. Grandchildren did not know how to treat him appropriately and were blamed for this:

> And the grandchildren don't know how to take it, and they don't know what to do round him. And they do stupid things that annoy me. They treat him like a child. (Elizabeth)

Murray's relationship with his wife's children deteriorated. His ACC case files also stated that his own 11-year-old daughter was sent to live with her uncle and aunt in Australia, but Murray made no mention of this in his interview.

Thomas' injury initially caused his children to keep a distance from him:

> The second oldest, she, normally she's all over me, she's real shy and kept well away, didn't want to know me sort of thing. Scared or unsure. (Thomas)

> When Thomas came back from hospital, the kids didn't know him….he was all bandaged up. They stayed away from him. (Karen)

Although this shyness on the part of his daughter was quick to pass, his physical relationship with his children was affected for some time afterward:

> He couldn't lift his kids up, he couldn't cuddle the kids when, especially when the twins were only babies and they were crying, he felt like he wasn't contributing with the kids. (Karen)

It is likely too, that there was a secondary impact for Thomas' children of observing the stress between the parents. Certainly the injury affected the stability of their home environment:

> And the kids were playing up because there wasn't stability in the home. (OSH inspector)

The injury also affected the children outside of the home:

> [Oldest child] was getting a bit of flack, like 'Your Dad's cut his fingers off', and [she] was five, becoming five when it happened and she got a bit of flack at school. (Karen)

Paul's hearing loss resulted in some communication problems with his children, which could lead to a degree of tension:

> So that does, does cause tensions, y'know. I suppose its caused a few arguments over the years. Not real major stuff, but it does cause a few arguments. (Paul)

In the same case there was an opposite reaction from Paul's mother. She had suffered temporary hearing loss, as well as seeing other family members experiencing hearing loss, so she was able to have a higher level of understanding and be supportive.

Nor was the impact on relationships limited to young children. In the cases where the individual had adult children, the injury or illness and its aftermath also profoundly affected their relationship with them. Mark's 25-year-old son was affected by his father's injuries:

> I sort of tried not to be around him, that probably sounds awful, but, like I'd come home from work and say hi, or whatever, and either go down to my room or go out somewhere…. 'cause I'm not used to seeing him like that, he's never been debilitated in any way, not even when he's sick, he's up and around and doing things, and to see him sort of helpless was pretty freaky. (Justin)

This was compounded by his father's frustration at being home. Once he was able to return to work (at a different job) the situation changed:

> He drove everyone mental because he wanted so much to get back to work. And he was so relieved when he was told that he could [work again], and he was so excited, and so positive about finding another job, he was actually quite fun to be around. (Justin)

He has found that his relationship with his father has improved dramatically since the injury . The family no longer take things for granted, and look out for each other more. His family now spend more time together:

> For a long, long time, every time I thought about the accident, I was, I think I started to realise how close he was to dying, I mean, if it had been a foot the other way, he'd be dead, and, just how lucky we were . . . you just realise how quickly things can change…I sort of, took things for granted a bit before the accident, things that I don't take for granted now…you might not be around to say things later. I think a lot more like that now. (Justin)

> Before the accident I thought nothing of not seeing my sister for a month... now I see her three or four times a week... She's only two minutes drive down the hill, I drive past her house every day, and I would hoot or wave or whatever before hand, whereas now I call in and see her. Because you never know. (Justin)

This was echoed by Philip's father who also felt that the experience had brought he and his wife closer to their son:

> Well the only [positive] thing is that my concern about him or my affection towards him you know has increased. Because I am looking now, even when I went home last night, I rang his place to see how he is you know? That sort of thing, the closer relationship, because myself and my wife we are always concerned about him you know and how he is. (Philip's father)

Sarah found that her injury isolated her from her children to a certain extent. She was unable to hug her children or show physical affection:

> I couldn't hug them because they were more likely to knock [my hands]. (Sarah)

In addition to this, her children needed to take over much of her work on the farm and so were unable to spend a great deal of time with her. For Sarah's 17-year-old son, who was driving the ute that hit her ATV, the emotional cost was immense. The injury had a very negative effect on him, making him emotionally withdrawn and needing counselling. His recovery from the trauma of being involved in the injury was impeded by the fact that he held himself responsible for its occurrence. The impact was also heightened by the attitude of police after the injury :

> I think he jumped out and saw I was alright and not dead and ran and locked himself in his room. He absolutely was beside himself. (Sarah)

> He locked himself in his room, the police arrived, and he didn't want to talk to them. And the policeman went up there and said to him if you don't come out we'll knock the door down and drag you out and it will make things worse. So obviously he came out …They asked what sort of relationship [he] had with me. And basically the police said 'do you want to kill your mother' or something like that. (Sarah)

Although the police took no further action, their response to his involvement in the injury resulted in considerable stress. The effects of this injury were apparently compounded by the impact of his father's death two years previously.

Ian's sons struggled without their father. They developed a range of problems after his death including depression and substance abuse. One son, Tony was an epileptic, and the grief and stress caused his condition to worsen. Another, Craig, began to drink heavily and use drugs. The third, Luke became suicidal, and eventually moved to Australia, a move that Jenny attributes largely to Ian's death.

> [After Ian's death] my son came back [to live with me], the oldest son. Back on the booze and drugs. Drink and driving. So I had problems with him. Tony, he was epileptic. He was having seizures left, right and centre. I had to get him put into a hospital …because it was quite bad because of the stress, the fits were from the stress. It takes months to get him an appointment to get his drugs changed. And my other son, the year before he was fifteen, form five, suicidal. [Ian and I] had spent the whole year with him…keeping him alive…He was suicidal, we got him right…He was actually a lot better, but he went back to being suicidal [after Ian died]. (Jenny)

Daniel, the youngest son, was also hugely affected by his father's death, having to take two months off school after the injury . At the time of the interview, three years after Ian's death, he spoke about the loneliness associated with losing his father unexpectedly:

> Like the loneliness comes back and its usually just before I go to sleep, it's like my imagination, and I remember Dad and I just want to speak to him, y'know, yeah? (Daniel)
>
> [I miss] just like talking to him, yeah, 'cause he was the one I could always go to. And yeah, we were just becoming friends. (Daniel)

He remained living with Jenny, and became very protective of her.

Brian's children had little to do with him after his injury . He was no longer the father that they knew and could relate to:

> Brian's children don't have anything to do with him….I heard [his daughter say] that's not her father. So she doesn't bother to come and see him at all. (Elizabeth)

Other family members

Relationships with other family members were also affected. For John's parents, his illness and the responsibility they took for his care resulted in a huge amount of stress. For some time they did not know what was wrong with their son and watched him undergo unexplained personality changes and sickness. They had to watch him constantly because they were concerned that he would attempt suicide. This was compounded by John disappearing for days at a time:

> But he would go away, just go, and you wouldn't know where he was…and y'know you sort of get really churned up because you really don't know what's happening. (John's mother)

For John's parents, his gradual recovery was a frustratingly slow process, where he took a step back for every two steps forward:

> Mother: He's not as well as what he was probably six weeks ago.
>
> Father: He seems to go like this then drop back, not drop back far, that's what happens.
>
> Mother: That's a good thing, not going back as far. The lows aren't as low as they were initially. Because the first six months was hell.

John's illness also strained his relationship with his brother and sister because they could no longer talk to him.

Philip's parents, too, found it difficult to watch the impact of their son's illness on him:

> To see sort of your own child suffering, you know, anxious and then not being able to cope… (Philip's father)

Added to this was his father's sense of guilt that he, a doctor, had been unable to see how sick his son was:

> I feel guilty sometimes, but I didn't recognise it as a sickness. I thought it was a stressful situation, [I thought] he's sort of learning to cope with it and one day he will y'know after getting used to, he will be alright. (Philip's father)

Murray found that the effects of his illness meant he was no longer able to interact with his brother and his mother the same way he used to:

> I mean, my mother sees me as not being that happy, carefree, sort of, y'know, pumped up motivated little twit I used to be…it's sort of affected them, I mean, I used to take my mum shopping quite a bit. And if I was having a bad day she knew about it. (Murray)

Moving outside of the family

It has been seen through a number of examples in the selected study cases that suffering does not limit itself to the injured or ill person and his or her family, but does in fact have a ripple effect that can extend to parties outside this immediate circle. This was seen quite distinctly in Brian's case where not only had life changed completely for him and his wife, but also for the caregiver, Rose who gave up working full time for a company to help Brian's wife take care of him. Because this duty was of great importance and priority to her, she took time away from her own family (a husband and two daughters) in order to do this:

> I basically sat my family down and said right, from here on, if Elizabeth needs me you kids, teenagers, you are old enough to look after yourself. If I have got to go, I have got to go. I have made this number one. And my family number two, sort of. To a degree. (Rose)

The effect of the injury therefore filtered down to her own family because she could no longer be a full-time mother or wife. Her family understood and appreciated the choice that she made. For her husband, who was a good friend of Brian's before the injury , it was a way of compensating for the fact that he could not deal with Brian's injuries:

> Because he can't cope with it himself, he sort of makes that much more allowance for me to [be able to do it]. (Rose)

Loss of social interaction

Injured and ill workers and their families are often isolated socially. The major reasons for self-isolation appeared to be due to lack of understanding by others, self-consciousness about injuries or, in the case of solvent neurotoxicity, inability to cope with the resulting mood swings. Close friends were often unable to relate to the new circumstances brought on by the workplace injury or illness. In the case of the major caregiver, self-isolation was caused by time taken to care for or treat the injured or ill participant.

Self-imposed isolation was found among participants with solvent neurotoxicity. Participants found that the impact of the chemicals on their mental state (mood swings, depression, lack of concentration) meant they were unable to act socially around friends (John and Murray) and would either isolate themselves or 'act up' in front of their friends. John commented that his illness resulted in a great loss in terms of lost friends and relationships:

> It cost a lot of friends, not really willing to get back into a relationship because just don't want to, I think I still have bad times or whatever you'd like to call it. I don't want to put anybody else through it, so I don't like to get close to anyone. (John)

Murray also noted this lack of social interaction:

> The social side of things is non-existent. (Murray)

> We used to have friends that used to come and visit, but now they don't. (Jane)

Both found that it was hard for those who did not have the condition to understand what it was like, and that this lack of understanding isolated them further. In John's case, however, there was an exception to this. Derek, John's friend and former workmate, also had solvent-induced neurotoxicity and was able to offer advice and encouragement.

Lonely as a widow among couples, Jenny found that it became increasingly hard to deal with people who were not in her situation. Unless people had the same experience, they could not relate to what she was gong through. She found that friendships suffered because people were unable to cope with Ian's death:

> People try and say nice things to you, but people don't want to know. You lose friends, they can't cope with death, that's a cost. (Jenny)

Julia's injury, and its associated loss of mobility, limited her social interaction. Added to this was the impact of her condition on her personality:

> The effect it's had on her has been really devastating, changing her whole world. I don't know how to explain it, she's not herself, hasn't been herself since she put herself off her work. Totally different lady, depressed and grumpy at me, friends, husband, kids, a lot of frustration. Before the injury she was bubbly, full of life. (Margaret)

Julia found that the pain of her condition meant that she lost the urge to socialise with friends:

> I really couldn't be bothered with people so much… I couldn't be bothered what they wanted … the pain just took over the mind. (Julia)

Paul's condition also resulted in a degree of social isolation. His hearing loss affected his ability to interact in social situations, and also resulted in him withdrawing from activities such as coaching and music, which would have had a social component.

The effort of looking after an ill or injured person also meant partners became isolated from friends. Nicole found that looking after Peter as he was recovering was practically a full-time job and both of them became isolated from their friends. The enormity of Peter's injuries also made contact with friends difficult:

> Friends found it difficult to come and visit us because what had happened was so huge and horrific. And nobody really wanted to talk about it and yet it was so in your face that you couldn't ignore it. It was hard for friends, I think, and hard for us too. We drifted apart from a lot of people … We became very isolated, I didn't have the same contact with my friends. (Nicole)

Elizabeth found that Brian's injury and her full-time role as his caregiver left her socially very isolated. She was unable to leave her husband to go on holiday. She had access to a nurse at Burwood for two weeks a year to go away but did not feel she had been able to use this service yet, the reason being she did not feel that Brian or herself were ready yet to have a stranger care for him. Many of her friends no longer visited. Her social life was almost non-existent:

> I really don't have a social life anymore. I go to darts once a week and that's it. If I have a social life it's here, people come round here, and we have a gathering. And we watch Sky Sport. Or celebrate birthdays here and that's it. We don't go fishing, we don't go for trips away anymore. (Elizabeth)

Most of the friends she had after the injury came from the medical community.

Impact on work situation/career/responsibilities

For the families of the all the individuals, the injury or illness brought about an enormous change in their situation, impacting on career, lifestyle and household responsibilities.

Revision of household responsibility

Many families found that their domestic and family responsibilities altered due to the injury or illness. The changes were either directly related to caring for the injured or ill individual, or assuming their normal responsibilities when they were unable to perform them. Although in some cases this was temporary, lasting anywhere from a few weeks to a few months, in others it was a permanent change.

For Mark's family, his incapacitation resulted in an increase in the physical burden on his wife, resulting not only in an increase in her physical workload, but also in her having to take time off work. Because of the extent of Mark's injuries, even when he was released from the hospital he was, for all practical purposes, physically dependent on others:

> Things like feeding him, and bathing him, and taking him to the toilet....but we never did it, Mum always did... things like cutting his food up, dressing him, on top of everything that she did for us as well. (Justin)

Although some tasks fell to the adult children, Justin regretted not helping his mother as much as he could have after the injury :

> I feel guilty now that I didn't give Mum more help. Like, she took the full brunt of it.... I tried to clean the bathroom and vacuum, things that Mum didn't really have to do. But I should have, like things like cooking, I mean, I can't cook, but that would have been the perfect time to learn, things like that, and being a bit more supportive of her as well, 'cause, looking back now, we did nothing to help her, things like ironing and washing and all those sorts of thing which she always does, she was still doing on top of looking after Dad, and we sort of helped out looking after Dad, but never really helped Mum, which is something I regret. (Justin)

This also occurred in Peter's case with Nicole having to provide a great deal of physical help, in addition to dressing his skin grafts twice a day:

> When I first got home I couldn't do, basically anything. Nicole had to help me get in and out of the shower, get in and out of bed, getting up and down out of chairs. (Peter)

Similar situations occurred in most cases where the individual was physically incapacitated. While Thomas' hand healed, Karen had to take on considerably more childcare and domestic responsibilities. Martin's wife Helen had to take on additional jobs on their lifestyle block as Martin was unable to manage his usual tasks (taking care of the horses, land maintenance and so on). Julia was unable to care for her elderly father and had to pass this responsibility on to various others (her sister, as well as a caregiver and meals on wheels). With the loss of her income, her husband had to take on additional work to support them, also having to do extra work around the home. Sarah had to totally review all her domestic responsibilities and the business (farm) management. She was no longer able to do or complete tasks and had to organise her family and her worker to do this. She overestimated the family's ability to perform to her expectations, which became frustrating for her.

Career/education

Partners also gave up employment or study to become the major caregiver following the injury or onset of illness in two cases.

Elizabeth had to give up her job to look after her husband full time. Rose, Elizabeth's friend who also cared for Brian part time, only worked two hours a day at the job where she was previously full time. This meant she interacted less with her workmates.

Nicole had to drop out of university study to support Peter:

> It was terrible, I had to drop out of my university study, I was in my third year...so I had to drop subjects that I was half way [through]... I got invited to do honours and I couldn't continue and I had to get a job. Basically I had to drop out of university and get a job to support him to get back on his feet. (Nicole)

Lifestyle

In almost all the cases, the injury or illness resulted in a considerable change in the lifestyle of the victim and their families. This varied from being a comparatively temporary change while the injured or ill individual was recovering, to being massive and permanent. The degree to which this occurred depended largely on the nature and severity of the injury or illness, but was also affected by other factors, in particular the pre-injury situation as well as financial considerations.

For a number of the participants there was a considerable change due to the drop in income that occurred after the event. Julia was refused ACC compensation for her injury, which meant that she and her husband had to manage on his income alone. The financial impact of this extended to Julia's daughters who Julia was supporting through university. Her inability to continue this support resulted in them having to take out student loans. However, most of the financial burden fell on her husband Darren:

> She doesn't know how he's handled it, he just plods along …He just fits it all in, the whole time, he works seven days a week in doing extra jobs for Julia in the weekend, or sometimes working [in paid employment] seven days a week. (Margaret)

Even for participants who were receiving ACC, there could be a considerable financial burden. Weekly compensation pays eighty percent of the employee's pre-injury earnings, and having their income cut by twenty percent could place serious financial strain on families. For Thomas and Karen with four young children, the drop in income had huge financial implications. This was further exacerbated by the fact that an administrative error resulted in Thomas initially only receiving one hundred dollars a week from ACC:

> The bills were getting penalty rates on top of penalty rates. (Thomas)

> They had no money, I remember something that really hit home to me was the fact that they had no money for their twins' first birthday. Thomas was so upset because [he saw] himself as the provider and was very, very adamant that it was his job to provide for Karen and the girls. And he just, he couldn't cope with the fact that he couldn't give his girls a birthday, he couldn't, they couldn't go and buy a cake. (OSH Inspector)

The financial strain resulting from the twenty percent income loss was compounded by Thomas' inability to barter for meat and firewood which he had done previously, and do cash jobs:

> He used to barter to make up his income. And he would do shearing and he would cut wood, and he would sell it. And that was an extra little bit for his kids. But once he lost his fingers he couldn't shear and he couldn't use the chainsaw. (OSH Inspector)

Peter and Nicole also found that their lifestyle changed considerably as a result in the drop in income:

> We had to seriously look at what we were spending, it was half of what we were used to. (Peter)

The financial strain resulted in Nicole leaving university and working to support them.

For other participants, the limitation imposed by the injury or illness also resulted in lifestyle changes. Because of Martin's illness, he and his wife were no longer able to cope with the physical work required to maintain their lifestyle block, and had to sell it and move into the city. In this case, however, there were some positive results of this change. Helen commented that the move meant they had more spare time to spend together, and being closer to the city was more convenient:

> I think we've adjusted to the change really well and probably we're better for it. (Helen)

> We've both got more spare time… we do more together since we've been here. (Helen)

For Elizabeth, Brian's injury had a massive and permanent effect on her lifestyle. Brian's treatment in the first year caused serious disruption, as she had to spend ten and a half months at Burwood Spinal Unit with him. She then assumed full responsibility for his care, becoming his full-time caregiver. She was not able to leave Brian alone for even a short period of time. She found this very frustrating:

> Sometimes I get really pissed off, I really do. You can't go out, you just can't go out. (Elizabeth)

For Jenny, the death of her husband resulted in a total change in lifestyle. Theirs had been a traditional marriage in which the role of providing for the family had been Ian's. She found that after his death she had to assume responsibility for a number of things that he had always taken care of:

> I had to learn to do things for myself without, different things Ian would do that I wouldn't have the faintest. Um, now I can go and get a warrant of fitness for my car which is, Ian did all those sorts of things. Yes, I suppose I, virtually I have become a different person in the fact I can do things for myself. But I tell you right here and now…I can't do it. (Jenny)

The stress led to health problems and also resulted in her taking up smoking again. She felt that she had lost her security and her future:

> It was [a security thing], it was, it's a dreadful thing and I can remember thinking, but it was in the first year, if I killed myself it was quite alright. But my kids were never allowed to do it because they had lives. I just felt my life was gone. (Jenny)

> And she's had to be [strong] because now you see her whole life has completely changed, I mean, as we say I mean Ian would have been retired this year. I mean she's still a fairly, she's still a fairly young woman. She had a lot more to go before her and a lot of the ideas and the things she wanted to do, they are never going to materialise now. (Company OHN)

Support

Family support

One of the factors that could make a substantial difference to the effective rehabilitation of the injured or ill individual and aid their ability to cope with the injury or illness both physically and mentally was the degree of family support available to them.

In John's case, the support of his family was instrumental in his gradual recovery from his illness. He was able to move in with his parents, who provided him with both physical and financial support. His mental state concerned them greatly and they were constantly on alert for signs that he might be suicidal, protectiveness that often clashed with John's desire to be left alone:

> I'm pretty sure my parents were on suicide watch because it felt like they were chained to me 24/7, even when I went away for a few days they would telephone constantly. (John)

His brother and sister were also very supportive. John's parents expressed concern about what would happen to other individuals with solvent-neurotoxicity, who did not have the family structure available to offer support:

> Him living at home, I don't know what it cost, it doesn't matter. A lot of kids haven't got parents… some of these kids have nowhere to go, that's what concerns me more. And I think a lot of people haven't got family to go back to. (John's mother)

For Murray, the other participant with solvent-neurotoxicity, the case was very different. He lacked the solid support that was present for John. His wife Jane, although aware of his illness, was not involved in his rehabilitation:

> I just couldn't be bothered with him, with his illness and that. Even today I still can't be bothered. (Jane)

Parents also offered support in Philip's case. Like John, he moved back in with his parents for a time after the onset of the illness. His father was able to offer him ongoing guidance and advice:

> It has eased off, but some mornings he rings me and tells me I am anxious today. I tell him you have had this before, you know how to cope with it, you go there, once you sit down, one by one, you will be able to handle it. (Philip's father)

In eight cases the family offered practical assistance, doing physical tasks the individual was unable to perform. While they were recovering from their injuries Mark, Thomas, Grant, Julia, Martin, Peter and Sarah all relied on family members to help them. Brian's reliance on Elizabeth to perform everyday tasks for him was permanent.

In three cases, the family played an active role in the rehabilitation of the injured or ill person, becoming involved in their medical treatment. The degree of this involvement varied depending on the medical knowledge of the family member. Family members with medical backgrounds were able to provide practical care. Elizabeth's nursing background proved invaluable in caring for Brian. Nicole also had a nursing background, which enabled her to take over the day-to-day care of Peter's injuries, changing his dressings and providing medical support.

Family involvement in the individual's medical treatment was not limited to those with medical backgrounds. John's parents also took an active role in his treatment and constantly explored new options that might help his recovery. They found this very frustrating, however, as nobody was able to tell them how to 'fix' the problem:

> Yeah, it just seems to take so long, so here is John, he's got a problem. So … you make an appointment, and the months go by, and all you are doing is just going to appointments, somebody interviews you or talks to you. But there has been nothing to say [this is the answer]. (John's father)

Support from friends

Support for the injured or ill individual was not limited to family members. In many cases, friends also offered considerable help during the rehabilitation process.

Derek, John's friend and former colleague, was able to provide John with considerable practical support as he had also suffered from solvent-induced neurotoxicity, but was further along in his recovery than John. He was able to offer John advice from his own experience as well as work trials when John was ready for it:

> And I've actually asked him if he wanted to come here and just work. Just to get his confidence up, to meet people and talk to people. (Derek)

John also had the support of a close friend of the family and some good personal friends. Murray and Julia also had close personal friends who were able to offer support. For Julia, having a friend who would listen and provide unconditional support was very important:

> She mostly took, she's mostly listened and a lot and thought, 'Aw God, do I have to hear this again'. But she's always been so supportive, rings me all the time. Calls up for coffee. (Julia)

For Brian and Elizabeth's friend Rose the degree of support offered was substantial, giving up a large part of her job and family life to help Elizabeth care for Brian.

Barriers to support

In a number of cases, families found that there were barriers that prevented them providing the degree of support they wished to offer. This often related to the availability of support structures or information.

Elizabeth found that the support structures she needed to provide Brian with the best care that she could were not in place. She was living in a medium-sized town, and found that it lacked the facilities to care for someone with such severe injuries. She knew that physical therapy conducted in a pool helped Brian's rehabilitation, but had difficulty accessing this:

> The physiotherapist … she said [the pool is] used for the arthritis and the stroke foundation, [she said] I don't think they'd be very happy to have someone like Brian in the pool. I thought you don't even know what he's like. (Elizabeth)

For John's parents, the main barrier to providing support was the lack of information available to them. They found they were often barred from information because of the Privacy Act. They felt that if they had been able to communicate more directly with the medical community about John's condition, it may have helped:

> Because we have no idea when he goes, we don't know what he tells them. Whether he just says he's got a headache, whether he explains all these other things and I think those are important things [that] whoever he's talking to needs to know. (John's father)

They also encountered problems dealing with ACC on John's behalf:

> I mean for the first six months we had to initiate everything, he couldn't do it, we had to do all that. And they say why are you doing it, and then he'd start feeling guilty… I mean we were probably on the back foot too because we had never been involved with anything like this. We don't know the system. I mean, I can understand ACC and that being cautious because you do heat some pretty horrific things of what people are doing because they know how to work the system. But it's very hard for us who have had nothing to do with it to know where to go and how to get help. (John's mother)

There was also a lack of support for partners of injured and ill workers. Nicole found that any support that was available was for her injured husband, not for her. This was despite being severely affected in many ways by her husband's injuries and nursing him at home for several weeks.

Family/friends and workplace

In seven of the cases, family members expressed some animosity to the individual's workplace. This varied from concerns about the safety of the work practices, to anger at how the workplace had responded (or failed to respond) to the injury or illness.

Paul's mother was concerned about the lack of safety precautions, not just in her son's workshop, but throughout the industry, which she felt was not as aware of the problem as it should be, although it was improving. Both her ex-husband and her sons had worked in the industry and had developed hearing loss as a result. She felt the industry as a whole was unsafe:

> If I had known today how it was going to affect panel beaters, there is no way I would let my son take up one of those jobs now. (Paul's mother)

> None of my grandchildren are going to be panel beaters, I can tell you that right now. And the children themselves have said if you are thinking of leaving the business to us Dad, forget it. Leave it to somebody else, y'know. And again we, they all realise. (Paul's mother)

John's parents were also frustrated with the work conditions and the lack of good safety provisions, at the boatyard where he worked:

> I used to call in, quite regularly, and I was amazed how little precautions were taken, it wasn't a good environment. (John's father)

Karen, Thomas' wife, was also angry at the company, and held them responsible for her husband's injury :

> I mean, it didn't take a genius to figure out really because they had no safety standards in place… All they had to do was spend a few more hundreds to get a proper saw that's fixed to a bench and none of this would have happened. (Karen)

Anger against the company was present in a number of other cases as well. Mark's family, Nicole, Elizabeth and Jenny all blamed the companies. For Jenny, this was exacerbated by the company's behaviour after the injury :

I was angry. I was so angry at the firm. How can they have done that to me. (Jenny)

Conclusion

The impact of workplace injury and illness is far greater than simply its effect on the individual. The consequences ripple out to include many other parts of the community. Principal among these are the family and friends of the injured or ill worker who frequently have to bear much of the burden of their care, rehabilitation and subsequent lifestyle changes. The presence of a supportive family and social network could make a considerable difference to the timeliness and effectiveness of an individual's recovery.

WORKPLACE

Introduction

In the study, the social and economic consequences of illness and injury were seen to impact upon the workplace. This was not just economically, but in unexpected ways as well. Much like casting a stone upon a calm pond, when an injury occurred the effects rippled out to every corner of the workplace. This covered not only primary actors such as the employer and the affected employee but also employee representatives, workmates and other staff. Similarly, the effect of an injury highlighted systems within workplaces and their respective strengths and weaknesses.

To explore the social and economic consequences for the workplace and the characteristics that influenced them a number of themes have been identified from the study. These themes include the employment relationship, the union, workmates (their attitude and supportiveness), the role of the supervisor and the employer (their role, both positive and negative), health and safety systems and economic costs. Across these themes certain key ideas occurred and have been, where appropriate, used for explanation.

Employment relationship

The nature and condition of the employment relationship was important in comprehending the social and economic consequences for the workplace. The key components of this relationship were influence and responsibility. Who held influence, and how it was used, was important. Its use had considerable effects on work processes and then consequently on health and safety in a workplace. Perceptions of responsibility and influence in the employment relationship were just as important as actual, legally determined, power relationships. As will be seen in this section, in several cases employers did not believe themselves to be influential in the workplace. These issues will be illustrated through examining the perceptions of the employment relationship, the right to refuse work, the work process and the roles of those within the workplace.

The participants' employment relationships in the study covered three categories. Two participants were self-employed (Paul, Sarah). Twelve participants were employees (Philip, Murray, Barbara, Mark, Brian, Peter, John, Ian, Lisa, Julia, Grant, Martin). One participant was a contractor (Thomas).

Employers' perceptions of their influence and responsibility within the employment relationship varied. The employment contract obliges the employee to obey the employer's instructions within the law. In five of the cases in the study (Barbara, Peter, Thomas, Julia, Martin) employers believed they lacked influence over their employees. The employers thought that their employees were at least, in part, if not solely, responsible for their injuries. There was in the opinion of these employers a practical limit to their authority over employees. When injury or illness occurred the worker was blamed for the injury. Employers felt there were limits to their responsibility for workers and they were concerned that illnesses may have occurred outside the workplace or be due to non-work factors.

These perceptions of influence and responsibility can be identified specifically from the case studies. The employers of Martin attributed leptospirosis infections to lack of hygiene and incorrect use of health and safety equipment, which they could not do anything about. Barbara's employers believed that smoking and not wanting to work in the dye room were the cause of her asthma and not health and safety practices. This was something that was not their responsibility. Management further believed that the safety gear that they provided, such as masks and respirators, were not being used. This was something that they could not enforce. Barbara's manager expressed uncertainty over her case in saying:

> Because, asthma is many reason, there are many reason make you asthma, right? Smoking, maybe that's one reason, and that after office hour, we don't know what she's doing. For example, cancer, if she suffer the cancer, how you can prove she get the cancer due to the workplace? Or others? Nobody knows. The asthma also. I was heard from some people before, that before she enter this company, she suffered asthma. It is true or not, I don't know, but there are so many things. And also is illness cannot happen all of a sudden. Takes long time. (Barbara's manager)

For two employers non-work factors such as drug and alcohol use and abuse were a factor. Thomas' employer believed that it was his fault. The injury in the employer's opinion was a consequence of not following instructions and possible drug use. Murray's employer also had doubts over the cause of his solvent-induced neurotoxicity. There were rumours that if not causing it then it certainly contributed to his subsequent problems. The manager commented on this:

> There is some talk that a, that an abundant use of home-grown New Zealand helped to the effect. (Murray's manager)

Two more employers expressed doubts about employer accountability. Peter's employer believed fundamentally that it was Peter's problem. In the employer's opinion Peter should have known not to use the light which caused his injury. The employer felt that it was not his responsibility to supervise Peter to that extent and Peter should have known better. Finally, Julia's manager asked how could she tell adults what to do when it came to the prevention of OOS. She could not make them take preventive action. Julia's manager described the situation:

> That's how it started a little pain, who knows maybe it was left too long before she physically went and did something. Maybe I should have written to her when she got told to take a week off by the doctor and made her take a week off. But you hope that adults are going to you know. You can't do everything for them. (Julia's manager)

As mentioned above employees are, within the limits of the law, expected to obey their employer's instructions. However, in the study, employees believed that the nature of their employment relationship with their employer did not allow them to refuse dangerous work. This was commented on in five of the case studies (Philip, Brian, Peter, John, Thomas). Peter, on instruction, was working with inadequate ventilation and lighting in an enclosed space. Brian had to work at a height. He did not wish to do this but felt that he could not refuse to do the task. Elizabeth, Brian's wife remembered:

> When it came to the roof cleaning he said I'll know I'll have to get up there, I don't want to do it... It will me that has to go up and do it, he put it off a week. (Elizabeth)

The work process, as set up by the employment relationship influenced the injury event in the study. Pressure to produce within set time periods was a common theme. This was apparent in five cases (Grant, Ian, Thomas, Julia, and Philip). At the company where Ian worked management set up a high-pressure production process. Increasingly, more was expected from each worker. The Occupational Health Nurse at the company remarked:

> I think the fact that it, that were times when I think production over rode a lot of things. I think the general consensus was most people at some stages used to feel unsafe about doing certain things. Yeah I think so. (Company OHN)

At the sawmill where Thomas worked there was the pressure to keep busy when normal work tasks had been completed. Thomas, with other workers, had to find other things to do. In his belief finding extra work involved tasks that may not necessarily have been specified in his job description. He described the situation:

> [Colleague] and myself, we finished all the work that was for us, so we were sweeping the floors just looking for odd jobs to fill in time. Just to keep busy, umm, we'd been told off by our supervisor prior to that, saying we weren't, when we finished our jobs and there were other things, we weren't doing things. So just looking for odd jobs to do, sweeping floors and stuff and um we, I'm not sure where it started from but. We had a system

> where we used to cut cardboard centres. … I was in the process of doing that when the saw jammed, kicked back whatever and took my fingers off. (Thomas)

In the financial services industry where Julia worked as a teller, there was constant pressure to produce results. Employee performance was based on weekly statistics and the number of referrals for product sales they achieved. As head teller and a senior member of staff, Julia had extra responsibilities that kept her busy throughout the working day. Julia has also faced industry-wide changes in the banking industry. Julia's union organiser explained that although more people were using internet and phone banking, staff had been reduced. This meant that the number of transactions per teller had actually increased. In small-town New Zealand, Julia described the pressure:

> Like the whole time you are running to time. Ok you had to do some days that you had to do a lot of time. But as a full time, the only full-time teller I had a responsibility to get things done on time for other, meeting other demands. I look back now and it was the pressure, too much pressure. (Julia)

Philip felt that he was impelled to work long hours. These long hours of work eventually contributed to his breakdown.

A key problem in the employment relationship was the understanding of what an employee's role was prior to an injury or illness. Employees and employers were uncertain over what their responsibilities were in their workplace and how far they extended. This was apparent in four cases (Thomas, Brian, Ian, Mark). The misunderstanding or a change of roles for the employee was often a factor in an injury event.

