Permanent Personal Damage from Qld Mining – How and Why?

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Abstract

The pattern (taxonomy) of personal damage (permanent and temporary) ≥60 Days lost from Qld Mining (surface and underground), Exploration, Quarrying and Petroleum activities will be presented for the years 2009-2013. The chances of any one person experiencing this level of damage will be described and set in the context of Australian All Industry data.

When one considers that 90% of the cost of work-related personal damage is associated with permanent impairment, a corporate Health & Safety activity should hopefully align with the pattern of what is actually occurring.

It is highly desirable that Health & Safety activity be data-driven versus intuition and feeling.

The paper will suggest that the pattern of permanent impairment and ≥60 Days Lost is not altering since it was first described in the 1980s. The likelihood of this level of damage to any one person is relatively constant and highly probable.

Several reasons will be suggested as to why the industry continues to fail to learn and focus on this very significant level of personal damage i.e. non-fatal permanent impairment.

Introduction

The Queensland Resources Council and WorkCover Qld have been instrumental in making available descriptive and codified data of all injuries and disease in Queensland Metalliferous and Coal mining (surface and underground), Quarrying, Exploration and Petroleum for the years of 2009-2013. This data has been analysed and major learnings presented. The data is set in the context of work-related personal damage in Australia. This assists in understanding. Only a particular subset of the data has been analysed.

Context

Damage can be classified as Class I, II and III[a].

Class I, permanent alteration of life, includes fatal (Multiple and Single) and Non-Fatal Permanent Damage. Non-Fatal Permanent Damage includes an upper level where the person does not return to work and a lower level where the person returns to work in a limited capacity, time or skill.

The classification forms part of a recent report of Safe Work Australia[1].

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[a] Class I damage alters the future of a person permanently and includes such things as fatality, quadriplegia, amputation, disfigurement, impaired spine, emotional disturbance etc.
Class II damage alters the future of a person temporarily and includes fractures, sprains, lacerations etc (e.g. Lost Time Injuries).
Class III damage does no more than inconvenience the person e.g. bruising, dust in the eye etc. e.g. Medical Treatment Injuries

What is the relative size and cost of these various Classes of damage for all industries in Australia?

There have been four snapshots of the damage to people from work, published by the Industry Commission (1995)[2], the National Occupational Health and Safety Commission (NOHSC 2004)[3], the Australian Safety and Compensation Council (ASCC March 2009[4]) and Safe Work Australia 2012[5]. The four studies gave the 'baseline estimates of economic costs' (ASCC 2009) for the years 1992-93, 2000-01, 2005-06 and 2008-09. NOHSC (2004) also estimated the cost equivalent of 'pain, suffering and early death'.

Table 2 summarises relative costs, in terms of Class I and Class II, (Class III damage is not recorded nationally), of the four snapshots. These assessments do not include pain, suffering and early death which would increase significantly the total cost if included.

Table 1 Percent distribution of the quantity of personal damage

	1992-93	***2000-01***	***2005-06***	***2008-09***
Class I Fatal	1.5	3.5	3.3	5.3
Class I Non-fatal	80.5	88.5	88.0	85.2
Class II	18.0	8.0	8.7	9.5
Cost $ billion *	**$20**	**$34.3**	**$57.5**	**$60.6**
2000-01 Goods and Services Exports $132.8 billion 2008-09 Goods and Services Exports $198 billion				

*** Without pain, suffering and early death costed**

Clearly, the greatest monetary cost is associated with Class I Non-Fatal Permanent Damage. These costs are typically 5-6% of Gross Domestic Product.

Table 2 summarises the numbers of people experiencing Class I damage (Fatal and Non-Fatal) for the years listed.

Table 2 – Class I Damage

Year	No. of Traumatic Fatalities per annum	No. of Cases of Non-Fatal Permanent Damage per annum	Cost of Class I Non-Fatal Damage as a Percentage of Total Costs.	Size of Australian Workforce (millions)
1992-93	693	50,018 (137 per day)	80.5%	6.56
2000-01	410	48,900 per year (134 per day)	88.5%	9.09
2005-06	393	64,000 per year (175 per day)	88.0%	11.2
2008-09	400	85,800 per year (235 per day)	85.1%	11.93

The annual numbers of Class I Non-Fatal Permanent Damage are staggering.

In 1992-93 and 2000-01, the Class I Non-Fatal per day figures were 137 and 134 respectively. Between 2000-01 and 2005-06, the workforce increased by 12% (ASCC[4]) while the 134 Class I Non-fatal per day increased to 175, an increase of 30%.

Between 2005-06 and 2008-09 the Class I Non-fatal increased to 235 per day (an increase of 34%) while the workforce increased in size by only 7.2%.

