What can work health and safety learn from road safety?

JE Woolley, TJ Bailey, SJ Raftery

Report documentation

TITLE

What can work health and safety learn from road safety?

AUTHORS

JE Woolley, TJ Bailey, SJ Raftery

PERFORMING ORGANISATION

Centre for Automotive Safety Research
The University of Adelaide
South Australia 5005
AUSTRALIA

SPONSORED BY

AVAILABLE FROM

ABSTRACT

Work health and safety (WHS) and road safety are distinctive perspectives of public health but they share much in common. Both talk of incidents rather than accidents. Both are characterised by proactive rather than reactive responses. Both suffer from a tendency to normalise levels of risk and to prefer training of individuals over system-wide, integrated approaches. As well, compliance and enforcement are important in both WHS and road safety, and their hierarchies of control share many commonalities. A literature review and a series of workplace interviews identified where various aspects of WHS policy and practice could be reviewed in relation to the road safety experience, particularly in relation to how compliance and enforcement approaches work best, the use of rewards and incentives, making fuller use of violation data, establishing chains of responsibility, and looking beyond regulatory solutions. WHS data collection and analysis approaches could be reviewed with respect to optimising use of auditing programs and considering employing non-traditional WHS performance indicators.

KEYWORDS

Work health and safety, occupational health and safety, road safety, enforcement, regulation

Executive Summary

Work health and safety (WHS) and road safety offer distinct yet inter-linked perspectives of public health.

The characteristic approach to road safety among many governments has been one of intense regulation, requiring significant levels of enforcement activity and mass media campaigns. More recently Australia's approach to road safety has adopted a Safe System approach that holistically integrates behavioural and regulatory initiatives with the safety of vehicles and road infrastructure.

By contrast, the approach in WHS historically has relied primarily on self-regulation and broad principles of duty of care. Whereas the prime targets of road safety policy are the general public as road users and more so now the road system, work safety initiatives primarily target the contractual relationship between employers and workers as well as the work environment.

Although WHS and road safety have some contrasting perspectives, the two now share important commonalities, including the promotion of a safety-oriented culture and systems over and above a singular focus on reducing incidents that can result in injury and death.

The purpose of this report was to compare policy and practices in road safety with those in WHS in order to identify principles and countermeasures having potential to improve WHS effectiveness, and thus further reduce death and injury in the workplace. The study's overall approach was to contrast the broad countermeasure philosophies and developments between road safety and WHS as adopted by governments. This included reference to countermeasure outcomes as evidenced by death and injury data. Although a focus of the study was the situation in South Australia, interstate and international evidence was also considered. The specific expected benefits from the study were:

- identification of areas where WHS policy and practice could be reviewed, based on successful approaches adopted in road safety

- identification of ways in which current WHS data sets could be improved for monitoring trends and their ability to permit outcome-based research to be performed.

The research study was conducted in two linked phases — a literature review and a series of interviews with key persons nominated by SafeWork SA, the main South Australian Government agency responsible for WHS matters in that State.

Literature review

The literature review examined evidence surrounding the proposition that some principles and approaches that are applied in road safety could be usefully adopted in WHS contexts. The review first sought to describe how WHS and road safety each evolved towards their present principles and state of play through an examination of the development of WHS and road safety in six western countries. This process then enabled the identification of commonalities and differences between the two fields. Where perceived deficiencies in WHS were identified, potential solutions from the field of road safety were considered.

WHS approaches in the United Kingdom, France, Sweden, Canada, North America and Australia owe much to the influence of the Robens (1972) report, particularly with respect to specifying which WHS processes should be followed rather than merely specifying work standards to be met. Robens also encouraged enforcement approaches to embrace self-regulation, notions of duty of care and what is reasonably practicable. While these developments avoided the pitfalls of a purely prescriptive

CASR Road Safety Research Report | What can work health and safety learn from road safety?

iii

approach to WHS, they created other problems. These included WHS differences within and between jurisdictions in the one country, ad hoc and reactive responses to problems rather than systematic development of standards, lack of incentive to find more effective solutions, and poor resourcing for enforcement.

Developments in road safety

Road safety approaches have evolved from a singular focus on education of road users and penalising those who break road rules to much wider understandings of the multitude of factors that contribute to pre-crash causes and to reducing death and injury during and after crashes. In particular, there has been a growing acceptance that the inherent safety of the driving environment and vehicle largely determine the safety of an individual, independently from the driver's behaviour. These more holistic understandings are now better integrated with institutional leadership in road safety and also with inter-government coordination and resource allocation management. As well, there is now a pervading vision that a non-injury incident should be regarded as a significant safety concern and a road fatality a disaster that must never be repeated.

Commonalities between WHS and road safety

The literature review identified several areas of commonality between WHS and road safety. It was important to determine these commonalities because knowing their existence supports any application of road safety solutions to problems experienced in WHS:

1. Having a sound safety culture and systems in place in both WHS and road safety takes precedence over merely focussing on reducing incidents that can result in injury or death.

2. The prime responsibility for safety risk in WHS and road safety has shifted from a focus on just blaming victims to challenging those who create the risk in the first place.

3. Use of the term 'accident' is avoided as it implies an event arose from unknown causes, chance factors or lack of intention on the part of an individual.

4. Both WHS and road safety have shifted from reactive thinking (such as describing an incident as a random or unfortunate event) to proactive thinking (exploring why the safety risks were not well managed, as well as areas for improvement).

5. In WHS and road safety, individuals tend to normalise levels of risk, or treat incidents less seriously than the actual risks indicate (for example, just because a safety incident has not occurred does not mean that one will never occur).

6. The evidence for the effectiveness of training programs as the sole solution to a safety problem is often over-estimated in both WHS and road safety.

7. Likelihood of detection, swiftness of applying a penalty and penalty severity are three key ingredients to securing compliance with both WHS and road safety laws.

8. Many offences or infringements in both WHS and road safety tend to be publicly viewed as 'to be expected' rather than requiring prosecution, and are rarely viewed as criminal behaviour.

9. Enforcement agencies in WHS and road safety now tend to strategically target enforcement activity to where the risks most frequently occur, combined with where the most serious risks occur, rather than predominantly using random targeting.

10. Both WHS and road safety have hierarchies of risk control, going from personal protective equipment (such as helmets) up to eliminating exposure to risk (such as by remote handling of hazardous chemicals and by reducing the need to travel by road).

Perceived deficiencies in WHS and potential solutions from road safety

While exploring the commonalities between WHS and road safety, several areas of difference were noted. These differences tended to highlight some perceived deficiencies or problems experienced in WHS that could potentially be rectified by solutions found in road safety. The numbers in brackets show the section in the report where the problem and solution are discussed in more detail.

WHS Deficiency	Potential Road Safety Solution
The need for compliance with WHS law is regarded as a relatively low-profile public interest issue (6.1).	Compliance with road safety law and the deterrent effect of enforcement activity are of relatively high-profile public interest (6.1).
There is limited understanding and application of how to make deterrence initiatives (such as threat of a penalty) work best in the long term in WHS (6.1.1 - 6.1.2).	Road safety adopts multi-faceted approaches to make the most of deterrence initiatives for long-term effectiveness (6.1.1, 6.1.2 & 6.1.3).
Persuasive techniques (such as sending warning letters or offering rewards) are usually the first compliance intervention in WHS, rather than issuing penalties (6.1.2).	Penalties (such as fines and demerit points), although accompanied by public education campaigns, are typically the first compliance intervention (6.1.2).
Rewards and incentive schemes are common in WHS contexts, but research tends to show they are of limited effectiveness and can be counterproductive (6.2).	Rewards and incentive schemes are rarely used in road safety and they have not been shown to be effective in changing behaviour (6.2.1).
Recent literature shows that data on WHS violations is rarely studied in detail for trends, patterns and possible countermeasures (for example in relation to young workers) (6.3, 6.3.1, 6.3.2 & 6.6).	Recent studies of road safety violation data have yielded some important conclusions about road crash causes, as well as identifying some worthwhile countermeasures (including for young drivers) (6.3.1 – 6.3.2 & 6.6).
There may be scope within WHS to implement more chains of responsibility and accountability for specific high risk industries than is currently the case (6.4.2).	Road safety has some experience with chain of responsibility legislation, particularly in the road transport sector (6.4.1).
Non-regulatory solutions to WHS issues are starting to emerge, although cost can be an issue (6.5).	Road safety is exploring non-regulatory solutions, for example new technologies that prevent violations in the first place rather than punishing an offence after it has occurred.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

v

WHS auditing of work places can narrowly focus on objectively measurable and easy-to-access safety issues to the exclusion of psycho-social factors that can encourage innovation, adaptability and flexibility in solving WHS issues (6.7 & 6.7.2).	In road safety, psycho-social factors such as a sense of shared ownership of safety issues can make auditing in alternative compliance programs (such as in 'TruckSafe') more tailored to the needs of the industry, employers and workers (6.7.1).
There is a paucity of research into the respective merits of targeted versus randomised WHS auditing programs (6.7.3).	A complementary mixture of targeted and randomised enforcement programs (which also provide an auditing function) are often used in road safety (6.7.3).
Use of non-traditional performance indicators that measure the *benefits* of WHS compliance and not just losses from non-compliance are starting to be advocated within WHS contexts (6.8).	Various non-traditional performance indicators have been used for some time in road safety, for example 'willingness to pay' calculations (6.8).