Thomas believed that as part of his employment relationship and the expectation of his workplace, he was expected to be productive. His supervisor stressed this to him repeatedly. Because of the lack of guidance, as opposed to what a permanent employee might have received, there was an injury. Thomas performed tasks for which he was not trained and as a consequence was injured. For Ian, he believed that his employment relationship allowed him the latitude to carry out extra exploratory work. This in turn led to serious consequences for the workplace. The occupational health nurse at the plant commented:

> …from what I can gather, the statement was made that they had a problem with the transfer tables. And there was a great discussion about it and apparently [employee] said I know what it is, we got an air leak. And they sort of, I think took no notice of what [employee] had said. And he went down to have a look and, instead of, I have no idea about what the procedure, whether he followed the procedure or didn't follow the procedure. The procedure was actually shit anyway, I mean I was unaware of that procedure, because the last time I was there, those gates were totally still opening up to stop that process. (Company OHN)

At Mark's workplace the responsibilities and roles were blurred by his complicated employment relationship. Mark's supervisor was unsure as to not only what his role was but what Mark's role was as well. The co-worker in relation to the injury commented:

> ...there was a bit of misunderstanding, just a bit of confusion... it just boils down to not enough supervision, there were two of us when there should have been three of us. (Mark's co-worker)

Brian had a role change forced on him. Normally his duties would not have involved working at height. In the pack houses, off-season, there was an expectation that workers engage in routine maintenance.

In two cases, Paul and Sarah, the employment relationship was complicated by the fact that both were managing small businesses. They were both responsible for and affected by the employment conditions that they worked under.

Union

Union involvement and advocacy played an important role in four cases (Barbara, Ian, Lisa, Julia). The union was not just a collective bargaining agent but also a health and welfare organisation. The

union was able to redress imbalances between an individual and a workplace. It did this by providing resources, knowledge of government systems, and support. This occurred where it stepped in and took responsibility for the situation. This advocacy involved medical and employment advice for the affected party.

In Julia's case the union, and in particular one of its representatives, took on an important advocacy role for her. They secured wages owing from the bank, arranged a medical referral, sought legal advice and took part in her ACC review. The union's knowledge of how to access compensation and medical systems was vitally important. This was of great importance for Julia, she said:

> …she gave me hope that something could be done. (Julia)

For Lisa, the union played an advocacy role. One of her workmates was a union and health and safety representative for Lisa's area. Through her own experiences in these roles and with OOS difficulties, she was able to help. Her knowledge and support were important for Lisa. Similarly, in the case of Ian's wife, the union took responsibility and used its power to assist his widow. The union stayed involved throughout the course of the investigation. At one stage they spoke to the OSH inspector to check the process of the investigation and whether a prosecution would result before the expiry of the six-month time limit. At the same time they explained to Jenny what was occurring and what rights she possessed in the situation. Jenny commented on their role:

> Nobody tells you, I mean the lawyer from the union sort of told me some rights. (Jenny)

In four cases, Thomas, Barbara, Martin and Ian, the union's role was a source of tension and misunderstanding in the workplace as well as of advocacy. This was apparent at Ian's workplace. On one side of the employment relationship was a young group of managers. On the other side was a group of older unionised employees who had been with the company for a long period of time. And so in the area where Ian worked there was a culture of unionism. The lack of understanding and respect between these two led to a lack of understanding about each other's roles. And this contributed to his injury. The occupational health nurse commented:

> I think quite often the statement was made, not just by [employee] but as well as [employee], as other people, they did want, they did speak to management and management sometimes just didn't listen. Or perhaps even because his management were a lot, lot younger than he was. … So therefore there was sort of that, not that interchange of respect that was there. I mean they didn't tolerate them and they didn't tolerate the young whippersnappers you know? So that was their turf without a doubt. (Company OHN)

In Barbara's workplace the union's role was a source of conflict. For Barbara the union had trouble in providing effective support and mediating in her workplace. The union representative reached a stage where he could not progress her ACC claim any further. At the same time his involvement in her dispute with her workplace created animosity towards the employee. This was especially noticeable when questions began to be asked by OSH. There was trepidation that the potential costs from a prosecution triggered by OSH could put the company out of business. Similarly, Thomas thought that the management did not approve of his union involvement. Thomas believed the union involvement and the subsequent prosecution may have coloured management's view of him.

The union at the meat processing plant where Martin worked was unconvinced of the health and safety measures that were been taken in the workplace. They did not believe it was their responsibility to deal with health and safety problems. They were not supportive of protection methods taken by the company. They believed that it should be prevented at the source via vaccination:

> So they don't worry, they can't do anything about it. OSH says they can't make them do it. I know um the union ah lady she was, she was going to do something about it. The only way they are going to do something is like with brucellosis in cattle, is to get them vaccinated so they can't send them to the works like that. I mean it doesn't affect anything so they are not going to worry. (Martin)

Workmates

Following an injury in the workplace, colleagues of the injured person displayed a variety of reactions. Responses from them to the injured ranged from hostility through indifference to minimisation, inability to support, guilt and support. Often the visibility of the injury influenced the reactions of workmates. The more visible an injury was, the greater sympathy and understanding it received. There was a distinction in attention given to occupational illnesses as opposed to occupational injury. Occupational injuries such as fractures, amputations and severe lacerations are more noticeable than occupational illnesses. Often there were doubts over the diagnosis of occupational illnesses. Outwardly the sufferers of occupational illnesses such as solvent-induced neurotoxicity were the same people to the workmates. Workmates also were concerned over the possible ripple effects of the injury for themselves and the business they worked in.

In four cases (Philip, Murray, Paul, John) the visibility of the injury influenced the reactions of the workmates. With some injuries such as an amputation or crushing the result was obvious. With gradual process injuries and occupational illnesses it was not. And consequently there was less sympathy. Philip's colleagues did not recognise that he even had a stress condition. Colleagues came to him and asked if he had heard about the doctor who had 'gone crazy'. Philip described it:

> 'Did you hear about the house surgeon who lost it at ophthalmology?' And people coming up to me, not realising it was me, that was the funny part. 'Did you hear about the bloody, some doctor, he nearly hung himself at ophthalmology.' (Philip)

Paul's mother expressed a similar sentiment. She believed it was difficult to get a 'fair hearing' from institutions and the people around you. It is hard to know whether someone actually had an injury or did not. She remarked:

> If they could wear a bandage around their head they would get all the sympathy in the world. (Paul's mother)

A final example was John, a boat builder who developed solvent-induced neurotoxicity. One former workmate, Derek, saw that John was not his usual self and was behaving erratically. Derek did not recognise this as an injury nor connect it to the workplace. For at a least a year he did not know why people were falling ill. He commented:

> Yeah, but I didn't realise, you got to understand too at that time, we didn't realise it was work related. (Derek)

Two study participants, (Barbara, Paul) experienced hostility from their workplace colleagues. This concerned colleagues' understanding of their workmates illness and then inappropriately applying blame to them. Barbara was harassed by other colleagues who believed she was lying about her illness:

> [Co-worker] was being very short with me, and I wondered... why she was being like that. And she came round the corner one day, and she said to me 'You can pull the wool over some people's eyes, but you can't pull the wool over mine'. (Barbara)

They did not understand the cause of the illness and attributed blame to her. There was suspicion that her illness was caused by other factors such as smoking and the stress of the position that she occupied. Hostility came from all corners in the company. OSH became involved and there was the possibility of a prosecution. The company faced issues of viability in an extremely competitive environment. Similarly, Paul experienced tensions with his colleagues. Paul's workmates thought:

> …he was arrogant because he would walk away when you were talking to him. (Former workmate)

Paul's workmates did not realise the effect that his loss of hearing had on his ability to communicate with others.

The support that Sarah received from her workmates was constrained by the nature of her workplace, which was a dairy farm. The farm was a small enterprise employing less than three workers and was spread over a relatively large area. It was isolated from its nearest neighbours as well. Most of the

interaction between workers occurred on the job as they performed tasks around the farm. With the nature of farm work and added responsibility from Sarah's injury, her employee did not have any time to spend with her. She remarked on the situation:

> …my whole life revolved physically being on the farm, I actually really, really missed that. Because I wasn't working or interacting with anybody and people get very sick of people that can't do anything, so basically no-one, so like [farm worker] was hardly likely to bowl in to talk to me for half an hour whereas we may have talked while milking the cows or shifting stock or whatever. (Sarah)

In one case Martin's workmates displayed disinterest in their colleague's illness. His workmates within his team were not close to begin with. Part of this resulted from the culture of the workplace. But he was isolated from them more so than others in the workplace. Another workmate who contracted leptospirosis was treated more warmly, with colleagues asking after him. Colleagues saw Martin as aloof and removed from them. So when he contracted leptospirosis they displayed little concern for his well-being. The health and safety representative commented:

> Um to be honest I don't know, um his, I did not have. I'll put it to you this way I did not have any of his work mates coming over here saying how's Martin going? Not one, but that's because of who he is. Right? The guy that's got it now, totally different story, every time I go into the pig house. How's [name] doing? Y'know? (H&S representative)

Four cases (Barbara, Paul, Grant, Peter) experienced minimisation of their injury from their colleagues. Sometimes workmates denied the severity of someone's injury and with others they compared their colleague's injury to other injuries that had occurred in the workplace. This, in effect, had the result of denying its seriousness for the study participant. In the case of Peter, his workmates were initially supportive after his injury occurred. His employer minimised the effect of what had happened to him and the sympathy for him from fellow employees disappeared. Peter's wife recounted:

> And then his boss came in and [I was] really angry with him. He'd come from the fire and he was really filthy and he stunk of all the soot and dirt and everything of trying to put the fire out. And he came straight into the hospital and demanded to see Peter's burns. And Peter was lying naked on a bed with a sheet, a paper sheet over him before they started to do all the dressings. He kept removing it and having a good look and putting it back and removing it and having another look. And he kept saying... they are not that bad, it doesn't look that bad. And his whole body was black because it was burnt and it wasn't until it was all cleaned off that it was raw. It didn't look, it just looked black. (Nicole)

Grant's injury received less sympathy than a fellow colleague who had lost a limb in an earlier production injury at the workplace. The injury was far more visible than Grant's hand crush injury. Although Grant may have suffered as much if not more mental anguish as his colleague, he received less support from workmates due to the less visible nature of his injury. To outward appearances he still had a functioning hand. A hierarchy of injury appeared to be operating. The occupational nurse noted this and commented:

> Because the problem now arises that you look at the injury that (another worker) has got, he lost his right arm. And you look at the injury that Grants got and there's no sympathy there. They think you've still got your hand, you've still got your fingers. (Company OHN)

On other occasions workmates wanted to support their colleague but were not able to do so. In the case of Brian, this was to do with the shock of what of what had happened. Brian had been a valued and popular workmate at the workplace prior to his injury. His workmates could not cope with what had occurred and were uncomfortable with visiting him. His injury had visibly affected him. They could not reconcile the active and fit person who he had been with the person he was now. This led to guilt on their part as they felt they should be doing more to keep in touch with him. Guilt was expressed both collectively and individually. His co-worker commented on this:

> I've caught up with Brian, twice and... I've caught up with Elizabeth a few times. When they were living here, I used to arrange for guys to go and do the lawns and take care of the place while they were away. Brian spent

> most of time either in hospital... It was pretty hard seeing Elizabeth again, again a Kiwi bloke thing. I don't know whether its ah trying to ignore it or what it is. If a lot of the guys had went up to see I don't know how well [indistinguishable] would have handled it. I know a lot of the guys want to go and catch up with Brian, it's the, it's a stupid thing really. He's still Brian at the end of the day. He's just not as we remember, I think a lot of the guys want to remember him the way he was. (Brian's co-worker)

Finally, some workplaces were supportive of their colleagues. Julia's colleagues were a tight knit team and they did their best to support and keep in touch with her. Julia's manager encouraged her to come and visit them. Lisa, a cashier at a large insurance company, had the help and understanding of her colleagues. Her fellow workers had both knowledge and experience of her condition. They were also willing to help Lisa. One person in particular who was an OOS sufferer herself was, as the health and safety representative, able to offer assistance. With their help Lisa was able to reduce the tasks which affected her OOS and pass on extra work to them. This allowed her to both manage her condition and keep working.

Role of supervisor and employer

The role of the employer and the supervisor was important in both the injury event and what occurred afterwards in all cases where this role was present. The supervisor and employer's approach often impacted on the rehabilitation outcomes for the worker. The most successful outcomes for both the worker and workplace were when the employer took an active role with the employee and appropriate responsibility for what occurred. This meant keeping the injured worker in touch with the workplace, assisting with rehabilitation and re-entry to the workplace and accepting responsibility for change. Other employers blamed their worker and denied their accountability when an injury occurred.

The employers of Julia and Lisa endeavoured to play an active part in keeping in touch with the affected worker. This had varying degrees of success. Julia's manager at the bank encouraged her to keep in contact with her work colleagues and to come in regularly and meet them. Julia's manager commented:

> Yeah well cause I was you know at the very beginning I was ringing Julia a lot because she needed support. She had um this was her, she had been part of this team for so long. You had to remember to just keep ringing her to say hello because um. … Well yeah sometimes it's easy to forget about people when they leave, and usually anyone who leaves here goes to greener pastures in their eyes anyway. And it didn't work that way with Julia. So we used to all make sure we rang whenever we could, and she'd come down here and bring her little sandwiches and have a cup of tea. (Julia's manager)

The case was complicated for Julia's manager by the fact that it was a small town and she was a personal friend. She felt there was a conflict between being both a manager and Julia's friend. Julia's manager was supportive but unwilling to take full responsibility for what had occurred. The manager believed there were limits to the liability of the workplace and their role in injury prevention. Lisa's manager provided consistent support and advocacy for her during Lisa's problems with OOS and ACC. This went to the extent of becoming involved in Lisa's ACC review and treatment. The manager went with Lisa along to an ACC review hearing and spoke for Lisa. This was a successful intervention partly because of Lisa's manager's motivation to help in Lisa's recovery.

The support of the employer and the supervisor in the case of Grant and Lisa extended to an active role in the rehabilitation process. With Lisa her employer provided support, through managing work flows, allowing Lisa to work flexible times to allow for rehabilitation and changing her job tasks so they did not further aggravate her OOS. Grant's employers provided him with a structured rehabilitation programme to help him return to work. This included extra training for a new position away from the site, support and transport. This new position was in a different area of the company and involved work that would not damage his hand. The company also assumed responsibility for the accident despite OSH feeling blame also lay with Grant. The site manager remembered:

> ... the compliance manager sat down with Grant and explained well if that is the case then the company is definitely admitting liability and we would step and try protect you in that sort of situation. We would say it was our fault as opposed to your individual fault. Um which did some good… (Grant's site manager)

Conversely, there were employers who did not provide support for their workers. This took the form of not supporting the injured person or denying accountability. Occasionally both of these characteristics appeared in a case. Avoiding responsibility usually involved blaming the employee or non-work factors. Faced with an injury or illness an employee or their actions were held to be at fault. This could be seen in six workplaces (Murray, Barbara, John, Ian, Thomas, Martin). Employers felt for varying reasons that the illness was either not caused by the workplace or the workplace was not solely responsible. There were uncertainties around the diagnosis of such illnesses.

And with John's employer, once the worker was removed from the workplace the employer no longer took any interest in him. The employer displayed a lack of responsibility. This is in part explained by the fact that it was an expanding company. It had a large pool of workers to draw from and did not notice when they left. John described it in this way:

> I think its like most employees now, when you're working for them its fine and if you are putting the hours in and doing the work its all good, but as soon as you get sick and not productive well they just replace you. See you later, I think a lot its like that now days. Umm there's no loyalty, you put in all the effort and soon as you get sick it's 'bye bye'. (John)

Workplaces cited non-work factors for the occurrence of an injury or illness to a worker. John's employer (who was also a boat builder) similarly believed that John was doing extra work out of business hours. Further, he was doing this extra work at home in unsafe conditions and this was what had caused his solvent-induced neurotoxicity. Murray's employer thought that drug and alcohol use plus extra work at home contributed to his solvent-induced neurotoxicity. In the interview the employer said:

> [Employer] There is some talk that a, that an abundant use of home-grown New Zealand helped to the effect.
>
> [Interviewer] Ok.
>
> [Employer] Hearsay
>
> [Interviewer] Did you ever see any evidence of that at work?
>
> [Employer] Ahhh, not at work, but the people who know, how should I say, people who know the use of it, stated that it was used.

Ian's unit manager told Jenny that it was Ian's fault and he had been somewhere he should not have been. The company's initial attitude was to blame the employee for what had happened. This would later prove to be incorrect in Court. The company's occupational health nurse described what occurred:

> Yes she saw him [the unit manager], that would have been about half past ten at night from what I can gather. And he had come to the hospital and met her at the hospital and made the comment y'know, as far it was their, it wasn't our fault, Ian shouldn't have been there. Or words to that effect I mean. (Company OHN)

Peter's employer initially offered to help them and then stopped. Immediately after Peter's injury his employer offered to assist Nicole, his wife, with bills. This ended when it became apparent that a prosecution was going to occur and they were going to be found liable by the Court. Nicole remarked:

> Yeah, so they were quite supportive up until they found out they would be liable for the accident and it was not their doing it was Peter's. So things got rather hostile after that, yeah… Yeah, and after that we never heard from them again. Never heard from a single one of them... (Nicole)

Occasionally employers had to step in to mediate between an injured party and their workmates. Barbara was experiencing harassment from her workmates as a consequence of the involvement of OSH and the potential for prosecution. After the OSH inspector discovered what was occurring she informed Barbara's employer. Barbara's employer then stepped in and prevented this from continuing.

In Brian's case, the employer and the management team wanted to keep in touch with him but felt unable to. Like Brian's workmates, the management team were greatly affected by what had happened. Even though they felt great sympathy for what occurred they did not feel able to visit Brian. They found it impossible to reconcile how Brian was after his injury compared to the lively, active person he had been previously. Brian's workmate remarked:

> I mean everybody's been so much aware of what happened to Brian, it could so easily happen to them. The thing is that he was a mate and that's the hardest part. He did work for us and he did work for us for three or four years and you don't get rid of someone for three or four years and not have an emptiness that needs to be filled by someone. And yet Brian's, Brian we know will never be able to do what he used to do. (Brian's workmate)

Health and safety systems

The health and safety systems in some the workplaces in this study were, on occasion, shown to be deficient in key areas (Ian, Brian, Peter, Mark, Grant, Thomas). In these cases there was a successful OSH prosecution. In other cases, while there was no legal action, systems were improved in the wake of the illness or injury occurring. Even if these areas were minor they often had larger ripple effects for worker safety and the workplace. These deficiencies took the form of a lack of knowledge on both the part of the worker and the workplace; procedures and equipment were incomplete; health and safety systems were impractical and unworkable; policies and procedures were non-existent; and there was a failure in the supervisory role or the employer. For health and safety systems to function effectively there had to be both responsibility from the worker and the workplace. Where there were inadequacies in health and safety systems and workers within the workplace did not feel empowered to ask for change, this resulted in unfavourable outcomes.

A lack of knowledge of potential dangers in a workplace and industry were a notable problem in the study. Health and safety systems were set up without a full knowledge of possible dangers. Inadequacies in workplaces' health and safety systems only became apparent later. This was displayed in three cases (Murray, Paul, Julia). With Julia the lack of knowledge by the workplace of OOS contributed to a slow discovery and treatment of her condition. Initially, her condition went unrecognised. Health and safety systems concentrated on risks of robbery and physical hazards. Similarly with Barbara there was a lack of knowledge in the workplace of the potential effects of the chemicals used in the dying process and whether they might contribute to occupational asthma. When Paul began his career within the panel beating industry it did not have considerable knowledge of noise induced hearing loss. Workplaces because of this lack of knowledge did not enforce the wearing of protective equipment:

> But nothing was ever said. No, they never said anything, oh yeah. I can't remember what they said. There was no you must wear hearing muffs, hearing aids or hearing earmuffs or something like that. There is no education... it's frustrating where this all could have been prevented. Well you, you can't, yeah well I think a lot of it could have been prevented. (Paul)

In some cases the health and safety systems and procedures were not complete or not followed through. This included the availability of health and safety equipment. For Murray it was difficult to get hold of the safety equipment. Initially, he only had gloves to work with and an extractor fan. As part of his job he had to regularly deal with solvents. However, there was only one set of breathing apparatus, which was often being used by others in the company. In some cases the hazard identification missed a potential danger. In Grant's case the hazard identification procedure missed an incorrect procedure. The inspector here commented:

> So they failed to detect a number of things that weren't being done as they thought it should and of course you know it is a significant hazard that they have failed to control. They failed to observe it when the opportunity came up and they failed to control it. They controlled it immediately after. (OSH inspector)

The study showed that there was a difference between having written health and safety systems and them being applied. For Julia there were simply not enough spare moments in the working day to consult the health and safety manuals. Further the focus of their training was on robbery and physical hazards like cords. Systemic problems such as structuring tasks to avoid OOS were not addressed. Julia's manager believed it that it was the responsibility of the employees to look after their own safety, they were adults. Similarly for Mark, his employer ran health and safety seminars. However, practically due to the demands of their jobs and workplaces they could not attend them. This meant not all the information was communicated to those who needed it. In Brian's case, the company has made substantial changes to its health and safety systems. As the OSH inspector in the case noted it is one thing to have made the changes in writing, it is another to communicate these changes to the workers onsite and follow this up by auditing on a regular basis:

> … the case has probably reinforced a few things, people can have excellent systems in writing but unless they are actually carried out … . The systems maybe excellent in writing but on site, they certainly highlight the need for actual onsite audit. (OSH inspector)

Health and safety systems proved to be impractical or ineffective in protecting against potential injuries or exposures. Martin worked in a meat processing plant where the danger of leptospirosis from pigs was high. There were a variety of health and safety measures in place, such as face shields, the covering of cuts and regular hygiene checks. However, because of the nature of the meat processing industry these measures were often seen as impractical. In the opinion of the union the best preventative measure would be vaccination. As a result there were still infections and occupational illness.

With two of the study's participants, Peter and John, health and safety systems were either minimal or non-existent. In these cases employees did not feel empowered in their workplace to ask for changes to health and safety practices. At the same time they faced blame from their employer over their injuries. This was the case with the employer of Peter. Peter was a spray painter working on the inside of a large 40-foot boat. There was, however, a lack of basic procedures, systems and protections at his workplace. This included proper ventilation and extraction of fumes. This coupled with an inadequately protected light led to a severe injury. Previously the employees' requests for more equipment had been ignored. They were powerless to change the conditions that confronted them. The employer blamed Peter, believing he should have been more aware of what he was doing. Similarly John worked in an unsafe workplace where he was being regularly exposed to toxic chemicals. This led to him developing solvent-induced neurotoxicity. Notably, there was no ventilation, wearing of dust masks and no following through on health and safety systems. With his workmates he asked for health and safety equipment to be provided. This request went unanswered. The employer blamed John believing he was moonlighting after hours and doing extra work. The employer remarked:

> He used to build, do a lot of work outside work, for other people. And he had two months off at Christmas to go and work um, well he said he wanted a break, but he finished another boat for someone else. (John's manager)

Finally, there was no proper supervision by the workplace that health and safety systems were being adhered to. This was observed in three of the cases (Mark, Thomas, Julia). Employers stressed the personal responsibility of workers for their own health and safety in the workplace. A common statement was that they are adults and it is up to them to look after their own health and safety. In the case of Julia, her manager believed that it was up to the workers to manage their own health and safety issues. Julia's manager felt that she was not able to tell them to take preventative action, such as exercises and stretching, against OOS. Further, health and safety information was not immediately available. The worker had to actively go to check stored health and safety manuals for information. The manager commented on this issue by saying:

> That's how it started; a little pain, who knows maybe it was left too long before she physically went and did something. Maybe I should have written to her when she got told to take a week off by the doctor and made her take a week off. But you hope that adults are going to you know. You can't do everything for them. (Julia's manager)

OSH and the workplace

OSH has two roles: provision of information and education about the requirements of the Health and Safety in Employment Act, and good health and safety practices, and enforcement of legislation. Education comes through the provision of advice so that a workplace can comply with the Act. Compliance is achieved through workplace visits, compliance tools (e.g. prohibition notices) and when necessary, prosecution. When an injury occurs and an investigation is begun this will often and unsurprisingly produce tension between OSH and the workplace. This was illustrated in two of the fifteen case studies. It should be noted that the case studies were selected for the project because an injury occurred and required a response from OSH. As such they are not a representative sample of all interactions between workplaces and OSH. Even within the study, tension and conflict is not necessarily permanent and OSH is able to continue good working relationships with workplaces.

In three of the cases (Barbara, Peter, and Julia) there was a level of antagonism in the relationship between OSH and the workplace. The antagonism centred on whether the workplaces had taken the correct action on health and safety and whether the investigation process was fair. Peter's employer had a long history of dealings with OSH over aspects of health and safety in his business. There was a series of confrontations with inspectors over the role of OSH. The relationship deteriorated further when a prosecution was taken against the business. The management of the company where Barbara worked was similarly antagonistic once an investigation began. Members of the management team expressed doubt over the Barbara's occupational asthma and the amount that would have to be spent on improvements that they did not believe were necessary. This strained their relationship with OSH. Julia's manager had concerns that OSH was trying to find something wrong. They believed they were trying their best to implement change. Julia's manager commented:

> I felt that I was doing what I needed to do. And I felt that she wrote a letter back to me and more or less had to find something wrong which she did by saying I need to show them the exercises instead of just putting a poster up. Something about something in my first aid kid being expired which I found absolutely ridiculous, sticking plasters or something. (Julia's manager)

Communication with OSH was mentioned by workplaces in the study. Employers felt they did not hear from OSH frequently enough. However, from an OSH perspective the idea of the Health and Safety Employment Act is the self-empowerment of the employer. The employer and the workplace have a responsibility to report to OSH in particular instances, such as when a serious harm injury or illness occurs. This lack of communication was a common perception amongst employers. Mark's manager was disappointed by the lack of communication from OSH. Of further concern to him was the lack of response from OSH over the health and safety improvements they made in their workplace. He commented:

> They were very thorough investigations, um, where I was disappointed, was we reacted instantly to improve and everything we did we forwarded to OSH for comment and any recommendations and never heard a word back. So um I don't know why, but we still haven't, so umm, so yeah I don't know why that is and uhh I thought they were to help companies improve, but it didn't appear, I had the impression, they just wanted a prosecution. (Mark's manager)

ACC

When an injury or illness occurred, the workplace and specifically employers dealt with ACC. Although most employers were generally positive about their contact, there were some who commented on difficulties they had communicating with ACC. Employers found it hard to access information on the affected employee and how the employee's situation affected the workplace.

The employers of Julia and Murray mentioned communication difficulties with ACC. Murray's employers were concerned both with his prognosis and possible impacts on the company's ACC levies. Murray's manager had to continually ring ACC to get any information on what was occurring. Julia's employers experienced the same sort of frustration. Julia's case took a long time to resolve. The harmful effect on Julia of struggling with ACC had a large emotional impact on her manager also. The manager herself spoke to several case mangers. The manager commented:

> You wanted to make it better and rub it and it would all be better but it never worked that way and um. I have been with her right through her first dealings with ACC and I've actually rung them on her behalf many a time because she would be in tears and they upset me a hell of a lot more than [Julia]'s injury, because of the way they dicked her around. Absolutely atrocious. And I think, I've heard from a lot of people they just dick you around until you say forget it and that's one case you don't have to deal with. They send you to so many people and aw I don't know. (Julia's manager)

The lack of communication and onus upon the injured party or workplace to contact ACC was noted in the case of Sarah. No claim form was seen until one month after her injury.

Improvement in ACC's performance was remarked on by the health and safety representative at Thomas' workplace. Important to the company was having an ACC employee dedicated to their case. The health and safety representative commented on this by saying:

> Um, they can be, can be strange sometimes, um generally they're pretty good. They have certainly got a lot better since they put account managers back in, we work with an account manager... and um I have his, sort of, I presume, everybody has, direct dial him or e-mail him and everything. (H&S representative)

Economic Costs

Economic costs to the workplace centred on a variety of factors. Among these were legal costs resulting from fines and prosecutions (including preparing for cases), lost production and morale in the workplace, extra health and safety compliance work, damage to plant and equipment, public odium and staff costs. Staff costs were made up of hiring and training new staff, paying out redundancy and over-employment (creating a new job while the worker recovered).

An injury or illness event caused costs for the workplaces involved. These included obvious expenses such as repairing damage to the work environment and fines if there was a prosecution against the company. There were other less apparent and intangible costs such as damage to workplace morale and loss of good name.

A considerable cost for workplaces in the study was where a successful prosecution occurred or a fine was imposed. This can be seen in six (Mark, Grant, Brian, Peter, Ian, Thomas) of the cases. This had three facets: the direct monetary cost of a court fine, indirect costs from preparing for a court case, and the potential damage to the public name of the company. For example in the case of Ian, the company was fined $35,000. This was a decision that was reported in the media and exposed the company to potential public odium. Similarly in the case of Brian, the company paid $20,000 and was also exposed in the media. Beside the cost of a fine there were the legal costs for the defence, which were more than the fine. For Mark's employer the fine under the HSE Act was $8,500. The lawyers' costs for the injury were $45,000, a total of $53,500. A further unseen cost was the time spent preparing for Court action by the staff.

One workplace made extra efforts to provide compensation when an injury occurred. Some sort of extra reparation above what they were obliged to give was provided. This required companies to take responsibility for what had occurred. After Brian's injury, the company provided an extra payment of $20,000 to Elizabeth.

Often following from an injury or illness and even more so from a prosecution, the workplace was forced to upgrade its health and safety systems and do compliance work. Changes comprised both cost and effort. This was noticeable in two of the workplaces (Ian, Brian). For Brian's employers, they had to institute considerable changes in their workplaces. This included a new health and safety

programme after the injury , costing $3,000. A fall arrest system was introduced costing $20,511. Ian's employers had to institute a number of expensive changes. This included establishing a new manager and a health and safety team of seven. Further, they implemented a new health and safety system across their plant and changes to their plant.

A more noticeable cost was the damage to plant and equipment that was incurred with some of the injuries. For Peter's employer who was a boat-builder there was the impact of a fire in his plant and the extensive damage to a vessel. These were all considerable impacts in an industry that runs on tight deadlines. Correspondingly, Sarah had to replace an essential piece of equipment for her farm, her ATV. This was at a cost of $500.

When a worker is removed through injury from the workplace, the workplace has to face the cost of not only replacing them but also paying them if they return. This can have a great impact on small businesses and the self-employed in particular. Sarah was in both those categories. When injured she was faced with hiring additional casual staff ($2240) and employing an additional worker ($8000) during her recovery period. Such costs put business viability at risk. Similarly, Paul was forced by his tinnitus to move off the shop floor of his panel beating business. To replace him there had had to be new staff hired, a cost of $60,000. Because of these costs he had to spend extra time to find further work to pay these new expenses. Eventually his tinnitus forced him from panel beating and he lost the time he had invested. As a result he had to spend time and money to establish a new business.

The cost of replacing workers impacts on larger firms in terms of replacing expertise, experience and the stress of finding a new staff member. Julia's employer, a New Zealand-wide financial institution, was faced with replacing a long-term staff member. They were forced to cover six months wages, three months medical retirement and $1500.00 for advertising with a personnel agency for a new worker. Personnel replacement costs are brought into stark relief with highly technical positions. For Philip, a doctor, a considerable amount of money was spent on training him over a long period of time. A loss of potential was incurred as well. There was also the possibility for him to progress further becoming a surgeon in the future.

Occasionally, a worker had to be incorporated back into the workplace in a new position and the old position had to be filled as well. Barbara was forced, because of her occupational asthma, to move from her position as a dyer. Her previous job became part-time and casual, and another person had to be found to fill the vacancy. This caused considerable stress for a small company that was under pressure financially. Grant, as part of his rehabilitation, was given a new job away from the area where his injury occurred. This meant giving him new, more technical training for his new job and covering his absence elsewhere. Similarly, Thomas could not return very quickly to his previous position because of the need to rehabilitate his hand. There was a cost of over-employment. In the words of the site manager of the company he worked for:

> … well we probably had to create a bit of a job for him, when he came back. Because he couldn't get out there stacking timber and so really we were obliged to stand by. (Thomas' manager)

Workplace injuries had intangible costs in the workplace as well such as a drop in morale and consequent decreased production. While not being able to be costed they were observable. This was apparent in two of the cases (Mark, Thomas). Mark's employer noticed a drop in morale and productivity after his injury:

> There was a cost in morale, the party leader lost [confidence] as part of that crew, I suppose that was because that was first serious accident he had been involved with personally and he saw the danger in the type of work they were doing. So there was a drop in morale there, which of course affects productivity. (Mark's manager)

Similarly, in discussing Thomas' injury the health and safety supervisor remarked in relation to morale effects:

> Long term I don't think so, short term they were, um y'know, that day and for probably the week after. Because it was the way it happened it was quite dramatic or whatever you look for. There was three fingers went flying all round the shed sort of thing. Like one guy was standing there watching, saw it happen, another

guy had his back to him and was reaching up to get a bottle or drink on the shelf or something and a finger came flying over and plop on the floor in front of him sort of thing. (H&S representative)

Finally there were more general long-term consequences for the companies when injuries or illnesses occurred. There were concomitant increases in their insurance or workplace insurance premiums. This was mentioned in one case, that of Murray. Murray's manager remarked:

> Aw yeah, yeah, it was stressed times, are we responsible, what's the problem y'know? So you go through all that process, ok. What effect is it going to have on our ACC levies? Because this is a long-term 12 years off, well that's the other next thing. Is it going to ever be resolved? That's another thing y'know? (Murray's manager)

Name of Participant	Dollar Cost to the Workplace
Barbara	200.00
Murray	Undocumented
Mark	89,699.62
Paul	60,000.00
Grant	24,822.74
Brian	54,761.18
Peter	23,130.85
John	Undocumented
Thomas	90,000.00
Sarah	10,740.00
Julia	8,257.00
Ian	109,402.05
Lisa	3,905.00
Philip	Undocumented
Martin	2,912.34
TOTAL	**477,830.78**

The total documented costs to the fifteen workplaces in the study was $477,830.78 plus six months, two days, and 12 hours of company time. This did not included undocumented costs which would be considerably greater.

Conclusion

When an injury occurred its effects were not felt just by the injured person and their family but by their colleagues and employers as well. The best outcomes for the workplace and the worker were when they co-operated and acknowledged each other's responsibilities. Critical to this was workplace actors understanding their roles and their place in the employment relationship. The active involvement of workers, supervisors and employers in supporting their colleague produced the best result. Other groups such as unions were important in mediating between workers and employers and in providing advocacy for the affected person.