There is a rule known as the Pareto Rule or, alternatively, as the 80/20 Rule or the Rule of the Critical Few. It can be observed that Class I Non-Fatal Permanent Damage represents some 80-90% of the cost of work-related damage and so it is the "Pareto" issue. However, we must not lose focus on Class I Fatal Damage but this is not the subject of this paper.

Class I Non-Fatal Permanent Damage is rarely the subject of detailed and focussed conversations in organisations even though the relative importance of Class I Non-Fatal Permanent Damage has been espoused for nearly 30 years with its originator being Geoff McDonald. However, current research being undertaken by Safe Work Australia is focussed on the Class I issue

Safe Work Australia supports the above conclusions[1].

Class I damage (Multiple Fatality, Single Fatality and Non-Fatal Permanent Damage) should preferably consume:

- 80% of our health & safety conversations
- 80% of our health & safety resources
- 80% of our health & safety leadership behaviours
- 80% of our health & safety system content

While it is useful to gain some insight into the numbers of people involved in the various classes of damage as well as the alternative measures (e.g. cost, weeks lost), it is useful to understand the chances (likelihood) of Class I Non-Fatal Permanent Damage.

Table 3 (derived from Table 2) summarises the likelihood of traumatic fatality and Non-Fatal Permanent Damage for all Australian Industry for the 4 years illustrated. Likelihood is expressed in terms of people required for any one person to experience fatal/non-fatal permanent damage in any one year.

Table 3 Likelihood of Class I Damage – All Industries

	Likelihood of a Fatality * (1:X people employed)	**Likelihood of Non-Fatal Permanent Damage**
1992-93	1 : 9,466	1 : 131
2000-01	1 : 22,170	1 185
2005-06	1 : 28,498	1 : 175
2008-09	1 : 29,825	1 : 139

* Qld Mining ≈ 1:20,000 person years

Class I traumatic fatality likelihoods are decreasing – a positive for all industry. Class I Non-Fatal Permanent Damage is highly likely to occur which is a shameful situation.

Before discussing the likelihood of Class I damage for the Qld Metalliferous and Coal Mining, Quarrying, Exploration, and Petroleum dataset, it is useful to understand why I included those people who experienced >60 days off work, but were not classified with permanent impairment.

Q-Comp has provided the Queensland Resources Council with Queensland Workers' Compensation data (company and person not identified) to allow analysis. In that dataset there were 12,283 claims over the years 2009-2013 inclusive. This dataset includes both Class I and Class II damage. Table 4 shows the numbers of people in different categories and those categories selected for analysis.

It is useful to focus on those people in the dataset who are classified as >60 days lost work (non-permanent) and the people who have been permanently impaired who have also lost >60 days. This filter removes those who have applied for industrial deafness compensation.

There are 422 cases of industrial deafness in the 1407 impairment cases .

Table 4 No. of Cases by Category of Damage

Category		No. of Cases
A.	Permanent damage cases	1407
B.	Permanent damage cases >60 days lost	**559**
C.	Permanent damage cases <60 days lost	848*
D.	Non-Permanent damage cases >60 days lost	**671**
	This study – B + D	**1,230**

* 422 Noise Impairment

The other reason for including the >60 day cases is based on the following research[6] which discusses the reducing chances of returning to work the longer a person is damaged and away from work.

> *The weight of the evidence over the last 20 years[7,8,9,10,11] shows that people who are out of work in the medium to long-term are at greater risk of negative health outcomes. Furthermore, the more time spent away from work, the less likely a person is to ever return.*
>
> ***Whatever the reason for sick leave, it is important to realise that missing work influences recovery.***
>
> *Figure 1 shows how the number of days spent away from work impacts on a person's chance of return. In many systems, the likelihood of return to work is down to 50% after 45 days off work.*

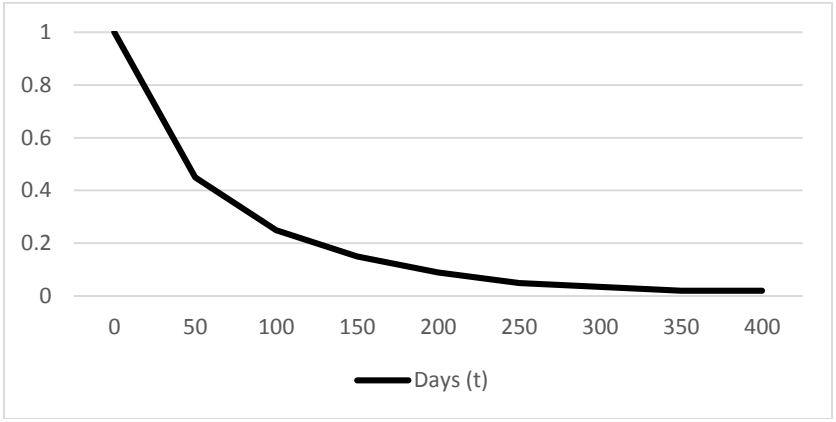

Figure 1 Likelihood of return to work after various length of time off work

This is supported by the following information[12]