Interviews with SafeWork SA

A series of interviews and discussions was held with persons nominated by SafeWork SA, based on points and themes identified in the literature review. It was anticipated this would provide a more practical understanding of WHS regulation with respect to policy and legislation, enforcement, the use of rewards and incentives, and the use of data (both in collection and analysis). More broadly, it was considered this would provide a better appreciation for the task of regulation and the problems faced by regulators, as well as how lessons learned in the field of road safety may benefit WHS.

SafeWork SA's policy and principles

During the interviews, it became evident that the overarching principle underpinning SafeWork SA's development of policy is to stop people being killed or injured in the workplace, chiefly through the elimination of risk or managing exposure to risk. Other principles include that WHS should be a shared responsibility, and that there should be a reduction of 'red tape' associated with meeting WHS obligations for both businesses and the regulator. Policies regarding enforcement and penalty regimes were seen as underpinning the principles of deterrence theory, and by the belief that SafeWork SA activities should aim for continuous improvement of WHS through other compliance measures such as prevention activities and improvement notices.

Regulation activities

As part of the national harmonisation of WHS laws, South Australia's *Work Health and Safety Act 2012* came into effect at the start of 2013. Interviewees considered the new legislation introduced major changes to the regulation of WHS in the State, while basic WHS duties and responsibilities remain unchanged. It was expected that harmonisation of WHS laws will improve the consistency of enforcement and regulation around Australia. Other stated benefits included: cross-border consistency for companies (making it overall easier to increase compliance). Specifically, following one set of rules simplifies and introduces the potential for collaborative work with interstate WHS inspectorates, and this includes the ability for interstate inspectorates to collect or provide evidence to other jurisdictions. Some of the most significant changes brought about through the new legislation have been to clarify and simplify WHS responsibilities through the concepts of due diligence and shared responsibility, as

CASR Road Safety Research Report | What can work health and safety learn from road safety?

vi

well as the shift from the concept of 'employer' to 'person conducting a business or undertaking' – the PCBU. The *Work Health and Safety Act 2012* has also introduced changes to enforcement by increasing penalties and formalising tools such as enforceable undertakings and expiation notices.

Rewards and incentives

Interview discussion of the use of rewards and incentives in WHS focussed on the annual Safe Work Awards recognising businesses and individuals who demonstrate excellence and innovation in WHS. These rewards reflect the ability for a company's self-promotion as a safe workplace. There is no financial reward or incentive for nominating or receiving the award beyond the savings and increased productivity associated with a healthy, injury free workplace. However, the ability to identify oneself as the recipient of an award may offer an advantage when competing for contracts. It is likely that these awards may attract businesses with a good WHS record who can also spare the resources (personnel, etc.) to complete the nomination process. The extent to which the awards encourage other businesses to improve their WHS systems and practices is unknown. The effect of the awards program on WHS outputs has not been evaluated.

Compliance and enforcement activities

SafeWork SA's approach to enforcement activities encompasses both persuasive and punitive techniques through prevention, compliance, and investigation and prosecution. Targeted prevention activities, such as its Industry Improvement Program, identify poor performing businesses for intervention. SafeWork SA works with these businesses to improve their WHS systems and practices. A general WHS prevention approach seeks to encourage industry to become more proactive by offering support and advice when needed. At the same time, safety and hazard alerts also enable workplaces to respond to issues before an incident occurs.

SafeWork SA's inspection and compliance program takes a more traditional approach to deterrence involving random inspections to ensure workplaces are compliant. Workplace audits and inspections are primarily intelligence driven, based on injury data, national trends, and prior SafeWork SA activities. Compliance actions take the form of improvement notices requiring a workplace to resolve an identified issue before work may continue.

SafeWork SA is also responsible for investigating workplace incidents and to recommend compliance actions based on its findings. These actions include warning letters, improvement notices, prohibition notices, enforceable undertakings and prosecution. An alternative to prosecution, enforceable undertakings are high level sanctions that offer the offending party an opportunity to undertake activities that provide benefits to the workplace, industry, and community. Prosecution is the highest level of enforcement action possible and may result in a criminal penalty in the form of a fine, term of imprisonment, or both. A court is also able to impose other orders such as adverse publicity orders, orders for restoration, injunctions, WHS project orders, training orders, and court-ordered undertakings. A persuasive outcome of an investigation may also be the issuance of an industry-wide hazard alert.

Data collection and analysis

The data used by SafeWork SA to monitor WHS comes from various sources. Information regarding injuries is based on claims data provided by WorkCover SA. Other information generated by SafeWork SA investigations and activities is stored on the internal system known as *InfoNet*. SafeWork SA also have memoranda of understanding (MOUs) to seek information from other authorities, such as SAPOL and hospitals. Additionally, SafeWork SA shares information with the State Coroner. Key performance indicators are monitored using WorkCover SA compensation claims data while data for

CASR Road Safety Research Report | What can work health and safety learn from road safety?

vii

monitoring SafeWork SA activities is obtained from *InfoNet.* Data provided by WorkCover SA is based on information generated at the initiation of a claim for a workplace injury and contains a number of variables, including number of days lost due to injury, occupation, industry, date of injury, mechanisms of injury, nature of injury, worker description of injury, and the cost of the injury or incident. The primary indicator monitored by SafeWork SA is the total number of claims with greater than ten days' remuneration, which is indicative of a severe injury, a classification that is used both nationally and internationally. As with any database, there are limitations as to the type of analysis the data is suitable for. SafeWork SA utilises the data in a manner that is reasonable given these limitations.

Comments on the interview outcomes

SafeWork SA's annual Safe Work Awards are intended to reward WHS effort and to provide incentive for others to improve. An award scheme is useful for promoting WHS in the community and allowing SafeWork SA to build relationships with industry through positive interactions rather than punitive enforcement activities. However, research shows the use of incentives or rewards can have varying degrees of success, depending on an individual's motivation for a desired behaviour. More specifically, research suggests that providing rewards and other inducements can reduce one's innate or natural propensity (i.e. intrinsic motivation) to behave safely, such that rewards (i.e. external motivation) may need to be regularly offered to maintain the safe behaviour. Within SafeWork SA there is a perception that its award scheme, in essence, may be rewarding people for doing something that any committed employer or employee should be doing as a matter of course. Given such doubts, ongoing provision of a reward scheme, or any other incentives-based program, requires careful consideration.

SafeWork SA's Industry Improvement Program (IIP) endeavours to redress the WHS shortcomings of poor performing workplaces. While the IIP is commonly viewed as a successful initiative, there are some doubts among interviewees as to its actual effectiveness. One of the IIP's strengths is that it is targeted at workplaces that contribute disproportionately to injuries as identified using WorkCover SA statistics. Given the data available to SafeWork SA, such targeting appears to be performed in a reasonable manner. A similar approach has been adopted in road safety where young drivers are known to be over-represented in crash statistics, leading to interventions targeting this population. However, where road safety differs from WHS in this regard is that it has been possible to identify factors that contribute to young driver risks and implement strategies to redress these. It is thus possible that the IIP's effectiveness could be strengthened through more strategic targeting based on identifying various contributing factors. Improved targeting will also require data with capabilities beyond simply identifying increased injury rates. While there is room for development in the way the IIP is targeted, it is worth noting that it likely improves the WHS systems and practices of workplaces at which it is targeted.

Conclusions

A number of broad areas where WHS policy and practice could be examined in relation to road safety, primarily in the areas of regulation compliance and enforcement, plus data collection, were identified through the literature review and interviews with SafeWork SA. The focus of such an examination should be to gauge if current WHS policies and practices are appropriately balanced. If an imbalance is identified, it may be of some benefit to undertake further examination of the issues in the light of experiences from the field of road safety. Based on the evidence compiled throughout the report, fourteen areas where a review of WHS practices may identify further benefits for WHS have been identified, and are outlined in more detail in the body of the report:

1. The role of enforcement in WHS, through examining successful road safety enforcement practices in conjunction with police with respect to:
   - The effect of both specific deterrence (individual instances) and general deterrence (effect on others) of various enforcement approaches
   - The durability of different enforcement approaches (such as mixes of targeted and randomised audit/inspection programs)
   - How the above may be best explained in terms of enforcement theory
   - The role of advertising campaigns in supporting enforcement initiatives.

2. WHS research programs, with respect to obtaining Australian data on the effectiveness of WHS targeted interventions.

3. The effectiveness of other (non-prosecution) compliance measures, such as improvement and prohibition notices, and adverse publicity orders.

4. The role of rewards and incentives with a view to limiting their use to those circumstances where they are likely to increase, but not decrease intrinsic motivation to work safely; this work should include monitoring the Cochrane Collaboration's current study on the effectiveness of incentive schemes in WHS.

5. How applicable the Regulatory Pyramid is as a tool to plan WHS intervention strategy, beyond using it simply as a description of the range of available interventions.

6. Systematic examination of the causes of violations, both at individual and system-wide levels, and in patterns of violations.