Injuries and illnesses resulted not just from the lack of health and safety systems. In the study they also occurred because systems were not enforced or followed through. Further, when written systems did exist, they on occasion proved to be impractical in everyday work practice. Health and safety systems were constrained by the lack of knowledge on the part of both the employee and the employer. System errors only became apparent later after an injury or illness had occurred.

In all of the cases there were costs to the workplace. These centred on such items as prosecutions, replacing workers and improving systems. The small to medium was in particular extremely vulnerable to these costs. Unexpected injuries or illnesses were a threat to these businesses' continued viability.

MEDICAL

'When you come to a patient's house, you should ask him what sort of pains he has, what caused them, how many days he has been ill, whether the bowels are working and what sort of food he eats.' So says Hippocrates in his work 'Affections'. I may venture to add one more question: what occupation does he follow? [60]

Background

A number of issues relating to medical treatment, and the medical system as a whole, were raised by the participants. Specifically, these related to communication, the diagnosis of occupational injury and the provision of treatment.

The study found that the occupationally injured had more opportunity and ease of gaining entitlement because the injury is generally obvious and its cause less open to dispute. The onus of proof for occupational illness is generally more difficult. There is rarely a specific event as the illness occurs over a period of time and establishing a relationship between exposure and symptoms is difficult particularly when other non-work related conditions can have the same symptoms. Results are frequently inconclusive.

Treatment providers have different roles to play in treatment; recovery and rehabilitation of occupational injuries or illnesses and a holistic team approach is desirable. However, effective and appropriate communication between treatment providers is often insufficient and this has implications in the recovery of the injured or ill person.

Many of the health professionals in the cases studied did not have training or expertise on the impact that work exposures can have on health and were not always aware of occupational conditions, diagnostic criteria, or treatments for occupational disease. In most of the cases early intervention could have prevented or halted the process of occupational injury or illness and most certainly reduced suffering.

Most participants commented positively about their treatment experience in relation to communications with the medical fraternity, although there was sometimes conflict within the same cases about this. Communication and provider/recipient relationships were enhanced when providers were able to relate to their patients if they happened to share the same or similar health experience.

The ACC contributes to public health costs of injured employees through bulk payments to the government. Therefore, the medical community does not incur any direct costs, Treatment providers (GPs, physiotherapists, etc) are part paid by ACC with a co-payment by the injured person. The treatment provider meets costs of administration. Please refer to "Methodology: calculating economic costs" for further explanation.

Emergency treatment

First Aid and Emergency Transport

First aid at the scene of the injury or illness occurred in a number of cases, and varied greatly in quality. For Thomas, the presence of a workmate who had received first aid training through the fire service was of major importance. He kept Thomas' arm raised and a tourniquet was put on his wrist to control the bleeding. He also knew how to transport Thomas' fingers correctly to the hospital, maintaining them in a condition that allowed one of them to be replaced:

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[60] B Ramazzini (1713). De Moribus Artificum Diatriba (Diseases of Workers). Translation by W.C Wright, Chicago, 1983.

> And they say the only reason why he's got the fingers [he has is] because there was a guy there that knew what to do... because he's had some training [with the fire service] in first aid. (Karen)

In Grant's case, his arm was put in a sling to control bleeding, but there was not much more that could have been done. Peter suffered from a lack of adequate first aid procedures. The only first aid treatment available to cool the burns was a fire hose, which was some distance away, and was very cold and hard:

> So we walked over there and she got the fire hose, it was freezing, hard freezing water. (Peter)

Six participants required emergency transport. For most, this was an ambulance. In Sarah's case, the ambulance that arrived on the scene called in a rescue helicopter, because of the nature of her injuries and the remote location. In three cases, Peter, Grant and Thomas, shock among colleagues at the scene resulted in delays in an ambulance being called (Thomas), or the injured individual themselves either requesting that one be called (Grant), or calling it themselves (Peter). In Ian's case, the shift electrician, who noticed Ian after he had dragged himself clear of the machinery, called an ambulance. While there was a delay in an ambulance being called, there was no agreement as to how long this delay was:

> He said, 'I don't know how long I was there'... I mean I know when you are injured it seems like a long, long time, but he could have been there a good half-hour before [he was found]. And he had been shouting as well, prior to that. (Company OHN)

The company has full-time occupational health nurses on site but they were not involved in any emergency treatment as the injury happened outside their working hours of 8-4.30pm. The operator of the plant where Ian was crushed knew nothing of the injury until he came out from 'smoko' and saw the ambulance. There was no pain relief or oxygen available and the first aid facilities were inadequate according to Ian's wife.

Emergency Treatment

Participants were largely satisfied with the emergency treatment they received. Reassurance and clear explanations of injuries and treatment from medical staff greatly contributed to lessening the shock of the injury . Peter stated he was scared during his emergency treatment as he did not know what was going on even though he was coherent.

Two participants, Brian and Thomas, had to be transferred to larger hospitals. For Thomas, the transfer went smoothly, although his partner was left behind and had to join him at a later stage. Brian was to be transferred to another city hospital within the hour but this was delayed, firstly due to pressure on his brain which required surgery and secondly because the emergency plane was full. When they arrived at the city hospital the emergency treatment for Brian and support for Elizabeth was excellent. There was even a psychologist present in the early stages. Brian remained in the city hospital for two weeks before being sent back to the intensive care unit at the local hospital.

> …And [the hospital] just gave up and sent him back to intensive care here. (Elizabeth)

Diagnoses

All of the occupational illness cases experienced delays in getting a diagnosis for a variety of reasons. Whilst those with occupational illness were often diagnosed late or inaccurately, there were also cases of incorrect and late diagnoses of physical injuries which impacted on recovery time.

Injuries

Brian's wife and caregiver, Elizabeth (who had previous experience as a nurse) was very critical of the city hospital where Brian received his first two weeks care following his injury and of the local hospital which he was sent back to. She stated that the city hospital sent him back to the local hospital after completing surgery without replacing a bone in his skull and that the doctors were very 'cavalier' in their attitude:

> ...he'd had part of his brain removed and skull in [city hospital]. And they'd just closed the skin over the flap and they had the skull bone in [the] freezer and because [they] gave up they didn't bother to replace it, they just sent him back to [local hospital]. (Elizabeth)

When he got back to the local hospital Elizabeth said they would not listen to her concerns about the swelling in his head following the surgery, which resulted in Brian having a massive seizure lasting two and a half hours:

> He was blue and it was a horrible way to die. That's all I could think of, what a horrible way to die. His body was lifting off the bed, convulsions. (Elizabeth)

Sarah experienced a 'double misdiagnosis'. She was initially informed that she had a fractured wrist. While this was being set, Sarah required oxygen as she experienced intense pain every time her finger was knocked or touched during the process. The specialist saw her the next day and a repeat x-ray was organised. This showed a fractured finger, not wrist. There was no explanation provided from staff about the misdiagnosis, which led to increase in suffering and possibly delayed recovery. Sarah continued to be in a lot of pain the month following her discharge from hospital so went back two weeks earlier than her scheduled follow-up appointment. The orthopaedic clinic told her that they could not do anything so she decided to go to the emergency department, to which the orthopaedic clinic staff responded that she would be unlikely to get help there. Sarah said they were 'totally uninterested'. However, she was seen within ten minutes at the emergency department and told she had a chipped bone in her thumb and given more pain relief. Sarah had not realised until this point that the bone in her thumb was chipped. She was told that her recovery time would be eight to ten weeks but in fact it was considerably longer than this.

Gradual Process and Illness

For gradual process injuries, diagnosis was more complex, and had a range of compensation implications. The problematic nature of occupational illness as opposed to workplace injury is that there is often debate about the diagnoses and whether or not an illness arose from exposure at work. This is particularly apparent where enforcement or compensation issues are involved. Participants found that a workplace injury is generally less likely to result in this conflict as there is usually a visible injury and a particular event that resulted in that injury. This debate can result in ongoing distress for both the affected person and their families, the workplace and the health care providers who are frequently the ones required to make the judgement. This can result in considerable conflicts of interest.

Lisa sought treatment (massage therapy) on her own initiative prior to seeing a doctor or telling anyone at work about her condition. Because the symptoms progressed she went to see her doctor. The doctor diagnosed medial epicondylitis, made an ACC claim and advised that physiotherapy might be helpful. Lisa did not go for the physiotherapy treatment as her doctor told her that she would have to pay until her claim was accepted. Lisa also felt that the doctor had only suggested physiotherapy and not considered it a treatment requirement. She continued her massage treatment in her own time and at her own costs. Her condition got progressively worse and five months after first noticing symptoms she went to another doctor for a second opinion. While the second doctor's diagnosis was the same as the first doctor, this doctor insisted that Lisa have physiotherapy as a priority. Both doctors knew the work that Lisa did and made an association between her symptoms and her work. After another two months Lisa found out that her ACC claim was not accepted and she had to pay back the treatment costs. The case went to a review and another three months passed before the claim was accepted.

Julia initially ignored her symptoms of neck pain and discomfort. Her co-workers encouraged her to go and see a doctor but it was another month before she did this. The doctor ordered x-rays and diagnosed a mild lip on her disc. The doctor also advised her to take a week off and referred her to physiotherapy. She did neither but waited for a specialist referral. Her symptoms got progressively worse and her manager and co-workers suggested she needed to go to physiotherapy. Nearly six

months after her original symptoms developed Julia went on a week's sick leave and at the end of that week went to the physiotherapist.

Like Julia, the delay in diagnosis in Paul's case may have contributed to a worsening of his condition. Despite his hearing going gradually down hill, there was no diagnosis made of hearing loss and therefore, he was not given timely advise to wear hearing protection or provided with further assessment.

In Barbara's case too, there was a considerable delay in establishing an occupational link with her illness. Barbara was ill for twelve months before she was finally admitted to hospital and a diagnosis of occupational asthma made. She initially went to a doctor who prescribed medication and gave her three days off work.

Martin spent a week in hospital not having a definitive diagnosis. Although it was recognised that he was experiencing kidney failure it was not known what was causing this. He was seen by many doctors in an effort to determine a diagnosis. Several specialists asked the same questions.

> I think I had a visit from every doctor in the place. Every head doctor in the place come through. And no-one knew what was going on and they had to put a drip in me. They put in about seven or eight litres or something like that. It wasn't just dripping in, it was just about running in, it kept going... See they didn't know, none of them knew. The whole lot came through. About every department's chief, I reckon I met that day, they come in, all giving their diagnosis. No-one seemed, no-one knew... So then I don't know they just, that day I think I went everywhere, they had me everywhere, they had tubes everywhere. They had to put a tube in me neck here and they were everywhere, things on my fingers. (Martin)

All they could do was to treat him with high doses of antibiotics, as they knew he had a severe infection but not its cause. The diagnosis of leptospirosis was not confirmed until after his discharge from hospital.

John and Murray both experienced considerable delays and difficulties in the diagnosis of their condition. Murray was eventually diagnosed with solvent-induced neurotoxicity after experiencing a range of signs and symptoms for up to eighteen months. His personality changes were gradual and hard to pick up and, of course, there was no visible injury. The occupational health nurse that the company engaged expressed concerns, but Murray recalled that she was reluctant to contact OSH and advised Murray to ask his boss to do so:

> But she said there was a problem with my respiratory side of things and she says 'you should get your workshop checked out, just have a yarn to your boss about getting him to call OSH in. And if he fails to do that, you call him in yourself'. I did not want to cause a thing like that so I did not worry about it. (Murray)

When Murray did go to the doctor, the doctor was not helpful and said there was nothing much that could be done, but suggested it be recorded on his file. An OSH doctor who saw Murray put him off work immediately but his GP whom he saw again on the OSH doctor's advice was, in Murray's view, unable and unwilling to deal with the case. The concern is the implications both for Murray's level of care and for other patients that might follow with the same problem.

> I went to see my GP and my GP goes 'I don't want to know about it'. I went 'you're kidding? You're joking?' I mean I had sort of gone in there with different sorts of things from time to time and he'd been alright. [GP said] 'I don't want to know about this'. (Murray)

There was no dispute about the diagnosis, however as the ACC and OSH doctors both recognised the diagnostic criteria and came up with the same diagnosis.

John was unable to sleep and experienced headaches and mood swings for two years without being diagnosed despite numerous tests. He felt that his GP had insufficient experience with the illness to make a diagnosis and assumed it was depression, prescribing Prozac:

> Virtually, that's what they, here's some Prozac or something…And that wouldn't have helped him. We felt he needed, there was more to it than that. You sort of wonder how many, because it's not a well known thing,

> how many people are getting diagnosed getting incorrectly because of this. It could have, it's something they have got to just, it's a time factor. (John's mother)

Finally, John and his parents read an article about Derek whom he had previously worked with. The article explained how Derek had been diagnosed with solvent-induced neurotoxicity due to exposure to chemicals in the boat building industry. John then contacted the occupational health nurse who featured in the article for assistance, as he believed he had now found the cause of his condition. Once his doctor was informed, she was able to be much more helpful in dealing with his condition. OSH completed a full assessment and John was referred urgently for formal neuro-psychological testing.

For Philip, difficulties in diagnosis were compounded by his close involvement with the hospital system. When he reached crisis point and phoned the psychiatric registrar, they were unwilling to deal with the situation:

> I rang up the psychiatry registrar on call and burst out crying and said 'I'm a doctor I need help'. He didn't know what to do. It was the worst thing, he said 'I think you've got the wrong person, you're going to have to ring [someone else]', he actually did brush me off. I was a colleague who rang up another colleague and said 'I'm a house officer... I understand you're the psych, I don't think I'm coping, I need some help'. And I started crying ... And then he actually said, I could hear whispering to another, there's some medical student who's losing it or something. Then they are trying to get rid of me, because that was more work for them...this is every psychiatrist's worst nightmare is a doctor going bonkers. (Philip)

He accepted this rejection of assistance as he was aware of their workload. He was referred to the staff occupational safety and health clinic. He went to see the company occupational health nurse where he completely broke down. He recalled that the nurse responded well to the situation despite the fact that he could tell that she was unsure how to deal with the situation. She listened and came up with a plan, which was to get Philip seen by the occupational health physician. The occupational health physician arranged for Philip to take two weeks off and Philip immediately felt relief that someone understood and would take control of the situation. One of Philip's biggest fears was having to go back to the work situation and tell them himself that he was not coping but the doctor relieved him of that responsibility and assured him he would take care of everything. Philip described the occupational health physician as very understanding and aware of the issues.

Treatment

Of the fifteen cases nine were admitted to hospital (Grant, Mark, Brian, Barbara, Peter, Sarah, Ian, Thomas, Martin). Of these nine, the longest stay in hospital was over twelve months (Brian) and the shortest was just one day (Mark). Six of the hospital stays were less than a month (Grant, Mark, Barbara, Sarah, Thomas, Martin). Two participants had transfers to different hospitals, one person to three hospitals (Brian), and a second person to two (Thomas). Two participants left hospital early, one (Peter) because they were sick of being in hospital after eight weeks and the other (Thomas) because they were concerned about what was happening at home. In both cases recovery was likely to have been delayed. Some participants felt they were discharged with little or no support and unable to cope (Mark, Sarah).

Mark felt frustrated that he had only spent one night in hospital before being discharged without any check-up in relation to his living arrangements and whether he would be able to cope:

> But it was frustrating to be released from hospital. I could barely got to the toilet by myself. I could not get dressed by myself. I was in intense pain, [the first week] was the shocker. And the drugs I was taking, the codeine-phosphate stuff, while I would recommend it. But you know it was a shocker. They just assumed that the woman taking him [will look after him], he'll be ok, we don't have to worry about him now. (Mark)

The hospital he was treated at took a different approach to that which another nearby hospital practised. The hospital he was in used a natural healing method, putting the arm in plaster, whist the second hospital treated the same fracture by gluing and screwing it. Mark described the first plaster he had as 'pretty dodgy'. He described the physiotherapy treatment the same way stating he was

prepared to travel to go to a physiotherapist whom he had been to previously. There were delays in his follow-up treatment and he was unable to start physiotherapy due to pain levels. He had months of physiotherapy and monthly x-rays and dealings with two hospitals resulted in conflicting proposals regarding treatment and rehabilitation. He found it difficult to sleep both at the hospital and once he got home due to his injuries and the pain. He was prescribed sleeping tablets but as with other cases in this study, was reluctant to take them. Mark criticised his doctor for not clearing him for work for ten months when he felt ready to go back to work two months prior to this.

Sarah also felt unsure of her ability to cope upon her release. She spent two days in hospital just before Christmas. When she was discharged the only thing she could do by herself was to go to the toilet and only if she had a skirt on. She could not do anything else for herself. She could only just walk. Both her hands were in plaster and she only had the use of two fingers on her right hand:

> So both in plaster I could use two fingers. That's how I managed to go to the toilet, using two fingers on my right hand. And they basically I said that's it, right you can go home. (Sarah)

As in Mark's case, no-one checked with Sarah to see if she would be able to manage or not but the hospital wanted her out and she wanted to get home. She was confident that the family would help. The specialist told her it would be an eight-to-ten week recovery period but in fact it was closer to thirteen weeks before Sarah started to feel she was improving.

Grant was very pleased with his treatment. He had two weeks in hospital initially and a further week when he had a skin graft done. While in hospital he had regular visits from his co-workers, the company occupational health nurse and an occupational therapist. He began intensive physiotherapy during his hospital stay and continued this once discharged. He had to have his dressings changed daily and a clinic nurse went to his house to do this. He could not do much for himself when he was discharged. Grant suffered from flashbacks from the injury and was seen by a psychologist to deal with this. His co-workers also had EAP counselling through work.

Thomas spent six days in hospital following an eight-hour operation. His wife arrived after the operation:

> It was really scary, I went up to recovery to get him, he was really, really swollen and at one part I got really scared but because I was in elevator and we were coming down, and he moved and he sort of fought but that was just cos he was coming out of anaesthetic and I got really scared at that stage and I didn't really go near him. I pushed a button, I got out and I walked y'know? I didn't want to. (Karen)

Thomas also felt that his treatment was excellent. He was offered counselling but felt uncomfortable with the thought of this and did not take the offer up despite feeling that perhaps it would have done him good. On his discharge the city hospital sent information to the local hospital and he had good follow-up and intensive physiotherapy. In the first month it was every day, in the second month every week, and gradually less until he became responsible for completing the exercises at home himself. During follow-up assessment by the orthopaedic surgeon it was decided that Thomas required more surgery to straighten his fingers. Thomas discharged himself early from hospital three days after this surgery, as relationship problems with his wife were developing and he wanted to get home to sort things out. Generally, Thomas and his wife felt they were well informed about the treatment and although they did not really have a lot of say in it they were more than happy about it. The communication between the two hospitals after Thomas' second operation was inadequate and this resulted in his ongoing physiotherapy being delayed. He received no physiotherapy for some time and his hand started to seize up.

> Even the physio and stuff [name] were excellent. I did find when I came down here that [place] sort of lagged a bit behind it. Like while I was waiting around and um it was a bit frustrating and even, mainly the second time I came back down. Umm I was supposed to have physio done on my hand and nobody contacted me for a month after or a couple of weeks after and [partner] actually rang them up, and said 'Look, he's just been up to [place] aren't you supposed to be doing some sort of physio or stuff'. 'Awww yeah we'll get that sorted out'. And by the time I got in to get some physio sort of done, my hand had stiffened up and probably lost a lot of valuable time because of it. [place] was excellent, but I mean, just the shortfall, lack of communication or

> whatever between two hospitals, I'm not sure what it was. I felt it could have been improved, I think it was probably more [place] I think. Just not up with the play or something. (Thomas)

This had long-term implications for his recovery.

Peter spent eight weeks in the burns unit at the city hospital. His wife who had nursing experience was upset that staff was not keeping either him or her informed. This changed once she had spoken to them about it:

> I accused them of not doing it at one stage, I think I was actually getting a bit stressed and upset myself because I, because I was used to being involved in what was happening in a hospital. And this time I am an outsider and it's my partner that it's been done to. But after I talked to them about how I was feeling about that they were really good. They brought me in on doing the dressings and helping lift him and all those kind of things which made me feel better because I wasn't just an observer. Yeah, yeah they were really good to me, they were good to Peter too, yeah. (Nicole)

He described the pain during the dressings, which occurred every two to three days as excruciating. Staff initially tried giving him ventonox (laughing gas) during the dressing changes, which was not satisfactory. They then tried oral morphine and when that did not work, IV morphine. Finally, he was put under general anaesthetic to complete the dressings. His wife found it awful to witness his pain. He believed the staff needed to improve their techniques as the procedure was very drawn out and the painkillers produced undesirable side effects, which were not managed well by staff. Peter still required morphine tablets after he was discharged but he did not like taking these due to the side effects and took codeine instead. Peter had counselling from a hospital counsellor but he felt this was not helpful. His wife commented that the counselling was ineffective and superficial and perhaps not the appropriate method for the circumstances. She herself was offered counselling by the hospital staff but felt that it was not offered in a way that she felt comfortable taking up. Instead, she found her own counsellor and found this very beneficial.

Following his discharge, Peter had been having nightmares and had problems sleeping so his doctor referred him for post-traumatic stress counselling. He went once a week for six to twelve months and found it good although he stated that they always seemed to run out of time. The nurses and physiotherapists were aware that vitamin E was a good treatment option for healing but it was out of their power to provide it as there was no ACC cover for it. His wife expressed that Peter found the hospital care was very good. Like Thomas, Peter discharged himself early from the hospital, which probably delayed his physical healing, but both he and his wife felt that from an emotional and psychological point of view he had to leave. They saw his early discharge as a trade-off between physical and mental wellbeing. Peter also had physiotherapy while in hospital and this continued after his discharge. He commented that the physiotherapy was gradually getting his strength back. He also had to return to the hospital to have his dressings done. He continued to see many health professionals following his discharge including physiotherapists, the burn specialist, occupational therapists, counsellors and his own doctor.

Brian had one of the longest stays on record in a hospital. There were a number of examples of staff going the extra mile. On his discharge from the specialised spinal unit a nurse went around for three to four days to make sure everything was alright. Once at home Brian's wife felt isolated with no support. Sometime after his discharge home Brian was taken to the emergency department as he had pulled out his nasogastric tube. The staff were at a loss as to what to do and unable to cope with the situation:

> Took him up to A&E, and they said we don't know what to do. And I said, for God's sake, you're a hospital...but the next time Brian ripped it out... I worked out that he had done it say one o'clock in the morning and we were still there at half past eleven in the morning. And they said it will be another couple of hours yet. And I said, right, give me a room and I'll do it myself... and I did it and they said, can you show us? (Elizabeth)

Elizabeth was happy with some aspects of follow-up care such as having rails put into the house but not with others such as not having any physiotherapy over Easter.

Ian had one month in the intensive care unit before he died of complications from his massive internal injuries. His wife Jenny expressed a huge amount of gratitude to the nursing staff in relation to his care although there were situations during his admission that she was not happy with. One of Jenny's frustrations was that she knew that Ian was in pain but the staff did not believe her. She believed that his pain was not managed well. During Ian's stay in hospital the company occupational health nurse became the intermediary between the workplace and his family. She was very involved in his case, offering support care. Jenny relied heavily on her for this. The health and safety inspector commented that she would be one of the best occupational health nurses around.

> Every day I was there, and, um I mean Jenny and I cried every time he took one step back and then one step forward again. (Company OHN)

Ian had a cyst growing in an artery in his back, which had been diagnosed and was being treated. It was not realised how serious it was and Jenny states that 'this is what killed him in the end':

> Even then the doctors thought he would survive, everybody thought he would survive. And it was the smallest thing that killed him off. He had a cyst in his back, that no-one, they were treating it, but they didn't realise how bad it was. It was growing in the arteries and they were very good. The hospital was good, they allowed us to be there when he died and they did everything to save him and they were very discrete. Because, he, I mean he just bled and bled and bled. And we saw the covers when he died, the covers got more bloodied. Very discreet, very nice, it was good and it gave us closure. … But overall if Ian had died in the first week it would have actually been easier. (Jenny)

For Murray and John, treatment was more frustrating, owing to the nature of the illness. Murray became frustrated, as he received no treatment for his condition even following his case being accepted by ACC. He saw the neuropsychologist and felt he was left to his own devices. In both cases, the main treatment once the condition was diagnosed was the elimination of exposure.

Barbara gave very positive feedback about her treatment, saying the hospital was a major help with advice and management of her asthma. She was, however, not similarly impressed with the ACC as in her view, they 'hounded' her for medical information. Her GP later reviewed and changed her medication, which made her feel better.

Lisa had an assessment and modifications to her workstation as well as alternative duties and flexible work hours as part of the treatment interventions. She also had physiotherapy treatment, which included acupuncture, five months after the onset of her symptoms. She was not prescribed any other treatment and did not see a specialist. The physiotherapist provided written information for Lisa who took a very positive role in her treatment. Lisa put a lot of effort into the exercises the physiotherapist gave her, followed all the advice and was very motivated to get well, although she commented that she wished she had begun physiotherapy earlier. Once she had improved she stopped doing the exercises and her symptoms returned which made her realise she would have to always take precautions.

Julia had delayed her treatment for six months after the onset of her symptoms. Following her first physiotherapy treatment the pain was worse and she was unable to sleep that night and unable to function the next day. She commented that she thought the treatment had been inappropriate:

> One bad thing he did was he pulled my head back. He was trying to open the disc up. And I found out from [specialist] later that no way you let anyone when you have got a disc out. And he also, he did some other manipulations. Well the next day I was getting, I got out of bed and I couldn't move. I was awake that night, but the next day I was just a cot case. (Julia)

Despite this result Julia continued to have regular physiotherapy treatment with the same therapist. Her doctor prescribed anti-inflammatories, which she took for six weeks, sleeping tablets, which she could only take for two days before discontinuing and pain relief. She did not find relief from any of what was prescribed but also admitted that she was not a person to take prescription medicines. She reported that she had faith and confidence in her specialist particularly as he was able to determine a correct diagnosis before seeing the x-rays and informed her that it would be an eighteen month

recovery period. She was not so impressed with other specialists and described the ACC specialist as hopeless. Her greatest criticism was that she was continually forced to consult with so many different specialists and they each had different views, which went against her in relation to her ACC claim.

Philip took two weeks off from work but after the first week he became anxious and worried that he had done the wrong thing. He went back to work, which was very difficult for him as everyone was looking at him and wondering about what had happened to him. A lot of rumours had circulated about the incident that resulted in his eventual breakdown.

Communication and perceptions of treatment

Injured or ill individuals received both positive and negative comments from their treatment providers. What the health provider stated and what the patient or significant other perceived often differed, resulting in misunderstandings and misinterpretations. In some cases there was a perception that something needed to be done immediately or sooner than it was, which is a common response when pain is experienced. It may have been felt that not enough was happening quickly enough.

Four of the participants had contacts in the medical arena. Two of the participants were married to nurses, one of them also had a co-worker that was a nurse in the hospital they were admitted to. A second participant had a daughter who was a nurse and another had a friend who worked in the local hospital and was able to provide assistance. Elizabeth previously trained and practised as a nurse and felt it was an advantage to be familiar with the hospital that Brian was in although she felt no one listened to her concerns about his treatment.

Peter's wife was a nurse and knew his burns were bad but she was not prepared for how revolting she found them despite her background. She was used to being around the hospital and accused them of not keeping her informed. This had a good outcome and she was involved in his care after this. One of Peter's co-worker's wife worked in the hospital as a nurse so he would visit Peter after he had met up with her.

Martin's wife found it very helpful that their daughter was a nurse because she was able to explain everything to them. The daughter also knew the staff and the family came to realise just how serious his condition was although Martin had no idea what was going on. His wife gave an account of the experience in ICU stating that when all the monitors Martin was attached to went off she had to wait outside and it was horrible as she did not know what was going on. She said that she often wanted to ask more but did not like to intrude. Her daughter found it very hard too but did not show it at the time. The head specialist of the ICU was called in and a severe infection diagnosed. The specialist told her that he may have to be on dialysis the rest of his life and that Martin had to want to live. This distressed her:

> And I thought 'Oh my God Martin will never cope with that'. (Helen)

Martin was told that the recovery process would be about six months and that is exactly what it took. Martin found his GP very helpful to start with but never went back to him since he believed that the GP was 'railroaded' by the company to get him back to work before he fully recovered. He felt that he could not cope with the work he was initially given. He also criticised his doctor for not being able to give a full clearance, depending on Martin to let him know when he felt one hundred percent better. Martin was frustrated, dissatisfied and angry with his GP over the long and drawn out procedure to get clearance.

In seven of the cases reference was made to the great deal of pressure that treatment providers were under and it was observed that many staff were overworked and busy. This may in turn have compromised the amounts of time providers had for explanations of the condition or treatment as well as other communications. The perception of the patient and their significant others may include the feeling of a lack of care or priority of themselves.

Barbara, Sarah, and Elizabeth all made mention of how over-worked – 'run off their feet' - and busy staff members were – 'twelve hour shifts' - which resulted in an impression of there not being time, or that other patients had priority. Despite this observation, Barbara stated that she could not fault the hospital treatment. Jenny stated that 'they were so busy it was unfair'. Mark did not see himself as 'anything special' from a 'patient status' point of view and made this observation based on the heavy workload and busyness of staff. Grant perceived himself in a similar position when his surgery was postponed three times. While he found this very frustrating he felt others were more deserving and therefore had priority.

Philip felt under immense pressure from his first shift. He worked in an intensive care facility on night duty. Although he had the support of an on-call registrar the reality was that he was on his own. When a major crisis arose it took all his courage to phone the registrar for a second time but he soon realised that the registrar had no intention of coming into the ward and Philip could only follow advice he had been given over the phone. The patient was a young woman who had developed permanent complications. It was recognised that had Philip been in a more senior position he would have been in a better position to demand the registrar come down:

> If you get off side with your seniors they can make your life a misery. So the whole idea is survival. Just keep your head down, get through the day, try not to make too many mistakes, because the mistakes will happen….I thought it was just me being anxious and worried about the first week. They [other house surgeons] said that they were shitting their pants when they go in for the first night on call or something. (Philip)

Philip felt sheer exhaustion at the futility of not being able to meet the demands of the job. When he changed rotation to general medical he was the calls officer and carried a pager to alert him to patient needs:

> On the pager it fills up after twenty beeps and you have to clear to get rid so that the next lot can come through. So my first Sunday I cleared it twenty times. That's four hundred times I was paged in the space of sixteen hours. (Philip)

Philip made observations of the health providers and summarised that often they were doing their best against the odds:

> There are doctors out there that are very bad, there are nurses out there that are bad who are doing lots of mistakes and some of them shouldn't be practising. But I think on the whole everyone is trying to do their best and they are going over the top. And people want to blame doctors and nurses for problems that are going on but it's just I think everyone is trying their best, and under the circumstances you do stupid things and do things to avoid the, the interaction with a patient actually. (Philip)

The system was such that those responsible for the medical care of the injured or ill employees were under such pressure that they were unable to deliver care to a level that was expected or desired.

Conclusion

The experience with, and perception of, the medical system was a major factor in the treatment and rehabilitation of the injured or ill individuals and their families. Clear communication, with the individual and their family, as well as with other medical professionals played a substantial role in the appropriate and timely provision of treatment. It also allowed participants and their families to understand their condition, which was often an important step in the recovery process. For those individuals with gradual process injuries or occupational illnesses, there were also issues relating to timely diagnosis and appropriate treatment. Concerns were also raised regarding the pressure placed on the medical system and the workloads of medical professionals. Philip's case provides an insight into this.

Although all the participants were generally very impressed with their medical treatment, factors relating to communication, diagnosis and the provision of treatment could make a substantial difference to the participant's mental and physical rehabilitation.

GOVERNMENT

New Zealand Government agencies have a range of statutory functions that impact on the social and economic costs of injury and are, in turn, impacted on by the social and economic consequences of workplace injury. This study may assist decision makers in making policy for the prevention and management of injury.

In this study there was a range of government issues that had a direct impact on the consequences of workplace injury, such as enforcement, investigation, payments of medical expenses, treatment, rehabilitation, compensation and support services. There were also indirect factors that had an impact on the social and economic consequences of injury. Indirect impacts are actions such as education as found in government department injury reduction targeted programmes and injury prevention programmes.

The government sector is responsible for administering the range of New Zealand laws that have evolved to encourage, enable and enforce sound health and safety in New Zealand workplaces. Government agencies also record injury data, to monitor the effective management and enactment of these laws. The range of statutory functions relating to health and safety are broadly:

- the administration of health and safety legislation (Department of Labour/ OSH);
- the enforcement of legislation relating to public safety (OSH/Police);
- the development of policy advice for health and safety legislation and ACC legislation (DOL/ Labour Market Policy Group); and
- the policies and administration of ACC legislation – especially related to issues of compensation and injury prevention (ACC).

The legislative environment has two broad functions. A twenty-four hour no fault personal injury insurance scheme to cover all New Zealanders. This is administered by ACC, a crown corporation, set up by the New Zealand Government. Workplace injury is covered by the Employer's Account. This is funded from premiums paid by employers based on industry risk. It also includes the Self-Employed Account covering work–related injury to self-employed and private domestic workers.

In addition, there is investigation (and possible prosecution) undertaken by the New Zealand Police. In this project, two cases involved such investigation. In Sarah's case the Police investigated but did not subsequently prosecute. In all fatalities, such as Ian's, the Police are notified but as it was determined that this was a work-related fatality, OSH was the lead investigator. There are some government costs relating to the infrastructure and services provided by the justice system. These include the provision of courts and linking to the collection of fines, and coroner's reports for workplace deaths.

There are some related but difficult to quantify costs for government to do with the Official Information Act queries, Ministerial complaints, the Privacy Act, and the Ombudsman functions. The wide range of legislation that relates directly and indirectly to workplace injuries was noted and included other government agencies. These were Work and Income, Ministry of Consumer Affairs, Employment Relations, and the Ministry of Social Development.