> *Both internationally and within Australian and New Zealand, there is growing awareness that long-term work absence, work disability and unemployment are harmful to physical and mental health and wellbeing.*
>
> *Work absence tends to perpetuate itself: that is, the longer someone is off work, the less likely they become ever to return.*
>
> *If the person is off work for:*
>
> - *20 days the chance of ever getting back to work is 70%;*
> - *45 days the chance of ever getting back to work is 50%; and*
> - *70 days the chance of ever getting back to work is 35%[13].*
>
> *This section of the position statement examines the available evidence regarding the health effects of remaining away from work.*

Therefore, a 60 Day threshold for analysis of the Q-Comp data was completed.

To allow a calculation of the likelihood of people experiencing >60 days lost (Permanent and Temporary), it is necessary to examine the exposed population. Table 5 shows the number of people employed by year in the Queensland Mining Industry based upon ABS data.

Table 5 No. of Persons Employed in Queensland Mining Industry, by Year

Year	No. of Persons Employed (ABS Data)
2009	45,659
2010	41,578
2011	53,365
2012	64,112
2013	72,006

This allows for a calculation of a likelihood of 1:219 persons employed for Class I Non-Fatal Permanent Damage (>60 Days lost) combined with the more serious levels of Class II damage (>60 days lost).

This likelihood of genuinely seriously damaging people and the staggering number of people involved should concern us from a moral, ethical, financial, legal and compassionate perspective.

The Data

The data is analysed on the basis of the "damaging energy" involved. A useful set of describers has been developed by G.L. McDonald and InterSafe and should be generally self-explanatory when reading the taxonomy except for "Human Energy". The energy to do the damage in these Human Energy incidents comes from the metabolic processes in our own body. People are the energy source. Let me explain further. In a near fall, our musculoskeletal system can "fire" so hard that soft tissue is permanently damaged e.g. intervertebral discs, ligaments, tendons. The design of an access system can be such that the level of muscular effort required to ascend the access can permanently damage soft tissue e.g. the shoulder, The source of damaging energy is "us" i.e. Human Energy. Situations such as lifting, pushing, pulling, near falls to the same level, descending access systems (near fall) or overexertion are captured in this energy type.

What has been developed is a taxonomy – a cascading set of describers – showing the relative importance of various damaging energies and their mechanisms.

The first level of breakdown (Figure 2) shows that Human (527 incidents), Gravitational (340), and Vehicular (208) (Total 1,075 of 1,230 = 87.5%).