7. The establishment of robust feedback loops for improving WHS systems, particularly where people can own up to genuine mistakes without necessarily fearing blame or legal action.

8. Whether more chains of WHS responsibilities and accountabilities, particularly for high risk industry categories, should be established.

9. Is there a balance of cost-effective solutions to WHS issues as distinct from just regulatory ones?

10. Whether there are possibilities for adopting alternative, worker — management negotiated forms of compliance, where enforcing 'one size fits all' regulations can be operationally problematic.

11. The possibility of a more substantial evidence base for WHS policy and action through improved WHS data collection and analysis, particularly with respect to:
    - Linkages with other relevant databases
    - Considering a wide range of performance indicators beyond just deaths and injuries, for example: the outcomes of covert versus overt WHS inspection operations, or random versus non-random inspections
    - Psycho-social relationships and safety culture in workplaces, including feedback mechanisms for identified safety problems
    - Calculating the financial benefits of spending on safety improvements, not just the costs of WHS failures; this can include willingness-to-pay calculations.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

ix

12. The manner in which participants are identified for an industry improvement program. This might also involve a review or investigation of factors associated with increased risk, and the characteristics of high-risk workplaces. This could be further stratified to identify industry-specific risk factors.

13. The data collected on novice worker deaths and injuries, particularly for workers aged 15-24, with a view to determining the need and feasibility of a more graduated acclimatisation to work, especially in industries where novice workers appear to be at most risk.

14. Whether WHS worksite audit provisions could be tailored to accommodate alternative, negotiated forms of compliance.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

x

Contents

CASR Road Safety Research Report | What can work health and safety learn from road safety?

xi

CASR Road Safety Research Report | What can work health and safety learn from road safety?

xii

1   Introduction

Both work health and safety (WHS) and road safety, along with such fields as epidemiology, environmental health, community safety and health economics, are distinct yet interlinked organised efforts by society that belong under the collective term 'public health'. A now almost universal definition of health is "…a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1946). This definition is as applicable to WHS as it is to road safety. WHS and road safety have some contrasting perspectives, but there are some important commonalities, for example both currently promote safety-oriented culture and systems over and above just focussing on reducing incidents that can result in injury and death.

Road safety has generally been considered a success story in developed countries over the past 35 years. Fatality numbers have typically fallen, despite steady increases in road user exposure. The characteristic approach to road safety among many governments has been one of intense regulation, requiring significant levels of enforcement activity and mass media campaigns. In recent years, Australia's approach to road safety has adopted a more holistic and integrated perspective that recognises the significant contribution made by broader contextual influences such as safer vehicles and safer road infrastructure, in conjunction with behavioural and regulatory initiatives. Collectively, they make up what has become known in road safety circles as the Safe System.

The key players influencing road safety are road designers and builders, regulatory and licensing authorities, vehicle manufacturers, enforcement agencies and road users themselves, essentially the components of the Safe System. The roles of relevant government agencies vary across jurisdictions, and cross-agency coordination is more evident in some jurisdictions than in others. For example, in the South Australian Government, road safety predominantly falls under the aegis of the Department of Planning, Transport and Infrastructure, with essential support provided by South Australia Police with respect to enforcement and the Motor Accident Commission with respect to public education campaigns. There are various national coordinating bodies such as the National Transport Commission and Austroads.

This is in contrast to the typical approach in WHS circles, which, historically, has primarily relied on self-regulation and broad duty of care principles. The influential players in WHS cover a much broader spectrum than in road safety, encompassing various regulatory authorities, a wide variety of industry sectors, employers of all types and sizes from large corporations to single person businesses, worksite WHS officers, safety equipment manufacturers, workplace insurers and workers themselves. Moreover, whereas the prime targets of road safety are the general public as road users and now increasingly the road system, by contrast work safety initiatives primarily target the work environment and the contractual nexus between employers and workers rather than the general public. From the perspective of government roles, WHS is centrally represented in each jurisdiction by a single department or agency such as SafeWork SA, with a national coordinating role performed by Safe Work Australia. A supporting role is provided in each jurisdiction by a local WorkCover type insurance agency.

1.1   Purpose and structure of the report

This research study was originally conceived by SafeWork SA staff as a means for improving its approaches and countermeasures to reduce death and injury in the workplace. The project aligns with several directions outlined in the *OHSW Research Strategy for South Australia* (Blewett, 2009).

The fundamental approach of the study was to compare the broad countermeasure philosophies and developments between road safety and WHS adopted by governments, including with reference to

CASR Road Safety Research Report | What can work health and safety learn from road safety?

1

measured outcomes informed by death and injury data collection. Although the focus of the study was to be on the South Australian situation, interstate and international evidence was also considered. The expected benefits from the project were:

- identification of areas where WHS policy and practice could be reviewed, based on successful approaches adopted in road safety

- identification of ways in which current WHS data sets could be improved for monitoring trends and their ability to permit outcome-based research to be performed.

The research study was conducted in two linked phases — a literature review and a series of interviews with key persons nominated by SafeWork SA including consideration of its collection and analysis of WHS data.

The literature review essentially explored a research basis for the proposition that some principles and approaches that are applied in road safety could usefully be adopted in WHS contexts. In this light, WHS and road safety are best viewed as two perspectives within public health, but having both commonalities and differences between them.

In order to fully appreciate the potential for road safety application to WHS, the literature review first briefly explored, through a comparative examination of respective developments in a few leading countries, how WHS and road safety have each evolved towards their present principles and states of play. This comparison then informed identification of various commonalities between WHS and road safety. To explore possible areas of learning for WHS, perceived deficiencies in WHS as revealed in the literature review were considered in relation to how such issues are approached in the field of road safety. The literature review concluded by suggesting areas within WHS that could be reviewed by SafeWork SA with the aim of gauging if current South Australian WHS policies and practices are appropriately balanced.

In order to understand WHS regulation from a more practical perspective a series of interviews were conducted with SafeWork SA. Drawing on several points and themes identified in the literature review the interviews focussed on the key areas of policy and legislation, enforcement (encompassing prevention, compliance, and investigation), rewards and incentives, and data collection and analysis. This process provided some insight into the relationship between theory and practice with regard to the role of regulation in WHS, and also enabled further comparisons between road safety and WHS in these areas.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

2

2   Developments in WHS

The WHS systems of many countries derive from a dramatic shift in WHS thinking brought about by Alfred Robens in his review of Britain's WHS system in the early 1970s. It is fitting, therefore, to begin with that country.

2.1   United Kingdom

In 1996 the esteemed judge, Lord Cullen, who headed the inquiry into the 1988 Piper Alpha oil rig disaster that made far-reaching recommendations to transform oil industry safety, gave an address in which he discussed how the 1972 Robens Report changed Britain's whole approach to WHS. Lord Cullen noted that, as a direct consequence of Robens, WHS legislation broadly became less to do with pursuing regulation and supervision by the state (the approach hitherto) and more on embracing self-regulation and broad duty of care principles. Lord Cullen remarked that this had the effect of encouraging industries to deal more with their own specific problems, leaving official regulation to focus on serious generic problems. It also encouraged safety legislation to be prescriptive less often, in favour of promoting safety goal-setting in the self-regulatory sense. The primary responsibility for accident prevention thus shifted towards those who *created* the risks rather than those who became victim to them.

Lord Cullen also noted that while WHS regulations still need to be strongly prescriptive in some (high risk) industrial settings, the general regulatory approach in the 1990s that had evolved from the Robens era was to reflect what is considered to be *reasonably practicable* in the circumstances rather than arbitrarily prescriptive. Moreover, WHS standards shifted from prescribing specific standards for how to perform work safely to stipulating the *processes* that should be followed for achieving safe work environments. To illustrate this changed approach, Lord Cullen made a contrasting reference to the WHS system in America where a common view at the time was that industrial accidents can be prevented simply by the government releasing lengthy regulatory tomes. In that country, there were once 140 regulations on wooden ladders, with one subset governing the grain in the wood (Howard, 1994; cited in Cullen, 1996). In comparison to specification standards, standards that focus on processes have a greater capacity to deal with complex and dynamic or evolving sets of work hazards (Walters et al., 2011).

Britain's embracing Roben's remedy of self-regulation and development of process standards turned out to be by no means a problem-free alternative to the previously overly prescriptive approach. Walters et al. (2011) commented that WHS standards subsequently began to be developed ad hoc to resolve problems as they arose, resulting in uneven coverage across workplaces. Moreover, these standards did not encourage or enable employers to look for still more effective solutions and nor did the approach reflect the more recent realisation that many workplace hazards do not arise from static features of the workplace, but rather from the way work is organised. Finally, there were insufficient resources to adequately enforce the regulations and standards. Of course all Walters et al.'s criticisms could equally be applied to the former (pre-Robens) primarily prescriptive focus.