There is also an inferred cost relating to taxation. Loss of personal income is linked to an overall reduction in income, which can filter down to reduced taxes. It is difficult to quantify what effect injury has on the reduction in government income related to taxation, but as a discussion point, it must be factored into the overall review of the economic consequences of injury. One factor highlighted in this research was loss of income for individuals who undertook 'cash' jobs in addition to their primary employment. Obviously there is no tax paid on this work and therefore no

entitlement to compensation either. Compensation is calculated on taxable income only. This was of particular note in the case of Thomas. Following his injury he was unable to do shearing, and this affected the quality of life for his family who relied on these additional items that did not have to be paid for out of their income:

> He sort of used to do some bargaining or bartering with other people. He would do some of that sort of work. In return they'd give him the meat and the firewood for his family. (OSH Inspector)

The contribution of family labour to the overall productivity of a family business was also a factor for consideration. This labour is another non-taxable income source and therefore is also unable to be compensated. These examples represent both a saving to government (no compensation) and a loss to government (no tax revenue). Sarah's family is an example of this phenomenon. The complexities of the downstream effects of Sarah's injuries following her ATV injury are enormous – and difficult to quantify from the government perspective. It did result in employment of additional labour; a possible saving in unemployment benefit. As a result of her injury she retained a worker on full pay. Her children, who were students, came home and did some of the farm work instead of pursuing holiday employment, so did not pay taxes on employment. Julia also had children who have had to take out student loans as she could no longer support them.

The value of unpaid and/or voluntary work to the overall economy was another area that was present but extremely difficult to quantify. Following the onset of her OOS condition Julia was unable to continue with the 'work' tasks that were unpaid (activities of daily living) as her claim was not accepted she was not eligible for any assistance such as home help. In addition, she had provided support for her elderly father in the way of meals. He now requires 'meals on wheels' support from other volunteers and represents a cost to the health system.

There is an additional issue of cost to the government through loss of investment. This can be seen most clearly in Philip's case, where a substantial amount of government funding had gone into his medical training. Philip also made the point that this investment loss is relatively common in the medical area:

> One of my classmates... committed suicide... Because you don't have the facilities and the back up... And I know from within my own class lots of people who have given up medicine or they become very unwell. (Philip)

ACC economic costs

ACC provides payment of medical expenses, emergency transport costs, non-hospital-based acute health care, ongoing support in the form of home help, social and vocational assessments, transport costs, housing and vehicle modifications, payments to dependants, independence allowances, pharmaceuticals and more. ACC is a fully funded scheme and meets the costs of injury by collecting premiums. To meet the cost of workplace injuries employers pay the premium on behalf of the employees and according to a premium classification unit (occupation). These premiums are based on the actual cost of injury in these occupational bands. Therefore if there are a lot of injuries to workers in the boat building industry, and these are costly due to the severity or frequency, the premium will rise for all of those employers. This will ultimately affect the overhead costs within the industry and have a flow-on effect on the economy, for example, increased prices.

The three workplace injuries associated with boat building in this study had considerable costs. John, who developed solvent neurotoxicity, required a prolonged period of time off work, considerable specialists' costs, and retraining in order for him to be able to return to work. Murray was similarly affected. Peter's severe burns resulted in considerable physical and psychological harm, and he was also unable to return to his previous employment and had to retrain. There has been an increase in premiums for this industry.

There are only three of the fifteen cases in which weekly compensation was not paid (Julia, Philip and Paul, although it should be noted that Barbara had also not received compensation at the time of the interviews). Philip was not entitled to weekly compensation, Julia's case was still being disputed at the time of the interview, and Paul did not take extensive time off work.

Name of Participant	Dollar Cost to ACC
Barbara	6,557.68
Murray	96,090.88
Mark	1,432.24
Paul	9,360.25
Grant	14,309.38
Brian	194,177.44 ongoing (private insurer)
Peter	113,653.74
John	24,509.00
Thomas	28,264.24
Sarah	11,638.24
Julia	2,264.00
Ian	72,912.08
Lisa	1,081.00
Philip	Undocumented
Martin	9,150.00
TOTAL	**391,222.73 + 194,177.44 (private insurer)**

The documented costs for ACC and the private insurer for the 15 cases in the study was $585,400.17. The cost of medical treatment or public health acute services received under ACC's bulk funding of the health sector has been estimated. This does not include any time or administration costs, or the ongoing cost of some of these cases (Brian in particular).

OSH economic costs

The investigation of the injuries by OSH represented the largest quantifiable economic cost of workplace injury. The hours related to investigation, analysis and prosecution were identifiable and quantifiable. However, the hours recorded by OSH field staff in HASARD (the time recording system used by inspectors) are not truly indicative of the real time spent on a case:

> [To get an idea of the hours spent] I would check HASARD and then double it... Because this, all this time is never recorded. There were lots of little phone calls. Lots of checking. (OSH Inspector – John's case)

OSH tends to calculate these on the basis of direct costs only, and assign the costs according to hours of work involved in the investigation based on the salary of their staff. The full costs, including all overhead costs such as recruitment, training, management, administration, etc., were not factored into calculations. Professional support and the costs of education and qualifications were also not calculated. In addition, where a case is brought to trial, there are considerable legal costs.

OSH investigations took place for Grant, Murray, Mark, Paul, John, Peter, Brian, Ian, Sarah, Thomas, Martin, Barbara and Julia, 13 of the 15 cases.

Documented costs for the government (excluding ACC), including OSH costs and sickness benefits (Barbara) were $46,488.89, plus over 390 hours of inspector time. This does not include undocumented government costs.

Name of Participant	Dollar Cost to the Government
Barbara	47.5 hours OSH; 1,482.64
Murray	20.75 hours OSH
Mark	6.5 hours OSH; 13,265.00
Paul	2 hours OSH
Grant	6.5 OSH; 1,270.50
Brian	39.5 hours OSH; 4,012.00
Peter	106 hours OSH
John	12 hours OSH

Thomas	OSH time + 25,191.25
Sarah	11 hours OSH
Julia	1.5 hours OSH
Ian	50.5 hours OSH + 1,267.50
Lisa	None
Philip	Undocumented
Martin	7 hours OSH
TOTAL	**390.25 hours OSH; 46,488.89**

Social costs for the government sector

The social costs of the OSH and ACC functions were more difficult to quantify. The issues are similar for police and health and emergency workers.

When a serious injury in particular occurred OSH staff, emergency services and police were called immediately and were required to work in conditions where there were possible fatalities and often extremely catastrophic events resulting in disturbing sights. One inspector noted that it was hard for staff to deal with this exposure:

> I have been to several fatal accidents with various [inspectors] in the past... at least two where the other [inspectors] have gone back to the car. In fact one of them walked... left the site and started walking back to the office. And he walked something like 12 kilometres before I actually caught up with him. (OSH Inspector – Brian's case)

Staff were required to face people who were distressed and injured as well as those who had witnessed the injury and /or may have contributed to the injury .

The investigations require impartiality and professionalism under testing conditions and can occur at any time of the day or night. In Sarah's case, for example, the rural emergency helicopter was able to remove her to hospital very rapidly as there was an ambulance already in the area. But when she had left, the Police and other services were still there to do the scene examination.

There can be a delay in obtaining professional support to help staff cope with the disturbing nature of the work, frustration with other government sector employees or services and work has to be carried out in all types of weather in a range of environments. Scene examination in the cases in this study included tasks such as photography, measuring and documenting the injury scene and conducting interviews. Following this was the preparation of reports that must be accurate and are often done under difficult and distressing conditions. In this project in a number of the cases this was particularly difficult – in Thomas' case because of the shock of such a bloody and physically disfiguring injury in the early stages. Even the photographs were disturbing. Peter's serious burns were equally disturbing for those directly and indirectly involved. There have been ongoing issues with pain and disfigurement that have made relationships with statutory organisations strained. Ian being so seriously injured, seeming to get better, and then dying due to complications arising from his injuries was hard on the OSH staff in their investigations and also in working with his distraught family and colleagues. Similar issues of distress were noticed in the case of Brian's near death and permanent disability.

Post-trauma support for workers is another indirect cost, but no costs were provided in relation to the cases in this study. Providing professional supervision is an overhead cost of employment in this sector. Post-traumatic stress is one factor that contributes to the costs of staff turnover and absenteeism. It contributes to job dissatisfaction, illness and conditions arising from fatigue and stress. An example of the type of events recorded in this study that would contribute to exposure to the risks of emotional distress, was breaking the news of serious injury to the family or co-workers in the cases of Grant, Mark, Peter, Brian, Ian and Thomas. The government sector meets the organisational costs of providing appropriate professional support and employee assistance programmes, redundancies and severance payments, as well as recruitment and training.

Social consequence of legislation on workers and government employees

There are also costs relating to the difficulty in administering legislation. Both OSH and ACC staff are required to perform statutory functions relating to the acts they administer that employers and the public and even treatment providers may find difficult to understand. Investigation of injuries, especially when there is the possibility of prosecution, is, by the nature of the task, unpleasant. Some workplaces in the study noted that there could be hostility towards inspectors:

> [The OSH inspector] was a woman and she said she was quite, quite convinced if she had been a man she would have had her lights punched out several times. Y'know the attitude to OSH in some places. (H&S officer, Thomas' case)

Attitudes of the injured persons, their families, colleagues, employers and treatment providers can be negative and can differ widely. If 'clients' are dissatisfied with the nature and level of service from the government workers, they can and do complain. The management and investigation of these complaints is another indirect cost.

Gradual process claims have an international equation developed for determining the work-relatedness of OOS conditions. In Julia's case this was challenged so was required to go to the review process. This resulted in additional financial costs, as she had to meet the cost of specialists' appointments, including the costs of travel as these specialists were in another city, ninety minutes drive away from her home. As a result this case involved an application to another government department – Work and Income – for financial assistance, but her income and savings prior to the onset of her condition was too high for her to qualify for financial assistance. She would need to run down her assets first so she had no income of her own. There was a longer-term implication of running down savings in terms of ability to support herself when she was over sixty-five. She had four case managers, and commented that often they would ring her but not leave a contact number.

Julia, however, found OSH to be very supportive, although her manager felt OSH was over reacting:

> … she wrote a letter back to me and more or less had to find something wrong which she did by saying I need to show them the exercises instead of just putting a poster up. Something about something in my first aid kid being expired which I found absolutely ridiculous, sticking plasters or something. (Julia's manager)

OSH was caught between these two opposing views and in addition, the union organiser in that workplace said that other cases of OOS conditions were 'hidden' by good sickness provisions so the bank did not report cases. OSH was also frustrated by the employer's lack of concern for Julia and the fact that there was no rehabilitation. OSH noted that contributing factors for workplace stress that could contribute to an OOS condition were: competition between employees; key performance indicators set very high; ambitious targets; and monitoring of statistics on processing performance. The banking industry is a competitive environment and benchmarks are becoming increasingly tougher to meet. Those who do work hard and meet them, as Julia did, can sometimes pay the price in health terms.

Conclusion

The experiences with and perceptions of both the legislation and government agencies by participants in this study could add to the social and economic consequences of their injury or illness. There was a range of responses, positive and negative, towards OSH and ACC. Injured persons, their families and even employers were also annoyed when ACC would not provide assistance. OSH was seen as supportive by the injured person, but over reactive by the employer.

There was a positive side to the social and economic costs incurred by the government. Some 'clients' were satisfied with the levels and nature of the services provided and were grateful for the

assistance. In difficult circumstances the professionalism and support of OSH staff and ACC staff lessened the negative aspects of the injury experience. The costs associated with the provision of high-quality care and support do minimise the costs of injury.

Injury prevention programmes developed and delivered by ACC and OSH also generate positive costs. The cost benefits of these programmes are readily identifiable. Research costs of OSH and ACC are also linked to a positive cost benefit. This project is one example of a carefully planned and administered project to assist decision-makers, policy makers and organisations to make cost-effective decisions to reduce the social and economic costs of injury.

CONCLUSION

The effects of workplace injuries and illness are complex and inter-related. In addition, because many of these effects are specific to individual situations, not one person sees or experiences them all. Large-scale 'macro' studies have used data analysis or survey methods to provide a total, aggregated economic cost; calculated as ongoing or for a particular period in time. However, using these 'blunt' methodologies to calculate economic costs means the uncounted economic costs and many social consequences, what Dembe terms 'the social effects', of workplace injury and illness, remain hidden, and thus not part of any economic calculation.[61]

This study aimed to extend knowledge of 'costs' to include 'non-economic' costs; in particular to explore the emotional, physical and social impact on the lives and daily activities of injured and ill employees and those around them. Most organisations know how much and what types of insurance cover they have, what their machinery and equipment is worth, and the amount paid out in wages. But our understanding of the enormous, varied, and dispersed effects of workplace injury and illness remains limited.

Other research into the social and economic consequences of workplace injury and illness has identified the complex interplay of personal, social, organisational and environmental factors. The outcomes for the individual of injury and illness are subject to a range of influences from the workplace, community, medical profession, workers compensation and social security systems, and broader society.[62] These studies have discussed the mutual dependence of these factors, which create a ripple effect in spreading the effects of workplace injury and illness out beyond the injured or ill employee to reach wider society, and which act to increase or mitigate the resulting consequences. One study termed these factors 'cost determinants'.[63]

This research provides a useful framework for our findings. The Conclusion briefly repeats some examples of direct and indirect costs from the Findings chapters, and discusses how certain determinants act to cause or prevent, alleviate or exacerbate the outcomes of injury or illness across all, or selected, areas. For ease of understanding, the cost determinant discussion first outlines those determinants which influence outcomes across all groups. This discussion is followed by how other determinants influence outcomes in particular areas: individual, family and friends; workplace; and government and medical. Finally, six overarching themes, which are subject to, and have influence over all areas and parties involved, are briefly discussed.

Identifying the consequences

We found examples of direct and indirect costs, which affected the employee, employer and community. A considerable proportion of the indirect costs was borne by the injured or ill employee or their family. For example, the effects on their relationships were considerable. Loss of intimacy, increased distance between spouses or parents and children, employer to employee, between workmates, were common in the participants. Feeling isolated or self-imposed isolation put relationships under pressure – some broke down while others emerged from the difficult period strengthened through shared experiences. Other costs involved loss of future earnings and medical costs.[64]

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[61] A Dembe (2001). p403. Please refer to the Literature Review Part I: Macro Studies.

[62] A Dembe (2001). p413. Also see for example Kiel et al (2000); Coulton et al (1995); Boden et al (1999).

[63] Kiel et al (2000). p110.

[64] This conclusion is supported by previous research findings. For example see Australian Industry Commission (1995), for a discussion on consequences to different areas of society.

For the family and friends of the injured or ill employee, one of the most considerable indirect costs observed was separation, both physical and emotional. This led to strain on relationships: in three cases, relationships were broken, with a further two cases losing their pre-injury relationships permanently. In addition, there were major lifestyle changes for many of the families, with many participants changing their careers, beginning or stopping study and giving up hobbies to care for the family member. Friends of the individual were also affected – from the loss of a close friend, to helping them through their illness and injury with support – often at their own cost. This may have meant less time with their own families, or financial cost.

For the employer, costs included lost production, negative impacts on staff morale, bad publicity, and the costs of replacing employees or equipment; and in some cases, legal costs. For the workplace, costs included the loss of a friend and colleague, possibly animosity towards the injured or ill employee and even the immeasurable impact of feeling responsible for an injury or fatality.

For the government sector, the impact on officials carrying out statutory functions was observed, including the psychological impact of investigating fatalities, dealing with recalcitrant employers and comforting bereaved or confused families. Other hidden costs included costs of medical retirement for government employees, as well as education, injury prevention; and costs of investigation and appeals. Many costs are non-recoverable; for example, lost taxes, lost labour, voluntary and unpaid work, casual work (while this was also a loss to the individual, because it was not taxed, it was also not compensated), and social capital. For the medical community, indirect costs observed included time, equipment and drugs, and rehabilitation costs.

These costs and their impacts were discussed fully in the Findings chapters. However, based on the results of these fifteen case studies, conclusions may be drawn about the nature of these costs: what causes or prevents them; and what factors may mitigate or increase them.

Key results: determinants that influenced outcomes across all areas

We found one of the major relationships between social and economic consequences revolved around socio-economic status. One of the protective factors that prevented or alleviated adverse social or economic outcomes, was being in a higher socio-economic profession. Usually related to this was having a higher level of education, with ample social and/or workplace support.[65] If not, the participant had less choices and support following their injury or illness to prevent the economic consequences reaching into and affecting their home and family life. Compare Philip and Paul to Thomas and Barbara. The latter lived in small towns, with limited employment opportunities and an unskilled, insecure job. Their choices were a lot less than that of Paul and Philip's – who, although they did not receive much (if at all) workplace support, still had the unstinting support of their family and the financial reserves to change careers.

The labour market status of other participants affected their behaviour following their illness or injury. The fact that some participants indicated they did not feel secure in their current job and were finding it difficult to secure alternative employment (such as Grant, Thomas, and Mark) has meant staying in their former occupation instead of moving on. Others, like Peter and Paul, have chosen to leave the profession and retrain in another career, while others (Julia, Philip) were forced to leave their profession and have not yet found an alternative. This has no doubt exacerbated the economic consequences for them and their families.

The visibility and invisibility of injury or illness was a major factor in many of our cases, with influences acting from all areas. With an obvious, demonstrable link to the workplace, we found that the injured participants received more support. Diagnosis and treatment was accurate and prompt when medical providers were dealing with an injury associated with a specific event. There was (largely) more

[65] This conclusion is supported by previous research findings. For example see Keogh et al (2000).

support provided by the workplace. Examples included Mark (provided income support by company), Grant (structured rehabilitation and support programme, transport), and Brian (a gift of money, use of cell phone).

Conversely, for the ill participants, establishing the work-relatedness of the illness was a major barrier to effective and timely support. Delays in diagnosis, and/or debates over the nature of exposure, had serious implications for treatment and recovery. Murray and John, Barbara and Julia all experienced this. Fast and appropriate treatment and acknowledgement by others of the condition would have helped speedy recovery and return to work, such as in the case of Martin.[66] It would have also helped alleviate the financial costs for these participants.

This injury and illness discrepancy also had implications for acknowledgement, from all parties involved. The more obvious and visible the injury, the greater the sympathy and recognition it received. In its own way, this acknowledgement often served in assisting recovery and learning. Acknowledgement and support included appropriate treatment and compensation, thus lessening the burden on family and friends. One additional method of acknowledgement was participation in this study. Some participants commented that this was validation for them, because although it meant revisiting difficult memories and experiences, it also served as an acknowledgement of the seriousness of what had happened to them, and the impact it had on their lives. Participants were able to reflect on their experiences and understand some of their actions and reactions. Participants also commented they hoped others would benefit from their experience.

Finally, a further determinant that was observed that impacted across all areas was the level of health and safety awareness by the employer and their employees. The case studies showed this influenced the attitude of the employees themselves, and had a considerable impact on the outcomes for the injured or ill employee, and their family, as well as how they were treated by others.[67] Whether health and safety was regarded as integral to the business, an afterthought, or was not even considered, this attitude and its resultant behaviour had major consequences for the injured or ill employee. As a result of Ian's death, his employer instigated an extensive health and safety compliance team. The support given to Grant was in stark contrast to the complete lack of acknowledgement or support given to John. The ignorance shown by Barbara's employer contrasts with the successful case managing Lisa's supervisor and health and safety officer. These cases showed that having an effective health and safety system in place prevented or helped alleviate such adverse outcomes for the participants and their families.

Further results: determinants that influenced outcomes in particular areas

Individual and their friends and family

For the individual and their friends and family around them, certain characteristics affected the presence, or absence, of social and economic consequences.[68]

The personality of the participants had an observed effect on the presence of certain social consequences, and changes and feeling more positive as a result were of benefit for Paul and Lisa. Other whether these were severe or minor. Conscientious, perfectionist, high achievers were present (these included Philip, Julia, and Lisa). Other employees showed initiative based on experience, were problem solvers, choosing to take responsibility (such as Thomas and Ian). Taking charge of their situation, making personality traits impacted negatively on consequences. Some participants became

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[66] This conclusion is supported by previous research findings. For example see Wood et al (1993), quoted in Kiel et al (2000).

[67] This conclusion is supported by previous research findings. For example see Australian Industry Commission (1995), and OSH (2000a).

[68] It is interesting to note that many of the following findings are supported by previous research. For example see the discussion of consequences by A E Dembe (2001) in the Literature Review Part I: Macro Studies.

withdrawn, internalising their problems and worries (such as Martin and Peter). This led to pressure within the relationship. Becoming suicidal, depressed or violent had adverse effects on relationships (John, Peter, and Murray). Eventually these relationships did not survive.

While the cases were not selected on the basis of ethnicity, a range was still represented. However, it was felt that only one case warranted comment on the basis of ethnicity. The fact that Philip came from an Asian cultural background may have accounted for a number of consequences of his condition. Philip (and his family) had very high expectations for him, and this was reflected in the amount of worry and support observed following his breakdown. His father blamed himself for Philip's condition and the family did all they could to assist his recovery (financially and emotionally). However, this may be an individual reaction.

The family status of participants – particularly having dependants – affected the way they reacted and the subsequent consequences faced after their injury or illness. Wanting to provide for the family pushed Thomas to cultivating cannabis, getting caught, and then facing the consequences of his employers continuing to blame the injury on this. However, in Thomas' case the strength of his relationship with his partner bonded them even more strongly together, whereas in Peter's case this worked in the reverse and the relationship broke down. Lisa had no dependants whereas Julia did (including her elderly father), and the consequences for the two were distinctly different. Ian's family were completely devastated and continue to suffer after their loss of a father, provider and husband.

Related to family status, the age of the individual had an important impact in that it affected the social and familial responsibilities of the individual. Younger participants may have been caring for young children, while older participants were caring for elderly relatives.

Geographic location had some effect on the support structures that were available to the families of the individual. Often couples were separated for a time while the injured or ill employee received treatment elsewhere, such as Brian's wife while he was in Burwood, or Thomas' partner when he was undergoing surgery. Sarah did not have the same access to physiotherapy as other participants due to her geographical isolation.

Their job roles also affected outcomes. Some participants were involved in activities other than their set tasks, which may have contributed to their injury or illness, and in other cases made a difference to subsequent consequences. For example, Brian was doing maintenance work that was not part of his usual job description when he fell through the skylight, while Thomas had been told to 'find something useful to do' and was cutting cardboard corners that normally would have cost the company about ten cents to purchase.

The cases did not show any consequences based on gender alone sufficient for comment.

Workplace and colleagues

Some of the factors that influenced outcomes for the participants emerged from the workplace.

If the injured or ill employee was able to return or remain within the workplace, they experienced better rehabilitation outcomes. The prime example of this was Lisa, but Grant was also encouraged to return to work quickly as part of his rehabilitation. However, he indicated he was not comfortable there. Conversely, some participants felt they were forced to return to work too early, thus exacerbating the outcomes for them. Martin felt he had not recovered sufficiently from his leptospirosis and Thomas was forced to return to the sawmill.

We found that some larger firms have more resources to support the affected person, and also institute comprehensive health and safety improvements. But we also found that bigger companies did not necessarily mean more developed health and safety systems, for example, the rapidly expanding boat building workplaces of John and Peter had either woefully inadequate systems in place, or none whatsoever.

The role of the supervisor impacted on the recovery outcomes for the workplace and the attitude that the workplace took to the injury . When the employer could and was able to assist (for example Lisa), there were better results.

Government

The various roles and functions of the government, including the medical community, helped determine the consequences for participants.

The involvement of an outside advocate, such as a union, was important in mediating with employers or supporting the affected person and the workplace. In Ian, Julia, and Lisa's cases they provided assistance and understanding of the systems involved in and around injury and illness.

Related to this finding is the fact that some participants saw OSH and ACC as non-communicative. Workplaces and employers wanted direction and response from OSH about their obligations. Multiple case managers and lack of contact about the individual's case, information about entitlements, and seemingly endless paperwork exacerbated what was an already stressful time for participants.

However, on a positive note, some participants noted the particular support from OSH staff that went beyond the usual role of the inspector – telling them about the legal process, or providing information on their condition. In difficult circumstances the professionalism and support of OSH staff and ACC staff lessened the negative aspects of the injury experience.

When receiving medical treatment, multiple treatment providers increased negative outcomes for participants due to long-term, ongoing and often expensive treatment and rehabilitation. Delayed diagnosis resulting in delayed treatment and therefore recovery time and an increased chance of complications which may delay or prevent return to usual work activities has already been discussed.

Discussion: the links between social consequences and economic costs

The social and economic costs of workplace injury and illness are inextricably linked. For our fifteen participants and their families, friends, workplaces and various officials, social consequences had economic costs, and vice versa. These inter-related determinants and outcomes are difficult to explain, and previous studies have chosen different methods to illustrate the pattern of outcomes.[69]

Six overarching themes that we observed acted to influence the outcomes for participants and those around them, but which are also determinants of consequences in themselves. These six themes mitigate or exacerbate both short- and long-term outcomes for all involved. They are generated from all areas; the individuals themselves, the home, workplace, and wider society.

Isolation: self-imposed or forced isolation had a negative impact on family and work relationships. For others to offer support, they needed to understand the condition and the effect it had on the individual. Likewise, the individual received better support when they sought out contact and did not withdraw, isolating themselves and others. Cases showed examples of both physical and emotional isolation.

Blame: many of those involved in the cases were either blamed by others, took the blame, or avoided the consequences. Injured or ill employees blamed their employer, felt they were blamed by other employees or their employer. Families suffered emotional consequences from both being blamed or blaming others. People – and government services – denied their responsibility and culpability for consequences or shifted this responsibility onto others.

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[69] For a discussion of various models, please see Literature Review.

Responsibility: accepting responsibility has been shown to alleviate or even prevent adverse social and economic consequences for all parties involved. Some participants were forced to make choices and changes in their lives or careers, while others took responsibility and made the necessary changes, to alleviate negative outcomes. Others have felt the immeasurable weight of responsibility for not preventing an injury or illness.

Suffering: physical and mental suffering was an enormous factor in all the cases. There were also indications of considerable suffering in cases where another party felt responsible for someone's misfortune. The sense of helplessness at a situation, in turn, led to increased negative social effects, whether it was the injured or ill employee, or another person associated with their situation. Acknowledgement of the progress they have made (either physically or emotionally) was important for understanding their condition and enabling some recovery.

Understanding: a lack of knowledge about their situation on the part of the employee, their workplace, and medical staff increased the suffering, isolation, and confusion for all involved. Conversely, knowledge and information, timely and appropriate support and treatment greatly alleviated the negative consequences of the injury or illness.

Power: taking charge of their situation, understanding their actions and reactions, and making changes alleviated or even prevented negative outcomes for the participants and those around them. The usual power relationship in a workplace leaves the employee subject to the decisions of the employer, however, negative consequences are avoided when the employee is supported by the employer and others, and understanding is shown by those involved.

Final remarks

Consequences from workplace injury and illness extend out from the injured or ill employee to reach all of us. These consequences are both visible and invisible, including the loss of life and a marriage, the loss of a taxpayer, another person on a benefit, loss of social capital, productivity and retraining, or morale costs. They may be temporary or permanent, or even final. However, the costs and consequences described here represent the 'tip of the iceberg'.

No one person in any of the 'areas' that has been discussed (the individual, their friends and family, their workplace and colleagues, the government, the medical community) sees or experiences the full extent of the direct and indirect social and economic consequences of injuries or illness in workplaces. The nature of the consequences are such that it is rare all the costs are combined to provide an overall picture of the magnitude and complexity of outcomes.

Therefore, to understand the total consequences requires measures that go beyond just counting cases or calculating dollar figures. To provide insight and understanding into specific impacts, and to gain a human perspective, the definition of costs must be widened beyond compensated costs to include 'non-economic' costs – the unquantifiable consequences of injury and illness that are both multiple and complex.

These fifteen case studies, totalling sixty-eight interviews with the employee and the people surrounding them, illustrated common experiences that happened to ordinary people. They also showed how certain factors may alter the outcomes for those harmed in a positive or a negative way. Seemingly minor gaps in systems or practices that appeared insignificant on their own created huge far-reaching consequences for a range of people and the government agencies that were affected.

This is why, as Hopkins argues, it is important to identify where the costs fall, as well as how much the costs are, as a direct motivation for action. Hopkins stated that any attempt to argue that safety pays must specify 'for whom?'.[70] It must be clearly communicated to employers, employees, the Government and the community that believing it is cheaper to take an unnecessary risk than to

[70] A Hopkins (1999). P152.

prevent it, is fundamentally flawed. The costs and consequences of workplace injury and illness will still exist – except they will be borne by the workplace, employee and the community.

Shifting the costs - from those who create the risks to those groups who bear the majority of the hidden, non-compensated costs - lessens or removes the incentive to control them. Conversely, the benefits from controlling and minimising these risks, for the employee, the community, government and medical community, are increased when adverse outcomes are minimised or removed.

Research has shown that these indirect, unquantified costs are many times the amount of the direct, known costs, estimated as at least 4 percent of New Zealand's GDP. Dorman further argued that this cost should be seen as an investment; that the long-term benefits of improved employee health and well-being, and innovation, can happen simultaneously.[71] How to create the right incentives to encourage a commitment to health and safety, and thus alleviate the devastating impact of injuries and illness, must continue to be explored.

Increasing our understanding of how these costs arise; what alleviates and exacerbates, causes or prevents them, will also increase our understanding of the consequences to ordinary people of the impact of government policies and legislation. It also contributes to our understanding of how to minimise the aftermath for all those affected, as well as plan and provide appropriate support and prevention. This study aimed, and achieved, its purpose of highlighting and raising awareness of the debilitating effect of not preventing workplace injury and illness for the injured or ill employee, their friends and family, workplace, and the costs to government.

For our fifteen participants and thousands more just like them, they are counting the human costs every day.

[71] P Dorman (2000). Introduction. Dorman concludes that economic incentives will be become more sophisticated and enjoy greater use, but that they will be seen as only one leg of the OHS tripod. There will continue, Dorman redicts, to be key roles for regulation and self-regulation to improve working conditions. (p12).

EPILOGUE

Grant

Grant feels alright now but he as well as his family is keen that he change his workplace. He has attended a couple of interviews but has not been successful in finding other employment, he feels, because of the condition of his hand. Meanwhile, he continues to work at the same place he was at when he had his injury and is now doing a full-time job. He feels 'trapped' and much as he wants to, does not think he will be able to change careers.

Murray

Murray feels worse now than he did at the time of his interview. His family has left him (he and his wife have separated again) and he is still not working. He describes himself as 'the loneliest man in the world'.

He thinks that his employer believes that his problem is associated with alcohol and drugs use and he has not heard from them since OSH got involved. He feels angry about the position he is in because of his condition and is concerned about the problem of solvent-induced neurotoxicity in New Zealand. He feels the government needs to take more interest and action in this area.

Mark

Mark still has moments of pain and immobility and is frustrated by that and the fact that he is still unable to take part in sport. Though he is no longer in the same company he is in the same industry, and so often sees his old colleagues who he says are still sympathetic and show interest. He is now more involved with indoor tasks which are computer based. However, he feels that his lack of mobility restricts what he can do in an office job – he has always had jobs that were largely outdoors based. This year he was turned down for a job because the prospective employer felt Mark would not be able to cope with working indoors all the time.

As far as his personal life is concerned, he feels he is a very honest person and the lack of honesty following his injury was unpleasant. He realises how easily he could have died in the injury and how very lucky he was, and that has 'turned his life around'. He now enjoys each moment of each day.

Julia

Julia's symptoms have not completely gone. She still experiences stabs of pain when driving or bending (which medication reduces) and gets numbness down her left side to her legs. She has not returned to her workplace because of her on-going discomfort and spends her time caring for her elderly and sick father. This mainly involves getting his meals. Because of her not being able to return to work, there has been additional financial strain of the family. Julia sees her future as a receptionist without the pressure of computer work.

Although specialists' opinion remained divided, ACC did not provide cover for Julia's claim because the specialist medical advice provided to ACC determined that her injuries were not caused by activities in the workplace. Julia appealed this decision at the District Court but the appeal was dismissed.

Philip

Philip feels better now and is only working part time – 20 to 30 hours a week – as he feels he cannot cope with a full-time job yet because he still gets anxious and depressed. His family, he feels, are sad for what he has and is going through as well as at the loss of the potential they feel he had. Philip admits that they bear the brunt of his illness and its symptoms.

Philip is now working in a GP clinic. He comments that though the different work is helpful, it can be just as demanding. He has learned to 'let go and relax'. Overall, however, things are, he says, better as he now has more free time and is treated better by staff and colleagues.

Brian

Brian has not improved since the interview but is no worse and better settled. Elizabeth feels more adjusted and confident – she was able to take a short vacation overseas with her friend, Rose and thought Brian was fine with the care he received in their absence. Elizabeth comments that this has given her the confidence that she can do it again in the future and take breaks from caregiving as required.

Elizabeth is however, very disappointed with the reaction of family (particularly Brian's daughters) and friends who, she feels, have let Brian down badly as they have stopped visiting. The same is true of his former colleagues and workplace – they have never phoned or visited to ask about Brian and Elizabeth feels it is a case of 'out of sight, out of mind'.

Barbara

Barbara's condition has worsened since the interview. She has been back in the hospital twice - the second time she was in ICU for six days. She is on oxygen sixteen hours a day and her family are very concerned about her condition. She is no longer able to work (and feels she is unlikely to ever again). ACC did not in the end accept her claim for cover, because specialist medical advice provided to ACC concluded that her incapacity was primarily a result of smoking and not occupational asthma. She is now receiving an Invalid's Benefit. Barbara has doubts over OSH's approach to her employer during its investigation. In her opinion, the employer should have been prosecuted. However, despite these problems, Barbara seems quite positive about her situation, commenting, 'yeah, you've just got to get on with it'.

John

John comments that he feels seventy percent better now than when he was interviewed. He has changed careers and has, because of advice from his doctors, removed himself from the environment that caused him the problem. He has not heard from his employers at all – not even to find out how he is doing. His family too, is doing better and they believe the credit for this goes to the OSH inspector who gave them the initial direction to help John.

Peter

Peter is still sensitive and fragile, which affects his mobility. He and his wife are getting divorced but Peter comments that his immediate family and siblings are now in much closer contact with him. Peter feels that he is more accepting of his situation, and he is less self-conscious about his scars around others. He is not currently employed and has heard nothing from his previous employers.