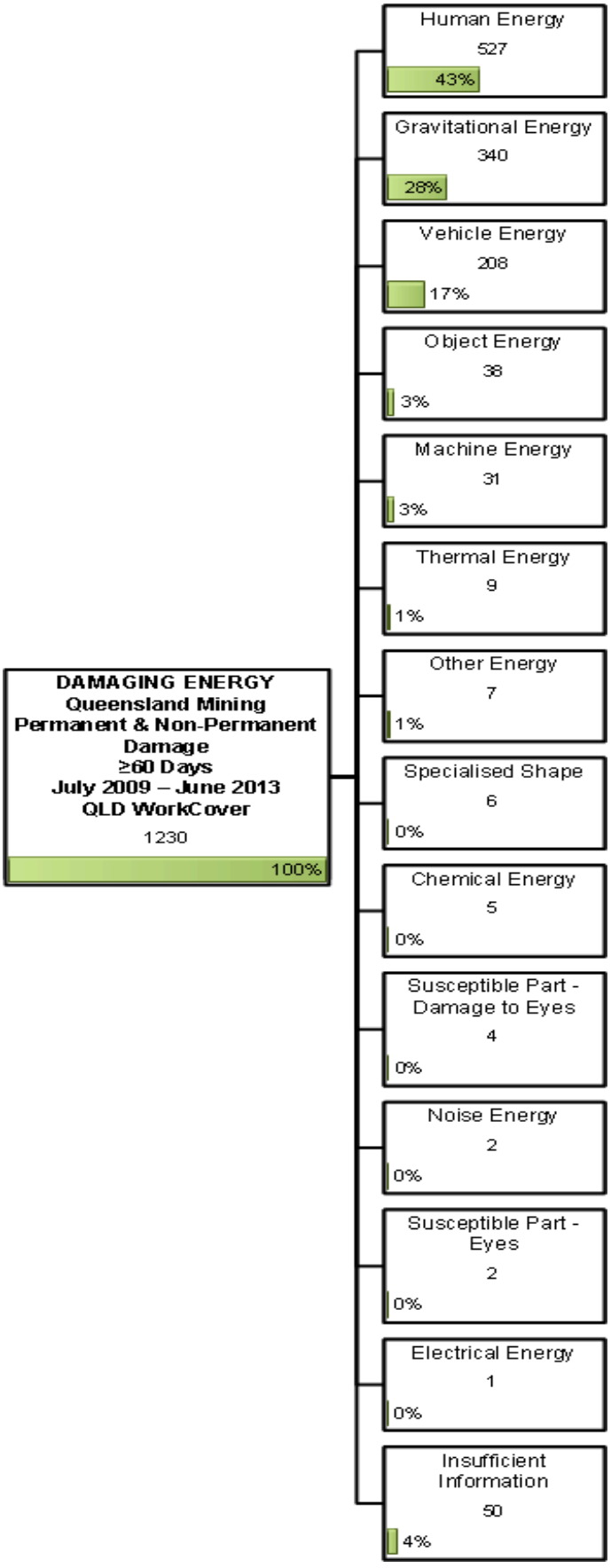

Figure 2 Damaging Energy taxon

I respectfully suggest that 90% of our Health & Safety effort with respect to Non-fatal damage should have a “Human”, “Gravity” and “Vehicular” focus.

With respect to Vehicular energy, (Figure 3) describes the mechanisms of the damaging energy with further breakdown of the “vibration/jar/vertical jolt” and the “travelling to/from work”.

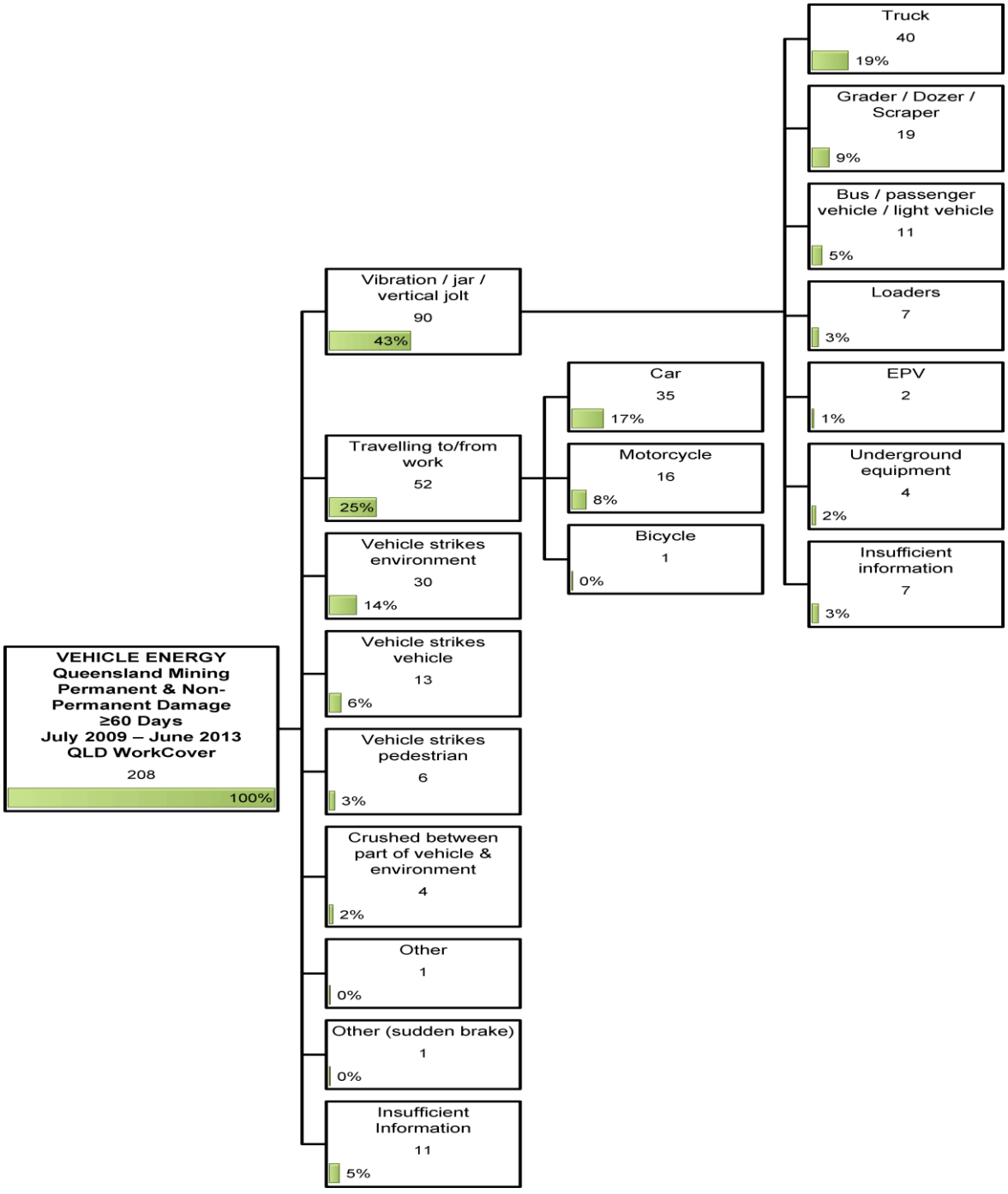

Figure 3 Vehicle Energy taxon

With a Pareto focus, an organisation should be defining its strategies and controls for:

a) Travel to work; and
b) Jolt/Jar imposed on steady state ride vibration.