This situation was no better from around 2000 when Britain's WHS regulations became couched in the "…rhetoric of New Labour governance with much airing of business benefits, partnerships, responsible employers and removal of excessive regulatory burdens" (Walters et al., 2011, p. 189). Removal of 'excessive regulatory burdens' translated into a shift away from inspection to educational and advisory approaches, particularly for senior managers of an organisation. A major report by Britain's Work and Pensions Committee in 2004 recommended increased resource allocations for both inspectoral and educational approaches, but this was rejected by the Government who nonetheless still championed educational, advisory and other persuasive approaches.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

3

Fear of an excessive regulatory burden on business was revisited in 2011 by Professor Ragnar Löfstedt from Kings College, London as an independent review conducted for the UK Government. The professor concluded that there is no case for radically altering current health and safety legislation, finding that the regulations place responsibilities primarily on those who create the risks. However, he made some recommendations to "…enable businesses to reclaim ownership of the management of health and safety and see it as a vital part of their operation rather than an unnecessary and bureaucratic paperwork exercise" (2011, p.1). For example, he recommended that where regulatory provisions unnecessarily impose strict liability on a business, the provisions be qualified with 'reasonably practicable' clauses, and that businesses be provided with guidance on determining what is reasonably practicable. Professor Löfstedt also recommended a wider public debate about the nature of risk and how it should be regulated. As a further refinement to WHS policy, he advocated the UK Government working with the European Commission to ensure that EU-wide WHS legislation is both risk and evidence based.

2.2   France

Since 1989, in common with other European Union (EU) countries, France's WHS regulatory systems have been established and operated centrally, for example through the work inspection system under the Ministry of Labour, though there are regional as well as central offices. France's management of WHS is characterised by less attention to process standards as compared to the UK and Sweden, but a greater focus on systematic and risk-oriented enforcement approaches (Walters et al., 2011). For example, there might be a greater emphasis on regular inspections of high risk work activity rather than implementing effective measures to avoid exposure to the risks (Frick & Zwetsloot, 2007 in Walters et al., 2011). The strategy is one of implementing procedures of risk assessment and accountability, and then checking the procedure, rather than controlling a safe working environment (Walters et al., 2011).

2.3   Sweden

While France's WHS systems are broadly commensurate with EU requirements, by contrast Sweden's WHS provisions go beyond EU requirements (Walters et al., 2011). For example, Sweden's workers have greater representation and participation in WHS management and there are requirements for employers to regularly audit and improve their Systematic Work Environment Management (SWEM). Moreover, Sweden has seen "…a conceptual shift away from behaviourally based notions of safety to greater emphasis on environmental and engineering control" (Walters et al., 2011, p. 30).

Despite these positive Swedish developments, some endemic problems have evolved. Largely due to various political and economic forces, SWEM teams tend to consider it may be cheaper to reactively reduce the *symptoms* of work risks (such as by cutting benefits or implementing image campaigns) than to proactively reduce risks by intervening at management levels (Frick & Zwetsloot, 2007 in Walters et al., 2011). Also, Sweden's work environment is characterised by high workloads that bring organisational and psychosocial risks rather than physical/technical risks to safety. This has led to less compliance with planning, organisation and management of work safety than with the specific technical provisions for safety. This trend has been exacerbated by Sweden's industrial relations setting favouring motivating employers to voluntarily comply with work regulations rather than by compulsion (Walters et al., 2011).

2.4   Canada

WHS management across Canadian provinces is variable as in only three out of eleven jurisdictions is it mandatory to have a written WHS policy and program in all workplaces (Walters et al., 2011).

CASR Road Safety Research Report | What can work health and safety learn from road safety?

4

Nonetheless, one quality program is Quebec's mandatory WHS Prevention Program, begun in 1979 and which has origins in the UK Robens Report, process standards development in Sweden, good WHS practice in Saskatchewan and public health directions in Quebec itself (ibid). Key features of the program are its main objective to eliminate WHS dangers at their source and general duty of care legislation supplemented by sub-ordinate legislation, with specific regulations for high risk industries for steering inspectorate activity. There is also a complementary employee health program. Walters et al. (2011) noted that the WHS legislation tended to be interpreted somewhat restrictively in law practice and in any case was poorly supported politically, which has led to a reduction in resourcing of inspectorate activity. This downplaying of the role of enforcement parallels what occurred in Britain and, as Walters et al. observed, also happened in Ontario.

2.5   North America

Since 1970, the Occupational Safety and Health Administration (OHSA) has been the principal agency tasked with overseeing WHS matters in North America. In their review of OHSA, McGarity, Steinzor, Shapiro and Shudtz (2010) report that in its early days OHSA established important WHS standards that saved thousands of injuries and illnesses. However, they describe the current state of WHS in America as 'a picture of regulatory dysfunction'. Essentially they say, OHSA's enforcement staff are stretched thin and struggle to develop WHS standards that can withstand an onslaught of legal challenges. Moreover,

> …in the last decade, OHSA has dropped more standards from its regulatory agenda than it has finalized, largely due to insufficient budget authority. And the agency's enforcement program has assessed such paltry fines for even fatality-related violations that many employers see no incentive in addressing hazards, much less developing precautionary health and safety programs. (ibid, p 1)

To further illustrate such issues, McGarity et al. (2010) report, for example, that OHSA's operating budget for 2009 was less than 0.02% of the year's total federal financial outlays. Also, there are eighteen different statutory, court-created and administrative limits that serve to slow OHSA's rule making processes. While there are over 8.6 million workplaces in the USA, there are only 2400 federal and state WHS inspectors who cannot inspect even a small fraction of the nation's workplaces in a year (ibid).

On the positive side, however, McGarity et al. (2010) report that the Obama Administration, aware of the dire straits American WHS was left in by the prior Bush Administration, has since appointed a Secretary of Labor and provided funds to hire 130 new workplace inspectors. More recent developments include proposing a fundamental rewriting of the forty year old OHSA Act to better empower workers and ensure that all workers have healthy and safe workplaces (McCluskey, McGarity, Shapiro, Steinzor & Shudtz, 2012).

2.6   Australia

Australian national and state WHS legislation, in addition to UK, New Zealand and Canadian laws, was also strongly influenced by Robens, particularly with respect to the favouring of process standards involving 'reasonably practicable' measures and proactive risk management approaches (Walters et al. 2011). All Australian jurisdictions have general duties of care towards safety of workers (including subcontractors and members of the public) but these duties are generally limited to what is deemed to be reasonable and practicable in the context. All WHS statutes ensure the duty of care principles apply not just to workers but likewise to designers, manufacturers, importers and suppliers who each

CASR Road Safety Research Report | What can work health and safety learn from road safety?

5

have to identify hazards, assess and control risks and to comply with documentation requirements (ibid).

All WHS statutes also provide for inspectorates with wide ranging powers for workplace inspection and hazard control. Employers who transgress a WHS requirement might be entreated by the regulator to an 'enforceable undertaking' for the employer to do, or refrain from doing, certain activities (Walters et al., 2011). Enforceable undertakings essentially afford an alternative pathway to prosecution. Typically, they comprise a written commitment by the offending party to cease an identified unsafe behaviour(s) and an undertaking to improve WHS practice accordingly. While this enforcement approach is intended to be merely advisory or persuasive and this happens in the majority of cases, the undertakings are enforceable in court with penalties if the employer does not voluntarily comply. Penalties depend on degree of intent to commit the offence and are higher for repeat offences, if a death is caused or the offence is otherwise aggravated. Penalties usually involve fines, but can also include adverse publicity orders and compulsory completion of WHS projects or remedial measures (ibid). Safe Work Australia (2013) noted that while there is some evidence that enforceable undertakings can improve WHS practice in a work place, little is known about how they would be effective nor whether they are more effective than prosecutions.

However, there have also been substantial jurisdictional and industry differences in the extents to which risk management processes have been prescribed and implemented. For example, WHS standards tended to be developed on an ad hoc basis as problems arose rather than through systematic analyses of a safety problem. Moreover, the standards did not encourage employers to look for more effective solutions and ignored the view that hazards arise from the way work is organised rather than from static features of the workplace (RegNet, 2012).

Recent years have seen the development of inter-jurisdictional uniformity in WHS regulation, even inter-jurisdictional cooperation between inspectorates (RegNet, 2012), although the notion of nationally uniform WHS standards originated from Productivity Commission work in the mid 1980s (Johnstone, Bluff & Clayton, 2012). The key components of the current *Australian Work Health and Safety Strategy 2012-2022* bear a striking resemblance to recent and current national road safety strategy components: a vision statement, national death and injury reduction targets and the following national strategic priorities:

- Reduced incidence or severity of work-related death, injury & illness
- Reduced exposure to hazards & risks
- Improved hazard controls
- Improved work health and safety infrastructure;

together with seven areas for national action:

- Hazards are eliminated or minimised by design
- Improved work health and safety through supply chains and networks
- Improved work health and safety capabilities
- Leaders in communities and organisations promote a positive culture for health and safety
- Evidence-informed policy, programs and practice
- Governments improve work health and safety
- The regulatory framework improves effectiveness by responding and adapting to changing circumstances.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

6

(In comparison, the *National Road Safety Strategy 2011-2020* also propounds a trauma reduction vision and associated targets, with safe roads, safe speeds, safe vehicles and safe people (Safe System) making up the key hazard areas).

Work on a nationally consistent regulatory framework (harmonisation) for WHS formally began in 2004 by the Productivity Commission (Johnstone et al., 2012). This was followed in 2008 by the National OHS Review, which conducted a series of consultations and invited submissions. Issues examined in detail included how the notion of duty of care was variously interpreted between jurisdictions, how 'reasonably practicable' and 'risk management' were defined, regulatory powers and accountability, compliance, enforcement and prosecution (ibid). Safe Work Australia began drafting model nationally uniform legislation in 2009.