Peter had joined an Honours programme at the university and is due to finish in November. He is looking forward to his financial independence once he has finished. However, he took out a student loan as he received no financial assistance for retraining after his injury , either from his employers or from ACC. He believes ACC has only continued his weekly compensation, as they themselves had not undertaken any retraining measures on his behalf. This, he feels, is now going to apply other

pressures to his life along with the ongoing ones suffered as a result of the injury . ACC cannot provide retraining unless Peter's skills are inadequate for him to return to work. ACC is required to provide weekly compensation until such time as Peter regains an ability to work.

But overall, Peter is feeling positive about the fact that his retraining and additional qualifications will help his put his unpleasant experiences behind him and he will be once again able to enjoy life to the best of his abilities.

Sarah

Although Sarah still has aches in her thumbs and hands and feels her wrists are weak, she feels a lot more positive now than she was at the time of her injury . She is completely rehabilitated and independent, and so is able to work full time on the farm. She is still is self-employed, with the same staff member who was there at the time of her injury , along with a new person she took on just after the injury . It took her staff time to adjust to her being back full time after being in an advisory role for six months – she still feels excluded at times.

Sarah's children are doing fine and have chosen their careers. But they are now extremely aware of how quickly and suddenly injuries and death can happen, and their worry for Sarah remains high, to the extent of their checking on her regularly.

Paul

Paul is coping better and is feeling less stressed. He says that dealing with customers is becoming easier as there is now less noise than in his former panel beating business. His family is also dealing with the situation much better now with stress levels for all of them being lower.

Ian

Jenny, Ian's widow, still feels lost without Ian and although she is planning her own future, she wishes she did not have to. The family has been getting on with their lives but still miss Ian terribly and talk about him a lot when they get together. The children still have many questions they would have liked to ask him.

She began an intensive six-month computer course, knowing that she would have to start working from the following year in order to support the household and realising that many jobs now require computer skills. She also realises that at her age jobs are not that easy to come by. However, the training has given her confidence and has made her more hopeful of the future.

Recent fatalities reminded Jenny and her children of what they went through when Ian died, and it has taken them several weeks to recover. People have been suggesting Jenny re-marries, but the thought upsets her as she feels it is disloyal. Paradoxically, however, she questions herself in that she feels she is living in the past. Overall though, Jenny is hopeful of the future and is glad that the children are doing alright.

Lisa

Lisa's condition continues though the severity has reduced considerably. She continues to have acupuncture up to twice a week to maintain the improvement and to provide relief. She has recently returned to the gym and has not experienced any problems. She uses this as an opportunity to keep up with the stretching exercises.

Lisa wanted a challenging career in the IT field and had been studying for an IT certificate. She began a new job earlier this year in which data entry makes up fifty to sixty percent of her daily tasks, writing about thirty percent, and the rest is reading and phone discussions. Since the data entry work is not as

intense or repetitive now as it was in her previous job and she has more freedom and control of her time and tasks, she can better manage her tasks and thereby, her condition. Her current employer was told of her OOS condition at the outset and has been very supportive of her, as well as taking health and safety very seriously. Things are, she feels, definitely better now.

Thomas

Although Thomas is still with the same employer, his relationship with them is, in his words, 'tolerable, only just'. This is because he feels that they still blame him and are trying to use his prior drug conviction as the cause of the injury. Thomas is looking for other employment which, 'pays better and treats the workers better'. On a positive note, his family is doing well – his relationship with his partner is strong and the girls are doing well, are healthy and enjoying town life.

Martin

Martin is doing better and his family is fine. He has returned to the same workplace, and is still working on the pig chain.

Part 4: Methodology

METHODOLOGY

Introduction and background

Main Research Questions

The research questions were drawn from the study objectives and were as follows:

1. What are the main social consequences of workplace illness and injury and how can they be identified and avoided?
2. What are the key characteristics (for example gender, ethnicity, age, family status, injury or illness type, and location) that shape the social consequences and economic costs following occupational illness or injury?
3. What is the nature and extent of the financial costs (for example loss of income, medical costs) of workplace illness and injury and how can these be valued in economic and social terms?
4. What are the links between social consequences and economic costs of workplace illness and injury?

Unit of Analysis

As the research questions suggest, the unit of analysis for the research was the injured or ill employee and his or her relationships in a range of functional areas and domains within the home/household, workplace and community.

Case Study Approach

Different objectives place different demands on measures of burden so clarity was needed about the purpose of the study before choosing the methodology.

A case study approach, using a mix of quantitative and qualitative methods and data, was deemed the appropriate methodology to explore these questions for reasons given below.

The case study approach involves triangulating data from a range of sources, using a variety of research methods:

- Analysis of OSH and ACC data and existing research reports.
- Analysis of 'stakeholder' interviews with specialists in relevant fields.[72]
- Case studies involving semi-structured interviews with the injured or ill employee, their family, work mates, and, if appropriate, OSH and health professionals who were involved.

A case study approach also:

- Illustrates complexities involved when attempting to measure economic consequences of workplace injury, along with highlighting the multiplicity of costs and losses borne by various members of the community (the depth and breadth of costs).
- Shows the human perspective as part of comprehensive insight into consequences.

[72] Specialists were from various academic disciplines including health research and psychology, as well as occupational health practitioners.

- Can be used as a learning process for communicating the extent of costs and implications of unsafe work practices. That is, a series of case studies, targeting different industries, may prove a more persuading tool than 'statistics' to encourage greater safety regulation compliance and emphasis on injury prevention.[73]

Because of the exploratory nature of the study, the fifteen case studies were selected to express contrasting variables, which enabled the project to encompass a broad range of experiences with workplace injury and illness.

Since our focus was on changes in HSE legislation and its impacts, employees who had had serious injuries after 1992 (when the HSE Act was introduced) were selected.

In keeping with case study methodology, the following steps were taken:

1. The overall 4-phase research project is itself a case study.
2. A key component of the design is that a series of case studies of injured and ill employees was carried out. These included examining (a) their relationships within their families, workplaces and communities; and triangulating the findings with (b) other primary and secondary data that was collected in each of the three phases of the research.
3. In other words, case study research involves triangulating data from multiple sources, methods, researchers and points in time. Another way of describing this is to talk about analysing 'layered sources of data' to reveal patterns and causal connections.[74]
4. The analysis is carried out using analytic-induction techniques. Analytic-induction can be defined by contrasting it with survey research. It is not the numbers that make data valid under the case study process, but the logical integration of data from different sources and different methods of analysis into a single, consistent interpretation.
5. The integration of both qualitative and quantitative data to determine consistency (and to account for inconsistencies) adds power to the analysis.

Research process

An iterative research process was used. The research objectives, questions, the case study framework, and a process for selecting the participants were developed. This involved four main steps:

- A literature review to inform this research process.
- Developing semi-structured interview questions (see Appendix).
- Workshops to develop an analytical framework and then to begin the data analysis.
- The report writing process.

Based on the interview data and the reading of the literature, a framework for analysis of the data from interviews within a case was created and this led to cross-case analysis.

After each interview, the paired researchers drew out their key insights about the interview and reflected on their relevance to our research questions. Following the completion of a case, the researchers repeated this process, but this time, took into account data from all the interviews which comprised a case, and any other sources of data about the case such as OSH and ACC case notes.

Once the cases had been analysed in this manner, the research team had a workshop to identify some of the following in the cross-case analysis:

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[73] G Kiel et al (2000). p.134.

[74] J Leibrich (1993). Straight to the Point: Angles on Giving up Crime. Dunedin. P55.

- themes which were common among some of the cases, and why,
- themes which were not shared by some of the cases, and why,
- themes which were surprising, unexpected or puzzling, and why, and
- themes which were not surprising, unexpected or puzzling, and why.

After the first case had been completed, the team considered the findings in relation to the research questions. In order to do this in a systematic way and to feed the fruits of the early case studies into the remainder, a formal 'stocktake' after the first 2 case studies was done.

At this workshop, the following were considered:

- the research questions that had so far identified were appropriate,
- the interview data was answering the research questions, and
- the selection criteria for the cases were covering the range of variables which were expected to influence and be influenced by the research areas.

On the basis of such consideration, the subsequent case studies and analysis framework were modified where appropriate. This iterative cycle, in which generalisations from the particular instances were drawn out, was repeated and this revised our understanding of the earlier generalisations, as the project continued.

Selection criteria and study population demographics

A mix of people were selected so that cases could be contrasted and compared based on participants' experiences and on a range of circumstances to reflect the exploratory nature of the study. The main selection criteria and resulting population demographics for the fifteen cases are summarised below:

- Age – based on the assumption that the age of 40 years is approximately halfway through one's working life, people between the ages of 20 and 60 years were selected.
- Family status – employees who had economic dependants within the family unit, and those who did not were selected. Eleven participants were in a relationship at the time of their injury or illness diagnosis, and eleven participants had children. Not all participants who were in a relationship had children.
- Although participants were not selected on the basis of ethnicity, there was one Maori, one Cook Islands-Maori, one Asian and eleven European/Pakeha participants.
- Socio-economic status – including occupation, income and education, both those in low and those in the high status were selected. Participants' incomes ranged from that of a house-surgeon to one participant earning approximately $20 000 (gross) per annum.
- Occupation – people from high-risk industries (those with high representation in the injury and fatality statistics) were selected. Of the fifteen participants, three were in the boat building industry, two were in heavy manufacturing, one was a farmer, two were in the manufacturing industry, one was in meat processing, one was a panelbeater, two were office workers, and there was one tradesman and one storeman.
- Employment: two participants were self employed, and thirteen were employees. Of these, four worked in medium sized businesses (that is, less than thirty employees), and nine were in large companies (that is, more than thirty employees).
- Gender – eleven males and four females were selected.
- Nature of workplace incidents: – five persons with occupational illnesses and ten persons with work-related injuries were chosen. Occupational illnesses included harm resulting from

stress, occupational asthma, leptospirosis, and two cases of solvent-induced neurotoxicity. Injuries that were included were two cases of falls from heights, two cases of crushed limbs, one amputation, one serious burns, two cases of OOS, one noise induced hearing loss, and one fatality from crushing injuries.

- Work status following injury – employees who had been unable to return to the same occupation/job/employer, and those who were able to, were selected.
- Time of injury/NODS notification/exposure – was between 1993 and 2001.
- Geographic location: participants resided between Auckland and Invercargill.

Interviews

The team, following the criteria listed above and after detailed discussion and consultation, selected fifteen cases. The process of case selection took place over a period of time. As respondents were selected, the following steps were taken to set up interviews with the primary and secondary respondents.

- The project team established a set of selection criteria that the fifteen cases should meet - this was to ensure there was a suitable spread across demographics, industries, etc.
- OSH branches were contacted and asked to suggest possible participants within certain criteria. Initially this was very broad. As the study progressed, the criteria became more specific to ensure that we were meeting the selection factors above. For example, with the first two cases, we simply asked one branch to give us a list of people suffering from an occupational injury or illness within a certain timeframe. By the end of the study, we were assessing the cases that we had already done, and looking to see which criteria had not been met - so for the OOS case, we were looking for a female office worker with an OOS condition, in a certain region. Most cases were identified by OSH inspectors (whether the case had been prosecuted or not). However, the OOS cases were identified through FinSec (a financial sector union).
- The OSH branch involved would send a list of possible cases, who conformed to the criteria, and who they felt would be interested in taking part in the study.
- The project team prioritised this list, selecting preferred cases, and then informed the OSH branch of their decisions.
- The OSH inspector involved in the case would then ring the prospective participant, telling them about the research, and asking them if a member of the project team could contact them.
- The project team would decide who would conduct the interviews and then one of the interviewers would ring the participant, explain the study in more detail and send out information and consent forms (see Appendix).
- If the person was willing to participate, time for the interview was arranged.
- If appropriate at this stage (i.e. if the participant had given consent to interview the employer, etc.), meetings with employer/workmates were arranged.
- If the participant wished to read the information sheet, etc. before arranging the meeting, time was provided until the team member received the consent form (or else the team member phoned a few days later) to set up interview times.
- Participants were given the choice of a tape recorded interview, or notes. The majority chose the former, which enabled the Report to use participants' own words in direct quotations.

When contacting the injured or ill person, the team member made sure to:

- Enquire if the family, workmates, employer, etc. could be contacted and interviewed, and if so, obtain their contact details so that meetings with them could be arranged before the visit to the injured or ill person.
- Stress confidentiality.
- Inform the respondent that the study would like to access their OSH and ACC information.
- Inform them that the consent form and the information sheet would be sent to them.

An effort was made to arrange an interview with the injured or ill person about two weeks in advance as this could then provide more lead time for the employer and workmates to be contacted and informed.

Participants were informed that they would probably have contact with two researchers as each case had at least a pair of researchers assigned to it.

Primary participants were given an information sheet (as mentioned above) containing the following information:

- Benefits in participating in the study

  By participating in the study the participant will considerably contribute to research that would inform the development of ACC and workplace health and safety policy and inform government Ministers of the social and economic consequences of workplace injury and illness.

  It was emphasised to participants that project team members would listen to them and to others to understand and not judge. Participating in the study may provide participants with a greater understanding of their experiences. They would also learn about others' experiences. It was also explained, however, that although what they learned may be helpful, it might also open up issues and memories that were not comfortable for them.

- Confidentiality stressed

  The project team signed confidentiality agreements and ensured that the process used followed ethical guidelines. Confidentiality was constantly stressed and respondents were told that the team members would not reveal to anyone else any personal identifying information respondents or others gave the team. The study report would keep their identities confidential by assigning codes to each interview, followed by pseudonyms. They were told, however, that they would probably be able to identify themselves in the reports.

- Length and venue of the interview

  Respondents were informed that the interviews would last about one hour, although it was possible that they could be longer, or that more than one visit might be required. It was suggested that wherever possible, a morning or afternoon should be arranged to be potentially free to meet and talk.

  Respondents were informed that the interviewers would go to participants' homes, or another location of their choice. The interview would take place somewhere where participants felt comfortable and where there would be no interruptions.

- Research information

  Participants were told that the information that they provided in the interview would be recorded, either by taping and/or written notes. They could select the recording method with which they felt most comfortable.

  Confidentiality was again stressed by informing respondents that their details would be totally confidential to the research team, and no material that could personally identify them would be used in any reports on this study. Only the project team members, who had signed confidentiality agreements, would have access to the information and, at the completion of the study, the information that was collected would be destroyed. This included any information respondents or their employer provided, and any that was accessed from ACC or OSH. While the study took place respondents' personal information would be identified with a code rather than their name to further protect privacy.

  All personal information provided in the course of this research was covered by the Privacy Act 1993. Respondents were informed that they had the right to access all personal information that the team held about them and to ask that the information be corrected if they considered it was incorrect.

An interesting point to note was that a large majority of the people who were approached for participating in the study, readily agreed to participate in it (two declined). One unanimous reason given for participating was that they felt that if by telling their story, they could prevent the same thing from happening to anyone else then it was, for them, worth it.

The report

The report was the product of a joint effort by the team members. Different team members wrote different chapters and initial drafts were made in consultation with other team members and during workshops. When the report was in complete draft form with case identifiers, etc. removed, it was tailored into a standard report template. It was then made the responsibility of one of the team members to 'finish' and 'polish' the report, giving it an even flow and a 'single voice', as the individual chapters written by different members of the team naturally had differences reflecting their respective styles of writing. The report was then commented on by members of the expert group and circulated for internal consultation. Participants were provided an opportunity to comment on it prior to this stage if they wished to. But before sending the report out to participants for their comments, they were phoned and the following information was sought:

- Did they want to see a copy of the draft report?
- Were there any special conditions they would have when the draft was sent to them (e.g., courier, send to a different address, etc.)?
- Update on where they were at (for the epilogue).
- Do they want a copy of the final report?
- To please let the researchers know of anything they wanted changed/modified/deleted, etc.

The research team

The research team consisted of seven researchers from the Department of Labour (including an OSH field staff member), a researcher from ACC and two independent researchers. The team came from a range of backgrounds and disciplines (nursing, law, community development, and social sciences) to ensure that the research was as comprehensive and sound as possible.

It was seen as important to constantly be mindful of the safety of the project team members – during the course of the interviews and subsequently, they were being exposed to situations (both physical and emotional) that were, for the most part, outside the experience of most of them. It was therefore, felt necessary to meet regularly to discuss and solve any issues that might arise as a result of this exposure. The team also had access to the Employee Assistance Programme (EAP).

The expert group

An expert group was put together because it was seen as an important way to gain external input for the study. The group consisted of representatives from universities and other injury prevention agencies. It included those not directly involved in the research, but with an interest in the area. The group was set up as an e-group, whereby information and comments were accessible to everyone in the group and this facilitated open discussion. The role of this group included fulfilling the following – it was seen as a way to:

- Keep those outside of the project team up to date with the research and to help inform individuals and groups of the existence of the research.
- Provide a wider vision and different perspectives.
- Provide additional and/or broader information from the specific expertise of expert group members.
- Provide access to knowledge on international research that the project team may not have been aware of or have had access to.
- Provide a wider national experience. The project team members were based in Wellington, Tauranga and Christchurch. The expert group was able to fill in some of the locational gaps, especially Auckland, which possesses a very different employment situation to Wellington, Christchurch and regional/rural centres.
- Help to prevent the focus of the project team from becoming too narrow.
- Provide for the early and continued involvement of experts in the field, adding to the credibility of the research.

Calculation of economic costs

This study used a mixture of interview questions, data analysis and participant recall to determine costs. Costs were divided into social costs (those which are intangible and impossible to quantify, for example the loss of a relationship or the extent of pain and suffering), and economic costs (those which have a dollar figure attached for example GP visits or penalties imposed after conviction).

At times additional economic costs had to be determined through secondary sources. These included OSH inspector time or costs of replacing equipment. The sources of information for these additional costs are footnoted on each separate economic cost spreadsheet. Where it was not possible to determine a dollar figure, it was noted that a cost had been incurred and was given, for example, in hours.

Other costs incurred when dollar values were not documented included :

- sick leave: where time was assigned (at an hourly rate if known) to the company as a cost. This was because the employer was paying for labour they were not receiving.
- lost production, lost time other staff, hiring additional staff, increased insurance premiums: it was noted that there was a cost but unless documented with dollar values, it was difficult to extrapolate this cost across a range of industries/occupations/circumstances.
- travel costs: where there was a travel cost, it was noted along with who bore it.

The information cannot claim to provide a complete picture, or total and final amount, as the extent to which costs were recalled by participants is a limitation of the research. Instead, the study aimed to illustrate the range of costs incurred, and who bore them; the injured or ill individual, the family/household, the employer, ACC, other government agencies or any other party.

In cases where, for example part or all of a Court fine was awarded, or the participants received a 'gift' from the employer, these amounts were recorded as costs to the employer but were not listed as 'benefits' to the individual.

Various cases included medical costs that were not documented in the ACC or OSH notes, such as particular procedures. The ACC pays for most public health costs of injured employees through bulk payments to the Ministry of Health.

Information from ACC included the costs of acute medical care to ACC, and Projected Value of Future Liability. ACC comments that its estimates of liability are based on the expected number and timings of procedures, inflated by rates used in the valuation for different types of benefits, then discounted at 6.1%. Future claim expense has been included, until 18 October 2002. Where there is no figure amount, this means the case is closed or that there are no expected future costs.

The total cost of entitlement claims for ACC does not represent the total cost of ACC's financial contribution to injury. ACC costs reported for a specific claim represent the 'cash' costs and include GST and PAYE and exclude:

- medical treatment costs(where the healthcare provider rather than the claimant is normally reimbursed directly - except where compensation has been paid for and dental treatment which has been claimed for by the patient)
- public hospital costs (which are bulk-funded)
- ambulance costs (also bulk-funded)

These estimated costs were subsequently supplied by ACC Actuaries.

Risks and limitations

- A key limitation of using a case study approach is that due to the small sample size, the information is not representative of the population. However, this limitation is irrelevant for this study as the purpose was to explore in depth rather than the ability to generalise, and the cases were put into their contextual framework to provide a wider and more holistic picture. In addition, the study was exploratory in nature, and subsequently better suited to a small sample size.
- Two of the main objectives of the study were to explore the social and economic consequences of workplace injury and illness for injured and ill employees, their families, and the workplace; and to identify key characteristics that determine social consequences. Issues related to social consequences are not covered by ACC and neither are they measurable or quantifiable. The research team had to be very careful through the entire process of the implementation of the study, to make sure that no personal biases or perspectives entered the interpretation and analysis of the data and that all conclusions and results were robustly ground in the raw data.
- In the process of interpretation and analysis, there was the risk of data being 'tortured' too much. However, because the data had to be qualitatively analysed, it required a fairly detailed, in-depth, and often iterative process of analysis (which included identifying common emerging themes related to physical, emotional, and psychological consequences for injured and ill employees, their families, and the wider community and pulling out links that connected these themes) – the analytic-induction techniques mentioned above.

- The team consisted mainly of female members (there were two males, of whom only one took part in the interview process). There was a possibility of the information provided being influenced by this gender equation.
- There are limitations (such as subjectivity and limited recall and memory) to self-reporting.
- The study took place at one moment in time and the on-going costs and consequences can only be estimated and imagined beyond that point.
- There are also considerable limitations to human perception and our ability to really understand other people's experience. We have, however, endeavoured to provide as full a picture as is possible within the constraints of time, budget, recollection and perception of the consequences of those involved in the fifteen cases that we studied.

The research experience

Ten researchers from different disciplines were involved in the project. A common experience for them all was that this study was unlike any other that they had been involved in. It created a bond both among the team due to shared experiences in the study as well as the intangible link with the participants in dealing with their pain and suffering. The project personalised for the researchers the extreme, enormous and on-going consequences of serious workplace injury and illness, and the real need for the awareness of practical health and safety systems and procedures.

Other experiences were that:

- The fieldwork was emotionally and physically draining, mainly because of exposure to the participants' high levels of pain and suffering. At the same time, this was a rewarding experience because of the openness, strength, courage and positivity displayed by the participants in spite of the huge burdens they carried. This increased the researchers' respect for human nature and put into perspective the 'fragility of what is considered normal life' and their own health and safety in their personal and professional lives.
- The participants' stories showed it is necessary to identify the costs and consequences of the injury and illness, and also seriously consider how to reduce these costs. Their experiences brought home the reality of injury and illness and their hope was that they inform practice in the workplace and improve health and safety of New Zealand workers.
- Direct quotes were a powerful way for participants to 'speak' to the reader through the report – this has enormous power and encapsulates a range of intense feelings in one sentence.
- At times the way some of the participants had been treated by their employers both before and after their injury or illness, made the researchers feel angry and frustrated.
- In a qualitative study of this nature, working with a team that was inter-disciplinary, open to constructive criticism, complemented each others' strengths and weaknesses and was extremely committed, was a great strength and advantage.

LITERATURE REVIEW

Part I: Macro studies

This literature review discusses two broad types of occupational 'cost of injury and illness' studies. Part I is the 'macro' study, which aims to provide the 'high level', or total cost of injury and illness for an entire population – covering the full range of injuries and illnesses. Part II is a review of selected 'micro' studies, which aim to provide a picture of costs to a sample population. This sample may be defined by, for example, a particular illness or injury, or by the inclusion criteria such as admissions to a particular medical clinic. The eight studies reviewed in Part II were partly chosen on the basis that they research the outcomes for some of the injuries or illnesses included in the Social Consequences study.

Defining 'costs'

The studies that were analysed used a range of definitions and descriptions of the nature of costs – these were defined as economic, social and financial; direct and indirect; tangible and intangible, insured and uninsured. In addition, these terms are interchangeable and what constitutes 'economic', or 'social', etc., varies.

Three studies defined economic costs as "the direct, indirect and opportunity costs borne by employers, employees and government (via the social security 'safety net')".[75] The Australian Industry Commission further defined direct costs as those met by Workers' Compensation and insurance, whereas indirect costs are all other costs.[76] The Health and Safety Executive (HSE) United Kingdom used case studies to show that examining the ratio of direct to indirect costs is problematic because the precise meaning of this ratio varies from author to author, making comparisons difficult. The advantage of analysing insured costs is that most organisations know how much and what types of insurance cover they have, and should be able to estimate their potential loss by comparison with a case study relating to a similar industry.[77]

However, Keller's definitions of social and economic costs summarise the general tenor of the cost literature:

> Social costs are typically described in losses or limitations in a person's ability to engage in major social roles and activities. These include working, parenting, or sharing leisure activities with or caring for friends and family. Impacts commonly discussed are the ability to perform tasks that are dictated by the work role (social consequences), as opposed to lost wages (economic consequences), or losing a range of motion (clinical consequences).[78]

The purposes of cost of injury and illness studies

The macro cost of injury and illness studies reviewed here had a range of purposes, which in turn affected their data sources and methodologies. Clearly stating the purpose ensures the correct methodology will be used.

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[75] G Foley et al (1995). 'The Cost of Work-related Injury and Disease.' Journal of Occupational Health and Safety – Australia and New Zealand 11(2). p171; National Occupational Health and Safety Commission (1994). 'The Cost of Work-related Injury and Disease.' Australian Government Publishing Service. pX. Also see Kiel et al (2000).

[76] Aust Industry Commission (1995). p553.

[77] Foley (1995). p171; NOHSC (1994). pX.

[78] S D Keller (2001). 'Quantifying Social Consequences of Occupational Injuries and Illnesses: State of the Art and Research Agenda.' American Journal of Industrial Medicine 40. p438, 439.

Some studies reviewed focused on quantifying the direct, economic costs of occupational injury and illness. They used Workers' Compensation insurance payments, provision of medical services, time needed to return to work, and other direct insurance and employment data. Reviewing a selection of cost of injury studies, Dembe found that researchers did not usually estimate or evaluate the various indirect economic consequences of a workplace injury. For example, there is little research on the lives and daily activities of affected workers and their families, what Dembe termed 'the so called "social effects" of workplace injury and illness'.[79]

There are different possible reasons for this. Because a lot of the costs and consequences incurred remain unknown, and thus uncalculated, Boden et al observed that these costs are treated as if they did not exist.[80] Brody commented that there is a possibility 'employers underestimate their work injury costs and therefore the potential savings of lower injury levels.' Such hidden costs, Brody explained, of which the typical firm is either unaware or does not attribute to its work injuries, are termed 'indirect costs'.[81]

In addition, while the direct cost literature relates primarily to the costs of occupational injuries, there is less published material on the costs of occupational illnesses. In a review of studies, Dembe observed that instead, occupational illness research usually examined the impact of disease on a patient's emotional health, family dynamics and economic well-being.[82] Dembe further argued that understanding these consequences of occupational illness is important because it helps us understand the full impact of workplace injuries and illnesses, minimise their repercussions, and plan appropriate preventative measures:

> Occupationally-induced injuries and illnesses have many outcomes including the payment of Workers' Compensation benefits, economic costs for employers, delivery of medical care services, work disability. In addition, there are less obvious implications for labour relations, family dynamics, domestic activities, community involvement, and personal mental health.[83]

Using the findings

The studies reviewed suggested a range of uses for their findings. For example, the results from macro studies allow comparisons with health conditions such as AIDS, Alzheimers, circulatory disease, cancer and musculoskeletal conditions; diabetes and asthma; as well as information on present costs and what data is needed in the future.[84] Also, knowing how much injuries and illnesses cost provides management with 'an incentive to motivate management to take more active interest in safety … and recognise their importance.'[85]

Analysing direct and indirect costs in Australia, the National Occupational Health and Safety Commission (NOHSC) commented that injury and illness cost information gives managers necessary health and safety information in a language they understand – 'the language of the bottom line'.[86] Keller proposed developing 'universally accepted guidelines for quantifying the severity of social

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[79] A E Dembe (2001). 'The Social Consequences of Occupational Injuries and Illnesses.' American Journal of Industrial Medicine 40. p403. The list of literature reviewed by Dembe is extensive and thorough. Please refer to Dembe's Bibliography for more details.

[80] L Boden et al (1999). p400.

[81] B Brody (1990). 'An indirect cost theory of work accident prevention.' Journal of Occupational Accidents 13. p256.

[82] A E Dembe (2001). p403.

[83] A E Dembe (2001). p413.

[84] J P Leigh et al (1997) p1557, G Salkeld et al (1996). 'Economic Cost of Health: Effects of Occupational Exposure to Hazardous Substances.' Stage One Final Report Volume Two. National Occupational Safety and Health Commission, Australia. p5, NOHSC (1994). p21.

[85] NOHSC (1994) p21.

[86] NOHSC (1994). p21.

consequences'.[87] A major 1980s study for the ILO aimed to identify the costs of work injuries and occupational diseases at the enterprise and national levels, and illustrate the cost distribution among different members of the community.[88]

The nature of social and economic costs

Economic cost studies largely calculated direct costs; that is, the costs that typically appear on an accounting balance sheet. Weil described these as including medical costs, lost time at work, and administration of programmes for those injured.[89] These costs are often incurred when complying with health and safety legislation and are regarded as a drain on corporate budgets. The HSE United Kingdom commented that while some organisations have made significant advances in their health and safety performance, others have failed to perceive the economic advantage of improving standards.[90]

However, many costs are also hidden, and are therefore more difficult to quantify. Weil listed some as loss of life; changes in future work activity and earnings of the injured; impacts on households of injured or ill workers; and diminishing quality of life.[91] Weil further observed that actual expenditures on medical costs provide a reasonable measure of social costs related to injuries. However, diminished labour force participation, earnings, or changes in household activity, are by contrast, 'more difficult to deal with in part because they are affected by the present and future behaviour of employers, households, and – most importantly – the decisions of the injured parties themselves'. Weil continued that studies must address the complex question of how injury events affect behaviour and how resulting changes in behaviour affect social welfare.[92]

An example of this is the time period used in the study. Weil explained that while traumatic fatalities occur at a point in time and consequences can be evaluated from that point in time, occupational exposures may happen over a period of years, and the diagnosis of an illness may not signal the beginning of the economic consequences associated with that illness. Weil also identified problems with assigning correct discount rates, and injury cases where the first return to work may not signal a long-term return to the labour market.[93]

Methodology

There is a range of methods used to calculate the economic and social costs. For the majority of studies, this involves determining the 'direct' and 'indirect' costs. Studies used different data sources, each of which involves strengths and limitations.

Using traditional data sources

Many studies have discussed the difficulties of using traditional data sources to calculated indirect or 'hidden' costs. One method is to analyse death certificates; however, these are known to undercount work-related deaths by 10-40 percent.[94]

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[87] S D Keller (2001). p444.

[88] D Andreoni (1986). *The Cost of Occupational Accidents and Diseases*. ILO, Geneva. p11.

[89] D Weil (2001). 'Valuing the Economic Consequences of Work Injury and Illness: A comparison of methods and findings.' *American Journal of Industrial Medicine* 40. p418.

[90] Health and Safety Executive (1997). *The Costs of Accidents at Work*. HSE Books, United Kingdom. p9.

[91] D Weil (2001) p418.

[92] D Weil (2001). p418.

[93] D Weil (2001). p418.

[94] J P Leigh et al (1997). p1557.

Other studies use single sources of data such as Workers' Compensation information. However, recent studies suggest that a major drawback of this data source is that a substantial number of workers with occupational illnesses and injuries never enter the Workers' Compensation system.[95] This includes those in casual or 'precarious' positions, termed by Quinlan and Mayhew as 'contingent and undocumented' workers'.[96]

Reville recommended using longitudinal data on earnings for injured workers, particularly if the injury precludes a return to work following the end of temporary disability benefits, but observed that by comparison, little progress has been made in the estimation of costs to employers.[97] One possible method, Reville suggested, was to measure the total amount of Workers' Compensation benefits paid in a given year.

> However, besides costs from Workers' Compensation, workplace injuries impose many other costs upon employers. Benefit payments or premium data do not capture lost productivity from time out of work, overtime, retraining, or other costs incurred by employers when injuries disrupt the production process. Despite the potential size of these non-Workers' Compensation employer costs, a lack of data has caused the literature on employer costs to focus on Workers' Compensation arising from injuries.[98]

The Australian Industry Commission discussed the limitations of the National Data Set for Compensation Based Statistics (NDS). Because it is based on Workers' Compensation claims, NDS data significantly underestimates the extent of work-related injury and disease. In Australia, reasons for this included injury or disease that results in an absence from work of less than ten days are not recorded; and not all types of employment are covered by Workers' Compensation, for example, the self-employed. It also pointed out that self-employment dominates in the fishing, agriculture, road transport and much of forestry and construction compensation statistics, which are also among the most highly hazardous industries.[99]

Boden explains that safety incentives are lost when the cost distribution changes to negatively impact on the injured or ill worker:

> Workers who do not file are not compensated and therefore the burden of compensation then falls on the workers and their families or on other social and private insurance systems. To the extent that Workers' Compensation payments provide safety incentives to employers, those incentives are lost when claims are not filed.[100]

Using administrative data

Administrative data is the primary source for information on injured workers in many studies that have used nationally collected data to estimate total yearly expenditure.[101] Also, national large regional datasets collected by the United States Bureau of Labour Statistics and other governmental bureaux

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[95] L Boden et al (1999). p400. For example, Foley cited a 1993 survey by the Australian Bureau of Statistics which found that only 47 percent of people with work-related injury or disease apply for Workers' Compensation. Foley also pointed out that, for example in Australia, different ratios apply to different circumstances, such as differences between States and between industry sectors. "Work-related Injuries and Illnesses, NSW, October 1993". G Foley et al (1995). p191.

[96] A E Dembe (2001). p406.

[97] R Reville (2001). 'New Methods and Data Sources for Measuring Economic Consequences of Workplace Injuries.' *American Journal of Industrial Medicine* 40. p457.

[98] R Reville (2001). p457.

[99] Australian Industry Commission (1995). p8.

[100] L Boden et al (1999). p400.