If current controls are strongly administrative, then the size and nature of the problem is unlikely to alter into the future.

With respect to Gravitational Energy, the pattern is as per Figure 4 for the first three levels. The last column of describers e.g. “at same level” has been analysed but space precludes its inclusion.

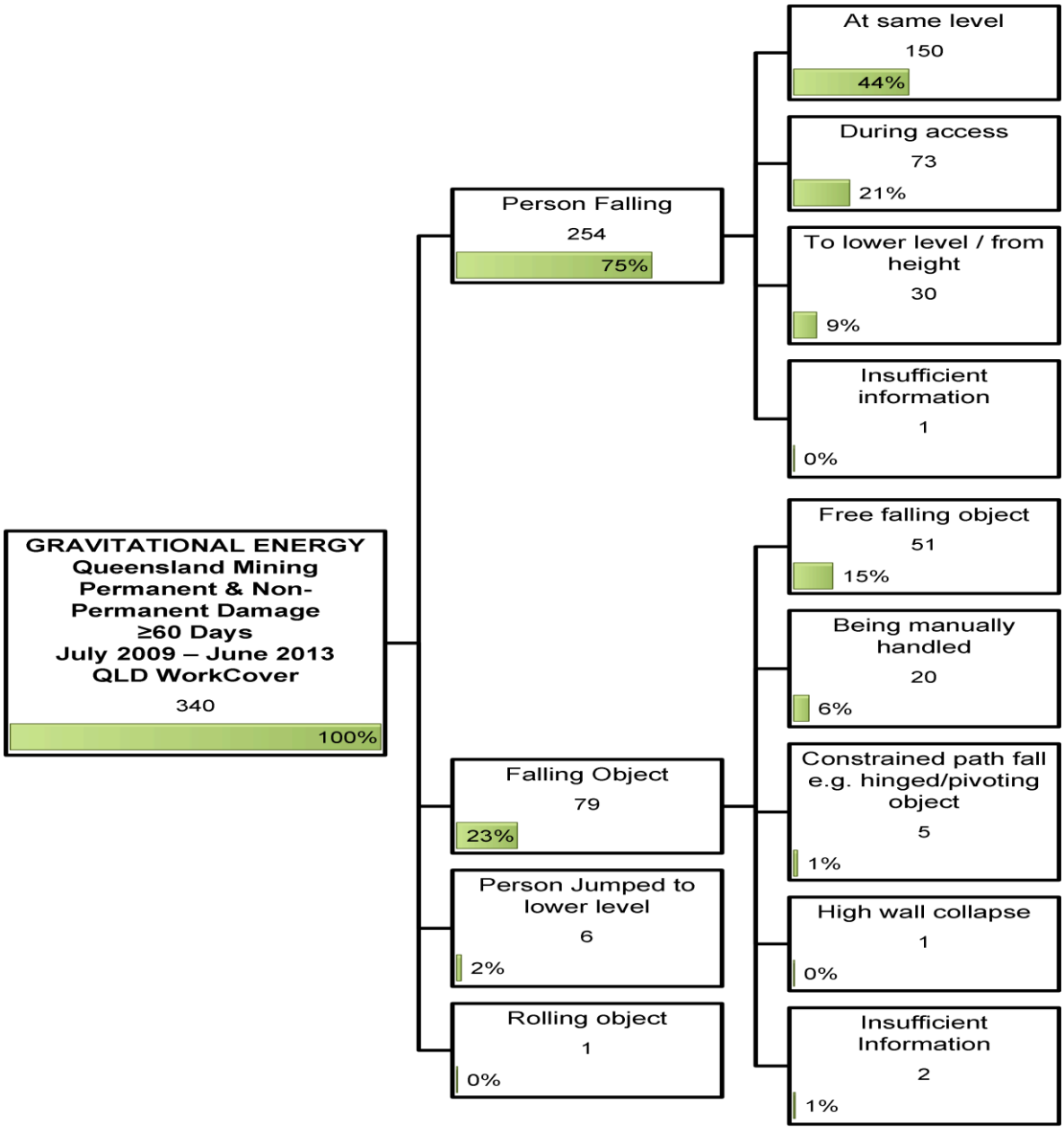

Figure 4 Gravitational Energy taxon

Figure 5 is for the taxon “During Access”. It is included to demonstrate the insights which can be obtained in assisting the Risk Management process.