The new national work health and safety laws commenced in New South Wales, Queensland, Tasmania, the Australian Capital Territory, the Commonwealth and the Northern Territory from 1 January 2012, plus South Australia from 1 January 2013. All these jurisdictions are also progressively adopting national model codes of practice. A key development in this national legislation is to establish the 'person conducting a business or undertaking' (the PCBU) as the *principal* WHS duty holder rather than an employer alone taking the chief role. The PCBU is all-embracing, encompassing employers (including the company itself), franchisors, contractors, heads of supply chains and others, and the PCBU must ensure the health and safety, as far as is reasonably practicable, of all workers engaged by the PCBU (RegNet, 2012). However, this broadened focus does not diminish the responsibilities of employers and managers as the *Australian Work Health and Safety Strategy 2012-2022* calls for deeper levels of work place leadership to 'drive' expanded 'due diligence' provisions among PCBUs, to ultimately impact on workplace safety culture (Sherriff, 2011).

2.7 Concluding summary

In sum, WHS approaches in western countries (albeit to varying extents) owe much to the influence of the Robens era, particularly with respect to specifying WHS processes to be followed rather than standards per se, by allowing self-regulation to become a valued component of enforcement, and by adopting notions of duty of care and what is reasonably practicable. While these developments avoided the pitfalls of the hitherto overly prescriptive approach, they nevertheless brought their own problems. These included differences within and between jurisdictions in the one country, ad hoc and reactive responses to problems rather than systematic development of standards, lack of incentive to find more effective solutions, and poor resourcing for enforcement — often the result of political interference.

While Sweden's WHS system is not without its own problems, uniquely it does recognise that successful safety and risk management frequently depends more on environmental and engineering controls than purely behaviourally based interventions (such as education and advisory approaches).

More recent years have seen still greater broadening of WHS parameters in ever evolving system-wide contexts, including in Australia. According to Hasle and Zwetsloot (2011, p. 962), today's,

> OHS management systems form a kind of shell which can be filled with different content, depending on the company, its ambitions, culture and history. OHS management systems also imply an on-going process, requiring constant interpretation, adaptation, anticipation and monitoring….

And later (ibid):

CASR Road Safety Research Report | What can work health and safety learn from road safety?

7

The functioning of OHS management systems therefore implies dynamic complexities, uncertainties and ambiguities, in fact all the characteristics of the recently developed concept of risk governance….

CASR Road Safety Research Report | What can work health and safety learn from road safety?

8

3   Developments in road safety

Compared to WHS development, evolution of thinking in road safety has been less extensively studied or even documented. Indeed, according to Evans (1991), road safety thinking has been less impressive than advances in knowledge in other scientific disciplines. Somewhat uniquely in this background of parsimonious detail, Bliss and Breen (2008) maintain that since the 1950s there have been four significant phases of development in road safety thought:

3.1   Phase 1: Focus on driver-based interventions

In the 1950s and 1960s road safety policies placed considerable emphasis on the driver by establishing legislative rules and penalties, and expecting subsequent changes in behaviour, with support from information and publicity initiatives. It was argued that since human error contributed mostly to crash causation it could be addressed most effectively by educating and training the road user to behave better (Bliss & Breen, 2008). However, placing the onus of blame on the road traffic victim acted as a major impediment to the appropriate authorities fully embracing their responsibilities for a safer road traffic system (Rumar 1999, in Bliss & Breen, 2008).

Even though it was another two or so decades before road safety policy began to shift en masse away from its hitherto blame the victim approach, there were some visionaries around. In 1965, the renowned American political activist, Ralph Nader, wrote:

> It is faster, cheaper and more enduring to build operationally safe and crash-worthy automobiles that will prevent death and injury, than to build a policy around the impossible goal of having drivers behave perfectly all the time, under all conditions, in the operation of a basically unsafe vehicle and often treacherous highway conditions.

His comments are still valid today, almost half a century later.

3.2   Phase 2: Emergent focus on system-wide interventions

In the 1970s and 1980s, the earlier behaviour-focussed approaches gave way to holistic strategies which recognised the need for a systems approach to intervention. This change began with Haddon (1972) who developed a systematic framework or matrix for examining road safety issues that encompassed (i) the driving environment (road infrastructure and traffic conditions), (ii) vehicles and (iii) road users, each cross-referenced in turn across three time periods: leading up to a crash, during a crash and after a crash. Central to this framework was the emphasis on effectively managing the exchange of kinetic energy in a crash that leads to injury, to ensure that the thresholds of human tolerances to injury are not exceeded.

From Haddon, the focus of policy subsequently broadened from an emphasis just on the driver in the pre-crash phase to also include protection provided by both roadsides and vehicles during a crash as well as the post-crash care stage. In other words, Haddon's framework helped shift the focus of road safety countermeasures from being exclusively focussed on human behaviour before a crash to countermeasures involving vehicles and the road environment both during and after a crash (Williams, 1999). This in turn eventually broadened to a system-wide approach to intervention and the complex interaction of factors that influence injury outcomes (Bliss & Breen, 2008).

Drawing on the work of Borys (2000), Mooren, Searles, Benc, Creef and Wall (2012) usefully discuss the important distinction between employing a *systematic* approach to road safety investigation, such as afforded by Haddon's (1972) matrix, and investigation terms that are sufficiently broad to include

CASR Road Safety Research Report | What can work health and safety learn from road safety?

9

systemic levels. While Haddon's matrix provides for a systematic approach, it does not encompass a process for examining factors (in systemic terms) for what caused the factors to present in or around an event being investigated (for example, factors such as the effect of fuel prices on crashes or the culture surrounding speed). In particular, the matrix does not enable ready analysis of the combined effects of road safety countermeasures implemented simultaneously (Mooren et al., 2012). The adoption of a more systemic approach underpinned a major shift in road safety policy and practice, and took several decades to evolve. However, because the focus still remained at the level of systematic intervention, it did not directly address the institutional management functions producing safety interventions or the results that were desired from them (Bliss & Breen, 2008).

3.3 Phase 3: Focus on system-wide interventions, targeted results and institutional leadership

By the early 1990s, good practice countries were using action-focused plans with numerical road safety targets to be achieved with broad packages of system-wide measures and based on monitoring and evaluation. On-going monitoring of road safety performance established that growing motorisation need not inevitably lead to increases in death rates, but could be reversed by continuous and planned investment in improving the quality of the traffic system (Bliss & Breen, 2008).

Key institutional management functions in road safety also became more effective. Institutional leadership roles were identified, inter-governmental coordination processes for road safety were established, and funding and resource allocation mechanisms and processes were becoming better aligned with the results required. This phase laid the foundation for today's best practice in road safety and reflects the state of development found in many higher performing countries today (ibid).

3.4 Phase 4: Focus on system-wide interventions, long-term elimination of deaths and serious injuries and shared responsibility

By the late 1990s, two of the best performing countries in road safety had determined that improving upon the ambitious targets that had previously been set would require re-thinking of interventions and institutional arrangements. The Dutch Sustainable Safety (Wegman & Elsenaar, 1997) and Swedish Vision Zero (Tingvall, 1995) strategies re-defined the level of ambition by setting an even more challenging goal for making the road system intrinsically safe. The implications of this higher level of ambition are currently being worked through in the countries concerned and elsewhere. These strategies recognise that speed management is central to road safety and accordingly have re-focused their attention on road and vehicle design and related protective features. Thus, speeding is no longer viewed simply as a behavioural risk, but as a safety management system problem requiring a complex response combining policy development, road and vehicle design, enforcement, journey planning and safety education among other systematic management responses. The former 'blame the victim' culture is superseded by 'blaming the traffic system', which throws the spotlight on operator accountability. Such Safe System approaches have influenced the current road safety strategies in Norway, Finland, Denmark, Switzerland and Australia (Bliss & Breen, 2008).

Bliss and Breen (2008) note that, today, the growing view is that road safety is a system-wide and shared multi-sectoral responsibility that is becoming increasingly ambitious in terms of its results focus. Sustaining the level of ambition evident in high-income countries requires a road safety management system based on effective institutional management functions that can deliver evidence-based interventions to achieve desired results. Achievement of the ultimate goal of eliminating death and serious injury will require continued application of good practice developed in a third phase of

CASR Road Safety Research Report | What can work health and safety learn from road safety?

10

targeted programs, coupled with innovative solutions which are yet to be determined but which are based on well-established safety principles (ibid).