[101] See for example, T Miller et al (1995). 'Estimating the Costs of Occupational Injury in the United States.' *Accident Analysis and Prevention* 27(6). p741, R Reville (2001) p455, J P Leigh et al (1997), NOHSC (1994).

and private firms is aggregated and analysed in or, in Australia, statistical indicators are used by the NOHSC to measure the total injury and illness cost.[102]

These studies made a range of assumptions and use extrapolations from estimates of particular costs. Leigh et al reviewed various data sources and concluded that the data and methods for the various injury categories often used flawed or limited extrapolations. This study also found that in addition to these data sources, there are a number of less common alternatives that may be more suitable. These include primary data collection, public-use survey databases, and linked administrative data, such as information on Workers' Compensation payments.[103]

Using administrative data has some strength in calculating injury and illness costs. For instance, State governments and insurance companies already collect them; the databases often contain detailed, information on the progress of a claim through the Workers' Compensation system and on the injury; the population of claims is available instead of only a sample. Also, longitudinal data on labour force participation and earnings as well as extensive information on disability and Workers' Compensation is available.[104]

However, the limitations of using administrative data are extensive:

- injuries that do not result in claims is unavailable;
- limited amount of demographic information;
- data sets include limited outcome measures, rarely going beyond benefits paid;
- misses uncompensated time off work;
- benefit payments or premium data do not capture lost productivity from time out of work, overtime, retraining, or other costs incurred by employers when injuries disrupt the production process. Despite the potential size of these non-Workers' Compensation employer costs, a lack of data has caused the literature on employer costs to focus on Workers' Compensation arising from injuries;
- ignore costs associated with pain and suffering as well as those of within-home care provided by family members, and because the numbers of occupational injuries and illnesses are likely to be undercounted;
- any single source of data about occupational illness and injury underestimates the numbers of illness and injury and is heterogeneous, hence multiple data sources must be combined for comprehensive and reasonably accurate estimates;
- they exclude the costs to innocent bystanders, (e.g. an airline crash);
- they may not allow for recurring injuries (e.g. an injured knee may be easier to re-injure);
- source data often less than desired (quality, scope, timeliness, etc);
- data availability on types of injury may not match their contribution to burden (e.g. non-fatal permanently disabling injuries contribute greatly to total burden, yet information on e.g. occurrence is often lacking);
- data less reliable as degree of injury decreases, since many moderate to minor injuries are self-treated or treated by allied health professionals;

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[102] J P Leigh et al (1997). p1557, NOHSC (1994). pX.

[103] J P Leigh et al (1997). Also see for example R Reville (2001) p453, W L Watson et al (1997). *The Costs of Injury to Victoria*. Report no.124. Monash University Accident Research Centre. p1.

[104] R Reville (2001). p455, W L Watson et al (1997). p1.

- complex events: losses may occur over many years or entire lifetime. Payments of costs made by both workers and employers, may change over time, and may be difficult to differentiate from costs that would have occurred even if injury had not. Losses for same injury may differ by socio-economic and demographic characteristics of the worker or employer, economic conditions at time of injury; and
- injuries are relatively rare events (i.e. in 1996, there were 98 million households in the US therefore using the labour statistics annual incidence estimate, an individual household had an injury propensity for Lost Time Injury of about 0.3). Data for rare events usually requires large sample sizes. But because survey data for complex events usually need to be detailed, and in order to be affordable, these surveys typically have small sample sizes. This makes generalisations difficult.[105]

Using a country's gross domestic product

One method used by researchers is to present cost findings as a percentage of a country's gross domestic product (GDP)[106]. The Australian Industry Commission explains that while the overall cost of workplace incidents includes some costs that are likely to be incurred in the future, GDP is an estimate of the nation's output at a given point in time. However, with some qualification, it is possible to show the overall costs of work-related deaths, injuries and illnesses in terms of GDP:

> Although this means that comparison between the two estimates may not be valid, as they are estimated for different time frames. However, workplace incidents which occurred [in previous years] continue to impose costs. So the costs incurred in [one particular year] are the costs of workplace incidents which occurred in [that year], plus the outlays on work-related incidents which occurred [in prior years].[107]

In 1999 John Wren undertook an analysis of data to determine the economic costs of workplace injury and illness in New Zealand.[108] His method involved analysis of four standardised tables to suggest some answers to the following questions:

- the estimated total costs of workplace injuries and illnesses;
- the amount of expenditure on occupational health and safety regulation in relation to GDP;
- the amount of expenditure on occupational health and safety regulation in relation to the estimated costs of occupational mortality and morbidity; and
- a comparison of fatality rates in a range of OECD countries.[109]

The Australian Industry Commission notes an important limitation of using the GDP method:

> Injuries create demand for many services. Workers' Compensation pays for most of these. A reduction in the level of workplace injury and disease will not immediately translate into an identical reduction in the demand for workplace injury and disease-related services. The demand for these services comes not only from injury and disease occurring in a given year but also from past years' injury and disease. By the same token, the benefits of reducing the level of injury and disease will accumulate over time.[110]

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[105] R Reville (2001). p455, 457, J P Leigh et al (1997). p1564, 1557, J Harrison (2000). 'Measuring the burden of injury.' Injuries Issues Monitor. Research Centre for Injury Studies, Flinders University of South Australia 17. p1, W L Watson et al (1997) p1.

[106] This method was introduced in the Context Statement, and included a qualification by the Australian Industry Commission on using estimates of costs at 'at certain point in time' to show accumulated costs.

[107] Australian Industry Commission (1995) p94.

[108] J Wren (1999).

[109] J Wren (1999). p88.

[110] Aust Industry Commission (1995). p527.

Using primary data collection to quantify social consequences

Quantifying social costs is also fraught with problems. One study, by Keller, attempted to measure social consequences in numerical terms. Keller found that quantifying social consequences was best measured by using data provided by workers themselves [defined in other studies as 'self rating' or 'using participant recall']:

> Methods for quantifying social consequences include estimates of population frequency (large scale population surveys) and prevalence as well as more complex worker- or patient-centred multi-dimensional measures of health impact.[111]

Keller further points that measuring the impact and severity for individuals (such as pain) has long been measured by self-report because 'these phenomena are internal to the person and not outwardly visible … but this information must be quantified (scaled or graded) to serve as a measure of severity'.[112] These measurements of health status may also include validated scales such as the 'SF-36' scale.[113] There are examples of these studies in Part II of the Literature Review: Micro Studies.

Reviewing a number of studies, Dembe made other observations about the limitations of measuring social consequences. Any analysis is likely to be fragmentary because of the investigator's inability to isolate social impacts precisely. Dembe also pointed out that comparative information might be lacking, so even if an effect can be measured (for example, anxiety among injured workers), similar referent data for uninjured workers or the general population may not be available. Therefore, Dembe recommended expanded use of qualitative research approaches, including ethnographic interviews, focus groups, population-based surveys and questionnaires, and case studies.[114]

Discussing economic costs, Dembe stated that these could be compared with 'indirect costs' but translating social consequences into an economic scale is difficult, especially for subjective responses such as anger, depression, sleep disturbance, and pain which may have no discernible financial correlates.[115] Dembe suggested researchers consider the magnitude and severity of the disorder: type, locus, extent of social effects varies according to extent of injury:

> Socio-demographic attributes of affected individuals and groups can also potentially modify the type and extent of an injury's social consequence. Characteristics such as the injured worker's age, gender, race, ethnicity, nationality, education, socio-economic status could influence the responses of the worker, employer, insurer and medical provider.[116]

Cost estimation methods

The overall purpose of the study will determine the methodology used. The first step is to decide the time period for which the costs apply. Economic cost literature uses two approaches to determine direct and indirect costs, depending on whether the purpose of the study is to calculate total, ongoing, compounding costs or the costs for a particular year:

Incidence-based costs measure the "lifetime costs from disease/illness, based on all cases with onset of disease in a given base year and for each and every subsequent year over the natural course of the disease." This method is used for decisions about treatment and research strategies. Results provide the basis for predictions about likely savings that reduce incidence and improve outcomes and is the preferred method for injury prevention programme evaluation. One advantage of this method is that

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[111] S D Keller (2001). p439.

[112] S D Keller (2001). p439.

[113] J Harrison (2000). p1.

[114] A E Dembe (2001). p406.

[115] A E Dembe (2001). p406.

[116] A E Dembe (2001). [p406.

it provides a baseline against which new interventions can be assessed. However, a considerable amount of data is required[117].

Prevalence-based costs measure costs that occur "as a result of the prevalence of the disease"; and estimate the direct and indirect economic burden (value of resources lost/used) to society incurred during base period (for example, one year) and are used for cost control; for example, results identify the main parts of costs and resources used and areas for cost-cutting. All illness events that occur in that year are costed, regardless of when the onset of the disease occurred. This method requires less extensive data than the incidence method and is used more often.[118]

Once the time period has been decided, the literature then uses one of three common cost estimation methods:

- contingent valuation;
- using labour market evidence; and
- human capital, which is the most common method.[119]

a. contingent valuation (valuation of life studies): An important component of cost-of-illness studies, willingness-to-pay studies often estimate human life in the millions. Their estimates are usually larger than human capital measures.[120] The estimation is based on trade-offs, what individuals are willing to pay for a change that reduces probability of illness and death.[121] One positive is that the estimation may be used to indicate how individuals value health and life, and social preferences regarding public policy, such as assessing the burden of pain and suffering. The drawbacks of this method are that estimates may be influenced by wealth (thus the ability to pay) of the individual involved, and the values placed on policies by individuals are influenced by those policies (thus, the calculations are 'circular').[122] However the main controversy surrounding this method is that it poses the question of setting a 'price on life'.[123]

b. using labour market evidence: Weil explains that data on the observed behaviour of workers and firms is analysed, where compensation for risk is expressed in wage levels.[124]

c. human capital method (opportunity costs, foregone earnings): this method presumes that a person produces a 'stream of output' valued at market earnings, from which future earnings are discounted (due to a partial - or total - loss of earnings).[125]

Reviewing various methodologies, Weil explained that opportunity costs are the 'lost return on investment in human capital'; it measures lost productivity to society (for example, education, experience and ability).[126] Its calculations also include the burden imposed on injured or ill workers by feelings of depression, anger, and pain arising from limitations in all activity areas. Some cost of injury

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[117] D Rice (1994). 'Cost-of-illness Studies: Fact or Fiction?' The Lancet 344. December 3. P1519.J P Leigh et al (1997). p1560, G Salkeld et al (1996). p7.

[118] D Rice (1994). p1519, J P Leigh et al (1997). p1560, G Salkeld et al (1996). p7.

[119] D Weil (2001). p424.

[120] D Rice (1994). p1520.

[121] DWeil (2001). p424.

[122] D Rice (1994). p1520.

[123] D Weil (2001). p424. One study in New Zealand which uses this method is published by the LTSA; where the latest published update in June 2001 valued a human life at approximately $NZD2 million. (LTSA (2001). The Social Costs of Road Crashes and Injuries).

[124] D Weil (2001). p424.

[125] D Weil (2001). p424.

[126] D Weil (2001). p424.

studies using this method express the cost in terms of 'quality-adjusted life years' (QALY); which attempts to measure good health lost when someone experiences a health problem or dies.[127]

Rice discussed negative aspects of this method. These included the fact that life is valued in market terms, so children or the retired elderly therefore have low values; and psychosocial costs (pain, suffering) are sometimes not included.[128] Weil also explained that this method is complicated because it uses Workers' Compensation records to estimate the worker's earning profile had they not been injured, and a dollar value must be attached despite variations in the estimates are over time.[129]

A further characteristic of cost of injury studies which use the human capital method is a positive or a negative factor, depending on the purpose of the study. It measures the overall reduction or loss instead of focusing on micro-level changes in behaviour – diminished health, physiological wellbeing, family and social interactions are not calculated.[130] As mentioned earlier, here the purpose of the cost of injury study will dictate the methodology used.

An example of 'incidence based' lifetime costs: Australian Industry Commission Inquiry into Occupational Safety and Health

In 1995 the Australian Industry Commission estimated the costs incurred in current and future years, as a result of workplace incidents that occur in any given year. It called these costs 'the life time cost of a work-related incident'. The Commission estimated the economic cost of injury and disease for six categories of severity, ranging from short periods off work with full compensation, to permanent incapacity and fatality. By using 'unit costs' for each severity category (the data was obtained from the South Australian Workers' Compensation scheme in 1992-3), these costs have been extrapolated to the rest of Australia:

> The costs to employers, injured workers and the community were calculated and expressed as a share of total costs. Costs included the loss of business productivity, extra overtime, loss of income and future earnings, social welfare payments and medical costs. The cost that an injury or disease imposes in future years was discounted to the present, to determine the total costs that would be imposed in current and future years by injuries and diseases occurring in any one year.[131]

Calculating the 'direct' and 'indirect' proportions of the total cost

The terminology related to costs has been widely discussed in the literature, where costs are usually distributed between 'direct' and 'indirect' costs. Other common terminology used includes insured and uninsured; controllable and non-controllable; direct, indirect and intangible costs; economic and non-economic, fixed and variable, direct and indirect, internal and external costs.[132]

However, direct costs usually included those costs met by Workers' Compensation payments, while indirect costs, or non-compensated costs, are not.

In the majority of studies, there are usually two steps involved. The first is to define and determine the amount of direct costs. Secondly, the ratio of direct to indirect costs is calculated, which in turn determines the amount of indirect costs. The following discussion reviews how the literature defines 'direct' and 'indirect' costs, and how calculation methods and ratios are presented. This calculation is

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[127] D Weil (2001). p424.

[128] D Rice (1994). p1520.

[129] D Weil (2001). p432.

[130] D Weil (2001). p432.

[131] Australian Industry Commission (1995). p17. Also, see Appendix C of Australian Industry Commission.

[132] For example, see T Larsson et al (1995). Cost Estimates of Occupational Injuries in Australia. Report for the Institute of Human Safety and Accident Research, Melbourne. p1, NOHSC (1994). p21, P Dorman (2000), M Harcourt et al (1998).

often expressed as a ratio, or illustrated as an iceberg or a triangle, where the amount of direct costs is far outnumbered by the indirect costs.

Defining direct costs

Direct costs represent actual expenditure (for which payments are made). These direct costs may be ex ante (premiums paid by employer 'in anticipation of workplace injury' including injury prevention programmes, or compliance costs) or ex post (benefits paid 'in response to actual workplace injury such as Workers' Compensation and return to work programmes, and costs of job accommodations).[133]

In Heinrich's opinion, direct costs are simply the total amount of benefits paid by the insurance company. Other studies have described direct costs as:

- treatment costs: hospital, nursing home care, physician and specialist services, drugs, appliances, medical and non-medical costs e.g. hospital (inpatient, emergency department), rehabilitation (services, aids, equipment), ambulance transport, may also include costs of caring for injured person at home (attendant care, visits by nursing service);
- costs associated with the injury event: property damage, equipment and material damage, product losses, process and technical breakdowns or damage to the environment;
- property damage can account for significant proportion of injury event; and
- government services: legal costs, police and fire services, Workers' Compensation administrative costs, social security payments.[134]

Some cost studies explicitly exclude some direct costs. For example, when calculating the 'burden' of occupational injury and illness in Australia, Watson et al noted that while services of family and friends (beyond productive loss to caregivers of child injury victims) who care for injured are likely to be significant, these costs were excluded due to lack of data.[135]

Defining indirect costs

It was noted earlier in this review that while indirect costs contribute a significant amount to the total costs of occupational injury and illness, they remain largely impossible to quantify for a range of reasons. Therefore, while it is impossible to place a definitive dollar value on indirect costs, the literature identifies a range of indirect costs and uses the direct to indirect cost ratio to provide an approximate total cost.

Indirect costs are variously known as intangible, uninsured, uncompensated and subjective costs. In Heinrich's words, these are 'the expenditure assumed directly by the enterprise'. Rice and Reville both divide these indirect costs (for which resources are lost). Rice separates indirect costs into morbidity costs (the value of reduced or lost productivity due to disease (lost days/earnings)); and mortality costs (the number of deaths from the disease with expected future earnings taken into account).[136]

Reville divides indirect costs into 'ex ante' and 'ex post' costs. For example, ex ante indirect costs include compensating higher wages for workers for job risks, and redundant hiring to insure against workplace injury. Ex post indirect costs include lost worker productivity, training other workers to

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[133] R Reville (2001). p458, J P Leigh et al (1997). p1560.

[134] D Rice (1994). p1519, J P Leigh et al (1997). p1560, W L Watson et al (1997). p1, HSE UK (1997). p46.

[135] W L Watson et al (1997). p1.

[136] D Rice (1994), R Reville (2001).

replace injured worker, decreased company morale and overtime costs paid to other workers.[137] Other studies describe indirect costs as:

- lost time: of injured employee; other employees who stop work as a result of the injury (e.g., sympathy, curiosity, assist);
- lost output: production loss; training and retraining; investigations and paperwork; under-productivity of injured employee on return to work; lost fixed overhead costs per injured employee, losses due to reduced output or premature death;
- lost income: as a consequence of non-productive expenditure of resources on injury and disease occurrences and, income on that foregone income in subsequent years;
- loss to society: or partial loss, of the productive efforts (both paid and unpaid) of injury victims and caregivers in the case of children, reduced physical activity;
- moral suffering of the victim's family is more serious if, for example in a fatality, the victim was 'head of the family' and made main contribution to budget and household services; also some types of occupational illness create costs to subsequent generations (e.g., birth defects);
- loss of business image and customer satisfaction, employee morale and goodwill;
- repercussions of after-effects (mutilations, mobility, blindness, scars, mental changes, etc.) which are represented in physical and psychological suffering and which lead to expenditure designed to provide new subjects of interest and distraction for the victim; and
- subsequent material losses, also where members of the family have to give up earnings.[138]

Foley and Andreoni also included some costs that other studies have termed 'direct costs'. These include out-patient treatment, hospitalisation or home care, payment for caregivers, prosthetics, transport; damage to materials, instruments, tools and personal vehicles; immediate loss of wages during period of work stoppage, as well as future loss of earnings if there is no return to work and also loss of 'secondary' jobs for which no compensation is received.[139]

Indirect literature was reviewed extensively in Brody who concluded that while some studies used different methodologies and definitions, many studies concluded that 'indirect costs are relatively small in magnitude and therefore incapable of stimulating an employer to increase prevention activity':

> The sum of indirect costs does not constitute a potentially fruitful source of savings likely to motivate typical firms to invest in additional prevention.[140]

Some cost studies explicitly excluded some indirect costs, such as compensation costs relating to pain and suffering.[141] Andreoni describes these as 'subjective' costs, because:

> … consequences of a subjective nature means an exact overall evaluation of their financial repercussions is impossible. Evaluation would mean using arbitrary and variable criteria.[142]

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[137] R Reville (2001). p458.

[138] D Andreoni (1986). p17, G Foley et al (1995). p191, HSE UK (1997). p46, W L Watson et al (1997). p1, J P Leigh et al (1997). p1560.

[139] G Foley et al (1995). p191, D Andreoni (1986). p17.

[140] B Brody (1990). p267.

[141] W L Watson et al (1997). p1.

[142] D Andreoni (1986). p18.

In addition, the level and incidence of indirect costs varies according to the severity of workplace incidents, whether or not Workers' Compensation is received, and the extent to which compensation payments adequately cover the cost of work-related incidents.[143]

From the above discussion, it may be concluded that studies do not agree on the cost categories to be used, let alone what costs fall under each category.[144]

The ratio of direct and indirect costs

The current debate about the cost of workplace incidents is focused on assessing the reliability of the direct to indirect cost ratio.[145] The first published data on indirect costs was Heinrich in 1950, who began analysing work injury files in the late 1920s. Heinrich concluded that indirect costs were substantial and generally a multiple of direct costs. [146]

Conversely, a New Zealand study by Harcourt and Head instead concluded that indirect costs are less than direct costs. However, the authors concede this disparity may be due to a number of issues, including differences in the definition of direct and indirect costs, and that in New Zealand, ACC funding of health and medical treatment relieves the public sector of some of the cost of providing treatment to injured employees.[147]

The total direct and indirect costs give the overall cost of workplace injury and illness. One visual tool used in various studies (beginning with Henrich in 1950) described the ratio as the 'iceberg'[148] where the direct costs are the tip of the iceberg, and the indirect costs make up a larger proportion that is hidden 'below the surface'.

In a major study for the ILO, Andreoni used similar proportions to describe the relationship of direct (or visible) costs to the indirect (invisible). Using a triangle to illustrate, Andreoni estimated that for one case of major injury, there were twenty-nine cases of minor injuries, and three hundred non-injury injuries.[149]

Some of the most comprehensive attempts to measure both indirect and direct costs included Miller, and Leigh et al, which included measuring disruption costs to employers. Leigh et al also reviewed the literature on training costs, and concluded that these costs have never specifically been measured in association with workplace injuries.[150]

Leigh et al used the direct and indirect method for calculating total costs, commenting that this is the most widely used method in the medical and legal literature in large part because estimates are available and reliable.[151] Both Reville and the Australian Industry Commission found no studies that attempted a detailed accounting of both indirect and direct costs at even a single firm, and certainly not a large representative sample of firms. Reville regarded this as a glaring omission, probably due to a lack of appropriate data.[152]

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[143] Australian Industry Commission (1995). p87.

[144] For a succinct discussion of the development of this 'cost terminology', it is suggested that readers refer to the M Harcourt et al (1998) article.

[145] G Foley et al (1995). p171, Australian Industry Commission (1995). Section C.

[146] Please refer to the HSE UK (1997).

[147] M Harcourt et al (1998). p55.

[148] HSE UK (1997). p46.

[149] D Andreoni (1986). p45. Andreoni also provided information on a range of other 'triangle' models which suggested different ratios.

[150] T Miller et al (1995), J P Leigh et al (1997).

[151] J P Leigh et al (1997). p1560.

[152] R Reville (2001). p459, Australian Industry Commission (1995). p87.

Presenting the findings

Cost distribution categories (who pays?)

Cost of injury studies used a variety of cost distribution categories, which reflects the difficulty of isolating and accurately measuring social and economic costs. Generally, the categories were divided into the following groups:

- individual (that is, the injured or ill employee/worker);
- workplace (that is, the employer and/or work colleagues);
- social environment (that is, the household, family and friends, society, community);
- medical costs; and
- government.

Different models illustrating the cost categories

Studying and measuring economic and social consequences is made more complex due to the complicated shared relationships between the participants, the impact of various modifying factors, and the effects of the injury or illness itself. Dembe explained that:

> Research studies of social consequences will need to account for the multi-factorial influences of personal, social, organisational, and environmental variables and the complex interplay of the individual worker with a variety of forces from the workplace, community, medical profession, Workers' Compensation system, and broader society.[153]

Reviewing various methods and findings in economic cost studies, Weil depicted the economic consequences as a flow or set of pathways. Weil explained that workers will be distributed across the pathways with varied economic consequences, and the sum of these equals the total economic costs.[154] However, Dembe described the social consequences as a 'ripple effect', where the 'repercussions of an occupational injury or illness reach beyond the boundaries of the victim's workplace and home, extending into hospitals, courts, and the local community'.[155] The evaluation of these consequences is made more complicated by the interdependence of these factors.

Dembe depicted these interdependent factors by outlining affected individuals and groups, describing the impact on their societal roles, and the role of institutions and structures in creating and carrying the costs.[156] Both Boden et al and Dembe argued that the social and economic consequences can be increased or mitigated by how various affected parties (injured workers, employers, social insurance systems, and health care providers) respond.[157] Coulton provided one example of this:

> Following an injury or illness, each area is linked. For example, tensions from prolonged home care can lower the self-esteem of the affected employee, which in turn affects the work environment. This could lead to poor work performance when the employee returns to work.[158]

The nature of these costs means that researchers attempting to evaluate the costs and consequences of workplace injury and illness will find choosing an appropriate methodology challenging. Dembe

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[153] A E Dembe (2001). p413.

[154] D Weil (2001). p418.

[155] A E Dembe (2001). p404.

[156] A E Dembe (2001). p404.

[157] L Boden et al (1999), A E Dembe (2001).

[158] R Coulton et al (1995). The Social Dimensions of Occupational Health and Safety. Social Science Press, Australia. p33.

observes that researchers in this area should be prepared to be as creative and flexible as necessary in their choice of study designs and methodology, because it is an important, yet neglected, aspect of public health:

> Such social consequences are complex, interrelated, and mutually dependent. Their study is complicated by the methodological difficulty of clearly defining and measuring the pertinent variables and evaluating their intricate connections.[159]

Categorising injury types

Leigh et al calculated the total injury cost to the United States. Injuries were categorised to match workers' compensation cost data:

- traumatic deaths;
- disabling injuries: at least 1 day of work loss;
    - permanent total: the person will never work again at any job;
    - permanent partial: the person will probably never work again at the pre-injury job, but with training my find a different job;
    - temporary total and partial: temporarily out of work or working at diminished capacity but fully anticipating returning to the pre-injury job;
- non-disabling injuries: no loss of a full workday;
- injuries were not categorised by type (ie head injury, amputation of fingers) since cost data for injuries categorised this way are not uniform, ie they originate with studies using varied assumptions;
- in addition, an 'accident' could have resulted in more than 1 injury and classified by body part (e.g. car crash could cause a concussion and a finger amputation) could lead to over-counting.[160]

Presenting results

Cost studies presented their findings in a variety of ways. As shown above, a common method was to show the total cost of work-related injury and diseases spread over employers, employees, their families, and the community. However, different methodologies and cost definitions, discussed above, meant that results across studies were not always comparable.

QUANTITATIVE RESULTS

Using a country's GDP

One method outlined in the methodology section was to express economic costs in terms of a country's GDP. The ILO and the WHO estimate that occupational fatalities and injuries, as well as work incapacity can cause losses of 3-5 percent and 10-15 percent of the global GDP, respectively.[161]

For specific countries, the calculations fall within the lower range. Calculating the cost to New Zealand's GDP in 1999, John Wren concluded that:

> … the direct and total costs of workplace injury and illness are commonly estimated to be in the range of 2 – 3% of GDP; with indications the costs could be as high as 8.5% of GDP.[162]

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[159] A E Dembe (2001). p413.

[160] J P Leigh et al (1997). p1558.

[161] WHO and ILO (1996).

His findings may be summarised as follows:

Estimates of the Total Cost of Workplace Injuries and Illnesses as % of GDP[163]

Country	Estimated total cost of workplace injuries and ill-health as % of GDP for respective years	Published estimates of direct and total costs of workplace injuries and ill-health
New Zealand	2.5 (1992)	Acknowledged estimate of total cost in 1992/93 $NZ 1- 1.5 billion. This figure is not based on any NZ research, it's a direct application to NZ of midpoint of the HSE and ILO estimates of total costs of workplace injuries and illnesses.
United States	2.05-4.0 (1992)	Estimated total costs in 1992 $US 171 billion. Estimates range from 115.9 to 247 billion (due to which occupational mortality and morbidity statistics are used).
United Kingdom	2.0-3.0 (1994)	HSC Report 1994 "Costs of Workplace Accidents".
Australia	3.4-8.4 (1994)	Estimates of costs range from $A5 to 37 billion. (due to which calculation is used: direct vs total costs or appropriate ratio to use between direct and total costs)
Sweden	2.81 (1994)	$6,349,446,123 in $US and includes costs of occupational health.

These 1999 results agree with findings from subsequent studies. In a 1997 study (updated in 2000), the HSE United Kingdom estimated that the total cost of work injuries and work-related ill health to society as a whole is estimated at 10 – 15 billion pounds a year – equivalent to between 1.75 percent and 2.75 percent of the country's GDP.[164] In Leigh et al the total costs of occupational illnesses and injuries in the US in 1992 was estimated as approximately 3 percent of GDP.[165] Likewise, the Australian Industry Commission estimated the overall cost of work-related injuries and diseases to be approximately 5 percent of GDP.[166]

Dollar figures

In a 1995 study, Miller found that workplace injuries cost $US140 billion annually. Miller calculated that injury costs an average of $US2.5m per fatality, $US46 000 per compensable injury, $US1600 per non-compensable lost work injury, and $US650 per injury without work loss.[167] Two years later, Leigh et al calculated the total direct costs to the American economy as US $65 billion, and indirect costs as US $106 billion. However, Leigh et al reiterated these estimates were likely to be low because they ignored costs associated with pain and suffering as well as those of within-home care provided by family members, and because the numbers of occupational injuries and illnesses are likely to be undercounted.[168]

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[162] J Wren (1999).

[163] J Wren (1999) p.84.

[164] HSE UK (1997). p9.

[165] J P Leigh et al (1997). p1563.

[166] Australian Industry Commission (1995). p94.

[167] T Miller et al (1995). p745.

[168] J P Leigh et al (1997). p1557.

Cost ratio

The Australian Industry Commission's estimate of the average ratio of direct to indirect costs of approximately 3:1 accords with the results of other research.[169] Heinrich developed a cost ratio for direct to indirect costs in the order of 4:1 (ratio or iceberg hypothesis of a liner relationship between indirect and direct costs), which is still generally accepted.[170] Later research has estimated the ratio of direct to indirect costs to range from 1:1 to 1:7.[171]

Allocate percent of total cost

a. by cost category (employer, employee, community)

Some studies, such as the Australian Industry Commission, allocated a percentage of the total costs to particular cost categories. This method identifies the various factors that act to affect the social and economic consequences for injured or ill workers. It then identifies who bears the costs (that is, where the direct and indirect costs fall), and whether these costs are 'shifted', such as from the employer to the individual or to the taxpayer through the compensation system.

For example, the Australian Industry Commission estimated that:

> Employers bear about 40% … injured workers bear about 30% … [and] the community bears about 30%. Employers bear about 90% of the cost of injury and illness resulting in less than five days off work. Where workers are permanently incapacitated, employers bear about 40% of the cost, the community 40%, and the remaining 20% by the individual.[172]

Because fatalities are a relatively rare event compared to minor injuries, it makes (financial) sense for the employer to control these common, yet costly minor injuries. Those workers who suffer the most severe outcomes bear the highest cost, while the share of costs borne by the employer falls. Therefore, in the case of traumatic fatalities, individuals and their family bear about 60 percent of the cost, the community about 30 percent, and employers 20 percent.[173] In this model, the costs of traumatic fatalities are shifted away from the employer. The Australian Industry Commission argued that therefore, the incentives for an employer to provide a safe workplace are reduced, thus creating a need for intervention through safety regulation.[174] The more severe outcomes account for the bulk of the total cost of work-related injury and disease.[175]

The HSE United Kingdom used a pyramid concept to show that controlling the more common non-injury 'accidents' will reduce the chance of injuries and fatalities, and so provide proactive control of health and safety.[176] This theory is termed 'total loss control'. Early cost of injury research by Heinrich argued that:

> … in order to eliminate injuries to people, managers must tackle the root causes of injuries that lead randomly to injury.[177]

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[169]Australian Industry Commission (1995). p17.

[170]G Foley et al (1995). p191.

[171]D Andreoni (1986), B Brody (1990), HSE UK (1997).

[172]Australian Industry Commission (1995). p19.

[173]Australian Industry Commission (1995). p19, D Weil (2001). p424.

[174]Australian Industry Commission (1995). p102. Other reasons for the high costs are because in Australia, many Workers' Compensation schemes stop or are substantially reduced after a certain length of time.

[175] Australian Industry Commission (1995). p19.

[176]HSE UK (1997). p49.

[177]HSE UK (1997). p49.

Some studies have further argued that employers may have a greater ability to control the number and severity of injuries than workers have. Reville pointed out that accurately estimating the full costs to employers is critical for education of the employer community and for the design of policies intended to improve safety.[178]

In conclusion, many of the studies reviewed above argue that it is important to identify *where* the costs fall, as well as *how much* the costs are, as a direct motive for action. In a review of cost of injury research, Hopkins observed that the amounts quoted (in the billions) are beyond most people's comprehension. They also do not provide any particular party an incentive to act; and are misleading (this is largely because some of the costs involve benefits to others, for example, those who provide specialist medical services). Hopkins also argued that:

> Any attempt to argue that safety pays must specify for whom. Unless we can identify a relevant decision-maker for whom safety pays, the argument has no capacity to motivate action to reduce injury and illness.[179]

Hopkins stated that the benefits would usually have to outweigh the costs of prevention:

> … cost arguments only develop potential leverage when we focus on who is paying those costs. We must take seriously the question of for whom safety pays. It turns out that at times managers have no financial incentive to attend to catastrophic risk and that the safety pays argument, therefore, has no capacity to motivate them to attend to safety. [180]

By this statement, Hopkins was arguing that some employers believe it is cheaper to take the risk than to prevent it through establishing health and safety systems. Hopkins suggested that the message should instead be that safety pays not financially, but in emotional terms, for example asking managers to consider how they would feel if a facility for which they were responsible suffered a major injury.[181]

Dorman also discussed the allocation of costs, and the importance of creating the correct financial and emotional incentives in a series of studies on the economics of safety and health. Dorman explained that according to economic theory, economic, fixed, direct and internal costs are the costs that financially motivate employers. Therefore, 'cost externalisation' reduces the incentives to act. Various instruments are designed to re-internalise costs. These include hazard pay, employer liability in court, and Workers' Compensation. This prevents the cost shifting to the worker or community. Without these incentives, health and safety is regarded by many as a 'cost', not an 'investment'. However, Dorman argued that:

> … the long-term, intangible benefits of worker health and well-being, and [economic] innovation (for example, enhancing product quality, reducing waste) can happen simultaneously.[182]

b. by injury or illness type

Other studies allocated a percentage of the total costs to particular levels of severity. For example, two studies concluded that for all injuries, those that occur in the workplace account for approximately 20 percent of the total, but account for either 32 percent of total injury medical care costs, respectively.[183]

Miller et al further concluded that:

- less serious non-fatal injuries comprise only 5 percent of the total workplace injury costs; and

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[178] R Reville (2001). p457.

[179] A Hopkins (1999). 'For Whom Does Safety Pay?'. *Safety Science* 32. p153.

[180] A Hopkins (1999). p143.

[181] Hopkins (1999). p153.

[182] P Dorman (2000). Introduction.

[183] T Miller et al (1995) reported this result, and also concluded a similar result as 38 percent.