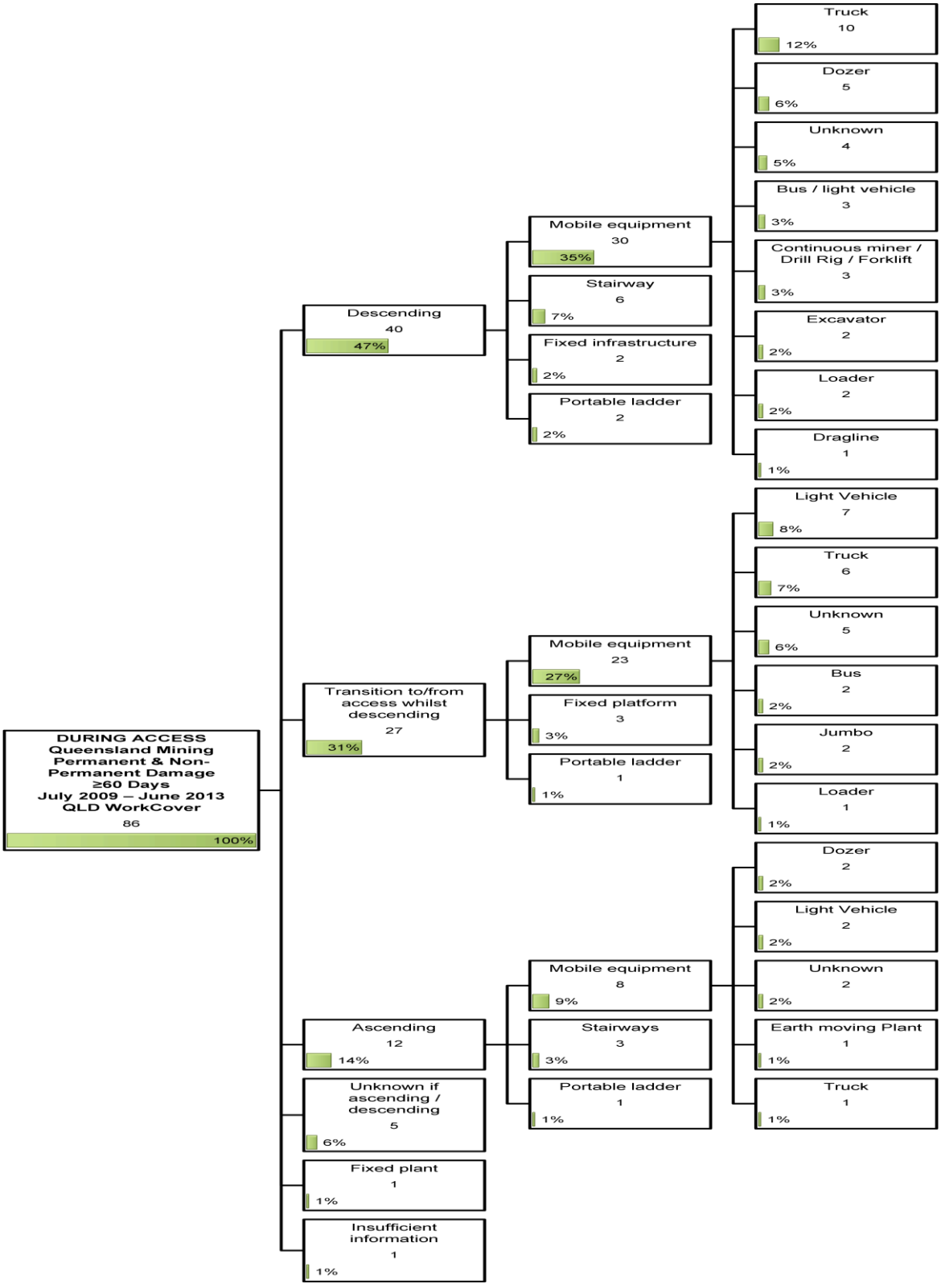

Figure 5 "During Access" taxon

What do we observe?

1. Health & Safety thinking must stop underestimating the importance of the design features of mobile access systems e.g. the height and flexibility of the bottom step...

2. People being permanently and seriously damaged during the descent of mobile equipment access systems must be a strategic focus. Three points of contact as a dominant strategy is not effective and will not change the future.
3. People transitioning from mobile equipment access systems to the ground must be a strategic focus...

Engineering solutions are required. If we were to add the Human Energy (Body Movement – ascent/descent) cases where there were no falls, then the size of the problem increases.

With respect to Human Energy, the data analysis shows the following taxons (subgroups) (Figure 6). The completed taxonomy analyses the pattern further but space precludes its inclusion.