An important step towards the kind of road safety management system advocated by Bliss and Breen (2008) has been the very recent publication of international standards in this area: ISO 39001 Road Traffic Safety Management Systems (ISO, 2012). ISO 39001 is "…a tool to help organisations reduce, and ultimately eliminate, the incidence and risk of death and serious injury related to road traffic crashes" (International Standards Organisation, 2012). ISO 39001 combines the quality management disciplines given effect through ISO 9001 Quality Management Systems with the most recent understanding of best practice road safety management. The following safety performance factors are set out in ISO 39001, and cover those aspects of road safety which are backed by evidence of their capacity to improve road safety:

- Road design and safe speed (especially separation features, roadsides, and intersections)
- Use of appropriate roads depending on vehicle type, user, type of cargo and equipment
- Use of safe driving speed, considering vehicle type, traffic and weather conditions
- Use of personal safety equipment (restraints, helmets, lights)
- Driver fitness (fatigue, distraction, alcohol and drugs)
- Safe journey planning (need/amount/mode of travel, choice of route)
- Safe vehicles (vulnerable/occupant protection, crash avoidance/mitigation, roadworthiness, load security)
- Appropriate authorisation for controlling different classes of vehicle
- Removal of unfit vehicles and drivers/riders
- Post-crash preparedness, recovery and rehabilitation.

Bliss and Breen's (2008) conceptualisation of the evolution in road safety thinking from a focus on the individual road user to a system-wide perspective is reflected in a very recent similar analysis by Johnston, Muir and Howard (2014), although Johnston et al. (2014) employ a fifth stage focussing specifically on Safe System thinking from 2000 to the present day. However, Johnston et al. (2014) note that this current stage is also characterised by a wide gulf between the views of road safety professionals and the public perceptions of how road safety works best, such that often in the public and political perspective:

> Instead of accepting the need for changes to the risk management system in place, the search remains for a symptomatic solution that is in line with the prevailing belief that the safety problem lies squarely in the hands of the road users. (ibid, p. 67)

For example, the ongoing popularity of educational interventions for road users lies in their low cost (relative to infrastructure investment), their avoidance of yet more legislative control, and their plausibility given the prevalence of an ongoing blame the victim view of crash causation (McKenna, 2007, in Johnston et al., 2014).

3.5   Concluding summary

In sum, road safety approaches evolved from a singular focus on education of road users and penalising those who broke road rules, to much wider understandings of the multitude of factors that contribute to pre-crash causes and to reducing death and injury during and after crashes. In particular, there was a growing acceptance that the inherent safety of the driving environment, and the various technologies deployed within that environment, largely determine the safety of an individual independently from the driver's behaviour. The next phase of thought was to better integrate these understandings with institutional leadership in road safety and also with inter-government coordination

CASR Road Safety Research Report | What can work health and safety learn from road safety?

11

and resource allocation management. Vision Zero then challenged previous ethical bases for road safety action by drawing on new thinking in other transport modes such as rail and aviation, and from workplace safety principles, to champion that a non-injury incident should be regarded as a significant safety concern and a fatality as a disaster that must never be repeated. The recent ISO 39001 subsequently imbued and cemented these principles at management levels.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

12

4 Commonalities between WHS and road safety

Despite broad differences in their range of key players and priorities in whom they target, as discussed earlier, WHS and road safety share much in common in both advantages and disadvantages. For example, for both WHS and road safety, responsibility for legislation, regulation and enforcement is variously divided or shared between local, state and federal levels of government. However, having more than one key agency responsible can impede uniform identification of hazards, the establishment of coordinated and effective risk management systems, as well as policy, research and enforcement initiatives and data systems (Stuckey, Pratt & Murray, 2013). This key disadvantage is common to both WHS and road safety. Johnston et al. (2014) discussed other parallels such as the need for unity, integration and commitment from the highest levels, without which catastrophic consequences can occur. Such commonalities afford valuable background input when examining those approaches successfully used in road safety for potential application to WHS.

4.1 Responsibility for risk — 'incidents' versus 'accidents'

Both WHS and road safety have shifted from originally placing prime responsibility for safety risk on victims to influencing those who create the risks in the first place. The contemporary trend is mirrored within WHS and road safety by the preference for terms like 'incident', 'collision' or 'crash' over 'accident'. 'Accident' implies that chance factors are at play, rather than for example behavioural, design, or environmental factors being the culpable agents, or at least substantially contributing to what happened. Stewart and Lord (2002) also note that 'accident' implies a lack of attributable fault, arising from unknown causes, or lack of intention on the part of an individual. In road safety, use of 'crash' encompasses both intentional and unintentional causes, as well as those rare incidents that can best be described as accidents of chance. As a consequence of such thinking, most current road safety policy and strategic documents now use the terms 'crash' and 'incident' and not 'accident'.

4.2 From reactive to proactive thinking

A related perspective of shared directions between WHS and road safety is that they have both transitioned from reactive to proactive spheres. As noted, originally in WHS and road safety, accidents were reactively viewed as unfortunate random events, which gave way to seeking evidence that a particular risk was not well managed (Dekker, 2011), and that the risk management can be improved.

The proactive sphere, by contrast, is characterised by the fostering of a safety culture with a zero tolerance of failure (ibid). Vision Zero treats the road environment the way workplaces are treated, with a view to placing prime responsibility on vehicle and road designers, and road traffic system managers, for eliminating hazards. A proponent of Vision Zero advised the Swedish Parliament that 95% of all road crashes depend on human error, but under Vision Zero, 95% of the solutions lie in changing the traffic environment of roads and vehicles (Johansson, 2009). Similarly, the *Australian Work Health and Safety Strategy 2012-2022* recognises that achieving its vision of healthy, safe and productive working lives depends on effective systematic management of risk (and including at systemic levels) much more than attempting to control the behaviours of individuals. In this regard, the overall strategic directions of WHS and road safety echo the early foresight of WHO (1946) in proactively defining public health in terms of achieving holistic well-being and not merely reducing disease or infirmity. In the modern day, we now know that safety cultures that champion safety as well as facilitating the anticipation of safety hazards before they arise lead to achieving the best safety records (Johnston et al., 2014).

CASR Road Safety Research Report | What can work health and safety learn from road safety?

13

4.3   Risk normalisation

Another area of similarity between WHS and road safety is the tendency of people to 'normalise' a greater level of risk, or to treat offences less seriously than their attendant risks would indicate (Purse & Dorian, 2011). Also, people tend to worry more about the severity of an incident and the number of people killed than its likelihood or frequency (Leathley, 2013). Hopkins (2010, p. 13) superbly illustrates such tendencies with reference to the Challenger and Columbia space shuttle tragedies where, leading up to the incidents,

> …a certain level of equipment malfunction came to be accepted as normal because it had not in the past led to disaster. People became desensitized to the risks of operating in this way. Ultimately, these malfunctions proved fatal.

This tendency is also pervasive in road safety, particularly as crashes are rare events for most people. The important difference between objective risk on the road (as calculated by experts) and subjective risk (perceptions from ordinary road users) has been studied for some time, but a good original illustration of the difference, still relevant today, was provided by Haight (1986): Few would doubt that running red lights is in general considerably riskier than not doing so, but there are often traffic situations where the risk of injury is minimal or zero, such that drivers come to reappraise the risk of injury as low. To better deter drivers from running red lights, Haight noted we need to rely on social disapproval, licence or fine penalties, or other safety considerations, to overcome drivers' erroneous perceptions of levels of risk at intersections.

4.4   Over-reliance on training

There are also commonalities in how both WHS and road safety problematically rely on training and enforcement as risk reduction strategies. For example, a meta-analysis of twenty-two studies of the effectiveness of safety training for workers concluded that, due to the low demonstrated effectiveness of training in preventing worker illness and injury, training should not be delivered as the sole intervention for worker safety (Robson et al., 2012). In road safety, a similarly cautious conclusion was reached by Christie (2011) in his extensive review of literature on the effectiveness of driver training and education.

4.5   Compliance and enforcement

Most people's propensity to comply with WHS requirements (Alford & Speed, 2006) and traffic regulations (DETR, 2000) does not depend solely on fear of punishment (deterrence), but also on people's intrinsic motivation to behave appropriately. However, the positive motivation must be stronger than any perceived benefits of disobeying WHS or traffic regulations. Compliance also depends on ability to comply. Safe Work Australia (2013) has identified several critical mechanisms affecting safe behaviour and regulation compliance that likewise apply in road safety: awareness of safety requirements, understanding of what needs to be done to meet the requirements, perceptions of levels of risk, financial incentives (such as lower insurance premiums) and fear of interruption to daily activities. One other key mechanism, concern for reputation, is more likely to be a factor in compliance by large businesses and less so for small businesses and individuals (ibid), but is rarely relied on as an effective motivator in road safety.

Early thinking on compliance in WHS parallels early thought on levels of compliance with road rules (e.g. Zaal, 1994): there are those who are typically pre-disposed to complying with road law; those who are generally compliant but occasionally slip up; and those who disobey a law whenever they can profit from it or otherwise gain an advantage from doing so. The first two groups can be described as

CASR Road Safety Research Report | What can work health and safety learn from road safety?

14

essentially voluntarily compliant – if they do not comply it is likely because obeying is too difficult to achieve, or they lack the capacity, or they make a misjudgement. If regulators treat these groups as if they are all recalcitrant, or otherwise too harshly, then they may well become antagonised and subsequently become less likely to comply (Mischke, Verbeek, Job, Morata, Alvesalo-Kuusi, Neuvonen, Clarke & Pedlow, 2012).