- quality of life losses account for 43 percent of workplace injury cost, but 61 percent of motor-vehicle crash costs, and 73-77 percent of victim crime costs.[184]

Leigh et al also calculated the costs of disease in the United States. The study concluded that $US19.7 billion of this cost was from the five most common disease categories. This amount was divided into direct costs (54 percent); mortality costs (36 percent); and morbidity costs (10 percent). With non-fatal illness, direct costs accounted for 92 percent of the costs. The most expensive diseases (accounting for 97 percent of the costs of fatal occupational illness) were occupational cancers, diseases of the circulatory system and chronic respiratory diseases.[185]

Impact on the labour market

While not directly comparable to New Zealand, the Australian Industry Commission's comparison between lost working days due to work-related injury and disease (between 20 and 12 million working days per year), and those lost due to industrial disputes (467 000 days in total, in 1994), is still interesting to note.[186]

QUALITATIVE RESULTS

Other studies presented their results in a qualitative method. This is because although there are not necessarily dollar values attached, these 'costs' are still of value, and represent intangible losses. These are sometimes termed 'social' costs. This section presents findings in this descriptive method.

Presenting findings that are broader than financial costs

Boden et al found that studies by researchers such as by psychologists, sociologists, anthropologists has begun to illustrate the social costs that economists find hard to capture:

> … injured workers' ability to continue to perform their social, family, and work roles is compromised by their diminished earnings, long-term physical limitations, depression, fear and anger. As a result, family relationships suffer and family members frequently sustain significant economic and psychological hardships.[187]

The list of studies cited by Boden is extensive. In a review of cost study research, Boden et al found that few studies have systematically defined or measured these effects. However, this review also concluded that some recent studies have attempted to measure broader impacts; such as functional and vocational status, satisfaction, worker experience with Workers' Compensation and medical care systems.[188]

The following information describes a range of impacts on the injured or ill worker, and the wider community. While this information is grouped into the same cost distribution categories that were used in previous sections, it should also be noted that interdependent factors affect the costs and consequences. However, costs are summarised by:

- Worker;
- Family;
- Employer and workplace; and

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[184] T Miller et al (1995). p745.

[185] J P Leigh et al (1997). p1563.

[186] Australian Industry Commission (1995). p17.

[187] L Boden et al (1999). p399.

[188] L Boden et al (1999). p399.

- Government. This section includes impacts on areas such as medical expenditure, and costs for government agencies.[189]

a. Impacts on the Worker

The Australian Industry Commission summarised the characteristics of workers at risk:

- men are more at risk than women;
- new migrants, especially those with non-English speaking backgrounds;
- older workers, and those aged between 18-24;
- labourers, tradespersons and plant and machine operators (the industries with the highest fatality rates are the mining, transport, rural and construction industries);
- those who work in workplaces employing less than five people.[190]

Economic consequences for the injured or ill worker

A review of research findings by Boden et al found that workplace illnesses and injuries have major economic and non-economic consequences for workers and their families. It stated that recent studies support the view that the economic burden falls heavily on workers.[191] Other studies have found that estimates of lost income accounts for only a fraction of a workers' total losses, which include medical and non-pecuniary costs.[192]

Non-economic consequences for the injured or ill worker

Coulton concluded that physical discomfort was one impact, but workers also suffered from emotional, social, financial impacts. There are temporary or permanent, unexpected and sometimes long-term changes in lifestyle and family relationships which may create anxiety over return to work or changes in employment.[193]

Social (or human) costs may be expressed in terms of the physical pain, loss of prospects for further development, social aspects of disability, a general decline in quality of life and living standards, and loss of self esteem.[194] For example, the Australian Industry Commission commented that this could cause a breakdown in their mental and social well-being:

> The worker suffering from hearing loss due to industrial noise has difficulty communicating in the workplace but, more importantly, is denied most of the social interaction everyone else takes for granted.[195]

A research review by Dembe provides an extensive list of non-economic consequences for the injured or ill worker, although many of these will have some financial cost associated. These 'consequences' were summarised into the following areas: [196]

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[189] Other Cost Studies have used variations on the above list. For example, in calculating the total costs of injury in the United States, Miller divided costs into the following categories: medical and emergency services; wage and household work; administrative and legal costs ; workplace disruption; and quality of life. T Miller et al (1995). p741.

[190] Australian Industry Commission (1995). p12-15.

[191] L Boden et al (1999). p399.

[192] L Boden et al (1999). p399, also see R Reville et al (2001), D Weil (2001).

[193] R Coulton et al (1995). p35.

[194] NOHSC (1994). pX, Australian Industry Commission (1995). p22, A E Dembe (2001). p404.

[195] Australian Industry Commission (1995). p24.

[196] The list of articles reviewed in Dembe (2001) is extensive. These are all listed within the Dembe article.

- Workers' Compensation;
- Medical care;
- Domestic daily function and activities of daily living;
- Psychological and behavioural responses;
- Stress;
- Vocational function; and
- Social aspects of rehabilitation and return to work.

Workers' Compensation Systems

Some studies found that workers perceived the system as "unfair, uncaring, adversarial" and that injured workers may be reluctant to report work-related ailments, because of fear of reprisal, a belief that pain is ordinary consequence of work/ageing, lack of management support, and a desire not to lose their usual job.

Other studies reported that many persons suffering work-related injuries and illnesses use their own health insurance or other private or public assistance programmes to pay for medical care and other expenses. Dembe quoted further investigations, which concluded the injured worker suffered significant economic hardship and found that many studies reported that injured or ill workers dip into their own savings, and borrow money.

Medical care experiences

A number of reviewed studies found that patient satisfaction generally lowered when care is provided within managed care plans, because, for example, the worker cannot choose their treatment provider. Other studies quoted workers who believed some physicians do not take their problems seriously and fail to understand the nature of their jobs, or provide insufficient advice about preventing further injury.

Domestic function and activities of daily living

Dembe reviewed studies that examined the outcomes for those with upper extremity injuries. Studies reported a range of impacts, such as sleep interference, or problems with household activities, from opening jars to writing and child care. Other studies found that the financial burden of injury meant that affected workers were more likely to move home; lose their home, car, health insurance; compared to a control group.

Psychological and behavioural responses

A number of studies reported that the overall mental health of individuals was worse than in the general population, particularly for those out of work at least one year following an injury. These mental health problems included feelings of anxiety and depression; elevated levels of stress; sleep disturbances, sexual problems, depression, lowered self-esteem, and occasionally, suicidal tendencies. One study involving focus groups with injured workers in California revealed widespread feelings of sadness, anger, humiliation, and despair in response to Workers' Compensation system handling their claims.

Stress

One common outcome of injury or illness is stress, which Dembe regarded as a "complex factor to analyse and study because of its putative role as a potential cause, effect, and modifier".[197] The research review cited studies that found a complicated feedback loop between disease states, stress reactions and stressors. For example, stress could lead to workplace injuries and illnesses, it could

[197] A E Dembe (2001). p.410.

develop out of unemployment, anger and other consequences of job injuries, and stress could mediate the ensuing social consequences following occupational injury or illness. There was also evidence that many injured workers suffered from post-traumatic stress disorder.

Vocational function

Dembe cited some studies which found injured workers face significant disruption in their working lives and in their subsequent labour market experiences; for example, they are more likely to change or lose their jobs, reduce work pace, or not return to work because the employer would not take them back.

The longer the delay before injured or ill workers return to work, the greater the impact on work quality, motivation, satisfaction, and the ability to handle job responsibility compared to those missing less than one week. Dembe also found studies that used economic analysis to show indirect costs associated with lost productivity far exceed direct healthcare expenditure for injuries and illnesses.

However, Dembe concluded that cost studies are hampered by an absence of a standardised assessment tool for measuring the impact of an injury or illness on work activities.

Social aspects of rehabilitation and return to work

The research review states that the kinds of social support available are particularly important in mediating the 'return to work' process. Some investigations have suggested that pre-injury job satisfaction and motivation to work are significant predictors of return to work, while others report factors such as the amount of formal education affects the time taken to return to work. However, Dembe reported that other studies have not detected this effect.

Some studies found that personal characteristics of the worker and their family, the social and economic environment and job characteristics, and the extent to which compensation is received all influence the duration of disability and successful return to work.

b. Impacts on the Family

Psychological and behavioural responses to a work injury are not limited to the injured individual. Families and others who provide support are adversely affected. The Australian Industry Commission stated that the loss is greatest for the families and friends of diseased workers.[198]

Dembe's review of research cited studies that found caregivers, administrators, managers, and family members, can respond with a range of attitudes and emotions. For example, nurses and other health officials treating patients have been found to minimise the patient's self reported pain; with one study suggesting that health professionals are prone to denigrate and distrust any occupational condition that are reportedly linked to psychosocial factors like job pressure and stress.

c. Impacts on Employers and the Workplace

Costs to certain industries and enterprises:

The cost of work-related injury and disease varies significantly between industries. For example, the Australian Industry Commission stated that 'the frequency of Workers' Compensation claims in the mining industry is six times greater than in the finance, property and business services industries, and twice as great as the all-industry average'.[199]

The indirect, or intangible, losses of productivity are extensive. However, there remains no established methodology for calculating them and information is usually based on particular workplaces, not a nation-wide data collection. According to the Industry Commission, these indirect costs include:

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[198]A E Dembe (2001). Also see Australian Industry Commission (1995). p22.

[199] Australian Industry Commission (1995). p22.

- shutting down production processes after an injury;
- damage to product, machinery and inputs;
- less effective temporary employees;
- less effective work from other workers who fill in for injured workers (possibly creating overtime charges);
- injury investigation and reporting;
- reduced worker morale; and
- increased absenteeism.[200]

Costs to small or medium enterprises:

In one particular study looking at 'hidden', or indirect, costs to various sized Australian enterprises, Larsson made some conclusions about smaller sized workplaces that are applicable to New Zealand. Larsson concluded that in the workplaces studied, the costs of serious injury are transferred to the public, through the Workers' Compensation system:

> Small business employers expected employees to attend their own GP or local hospital for minor accidents, and only claim Workers' Compensation for very serious accidents. Small businesses also employ family members to 'fill in for a few days'. Small business owners do not generally keep extensive accident/injury records or identify lost production time as a cost.[201]

Compliance costs:

Compliance cost research undertaken by the Department of Labour and the Ministry of Economic Development concluded that some employers regard health and safety as a cost, while others see it as an investment. However, various research confirms that compliance costs are difficult to identify and measure.[202]

Costs to government:

The Australian Industry Commission noted that most costs to government fall on social security programmes or health programmes. For example, these included hospital admissions, rehabilitation, inspection and investigation, travel, and social security.[203]

It is not surprising that one of the largest areas of cost arising from workplace injury and illness, is from medical costs. Studies have used different categories to break down medical costs into calculable areas. When calculating the total costs of injury in the United States, Miller used levels of severity ranging from fatalities and permanently disabling injuries to other injuries qualifying for disability compensation, and injuries with only medical care compensated. Similarly, Watson et al used three levels of severity: fatality, hospitalised injuries, and non-hospitalised injuries.[204]

In a major study for the ILO, Andreoni divided the total costs of injury into public funds (the government budget) for costs incurred by legislation, inspection or assistance and noted that taxpayers ultimately bear the cost for these. The second category was enterprise funds (costs are

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[200] Australian Industry Commission (1995). p518.

[201] T Larsson et al (1995). p1.

[202] For more information on the difficulties of measuring compliance costs, please refer to the following articles. Australian Industry Commission (1995). p159, OSH (2000a), Ministerial Panel on Business Compliance Costs (2001).

[203] Australian Industry Commission (1995). p20.

[204] T Miller et al (1995). p742, W L Watson et al (1997). p1.

added to the price paid for goods) for costs incurred by production, and noted that consumers ultimately bore these costs.[205]

However, the Australian Industry Commission noted that study results will generally undercount costs, due to reasons such as workers deciding not to file claims for minor injuries, or the work link not being made. Instead, estimates may be made concerning the 'magnitude'. The Industry Commission estimated that of the total Australian expenditure on medical services, about 6.1 percent was from workplace injury and disease. This equated, in 1995, to approximately $A1 053 million.[206]

A further cost to the Government, and to society in general, is the effect on the labour market. Lost work time, permanently disabled workers and Workers' Compensation insurance are all consequences of workplace injury and disease. The Australian Industry Commission noted that these costs have small but significant effects on the labour market and the economy.[207]

Or categories by causes of death, injury or illness

In their 1997 study estimating the costs of injury to Victoria, Watson et al rated the most expensive injuries. The most expensive accidents were caused by motor vehicle traffic, followed by other transport; then drowning, poisoning and falls. The seventh most expensive injury type was due to fire, flame or burns, followed by deaths due to being hit, struck or crushed.[208] Some of these injuries would no doubt be occupationally related.

In a major US study calculating the total injury and illness costs from a range of data sources, Leigh et al found that:

- for men, 10-33 percent of all types of lung cancer, and 21-27 percent of deaths from bladder cancer, are attributable to occupational exposures;
- studies demonstrate increased risks of cancer for specific occupations without clear identification of the suspect agents, e.g. farmers with lymphoma, and firefighters with brain cancer;
- side smoke from cigarettes is a likely carcinogen in some jobs;
- clear patterns exist in occupations concerning cigarette use:
- waitresses, bartenders, labourers, auto mechanics, welders and kitchen workers, among others report high cigarette use in recent surveys and in surveys from 20 years ago;
- teachers, physicians, nurses, dentists, clergy and librarians among others, report low cigarette use in the same surveys;
- the American Cancer Society estimates that 6-10 percent of cancers in adults aged 25 years and older are occupational in origin; and
- deaths caused by illness tend to occur later (e.g. 65 years of age) than deaths from injury (e.g. 25 years of age).[209]

Other types of macro studies

Other types of macro studies attempt to quantify non-economic, as well as economic costs. In New Zealand, these have included studies assessing the costs to society of family violence, alcohol and

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[205]D Andreoni (1986). p7.

[206]Australian Industry Commission (1995). p528.

[207]Australian Industry Commission (1995). p514.

[208]W L Watson et al (1997). p1.

[209]J P Leigh et al (1997). p1559.

tobacco misuse, and in Australia drug abuse. One of the most well-known studies in New Zealand is issued by the Land Transport Safety Authority; the annual 'value of life' study used to calculate the social cost of traffic accidents. [210]

Literature Review: Part II: Micro studies

Another type of study that explores the outcomes of occupational injury and illness is the 'micro study'. Micro studies have been used for a variety of purposes and thus employ a range of methodologies. Difficulties identifying and isolating the wide range of impacts was noted in Part I of the Literature Review by researchers such as Weil and Dembe. Micro studies, on the other hand, are useful because they isolate and magnify the outcomes for a particular segment of the total population, defined by injury or illness type, geographic location, industry, workplace, and so on. A sample of eight micro studies was selected to illustrate the variety of purposes and methodologies that are used.

In New Zealand, there has been limited research into the social consequences and economic costs of work-related injury or illness.[211] However, some social science academic research has explored outcomes of injury and illness in general. The most relevant was undertaken as a sub-project of the Social Consequences and Economic Costs project, looking at occupationally-acquired leptospirosis using similar objectives and methodology.[212] This research is of particular value as it magnifies and expands on outcomes for those with leptospirosis, one of the occupational illnesses explored in the Social Consequences study. Other theses, while not specifically focusing on work-related issues, explore the impacts of injuries often experienced at work, for example, hand injuries and occupational overuse syndrome.[213] Also of interest is a doctoral thesis that explored the outcomes and consequences for head injury victims, from the perspective of the individual, using a specific methodology that examines the use of conversation and other signals to communicate, termed 'symbolic interactionalism'.[214] These theses represent only a selection of numerous other examples of academic research contained in New Zealand's university libraries.[215]

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[210] B Easton (1997). *The Social Costs of Tobacco and Alcohol Misuse*. Report prepared to the Alcohol Advisory Council of New Zealand, the Health Research Council of New Zealand, and the Public Health Commission. Public Health Monograph no.2 Department of Public Health, Wellington School of Medicine. S Snively (1994). *The New Zealand Economic Cost of Family Violence*. Department of Social Welfare, New Zealand. M Collins et al (1992). *The Social Costs of Drug Abuse in Australia in 1988 and 1992*. Report prepared for the Commonwealth Department of Human Services and Health, Australia. LTSA (2001).

[211] The latest attempt to measure the total cost is by M Harcourt et al (1998). Also see Ministry of Health (2001a). *The Burden of Disease and Injury in New Zealand*. Public Health Intelligence Bulletin no.1. In addition, ACC recently produced an information booklet entitled 'Consequences' based on analysis of its claim data.

[212] M Adams (2002). *The Hidden Cost: The Health, Social, Psychological and Economic Consequences of Occupationally Acquired Leptospirosis* (Thesis submitted to the Victoria University of Wellington in partial fulfilment of the requirements of the degree of Masters of Social Science Research (Applied), Victoria University of Wellington).

[213] J Brown (1999). *Perception versus Reality: Implications of Living with Occupational Overuse Syndrome, an Acquired Hidden Disability* (1999). (Thesis submitted to the Victoria University of Wellington in partial fulfilment of the requirements of the degree of Masters of Arts (Applied) in Social Work, Victoria University of Wellington) (it may be noted that all participants in her study said their OOS was caused at work). S Sutcliffe (1998). *Getting a Grip: A study of the psychosocial factors that impact on the Rehabilitation of People with Traumatic Hand Injury*. (Thesis submitted to the Victoria University of Wellington in partial fulfilment of the requirements of the degree of Masters of Social Science Research (Applied), Victoria University of Wellington).

[214] D Sutherland (1996). *From Unconscious to Self-Conscious: Cognitive rehabilitation from the perspective of symbolic interactionalism*. (Thesis submitted to Massey University in fulfilment of the requirements of the degree of Doctor of Philosophy in Social Policy and Social Work, Massey University).

[215] Two further relevant examples are E H Mobayad (1999). *Till Death Do Us Part: Industrial Death Narratives*. 3rd edition. Industrial Deaths Support and Advocacy. Australia. Also, a project looking at the support available to surviving families of employees who have been killed at work may be of interest. S Spaak (1997). *Rights, Entitlements and Support for the Surviving Families of Employees who have Been Killed at Work*. (Thesis submitted to the Victoria

Purposes of micro studies

Micro studies have a number of strengths in determining the costs of injury and illness. As discussed in Part I of the Literature Review, the purpose of macro studies is to show the total cost of all injuries and illnesses. The purpose of a micro study, on the other hand, is to focus on a particular population, whether defined by injury or illness type, a single workplace, industry or occupation, geographic location, method of selection, and so on. Some studies aim to produce results that are indicative only, although they do retain the minute detail of individual changes, while others use sampling methods that will produce results to be generalised to the larger population. Furthermore, a number of micro studies can often be combined in a meta-analysis to provide a larger representative result. This is useful in, for example, ranking and comparing the respective burdens of individual diseases.

In a study examining the indirect costs of injury prevention, Brody explained that using standardised methodologies may increase employer awareness of the higher returns from preventative strategies, and provide more empirical research determining the magnitude of indirect costs across a variety of industries and occupations.[216] Four of the eight studies selected used scales to provide standardised (or objective) results concerning subjective conditions, such as feelings of depression or self-confidence.

In another example, Kiel et al used six case studies to illustrate how macro-economic studies do not show the total costs of individual injuries. Part of the weakness of macro studies, Kiel et al argued, can be attributed to the significant gaps and lack of uniform data collection nationally, and the extent of 'unreported' injury and disease.[217] A further drawback is that the 'blunt' methodology of macro economic studies hides the depth and breadth of costs associated with single injuries or illnesses, because a range of assumptions to standardise incidences across a population is made. Kiel et al illustrate this by identifying key determinants of cost to show how the actual costs of workplace injury can vary significantly to the typical costs used in some macro-economic studies. These features led Kiel et al to conclude that there are many varied factors potentially impacting on the cost of work-related injury, thus making an overall 'estimate' problematic.[218]

Macro studies typically give little idea of the non-economic costs of injury or illness beyond brief descriptions – if these types of costs are mentioned at all. What is missing, therefore, are the micro changes; the minute detail that makes each incidence different. Also missing is information about the exact nature of the costs involved, and importantly, who bears these costs. For example, one of the selected studies in this review, by Morse et al examining work-related musculoskeletal injuries, sought to repeat a large scale statistical survey (which was based on compensation data) on a smaller scale to show family, health and employment outcomes that were not originally explored. Morse et al also used alternative means of accessing the sample population to illustrate outcomes for those that do not enter the compensation system and were therefore not represented in the original macro study.

Micro studies, such as those using case study methodologies, may be a useful tool for highlighting these varied factors:

> While the statistics show that workplace injury is an enormous cost to society (both human and economic), they provide little insight into understanding the specific impact workplace injury has on the individuals and organisations affected (that is, the injured party, employer, and other government and community agencies).

University of Wellington in partial fulfillment of the requirement of the degree of Bachelor of Arts in Law, Victoria University of Wellington).

[216] B Brody (1990). p268.

[217] G Kiel et al (2000). p109.

[218] G Kiel et al (2000). p109.

> [Case studies would] also be useful in providing a human perspective behind what may seem impersonal figures.[219]

The HSE United Kingdom produced a range of case studies that illustrate the cost of injuries to various individual workplaces. It argued that large scale losses such as those from major fires or explosions, or involving loss of life, are very visible and many have been the subject of calculations; however, firms often do not know how much the less 'serious' incidents cost:

> Less well understood, however, is the nature and extent of loss from accidents of a more routine nature: those accidents which injure but do not kill people, which damage plant and interrupt processes. The costs of these sorts of accident can often be hidden in sick pay, increased insurance premiums or maintenance budgets. Few firms have the mechanisms to identify them separately and fewer still actually identify and examine the costs of accidents systematically.[220]

While these are important points of difference, micro studies do have some characteristics in common with macro studies. After reviewing a range of micro studies (many of which are not analysed in this review), it is possible to summarise some common features:

- cost is often distributed between the injured or ill worker, the community and family, and the employer and workplace, although in some studies the costs or outcomes for only one or two of these groups are studied;
- costs that are explored may focus on just economic costs, but outcome indicators can also include social, psychological, clinical, and employment costs or outcomes;
- studies use a range of statistical methods, including surveys, questionnaires, and telephone interviews; and may either contain or totally rely on data analysis; for example, using medical records and compensation data; and
- studies may use validated scales to standardise results, particularly when discussing symptoms or consequences that are subjective; for example, pain; depression; or the impact on daily living activities.

Methodology

This section discusses the following characteristics of the selected studies:

- Study selection method
- The eight selected studies
- Defining costs, consequences and outcomes
- Material and methods:
  - Defining and identifying the population
  - Subjects and exposure/injury (demographics of the population)
  - Research design (methods and measurements)
- Presenting the Findings
- Conclusions

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[219] G Kiel et al (2000). p116.

[220] HSE UK (1997). p3.

Study selection method

The vast number of published micro studies makes a total review of the literature impossible. Therefore, while the eight studies that are reviewed here represent a minute selection of the total range published; they had a range of objectives, used different data collection methods, and discussed the outcomes of occupational injury or illness in a variety of ways. Six of these studies were selected because they assess the consequences to specific populations affected by injuries or illness included in the Social Consequences study, thus making the conditions and outcomes familiar to the reader and, it is hoped, of particular interest. A further two case study reports were chosen which discuss the consequences for a range of injuries, but have different purposes and therefore use different methodologies. Terms used to search the database included 'social', 'economic', 'costs', 'consequences', 'socio-economic', and 'outcomes', as well as specific illness and injury terms.

The eight selected studies

Occupational asthma

Approximately five hundred new cases of occupational asthma are reported annually in the United Kingdom, a figure considered to underestimate the true incidence by at least threefold.[221] Two studies were analysed:

- Cannon, Julie et al. Consequences of occupational asthma. British Medical Journal, volume 311 2 September 1995
- Ameille, J.C et al. Consequences of occupational asthma on employment and financial status: a follow-up study. European Respiratory Journal, volume 10 1997

Cannon et al and Ameille et al stated that occupational asthma is now the commonest occupational respiratory disease in industrialised countries but data is considered to underestimate the true incidence by at least threefold. Both studies aimed to explore the consequences of occupational asthma for its largely young and economically active patients, with Ameille et al further arguing that many studies have been devoted to the medical aspects of occupational asthma, but few have investigated its socio-economic consequences.[222]

Neurotoxicants

Exposure to neurotoxicants (eg chronic toxic encephalopathy and solvent-induced neurotoxicity) is one of the ten leading causes of disease and injury in workers in the US.[223] Two studies were analysed:

- Morrow, Lisa et al: A Distinct Pattern of Personality Disturbance following Exposure to Mixtures of Organic Solvents. Journal of Occupational Medicine, volume 31 no. 9 September 1989
- Abjornsson, Gunnel et al: Long-Term Follow-up of Psychological Distress, Social Functioning, and Coping Style in Treated and Untreated Patients with Solvent-Induced Chronic Toxic Encephalopathy. Journal of Environmental Medicine, volume 40 no. 9 September 1998

Morrow et al and Abjornsson et al both explore the consequences of neurotoxicity in chemically exposed workers. Morrow et al explored psychological signs (such as personality changes or depression) because these are usually the first indications of disease and therefore the reason most people seek treatment, but in contrast to previous studies, used standardised methodology to research subjective psychiatric symptoms. Abjornsson et al explored the same issues but used a control group

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[221] S Meredith (1993). 'Reported Incidence of Occupational Asthma for the United Kingdom.' Journal of Epidemiology and Community Health 47. p459

[222] J Ameille et al (1997). p55.

[223] T J Callender et al (1997). 'Social and Economic Impact of Neurotoxicity in Hazardous Waste Workers in Lenoir, North Carolina.' Environmental Research 73. p166.

of untreated patients to investigate whether the short-term positive outcomes (less psychological distress and increased social functioning) of a treated group continued. Abjornsson et al then compared these results with a group of non-exposed workers to determine the long-term characteristics of psychological distress, and identify long-term coping strategies for those with this chronic disease.

Work-related musculoskeletal disorders

It is thought that many people who have work-related musculoskeletal disorders (WRMSDs) do not receive Workers' Compensation because of a lack of recognition of work-relatedness.[224] Two studies were analysed:

- Morse, Timothy et al. The Economic and Social Consequences of Work-related Musculoskeletal Disorders: The Connecticut Upper-extremity Surveillance Project. International Journal of Occupational and Environmental Health, volume 4 no. 4 October 1998
- Keogh, James et al. The Impact of Occupational Injury on Injured Worker and Family: Outcomes of Upper Extremity Cumulative Trauma Disorders in Maryland Workers. American Journal of Industrial Medicine volume 38 2000

Outlining the purpose of the study, Morse et al observed that Workers' Compensation does not reimburse all of the costs of injuries such as WRMSDs, nor does it address social consequences. Morse et al also stated that many people who have WRMSDs do not receive Workers' Compensation possibly because of lack of recognition of work-relatedness, or other barriers to filing and collecting claims. Keogh et al further observed that when outcomes are measured, most reports address lost work days and related costs for wage replacement, disability, medical care and replacement labour. Both Morse et al and Keogh et al explored a broader scope of outcomes including social, economic and functional consequences for injured workers and their families.

Case studies for a range of injuries

Both of the following studies assessed the costs and consequences for a range of injuries, but used different sampling methods and definitions of 'population':

- Workplace case studies chosen by occupation: Health and Safety Executive. The costs of Accidents at Work. HSE Books, United Kingdom 1997
- Individual case studies chosen by injury severity: Kiel, Geoffrey et al. Investigating the Economic Cost of Injury in the Workplace: A Case Study Approach. Economic and Labour Relations Review, volume 11 no. 2 June 2000

There are a range of published micro studies that examine the consequences of a range of injuries and illness to a particular 'population'. The HSE United Kingdom used a methodology that measures the financial loss caused by injuries and ill health, based on which inter-firm comparisons could be made, because this would make a valuable contribution towards reducing industrial injuries and occupational ill health.[225] The overall aim was to provide an incentive for all organisations to take the management of health and safety more seriously. Kiel et al also used case studies to illustrate the totality of costs that are incurred as a result of a work-related injury. The study compared the actual cost of six workplace injuries in Queensland with the average estimates determined by the Industry Commission Inquiry. However, neither of these studies calculated or identified the 'non-economic' costs of the injuries and Kiel et al did not specifically examine the costs of work-related illness.

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[224] P Barth et al (1980). Workers' Compensation and Work-related Illnesses and Diseases. Cambridge, Massachusetts.

[225] Safety and Health at Work, Report of the Committee 1970-72 London (Chairman: Lord Robens). London, HM Stationery Office, July 1972.

Defining costs, consequences and outcomes

The selected studies defined the 'cost' of injuries and illnesses in different ways. Cannon et al and Ameillie et al both termed these as socio-economic changes; that is, changes to earnings (including benefits), job status, and employment experience.

Psychological outcomes were the focus for Morrow et al and Abjornsson et al. Morrow et al discussed outcomes as patterns of psychological distress, while Abjornsson et al defined outcomes as particular coping strategies, classified into problem- and emotion-focused strategies. Abjornsson et al used the concept 'sense of coherence' to illustrate the characteristics of those who cope successfully with stressors and describe the conditions that aid recovery. Social support, coping and sense of coherence are considered to be moderators of long term stress and health outcomes.

Outcomes examined by Morse et al and Keogh et al were defined as health, functional and family outcomes. For Morse et al, these were the costs borne by the worker and their family (uncompensated costs), costs covered by other employer-provided benefit systems (group health insurance, sick time, etc.), or other externalised costs covered by government social programmes, such as Social Security. For Keogh et al, these outcomes included changes to home and recreation activities, sleep, daily living activities and depressive symptoms.

The HSE United Kingdom and Kiel et al both used a costing methodology. The HSE United Kingdom case studies aimed to identify the cost of all accidental losses that were considered to be preventable and that an organisation committed to loss control would aim to eliminate.[226] Costs included financial[227] and opportunity[228] costs. The ratio between insured and uninsured costs was represented as an iceberg showing the full costs of injuries, including those hidden below the water line. Kiel et al used the Australian Industry Commission Inquiry into occupational health and safety 1995.[229] The Inquiry developed six mutually exclusive categories based on the severity of the injury and then determined their typical costs (within a range of highest and lowest cost). The reported incidence by injury type then enabled the Inquiry to determine the number of incidents occurring in each severity category for Australia.[230] Kiel et al then used case study analysis to show how costs are allocated among various parties affected (that is, injured party, employers, government agencies, and the community).

Both Ameille et al and Kiel et al outlined what factors might affect these changes; these are known as 'cost determinants' and act to cause, prevent, exacerbate or alleviate particular outcomes or costs.

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[226] An accident was defined as: 'any unplanned event that resulted in injury or ill health of people, or damage or loss of property, plant, materials or the environment or a loss of business opportunity.' (HSE UK (1997). p17.

[227] Additional costs incurred to return the situation to what it was before an accident happened. This covers both material and labour costs. HSE UK (1997). p17.

[228] Costs of lost opportunities, either through people having to stand idle or not being able to produce at their regular job by virtue of being redirected to deal with the consequences of an accident. This may include energy costs from plant running idle and buildings being lit and heated. HSE UK (1997). p17.

[229] A major objective of the Inquiry was to identify the extent and impact of workplace injury on employers, the injured worker and the community and to make recommendations about reducing the negative impacts of injury. The study determined that without a clear understanding of how costs are allocated across different groups, the incentive for employers to provide a safe workplace and the onus of responsibility for care among workers will probably remain at unsatisfactory low current levels. The total cost of work related injury was determined by multiplying the average cost per severity category by the estimated number of incidents per category, then summing these to determine overall costs. The methodology of the Inquiry is detailed in the Literature Review Part I: Macro Studies.

[230] A key assumption was that the incidence of different injury severity's in NSW was consistent with the rest of the country (G Kiel et al (2000). p116.

Material and methods

Defining and identifying the study 'population'

The purpose of the selected studies dictated how potential participants were selected. Five of the selected studies (Abjornsson et al, Cannon et al, Keogh et al, Amielle et al, and Morrow et al) explored the consequences for those diagnosed with a particular injury or illness so used patients who had been referred for medical treatment during a set period. However, two of those were examining long-term outcomes as a result of an intervention to treat the illness (occupational asthma for Ameille et al, and exposure to solvents for Abjornsson et al). A further purpose of Abjornsson et al was to compare this treated solvent-exposed group with a non-treated group and also to a healthy 'referent', or control group with no symptoms. Kiel et al also sought potential participants who had been contacted as a result of their injury, through the local health and safety service.

In contrast, the HSE United Kingdom used a self-nominating process. Their aim was to identify workplaces that would reflect a 'typical' workplace in their particular industry. Morse et al sought to replicate the original macro survey on a small scale by contacting a particular segment of the total population based on their own subjective diagnosis, and also used a control group for comparison.

Once the potential population had been defined based on the studies' purpose, four different methods to identify actual participants were used. Four of the studies used the clinical diagnosis to determine that the injury or illness was work-related (Cannon et al, Ameille et al, Morrow et al, and Abjornsson et al). Conversely, Morse et al and Keogh et al used screening questions to assess whether the potential participant had a work-related musculoskeletal disorder. For Keogh et al, this was because the claims data that was used as a source included injuries other than upper extremity injuries; and for Morse et al's, random digit dialling was used to identify those with additional previously undiagnosed work-related injuries.

The HSE United Kingdom and Kiel et al selected their final population according to their information needs. The HSE United Kingdom based their final choice on workplaces that were high performers in occupational health and safety, while Kiel et al selected five case studies to fit with pre-determined levels of injury severity.

Subjects and exposure/injury

A summary of the demographics of each population is given below.

Occupational asthma:

- Cannon et al: n=225, mean age approximately 40 years old. Using the clinician's final diagnosis (clinical history, measurement of specific antibodies, serial peak flow recordings, specific inhalation readings), patients were divided into three categories: the first group was those with occupationally induced asthma (n=113), of which 31 percent were women, and 33 percent were in socio-economic groups I and II, accounted for by the high proportion of research scientists and technicians. The other two groups, pre-existing/co-existing asthma exacerbated through work (n=37), and those with asthma unrelated to work (n=75), both had twice as many men as women, and higher proportions in lower socio-economic groups.
- Ameille et al: n=257, plus follow up three years later (n=209 – demographics and results presented are for these participants). Mean age was 38, three-quarters were male. A large proportion of patients were employed in small companies with few employees. The diagnosis was often late, as the mean duration of symptoms before diagnosis was greater than three years. 124 participants had filed a claim, and at the time of follow-up, 103 cases had been recognised and compensated. The two most common causative agents were flour, and isocyanates, followed by house dust and formaldehyde. Using a clinical diagnosis (history of respiratory symptoms that improved on days away from work, and one of following including serial peak expiratory flow measurements, and other clinical tests).