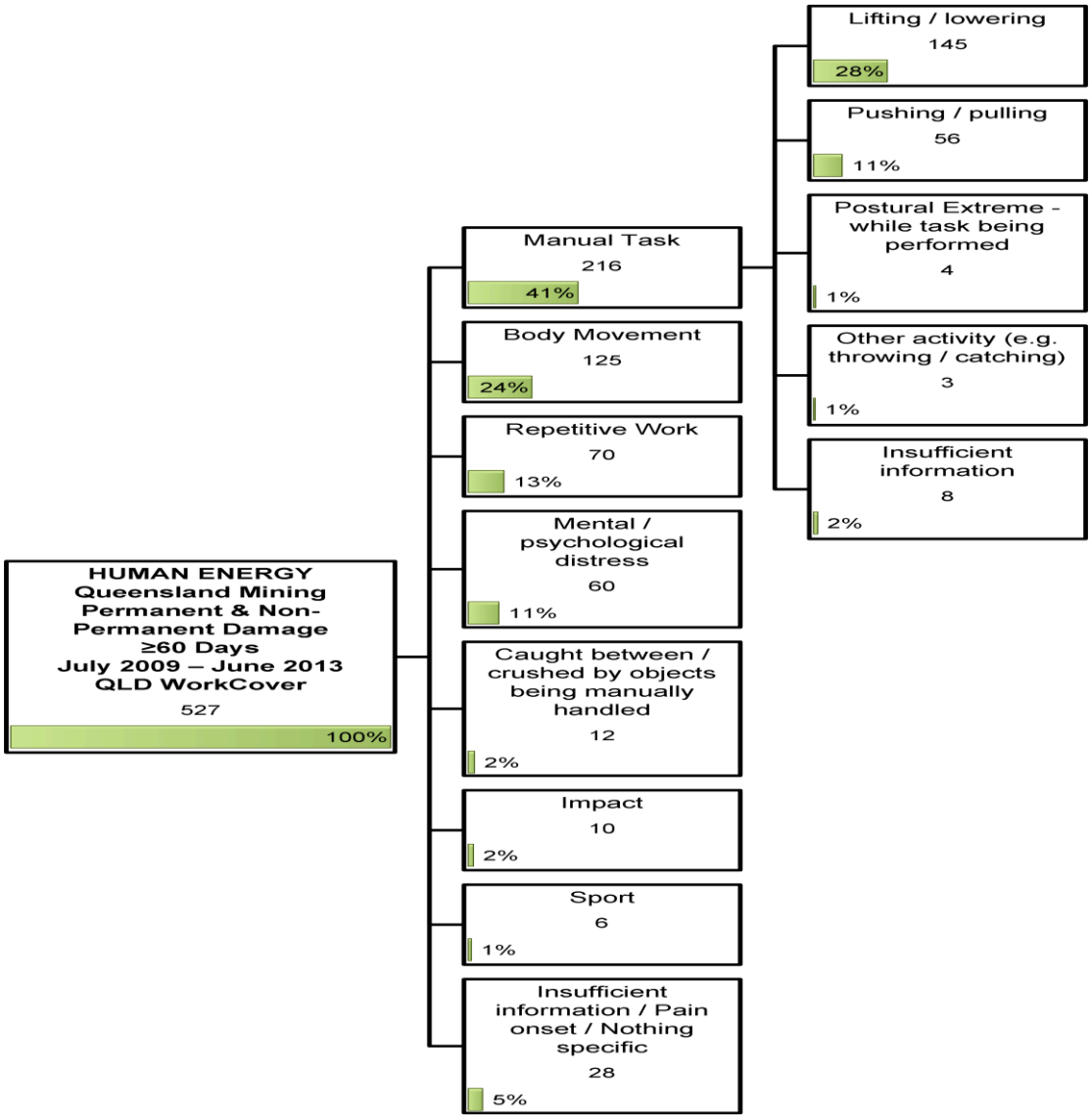

Figure 6 Human Energy taxon

As expected, lifting and lowering, pushing and pulling tasks represent 93% of Manual Tasks (36% of 527 Human Energy cases).

The age distribution of those lifting, pushing, pulling cases is illustrated in Figure 7.