The third group, those who disobey a law whenever they can profit from it, are termed by Alford and Speed (2006) as opportunistic non-compliers who comply (or not) based on the likelihood of detection and severity of sanctions if detected. If detection and sanctions are weak and/or if the regulator solely appeals to intrinsic motivations to comply then this group is less likely to comply. Purse and Dorrian (2011) note that this knowledge is bolstered by findings from traffic enforcement studies. In both WHS and road safety circles, the likelihood and swiftness of detection, along with the severity of penalties, have all been long recognised as key ingredients to both deterrence and securing compliance in both WHS and road law (Homel, 1988; WHO, 2001; McCallum, Schofield & Reeve, 2010).

According to Alford and Speed (2006), the WHS regulator's dilemma is that a greater reliance on enforcement tends to reduce voluntary and contingent compliance, whereas relying more on intrinsic appeals fosters opportunistic non-compliance (see also Gunninhgam, 2011). This may not be the case in road safety, perhaps because a greater emphasis on enforcement is needed to counter greater opportunities for non-compliance compared to WHS, as well as the personal benefits to be gained from getting to one's destination sooner, for example. Nevertheless, both approaches have a place in the enforcement mix in both WHS and road safety.

Alford and Speed (also Braithwaite, 2002) proposed a hierarchy of WHS enforcement options from which eclectic choices may be made, depending on the circumstances of an infringement incident. Likewise, recent reviews of best practice in WHS media campaigns, based on effective practice in road safety advertising, advocated integrating advertising campaigns with relevant enforcement initiatives (Wundersitz, 2011; PIARC, 2012; Lewis, Rowland & Wishart, 2012; see also Safe Work Australia, 2013). As mentioned earlier, such an integrated approach for WHS was advocated by Purse and Dorrian (2011), based on its success in road safety, although they noted it is by contrast very much under-developed in WHS.

However, the overlap in enforcement issues does not end there. Johnstone (2012) argues that the prevailing view in work systems and sites is that WHS offences are never seriously considered as criminal, with prosecution really only pursued as a last resort, or in cases involving death or injury. Purse and Dorian (2011) note that the intent and enforcement of Australian WHS laws have largely been negated by their subordination to the requirements of industrial and economic development (paralleling Britain from 2000, as noted earlier). Thus, non-compliance by employers with their WHS legal obligations has become accepted as normal, to be expected, and not sufficiently egregious to be subject to the full rigour and stigma of criminal law (ibid).

Similar views exist in road safety – for example, while creeping over a speed limit is illegal, there is often a popular consensus that it is not dangerous and certainly not criminal, as distinct from extreme road behaviour, which is typically portrayed as criminal (Wegman, 2012). Johnstone (2012) notes that WHS prosecutions resulting in fines rarely have the maximum fine applied, adding support to his view of WHS becoming decriminalised. As well, defence counsel might attempt to blame an incident on an oversight by WHS inspectors. Alternatively, they might project that the defendant is really a good citizen, that the event was an act of God or a one-off chance event, or that the issue would not occur in future due to changed work practices (ibid).

Fortuitously, Johnstone (2012) and RegNet (2012) both remark that Australian WHS enforcement practice is moving from a random approach (such as with worksite inspections) to a risk-based or

CASR Road Safety Research Report | What can work health and safety learn from road safety?

15

targeted, more strategic enforcement approach focussing on employers and industries creating the most WHS risks. This may ultimately serve to reinforce the high level of responsibility placed on WHS management in relation to individual workers' WHS failings. This is particularly, in Purse and Dorrian's (2011) view, if the targeted enforcement is well-publicised in various media formats as per the successful history of this integrated approach in the field of road safety. As well, WHS is now seeing a range of new enforcement tools to secure greater compliance and responsibility at WHS management levels, such as adverse publicity orders at the direction of courts (Johnstone, 2012). In comparison, given the plethora of road safety enforcement technologies now available, South Australia Police considers it constantly needs to review its enforcement approaches to maintain efficiency and effectiveness (Government of South Australia, 2012).

4.6   Hierarchies of control

The new ISO 39001 standard sets road safety performance criteria that echo key precepts of WHS approaches, for example the consideration of safety issues in infrastructure design, the use of personal safety equipment and the importance of journey/task planning. Indeed, many well-known contemporary road safety treatments fit well within the hierarchy of control in workplace safety provided by Safe Work Australia (2009):

- Can we *eliminate exposure* of the user to the hazard (through for example reducing the need for travel)?
- Can we *substitute the hazard* to the user for one with a lower risk (through shifting to a safer mode of travel)?
- Can we use technology to *safeguard the user* from the hazard (through safer road design or vehicle technology)?
- Can we put in place *training or procedures* for the user to mitigate the presence of the hazard (through setting greater expectations on behaviour)?
- Can we provide the user with *personal protective equipment* against the hazard (such as cycle helmets or motorcycle safety clothing)?

In WHS, the hierarchy of control is a descending list of effectiveness – the first being most effective, and the last being least effective. In road safety, the preponderance of traditional safety interventions among the last two controls is notable. Indeed, Johnston et al. (2014) remarked on how road safety has relied on both these and administrative controls, the least effective strategies, for so long. However, there has been a boost in the profile over the last ten to twenty years in the middle control when applied to road safety. In particular, technology can now eliminate much road safety risk with vehicles engineered to prevent collision with other objects and a refocus in vehicle design is protecting the road user from harm if there is an incident. In the context of the hierarchy, a focus on individual and behavioural responses (in both WHS and road safety) can be more easily seen as inconsistent with modern road safety and workplace safety management.

4.7   Conclusion

If WHS and road safety share so much in common, are there any differences between them in which road safety might offer lessons for WHS? In 2009, a trio of eminent road safety professionals in Australia (Mooren, Grzebieta & Williamson) seriously proposed the converse position, that WHS has some important lessons for work-related road safety, if not for road safety generally. In particular, they called for a road safety management system that is not so much reactively driven by injury incidents, but driven proactively with a systemic approach that anticipates hazards and injury incidents before they occur. Moreover, they say such a road safety approach should be integral to the way the WHS

CASR Road Safety Research Report | What can work health and safety learn from road safety?

16

system is managed (ibid). Since their paper, however, this more proactive approach is being realised through increasing adoption of the new ISO 39001 standard.

Other papers are occasionally published with specific lessons from WHS for road safety, such as that of Nævestad and Bjørnskau (2012) in relation to safety culture. More recently, Johnston et al. (2014) went so far as to imply that road safety is falling way behind WHS because "…the lessons learned [in WHS] have not been studied systematically by the transport sector" (p.111), which Johnston et al. attribute to institutional "silo" thinking. The irony of this is that road crashes are the single largest cause of work-related death and disability, yet are institutionally separated from mainstream WHS (Hughes, 2010, in Johnston et al. 2014).

By contrast, the possibility that road safety could reciprocally benefit WHS appears relatively unexplored in the literature, although the paper by Purse and Dorrian (2011) represents a significant step in this direction. It may be that the more appropriate question regarding links between WHS and road safety should not be, what can one learn from the other, but what can *both* learn from each other. Such a more cooperative and coordinated approach may do much to dismantle the institutional silo thinking between WHS and road safety as decried by Johnston et al. (2014).

However, for the purposes of the present paper, assuming road safety can offer lessons for WHS, how can the literature be best examined to shed light on this potential? A suitable approach involves seeing what WHS literature says is deficient with WHS policy and practice and follow this with consideration of what road safety could offer WHS by way of problem remediation. It may be that, as both have evolved with broadly similar philosophies and approaches in practice as just discussed, such contextual commonalities may be conducive to the effectiveness of applying road safety solutions to WHS problems.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

17

5 Perceived deficiencies in WHS and potential solutions from road safety

This section of the report is not intended as a discussion of the broad spectrum of issues deemed to affect WHS performance, nor explorations of any one or more issues in great detail, but rather to simply identify those areas of perceived deficiency within WHS that have potential for remediation through adopting policies and practices used in the area of road safety. These issues and their road safety solutions are best understood in the context of the earlier coverage of the respective developments in WHS and road safety, and the commonalities between them.

5.1 An enhanced understanding of enforcement's key role in WHS

Earlier, it was stated that Purse and Dorrian (2011) had already begun examining possible lessons for WHS derived from road safety. For these two researchers, in contrast to WHS, road safety's most salient feature is its "…overall strategy in which enforcement plays a pivotal role…." (p. 37), as exemplified by the Safe System approach in road safety discussed earlier. They state that road safety's overall strategy,

> …has had the effect of positioning road safety as an important public policy issue, highlighting the need for compliance with the law, and amplifying the deterrent effect of enforcement activity. The adoption [by WHS] of a similar approach for dealing with non-compliance, despite the many challenges involved, offers a strategic opportunity for overcoming the long-standing and entrenched ambiguity that continues to surround WHS offences and, in the process, the prospect of achieving significant reductions in the level of work-related death and injury. (ibid, p.37).

Purse and Dorrian's perception that deterrence is essential to road safety's reliance on compliance and enforcement deserves some further analysis.

5.1.1 Deterrence: an important element of enforcement

The underlying aim of deterrence is to increase the perceived cost of committing an offence, while at the same time decreasing any perceived benefits, so that the former outweighs the latter (Corbett & Simon, 1992).