Exposure to neurotoxicants (such as Toxic Encephalopathy (TE) and Neurotoxicity):

- Morrow et al: n=22, high school educated, Caucasian, native English-speaking men, mean age 38. A history of exposure to mixtures of organic solvents and had no documented neurologic or psychiatric disorder prior to their assessment. Patients with a (self-reported) history of alcohol intake exceeding one to two drinks per day were excluded. Mean length of solvent exposure was 7.3 years, the range was from 2 months to 19 years, and 28 percent of the patients had experienced at least one episode of excessive exposure (e.g. an injury in which they came into contact with a large amount of solvent).
- Abjornsson et al: treated TE patients (TTE) n=13, mean age 57, diagnosed with chronic TE during 1988-89 shortly after which they participated in an intervention programme. (All except one of original 14 are in this follow-up study). 62 percent were married or cohabiting, 23 percent widowers, 1 unmarried, 1 divorced. 23 percent had gainful work, 69 percent had disability pensions, 1 on unemployment benefit. Untreated TE patients (UTE): n=26, mean age 54, established clinical diagnosis of TE documented in medical records but had never been offered specific treatment for the TE. 85 percent were cohabiting, 8 percent widowers, 1 unmarried, 1 divorced. 58 percent were gainfully employed, 31 percent had disability pensions, 1 was on long-term sick leave, and 2 were unemployed. The two TE groups had similar exposure durations, in the range of 11 to 47 years. Their previous occupations were printer, house painters, car painters, industrial spray painter, and others. Most subjects in both groups had not been subjected to solvent exposure at work for a long period, often five to ten years before the present re-evaluation. The reference group used patients as closely matched as possible for age, over half were married or cohabiting, none had been exposed to solvents, and all were gainfully employed.

Work-related musculoskeletal disorders:

- Morse et al: 3,200 people were screened in order to find 374 people with chronic upper extremity pain. These individuals and 551 controls were interviewed by phone. A subset of WRMSDs of the upper extremity was then identified using set criteria (for example, 'was pain or discomfort either due to or made worse by work?'), as was a second subset using more conservative criteria (for example, doctor had diagnosed WRMSD) based on self-report. Demographics of the sample were similar to those of the general 1990 Census data, except for education, where the sample included a smaller proportion of those with less than a high school education, and ethnicity. Morse et al reasoned that this result is consistent with the use of a telephone survey, since individuals with minimal education are less likely to have telephones, and more highly educated households are more likely to have multiple telephone lines.
- Keogh et al: workers making claims through Maryland Workers' Compensation system, n=537. The majority of eligible respondents were employed in three of ten broad categories – manufacturing, keyboard, and other including service, retail, and finance. Women outnumbered men in all groups, particularly keyboards where 92 percent were women. 21 percent worked at sites with less than 10 workers, and most reported presence of ergonomic risk factors at work. Almost all reported repetitive motion and working with wrist flexion or extension. Most reported working with pinching motions and forceful use of hands. 84 percent of respondents had at least a high school education and these were more likely to be in the keyboard group. Carpal tunnel was overwhelmingly the most common diagnosis.

Case-studies of a range of injuries/accidents:

- HSE United Kingdom: none of the five participating organisations suffered major catastrophic loss during the study periods. Nor were there any fatal injuries, prosecutions or significant civil claims, all of which could have increased the levels of loss well beyond those recorded. The sites chosen employed between 80 and 700 people and covered five different areas of employment: construction site, creamery, transport company, oil platform and a hospital.

- Kiel et al: Criteria for inclusion: gender 1-2 females, 4-5 males; injury hazard: ergonomic (for example, manual handling); plant/machinery/environment (for example, falls from heights) seriousness of injury: serious bodily injury and hospitalisation; industry sector: agriculture; manufacturing; construction; employer sector: private sector (that is, non government); employer type: blue collar, white collar, managerial; all involved 'employed' persons as opposed to 'self-employed' but also included one rural case; size of firm: small, medium, large.

Research design (methods and measurements)

The selected studies used a range of research designs, appropriate to their purpose. Four studies used questionnaires; two of these used standardised questions. Cannon et al and Ameille et al explored treatment and severity outcomes for those with occupational asthma, as well as how their employment status was affected. For Cannon et al, the questionnaire focused on job changes made because of asthma, consequences on income, difficulties in acquiring new work, and current treatment. Ameille et al collected demographic and medical information, before assessing the illness severity with a score based on hospital admissions, frequency of symptoms, past and current use of steroids, and other medications. In the follow-up three years after, information was obtained on current working status, financial situation and whether a compensation claim had been submitted. Ameille et al subsequently used multiple logistic regression models to determine predictive factors for loss of employment.[231] Data was analysed using Statistical Analysis System (SAS).

Morrow et al and Abjornsson et al, in their study of workers exposed to organic solvents, both used questionnaires, although questions were standardised with validated scales to describe psychological outcomes. Morrow et al used a psychometrically sound questionnaire.[232] A detailed occupational and environmental chemical exposure assessment was conducted that measured duration of solvent use, type of solvents used, time (in weeks) since last exposure, and specific accidents or episodes of excessive exposure. Abjornsson et al also used standardised questions, but the research design was slightly different. Firstly, four tests were repeated from the original study.[233] These tests were followed by four scales: the Symptom checklist-90 (SCL-90), measuring psychosomatic and emotional distress;[234] Sense of Coherence (SOC), which is a 29 item, 7 point scale;[235] Interview Schedule for Social Interaction (ISSI), a self-report questionnaire about the quantity and quality of social support;[236] and fourthly, a scale to measure coping strategies, a self administered questionnaire called

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[231] Multiple logistic regression uses a stepwise backward (conditional) removal procedure to eliminate non-significant variables. This means all variables that did not affect the outcome (therefore were not significant) were removed, leaving the significant variables that had an effect on the outcome. For example, if gender is shown to be not an influence on outcomes, it is removed.

[232] Minnesota Multiphasic Personality Inventory consists of 566 true or false statements that describe various feelings and thoughts, for example: 'I get anxious and upset when I make a short trip away from home'. Clinical evidence is assessed based on ten different scales. These measure: scale 1 (excessive bodily concern); scale 2 (depression); scale 3 (somatic concerns coupled with emotional discomfort and social withdrawal); scale 4 (social nonconformity); scale 5 (identification with traditional gender roles); scale 6 (paranoia); scale 7 (anxiety), scale 8 (mental confusion, feelings of alienation, unusual thoughts, psychologic turmoil); scale 9 (mania); scale 0 (social introversion). Scores above 70 are considered to be indicative of clinically significant psychopathology.

[233] These were the SRB:1 vocabulary test and the Cronholm-Molander verbal memory test (both in Swedish), the WAIS-R Digit Symbol test, and the Gamma cylinder pegboard test.

[234] the SCL-90 uses a five point likert scale indicates symptoms for nine subscales: depression, anxiety, somatisation, interpersonal sensitivity, obsession-compulsion, hostility, phobic anxiety, paranoid ideation, and psychoticism.

[235] The Sense of Coherence scale (SOC) has an anchoring sentence, i.e. 'when you talk to people, do you have the feeling that they don't understand you?'. The respondent is asked to indicate a response by number, from 1 to 7, with the end points being 'never have this feeling' and 'always have this feeling'. The higher the score, the stronger the SOC. The SOC evaluates availability and willingness to use adaptive coping resources scored in three dimensions: comprehensibility, manageability, and meaningfulness.

[236] The ISSI consists of 33 items combined into four scales measuring availability and adequacy of attachment and social integration.

Strategies to Handle Stress (SHS) consisting of 61 items.[237] A medical examination and an interview by an occupational hygienist followed these tests. Data was analysed using the statistical software SPSS.

Four studies explored a broader range of outcomes. Two studies, Morse et al and Keogh et al, used scales within their interview schedule, while the HSE United Kingdom and Kiel et al used self-report and self–recall, respectively.

Morse et al and Keogh et al explored a broader range of outcomes for those with musculoskeletal disorders through interviews, but also used scales to determine certain outcomes.

Morse et al asked a series of questions about social effects, such as impacts on work, family relationships, and housing, and included a limited economic analysis which assessed direct and indirect costs for the past twelve months.[238] Keogh et al interviewed respondents using a standard questionnaire to ascertain injury details, diagnosis and treatment experiences, and impacts on personal life and employment status. This employment outcome included questions about lost work time, return to work, and functional capacity at work.[239] Both studies used the UM-ADL scale[240] to provide some qualitative information about impairments to daily living (such as loss of productivity in the home), and Keogh et al also used the validated CES-D scale to measure general population symptoms of depression. Data was analysed for both studies, and logistic regression was used to identify variables of interest; in Morse et al's case, specifically to explore a model for social impacts of WRMSDs.

The case studies undertaken by the HSE United Kingdom and Kiel et al had a different purpose to the other six studies and therefore used a different methodology to assess outcomes, using self-recall or self-report to provide data. Because the HSE United Kingdom aimed to provide costs of accidents at a firm level, this study used previously developed costings methodology that attempted to identify the cost of all accidental losses that were, in the opinion of HSE steering group and organisation's managers, considered to be preventable and that an organisation committed to loss control would aim to eliminate. To achieve this objective the methodology was based on a wide definition of the term 'accident'.[241] Accident details and costs were recorded using specially designed forms. Each recorded accident was examined by site management to decide whether it could have been prevented by the application of existing procedures or other cost-effective measures. Only those accidents judged to be economic to prevent were included. The methodology accounted separately for the financial and opportunity costs which arose from each accident.

Kiel et al, in contrast, used personal, in-depth interviews with all parties impacted in an economic sense, by the industrial injury, including the injured person and family/dependents, employer, Workers' Compensation Board, other government and community organisations and any others identified to determine outcomes. Participants were questioned about details of their injury and treatment, work situation and typical job tasks. Losses to production, modifications, subsequent work experience were assessed. Kiel et al included an analysis of costs, which were based on participant recall, with participants producing receipts and other relevant documentation.

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[237] SHS asks how the respondent copes, in general, with stressful events, irrespective of situational characteristics. The factor structure consists of 13 dimensions of coping such as 'substitution' (active mental or physical attempts to engage in other activities in order to avoid thinking about the actual problem); 'seeking professional help'; 'social comparison' (inspiring or reminding oneself that many others are worse off).

[238] This prevalence based model of costs was discussed in Part I of the Literature Review.

[239] CATI: computer assisted telephone interview.

[240] Functional impairment (UM-ADL) scale measures 'ease of performance of routine daily activities' from 1 'no problem' 2 'can do with difficulty', 3 'can't do by myself'.

[241] An accident is regarded as any unplanned event that resulted in injury or ill health of people, or damage or loss to property, plant, materials or the environment or a loss of business opportunity.

Presenting the findings

This section discusses how the costs, consequences or outcomes are reported. It does this by answering two questions about the selected studies: firstly, how were outcomes measured (for example, employment outcomes, socio-economic status, financial costs, mental health); and secondly, what factors were identified as causing, preventing, alleviating or exacerbating these outcomes (for example, does having a higher education 'protect' an employee from low paid, insecure employment following an occupational injury or illness diagnosis). It is interesting to note that while none of the selected studies used the same methodology as the Social Consequences study, there were some similar results.

Cannon et al and Ameille et al measured outcomes for patients with occupational asthma by evaluating the effects on income and employment status. Cannon et al reported that rates of income and employment were similar in the groups with occupational/work-exacerbated asthma, but differed significantly to patients with asthma unrelated to work. Proportions of those currently employed were similar in all categories, but those with occupational/work-exacerbated asthma were reported as experiencing greater difficulty in finding new work (mainly due to perceived employer prejudice), and many participants had changed or suffered disruption to their jobs. The main factors which exacerbated these outcomes (that is, resulted in a greater loss of income and were less likely to be currently employed) were having occupational/work-exacerbated asthma (as opposed to non-occupational asthma), and being in a manual socio-economic group.

Ameille et al found that for participants who had left their job, financial consequences and mean loss of annual income were significantly higher. Financial costs for (n=186) were assessed, with more than 46 percent of patients reported that they had suffered from a reduction in income. Of the 103 workers whose claim for compensation was accepted, 58 (56 percent) suffered from a reduction in income. The main factors which exacerbated these outcomes were being a young employee, single, with a low level of education, the asthma severity score, being employed in a small company, and having filed a claim.

Reporting the outcomes of participants exposed to neurotoxicants, Morrow et al and Abjornsson et al both reported scale scores as results. Morrow et al compared the scale test results to those expected in a 'normal' (that is, unexposed) population and found the results were 'clinically significant'. Factors which indicated the presence of neurotoxicity were for excessive bodily concern, depression, somatic concerns together with emotional discomfort and social withdrawal, and mental confusion, feelings of alienation, and unusual thoughts. It is interesting to note that Morrow et al used a case study to illustrate the psychologic distress. This 42-year-old worker was exposed for approximately 14 years to organic solvents while employed as a machine maintenance operator. He described his symptoms, which included weak spells and loss of balance, difficulty sleeping, personality changes and suicidal thoughts.

Abjornsson et al also presented the results of scales used to assess participants' long-term outcomes. Factors which were present in the treated TE cases (TTE group) and the reference group may be interpreted as factors which assist in alleviating the adverse effects of solvent exposure. These were improved and increased attachment, and of social integration; and more available support, which had led to reduced less psychological distress. The non-treated exposed patients used more emotional and less problem-focused coping than did the referents. Abjornsson et al also made some conclusions using correlations between results, which indicates further risk or positive factors. For example, low scores of SOC (testing sense of coherence) were related to a high degree of psychological distress, wishful thinking, and seeking professional help, all of which are measurements on the SOC scale. The GSI symptom score was positively correlated to the use of coping style 'wishful thinking', 'acceptance/resignation', 'seeking professional help'. GSI was negatively correlated to 'self-confidence/humour'.

Morse et al and Keogh et al both presented results for work-related musculoskeletal disorders (WRMSDs) as scale scores. Morse et al's outcomes examined various social factors such as activities of daily living and economic costs, while Keogh et al considered persisting symptoms, functional

impairment, and impact on employment and family life. The results of Morse et al were presented as percentages of each group who had experienced certain social factors (such as assigned lighter work, time off, promoted, lost car, lost health insurance, or divorce). Stress at home and time off were the most commonly reported outcome, followed by assigned lighter work and changed job. Work pace and home activities were also adversely affected, with odds ratios for tasks such as physically caring for a child, difficulty opening jars, gripping a telephone, carrying grocery bags or performing household chores.

Morse et al identified factors which alleviated the adverse social outcomes. These included having a higher education, and having a medical diagnosed case. Factors which were not significant were filing a Workers' Compensation claim, race, gender, and age. Of interest is the fact that Morse et al reported no significant difference between the responses of controls and cases to the question 'compared with 12 months ago, would you say your financial situation is better today, worse today, or about the same?' In those two weeks prior to interview, 31 of the WRMSD cases had out-of-pocket expenses that they attributed to their WRMSDs. These included costs for medical costs, transportation, equipment, child care and work around the house, etc. Morse et al concluded that this indicates a very high proportion of the medical visits and procedures were paid for either by general health insurance or were out-of-pocket which suggests a major surgical cost for WRMSDs paid outside the Workers' Compensation system.

For Keogh et al, results were divided into sections: persisting symptoms, functional impairment, and impact on employment and family life, with further results presented as quantitative information, such as the percentage who received which kind of benefit and what general and specific family problems resulted from the injury. 84 percent reported having some of their medical care paid for by Workers' Compensation. Most of the participants reported persisting symptoms, and these had symptoms interfered with work, home/recreation activities, and with sleep. Keogh et al noted that a current ability to function at work, home, and play and to sleep was not associated with length of time between filing the claim and the interview, suggesting the symptoms were now stable and chronic. Job loss was a common event after the injury with 38 percent of respondents indicating that they had been laid off, fired, or quit the job they had at the time of injury. Keogh et al suggested this indicated that most job loss occurred relatively early in the disease course. For those with a diagnosed WRMSD, positive factors that alleviated outcomes included keeping the job held at time of injury, higher income at the time of injury, and normal daily activities.

The case studies on a range of injuries used two different methods to present results. The HSE United Kingdom expressed costs of accidents as a percentage of total profits for each of the five workplaces, and presented the ratio of insured to uninsured costs, while Kiel et al quantified results and discussed impacts of certain factors on costs for six workplace injuries. The HSE United Kingdom produced results that could be used to compare costs, for example, accidents cost one organisation 37 percent of its annualised profits; another the equivalent of 8.5 percent of its tender price; a third organisation 5 percent of its running costs. None of the participating organisations suffered major or catastrophic loss during the study periods, nor were there any fatal injuries, prosecutions or significant civil claims, all of which could have increased the levels of loss well beyond those recorded. The HSE United Kingdom also reported that a further, separate analysis of 80 percent of the accidents showed that over 8 percent were judged to have the potential for serious consequences such as fatalities, multiple injuries or catastrophic loss. Uninsured costs far exceeded insured costs, being between 8 and 36 times greater than the costs of insurance premiums paid at the time of the studies. Many of the uninsured costs were in effect hidden, for example in maintenance and other budgets. Risk factors identified included the inherent risks of the operation, and the level of management control applied.

Kiel et al described outcomes and calculated the total injury cost for the six case studies. For all cases, there had been a permanent loss of use to the affected area (although the severity varied), and a significant economic cost to the injured worker, primarily a loss of wages. However, in some cases, additional medical and changed lifestyle costs are also significant. In one of the six costs were incurred by the Department of Social Security; the other five were on Workers' Compensation. In

five of the six cases, the injured parties have been unable to return to their usual type of employment as a direct result of their injury. Only two of the six were investigated. Kiel et al reported key factors which exacerbated negative outcomes or increased costs for the injured individual. These included whether compensation was paid, severity of injury (and therefore length of rehabilitation), geographic location (there is variation of compensation payments/entitlements between States in Australia), duration before a return to work, job security, gender (for example, there are more women in the service industries), industry, and occupation (the more dangerous occupations such as mining, although now employing less people, have serious – and expensive - accidents).

CONCLUSIONS

The links between social and economic consequences

The studies analysed as part of this Review concluded that most participants suffered adverse economic and employment, family and social outcomes. These were alleviated or exacerbated by certain factors, the detail of which was contained in the Findings discussion. For example, patients require quality, timely advice concerning their entitlements and what their injury or illness means for them.

However, Keogh et al in discussing the impact of work-related musculoskeletal disorders on workers and their families, summarises the general tenor of conclusions about relationship between social and economic consequences by observing that:

> the worse the injury, the more likely you are to lose your job. Having more impairment and being out of work makes it more likely you will suffer from symptoms of depression.[242]

The studies generally concluded that the main 'protective' factors, or 'cost determinants', that prevented or alleviated adverse social and economic outcomes, was being in a higher socio-economic profession and having a high level of education, with ample social and workplace support. If not, the choices that a participant could make about their situation were more limited, as was the support following their injury or illness to prevent the economic consequences reaching into and affecting their home and family life.

Final remarks on micro studies

Micro studies are of value because they often illustrate the detailed, minute insights on the specific impacts to particular populations, whether defined by injury or illness type, a single workplace, industry or occupation, geographic location, method of selection, and so on. These impacts are multiple, complex, far-reaching, and often permanent; but are commonly affected by atypical determinants that change outcomes.

However, this method also has significant limitations. While using standardised methodologies is of some benefit, for example comparison between studies, researchers cannot probe for further information, thus missing important qualitative data. This is an acknowledged limitation of pre-determined questionnaires, which is why case studies using a flexible line of questioning are of particular value.

Data sources also create some limitations. Using compensation data limits study participants to those who enter the system – and it is well known that many occupational injury and cases do not.[243] This means that information on who bears the costs of non-compensated cases, their experiences in doing so, and what may alleviate or prevent this negative outcome, remains unknown.

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[242] J P Keogh et al (2000). p504.

[243] Refer back to the Context statement, which explained that combined agency data captures approximately 60-70 percent of workplace fatalities.

Information on the 'non-economic' costs of workplace injury and illness, such as pain and suffering, is required to fully understand the societal impacts. In the end, the methodology selected will be determined by the purpose of the study. If the purpose is to provide information on clinical outcomes, such as the adequacy of certain medical interventions, then using a clinical test such as the ADL-scale or the CES-D scale to measure subjective conditions in an objective way, is ideal. However, if the aim is to motivate change – in the behaviour and attitudes of management, workers, and the Government – then this requires more than counting cases and giving clinical details, and instead requires a human perspective of the social and economic impacts of workplace injury and illness.

Appendix

GLOSSARY OF TERMS

ACC: The Accident Compensation Corporation (ACC) administers New Zealand's accident compensation scheme, a twenty-four-hour no fault personal accident insurance scheme which covers all New Zealand citizens, residents and temporary visitors to New Zealand.[244]

DMP: (Department Medical Practitioner) These are medical staff with qualifications in occupational medicine and are employed by the Occupational Safety and Health Service of the Department of Labour (OSH) to carry out a range of occupational health functions. [245] They are appointed under the Health and Safety Act. DMPs have a closely defined set of powers surrounding the assessment and management of occupational health. In practice, departmental medical practitioners are usually called in by health and safety inspectors or other OSH staff in response to an occupational health issue affecting a particular employee or place of work. Where there is a known history of occupational health hazards in an industry or amongst an identified group of employees, DMPs may follow their own inspection or monitoring programmes. [246]

ESR: (Institute of Environmental Science and Research Limited) ESR provides scientific services related to public health, environmental health and forensic science. In relation to OSH, they provide testing for diseases such as leptospirosis. [247]

FINSEC: This is the finance and information union. They cover employees in a variety of sectors including the finance, information technology and communications. [248]

EPMU: New Zealand Amalgamated Engineering, Printing and Manufacturing Union. [249] The EPMU covers: energy, aviation, mixed manufacturing, automotive, primary metals, plastics packaging printing, construction, forestry, food manufacturing, postal and telecommunications industries.[250]

Health and Safety in Employment Act: The principle objective of the Health and Safety in Employment Act 1992 is to prevent harm to employees at work. [251] Employers and others are expected to ensure that their actions at work do not lead to harm to others, including the general public. The Act also treats similar hazards with similar procedures, whatever the place of work. Primary responsibility is placed on the employer who has a general duty to provide a safe and healthy work environment. There are other specific duties, including a requirement for employers to identify and actively manage hazards in the workplace. To do this it sets out a hierarchy of action where employers must follow a process of identification, elimination and isolation. If a hazard cannot be eliminated or isolated, the effects of the hazard must be minimised. Regulations provide minimum standards for particular high-hazard industries and work practices. Guidelines developed by, or in consultation with industry, also outline good practice. Some guidelines may be approved by the Minister of Labour as 'approved codes of practice' providing an accepted means of complying with the Act.[252]

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[244] http://www.acc.govt.nz/about-acc/

[245] OSH (2000c). A Guide to the Health and Safety in Employment Act 1992. Department of Labour, New Zealand. p105.

[246] OSH (2000c). p105.

[247] www.esr.co.nz

[248] http://www.finsec.org.nz/home_fs.html

[249] http://www.epmu.org.nz/SITE_Default/

[250] http://www.epmu.org.nz/SITE_Default/about/industries.asp

[251] http://www.osh.dol.govt.nz/order/hseact-text/hse1-1.html#1.3

[252] http://www.osh.dol.govt.nz/order/hseact-text/hse1-1.html#1.1

Inspectors: Health and safety inspectors are employees of the Occupational Safety and Health Service of the Department of Labour (OSH). The broad functions of inspectors are:

- To provide information and education to employers, employees and other persons to improve safety at places of work and the safety of people at work.
- Inspectors ascertain whether or not the Act is being and will be complied with.
- To take all reasonable steps to ensure that the Act is being complied with.

Health and safety inspectors are appointed under section 29 of the HSE Act by the Secretary of Labour. [253]

Leptospirosis: Leptospirosis is an occupationally-acquired infectious bacterial disease. Humans catch it when they are exposed to animal urine containing bacteria. The bacteria enters the body through broken skin or mucous membranes, i.e. the mouth or eyes . Symptoms are flu-like but can be very severe, and they include any number of the following: headaches, severe and persistent fever, sweating, nausea and vomiting, muscle pain, back pain, mood changes, jaundice, breathing problems, diarrhoea and skin problems. Hospitalisation is often required, sometimes in intensive care for intravenous antibiotic therapy. Death has resulted overseas and one case in NZ. There can also be permanent complications and recurrent symptoms. [254]

Solvent-induced neurotoxicity: Organic Solvents are compounds that are relatively stable and exist in the liquid state at temperatures of 0-250 degrees centigrade. They are used in a wide variety of industrial process and goods. Some uses include, paint, adhesives, glues, coatings, degreasing/cleaning agents. Solvents generally enter the body through skin absorption or respiration. The solvents target certain body organs including the brain, kidneys, liver and blood system. Exposure is usually over ten years or more. In 1985 solvent neurotoxicity was classified by the solvent workshop as:

Type 1: Characterised by fatigue, memory impairment, irritability, difficulty in concentrating and mild mood disturbance. This corresponds to the WHO classification of organic affective syndrome. It is reversible on removal from exposure.

Type 2: Symptoms of neurotoxicity and abnormalities of performance on neuropsychological testing. Type 2 disorder has been divided into:[255]

Type 2A: Sustained personality or mood change, and

Type 2B: Impairment in intellectual function.[256]

The two subtypes are collapsed in New Zealand and called Type 2.

Type 3: Global deterioration in intellectual and memory functions (dementia). This corresponds to the WHO classification of severe chronic toxic encephalopathy and is usually irreversible. [257]

NODS: (Notifiable Occupational Disease System) NODS is a voluntary system to notify a health related condition which is suspected to arise from work. Once a notification is received by OSH, branch staff investigate the workplace and the individual concerned. Cases are then assessed by the local OSH departmental medical practitioner. Some cases are also assessed by a specialist panel. If the case is found to be of occupational origin, the details are recorded on a confidential database. In all cases, the individual will be notified of the outcome. Notifiable diseases include: Asbestos-related disease ; occupational asthma; other occupational respiratory disease; occupational disease due to

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[253] OSH (2000c). p98.

[254] OSH (2001). Guidelines for Control of Occupationally Acquired Leptospirosis. Department of Labour, New Zealand. p18.

[255] OSH (1992). Chronic Organic Solvent Neurotoxicity: Diagnostic Criteria. Department of Labour, New Zealand. p4.

[256] (OSH 1992). p4.

[257] (OSH 1992). p4.

chemical exposure; chronic solvent-induced neurotoxicity; occupational cancer; occupational illness due to infection; occupational noise-induced hearing loss; occupational overuse syndrome/ osteoarthritis; and occupational skin disease [258]

NIHL: Noise-induced Hearing Loss occurs because excessive noise damages the hearing mechanisms of the inner ear. [259] To begin with, excessive noise causes a temporary hearing loss. Over a period of time hearing recovers to normal. Repeated exposure to excessive noise results in a permanent loss. This may be accompanied by ringing in the ears, also known as tinnitus. [260]

OOS: Occupational Overuse Syndrome (OOS) is a collective term for a range of conditions - including injury - characterised by discomfort or pain in the muscles, tendons and other soft tissues, with or without physical signs. The symptoms of OOS can include fatigue, muscle discomfort, a burning sensation, stiffness, aches and pains, soreness, weakness or numbness and tingling.[261] OOS can be difficult to diagnose and attribute to a single work cause.

OSH: The Occupational Safety and Health Service (OSH) of the Department of Labour works to improve workplace health by monitoring and enforcing compliance with the Health and Safety in Employment Act 1992 and the provision of information and advice. [262]

Serious Harm: Serious harm is defined under the HSE Act and provides the criteria by which workplace hazards are considered significant and therefore require control measures under the act. [263] Further, it defines which injuries or illnesses are to be notified to OSH and subject to inspector action. It thus defines the boundary of an employer's duty to protect the health and safety of those in the workplace. Should the employer fail in that duty it provides a measure of the gravity of the offence.

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[258] http://www.osh.dol.govt.nz/report/nods/index.html

[259] OSH (2002). Approved Code of Practice for Management of Noise in the Workplace Department of Labour. p10.

[260] OSH (1996). p10.

[261] OSH (1995). Approved Code of Practice for the Use of Visual Display Units in the Place of Work 2nd edition. Department of Labour, New Zealand. p44.

[262] http://www.dol.govt.nz/Aboutus.htm#Workplace Health and Safety

[263] The full serious harm definition can be seen at http://www.osh.dol.govt.nz/report/harm.html

PARTICIPANT INFORMATION SHEET

Study into the Social Costs of Workplace Injury and Illness.

Thank you for agreeing to take part in this study.

Important Information

- You can withdraw from this study at any time, you don't have to give us a reason.
- Your identity remains completely confidential. The only people who have access to your information are the research team who have all signed confidentiality agreements.
- You do not have to answer any questions that you don't want to answer.
- This research project is completely independent of ACC or OSH case management.

What is the study about?

This study explores the range of consequences of workplace injury and illness for injured and ill employees, their families and the community. The project uses a range of case studies, where we will be interviewing the injured or ill employee. We may include members of their family, social circle and workplace, if we have their consent and the consent of the employee.

The study aims to understand the social and economic costs of injury and illness through the employees' own experiences and those of their social, work and family groups. The study will help the government, the Department of Labour and ACC with future planning.

What does participation involve?

With your permission we will be interviewing you and members of your family, community and workplace who have also been affected by your illness or injury. But we will not relay to those people what you have said.

Anyone is free to withdraw from the study at any stage, without having to give a reason.

You do not have to answer a question if you don't want to, and you may stop an interview at any time.

What do we see as the benefits for you of participating in the study?

There are two possible benefits for you in taking part in the study:

1. You will have significantly contributed to helping us develop better ACC and workplace health and safety, and you will help government Ministers understand what happens when employees are injured or become ill because of their work.

2. We will listen to you and others to understand and not judge. Because of this, when we have put all the information together you will get a bigger picture than you had before the research of what has happened to you. You will also learn about others' experiences and where you fit. However, although what you learn may be helpful, it may also open up things that are not comfortable for you.

We will not reveal any personal identifying information you or others give us to anyone else. The reports that we write will only talk generally about people's experiences in ways that keep their identities confidential. However, you will probably be able to identify yourself in the reports.

How long will it take?

The interviews will last about one hour, although it is possible that they will be longer, or we may need to visit you more than once. We suggest that wherever possible we arrange to have a morning or afternoon potentially free for us to meet and talk.

Where will the interview take place?

The interviewers will come to your home or another location of your choice. The interview should take place somewhere where you feel comfortable and where there will be no interruptions.

What happens to the information?

We will be recording the information that you give us in the interview either by taping and/or written notes. You can select the recording method with which you feel most comfortable.

Your details will be totally confidential to the research team and no material that could personally identify you will be used in any reports on this study. Only the project team, who have signed confidentiality agreements, will have access to your information, and at the completion of the study the information that we have collected will be destroyed. This includes any information that is provided by you or your employer, and any that we access from ACC or OSH with your permission. While the study is taking place, your personal information will be identified with a code instead of your name, to further protect your privacy.

All personal information provided to us in the course of this research is covered by the Privacy Act 1993. You have the right to access all personal information that we hold about you and to ask that the information be corrected if you consider it is incorrect.

Who is the research team?

The research team consists of three researchers from OSH, two from the Department of Labour, one from ACC and two independent researchers. The team comes from a range of backgrounds to ensure that the research is as comprehensive and sound as we can make it. You will probably have contact with two researchers, as each case has a pair of researchers assigned to it.

What happens now?

Please fill in the consent form attached to this sheet and return it in the envelope provided. Remember, you can withdraw from the study at any time, signing the form does not place any obligations on you.

We will contact you soon to arrange a suitable time and place for us to meet and talk about the consequences of your injury or illness.

If you have any further questions about this study, please contact:

(Researchers contact details)

PARTICIPANT CONSENT FORM

Study into the Social Costs of Workplace Injury and Illness.

Consent to participation in study.

I have been given a written explanation of this study, my role and my rights in it, and I understand what it involves.

I agree to take part in this study.

I understand that I may withdraw from the study at any stage. I may also request that some or all of the information that concerns my situation be removed from the record.

I give members of the research team permission to access any information held by OSH.

I give members of the research team permission to access my ACC file and I understand that my name will be removed from any information that is copied or used from this file.

I understand that all personal information provided to the research team in the course of this study will be covered by the Privacy Act 1993. I have the right to access personal information held about me, and ask that the information be corrected if I consider it incorrect, in accordance with the Privacy Act.

Name: _____

Signature: _____

Date: _____

I would prefer that the interview was recorded:

1. on tape ☐
1. through written notes ☐
~~3.~~1. through a mixture of both ☐

Please provide the following information to enable us to access your ACC case file:

Date of birth: _____

Date of injury: _____

ACC Claim no. _____
(if known)

INTERVIEW GUIDE

Interview Guide

Important Information

- You can withdraw from this study at any time, you don't have to give us a reason.
- Your identity remains completely confidential. The only people who have access to your information are the research team, who have all signed confidentiality agreements.
- You do not have to answer any questions that you don't want to answer.
- This research project is completely independent of ACC or OSH case management.

1. What was your job?
    a. Typical week/day.
    b. How did you feel about the work.
    c. What was your workplace like.
    d. Length of time in job.
    e. Number of hours p/w
    f. Second job?

2. When did you have the injury/become sick?

3. Why/how did it happen?
    a. What work factors were involved (e.g., system, machine, error)
    b. What non-work/personal factors were involved (e.g., home life, money worries)

4. How's your life changed?
    a. home/family
    b. job/employment
    c. community/recreation

d. friends/workmates

5. How have you been treated?
   a. Actual/physical treatment (Medical management)
   b. Treatment from other people
   c. The experience

6. What has all this cost?
   a. Medical
   b. Wages/lost opportunities
   c. Household work
   d. Psychological/emotional

7. Has anything positive come out of it?

Check details

Who else should we talk to?

Is there anything else you would like to add?

Thank you.

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