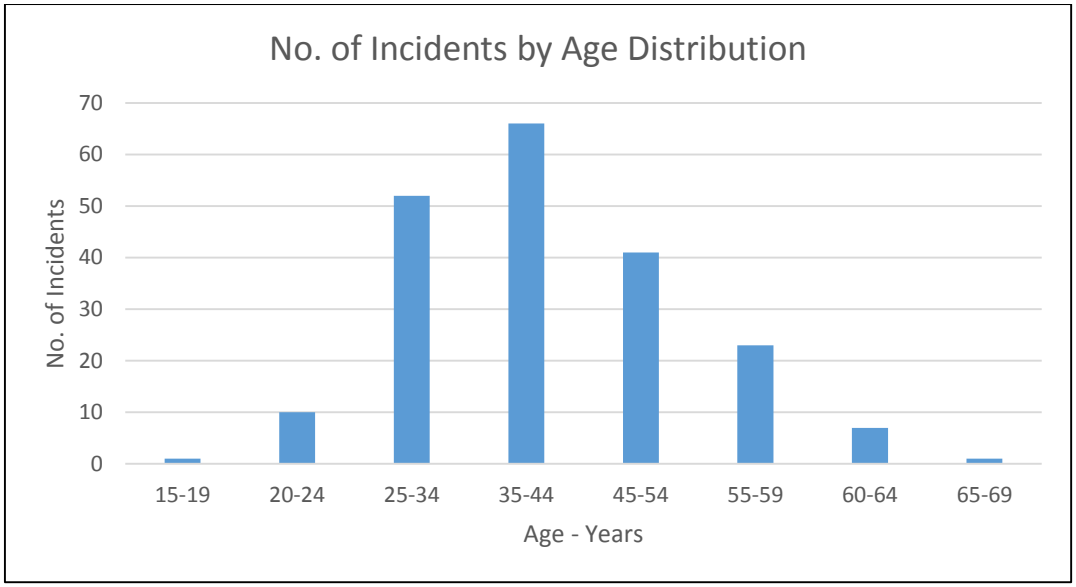

Figure 7 Age Distribution

Therefore, we must not assume it is a spinal degeneration/old man syndrome associated with an incorrect lift technique.

What are your strategies for identifying and modifying tasks that overexert/strain (load and deform) the musculoskeletal system of those people who do task?

Summary

The likelihood of people experiencing >60 Days Lost (Permanent Impairment and Temporary Damage) is very high for any one person at 1:219 people employed per annum. This level of damage represents 90% of the cost (pain, suffering, impairment, dollars) of work-related damage. It is clearly a Human, Gravitational and Vehicular Energy problem.

The taxonomy shows the relative importance of the subgroups of those energies. Your current Health & Safety strategies, planning and resources for the next 1-5 years could be reviewed to determine if its strategic focus is appropriate.

The purpose of this paper is not to describe the phenomena involved in each energy/sub group (e.g. slip involves loss of grip, heel strike, contaminant present, smooth surface) or the predictive strategies available to a business.

The starting point in Risk Management is to describe the problem.

The completed taxonomy will available in two weeks in full on the InterSafe website (www.intersafe.com.au). The taxonomy is not yet complete. Further conversations are required with the QRC and QComp but I would hope the significance of the pattern is not underestimated by the reader.

The InterSafe management genuinely appreciate QComp making this data available.

Thank you.

[1] O'Neill, S., Martinov-Bennie, N., Cheung, A., **Issues in the Measurement and Reporting of Work Health and Safety Performance: A Review,** Safe Work Australia, Safety Institute of Australia and CPA Australia, November 2013

[2] Industry Commission, **Work Health & Safety, An Inquiry into Occupational Health & Safety, Vol 1: Report, Report No. 47**. Industry Commission, Australia, September 1995

[3] National Occupational Health & Safety Commission, **The Cost of Work-Related Injury and Illness for Australian Employers, Workers and the Community**, August 2004, Canberra

[4] **The Cost of Work-Related Injury and Illness for Australian Employers, Workers and the Community: 2005-2006**, Australian Safety and Compensation Council, 2009.

[5] **The Cost of Work-Related Injury and Illness for Australian Employers, Workers and the Community: 2008-09**, March 2012, Safe Work Australia, Canberra

[6] The Royal Australian College of Physicians, The Australasian Faculty of Occupational & Environmental Medicine, **Helping People Return to Work – Using Evidence for Better Outcomes – A Position Statement**, 2010

[7] Waddell GA, Burton AK. **Is Work Good for your Health and Well-being?** London, 2006

[8] Artazcoz L, Benach J, Borrell C, Cortes I. **Unemployment and Mental Health: Understanding the Interactions Among Gender, Family Roles and Social Class**, *American Journal of Public Health*, 2004;94:82-8

[9] Waddell G, Burton K, Aylward M. **Work and Common Health Problems**, *Journal of Insurance Medicine*, 2007;39109-20

[10] Bartley M. **Unemployment and Ill Health: Understanding the Relationship**, *Journal of Epidemiology & Community Health*, 1994;48:333-7

[11] Jin RL, Shah CP, Svoboda TJ. **The Impact of Unemployment on Health: A Review of the Evidence**. *CMAJ Canadian Medical Association Journal* 1955;153:529-40

[12] The Australasian Faculty of Occupational & Environmental Medicine and The Royal Australasian College of Physicians, **Australian and New Zealand Consensus Statement on the Health Benefits of Work – Position Statement: Realising the Health Benefits of Work**, March 2010

[13] Johnson D, Fry T. **Factors Affecting Return to Work after Injury: A Study for the Victorian WorkCover Authority**. Melbourne: Melbourne Institute of Applied Economic and Social Research; 2002