In commenting on the need to study WHS enforcement experience in other countries, Purse and Dorrian (2011) examined various gaps in WHS's understanding of enforcement's role in promoting compliance, such as in gauging the deterrent and durability effects of enforcement initiatives. A specific example of the need to better understand deterrent effects was given by Gunningham (2011). In discussing the complex link between deterrence and compliance, Gunningham remarked that even when perceptions of legal risk and negative consequences are high, their deterrent effects are not necessarily an important motivator of a company's behaviour. The relationship of deterrence and durability to optimum levels of enforcement is not fully understood within road safety either, but exploring it is usually problematic in both WHS and road safety, if for no other reason than optimal enforcement depends on the availability of funds for strengthening enforcement programs.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

18

Nonetheless, Purse and Dorrian's (2011) call for a better understanding of the mechanisms by which deterrence works, and especially the linkages between specific and general deterrence,[1] would be a key opportunity for collaboration and cross-fertilisation of knowledge between WHS and road safety. In particular, Purse and Dorrian (2011) consider that current theoretical models of how deterrence should work do not adequately explain how deterrence has been shown to work in practice:

> The probability of detecting offences and the application of sanctions undoubtedly do matter, but the evidence indicates that both the means by which they interact with each other and the manner in which they are mediated by other influences is still poorly understood and beyond the ability of … theory to satisfactorily explain. (p. 39)

Road safety's understanding of the substantial influence of the probability of detection (and apprehension) on deterrence arguably began with the seminal work of Homel in 1988, based on his comprehensive examination of a highly successful random breath testing (RBT) program on drink driving rates in New South Wales. Broadly speaking, the long term deterrent effect of RBT is currently considered to depend mainly on maintaining high levels of continual, visible police enforcement along with suitable penalties and extensive publicity about RBT initiatives. The enforcement must also be conducted with high intensity, for example an evaluation of Australian RBT practice called for testing frequencies to be intensified to a level equivalent to one test per licensed driver per year (Hestridge, Homel & Mackay, 1997). Heightened enforcement intensity leads to increased perception that drink drivers are likely to be caught, thus producing a greater deterrent effect. Also important in deterrence is the perception of *certainty* of a penalty although it is less clear which types of penalty are more effective as deterrents. While licence disqualifications tend to have a uniformly positive effect in reducing crashes and traffic offences, imprisonment for drink driving has consistently been shown to be of marginal value and longer gaol terms may increase the probability of further offending (Watson, 1998).

5.1.2   Deterrence, punishment and the Regulatory Pyramid

In sum, effective deterrence relies on ongoing high-level enforcement activity, involving a high likelihood of detection and the certainty of a penalty or punishment. This is behind Purse and Dorrian's (2011) view that enforcement plays a pivotal role in road safety, hence making it an important public policy issue. Also, in road safety, having a range of penalties constitutes the *prime* intervention method employed by driver licence authorities and the police. By contrast, in WHS, while securing compliance relies overall on the general and specific deterrence effect of enforcement activity, *initial* WHS interventions are far more likely to be persuasive than punitive in nature.

In an attempt to solve 'the puzzle of when to punish and when to persuade' offending employers (and also employees), Ayres and Braithwaite (1992, in Braithwaite, 2002, p. 20) proposed a Regulatory Pyramid in which persuasive techniques are seen as the first (base-level) step of intervention.

In the pyramid (sometimes more accurately referred to as the Compliance Pyramid), the base levels are occupied by persuasive techniques, such as offering rewards and incentives or sending warning letters. These techniques are commonly used within WHS circles (Mischke et al., 2012). Escalation towards the apex of the pyramid is recognised by penal sanctions of increasing severity from fines and public citations up to permanent work licence revocation which, in WHS, tend to come into play only after earlier attempted persuasive techniques fail.

---

[1] Specific deterrence involves a threat (e.g. threat of punishment, or fear of death/injury) to deter specific offenders from re-offending, whereas general deterrence deters the wider population (or all at a worksite) (adapted from Homel, 1988).

CASR Road Safety Research Report | What can work health and safety learn from road safety?

19

Regulatory Pyramid (after Ayres & Braithwaite, 1992)

Braithwaite (2002) notes that the pyramid model assumes an offending company is a 'rational actor' who can be motivated by a reward, just as readily as deterred by a penalty, thus presenting a 'moral hazard' in which a recalcitrant company may fail to comply in anticipation a reward or inducement may be offered. Thus, not only can non-compliance go unpunished, but it may be inadvertently rewarded. If poor detection probability is chiefly responsible for an initial non-compliance, this echoes Alford and Speed's (2006) concerns with opportunistic non-compliers and perhaps also reflects Purse and Dorrian's (2011) concerns about extraneous influences and the ability of regulatory theory to sufficiently explain effective enforcement practice.

The Regulatory Pyramid, as originally conceived by Ayres and Braithwaite (1992), has been adapted in different formats to suit particular industries, entity sizes and other circumstances, while maintaining faith with the hierarchical notion of scale of intervention (for example their use in tax compliance and insurance risk management). This is only to be expected, given the earlier mentioned view of Hasle and Zwetloot (2011) that contemporary WHS management systems are of necessity continually evolving. A recent review of best practice in regulatory compliance respected the legacy offered by the pyramid (Gunningham, 2011), with that author coincidentally reporting from a road transport perspective.

However, Gunningham (2011) also recognised that, in terms of efficiency, effectiveness and legitimacy, no one approach under the pyramid represents generic best practice in WHS compliance interventions. Instead, the most appropriate approach will depend on the context because, "… different [WHS] duty holders confront different external pressures, and have different skills, capabilities and motivations…." (ibid, p. iii). In its review of effective WHS interventions, Safe Work Australia (2013) concluded that different approaches work better for some companies than for others. For example, large businesses may respond best to enforcement approaches where their public reputation could be at greater risk (such as with adverse publicity orders), whereas informational and lower level persuasive approaches are often better suited to small businesses.

Although Gunningham (2011) outlines several shortcomings of the pyramid, his overall position is that the pyramid affords scope to make greater use of various compliance tools *before* an enforcement

CASR Road Safety Research Report | What can work health and safety learn from road safety?

20

action takes place, as well as including broader and more innovative mixes of tools at each of the levels of the pyramid.

Thus, despite its usefulness as a model that describes the full range of compliance approaches, misgivings have been aired about the Regulatory Pyramid's usefulness as a practical tool when choosing appropriate WHS interventions. While a full range of interventions is employed throughout WHS, persuasive techniques are largely the initial approach and a most common one. By contrast, in road safety, persuasive techniques are largely limited to media campaigns, although these are known to work best, not in isolation, but when used as adjuncts to enforcement initiatives. Other forms of persuasive techniques, such as rewards and incentives, are rarely used in road safety, largely due to their known ineffectiveness (as discussed later). Hence, in road safety, as championed by Purse and Dorrian (2011), the first and largely the only compliance intervention is at the 'civil penalty' level and as such, there may be a case for WHS to consider beginning its intervention approach also at that level. At the very least, it seems there are grounds for examining the extent of the applicability of the Regulatory Pyramid as a guide to WHS intervention strategy, rather than merely as a structural description of the range of compliance approaches in use.

5.1.3 Best practice in deterrence

Studying directions in road safety enforcement practice may also yield greater insights for both a better mutual understanding of how deterrence works best, as well as WHS enforcement practice specifically. For example, with alcohol and drug testing of drivers, police use mobile and stationary (road side) forms of random testing, although drivers can also be tested if police consider a separate traffic offence has been committed. Speed cameras can also be either fixed (e.g. to traffic lights) or used in mobile operations. Both alcohol/drug and speed detection operations can occur covertly or be highly visible and well-publicised, with a strategic mixing across the approaches commonly advised to maximise enforcement effectiveness (e.g. Zaal, 1994; Elvik & Vaa, 2004; Doecke & Grigo, 2012; Kallberg, 2012). Thus, road safety enforcement practice has broadened from its former reactive approach (that is, acting on transgressions only after they have occurred) (Bjørnskau & Elvik, 1990). It is now in a pro-active mould involving very visible, intensive, long-term and high volume (including automated) detection systems that afford general deterrence of unsafe road use behaviour as well as a specific deterrent effect on wayward individuals.

A fundamental factor in successful enforcement approaches is how they are complemented by appropriate advertising campaigns. For example, in road safety, it is becoming increasingly evident that 'shock-horror' approaches are very often ineffective and sometimes counterproductive among those recipients with the greatest need to curtail unsafe behaviours (e.g. Jessop & Wade, 2008; SWOV, 2009; Algie & Rossiter, 2010). Nonetheless, as cited earlier, guidelines are available towards running successful campaigns that are integrated with enforcement rather than run simply for their own sake (e.g. Wundersitz & Baldock, 2011; PIARC, 2012).

5.2 An enhanced understanding of the role of rewards and incentives in WHS

Compliance strategies that rely on deterrence tend to emphasise a confrontational style in which energy is predominantly devoted to detecting violations, establishing guilt and penalising violators (Gunningham, 2011). Deterrence chiefly occurs when compliance approaches involve coercive methods. Deterrence is implicit throughout the Regulatory Pyramid from a subtle sense of coercion in persuasive techniques, but increasing to the highly dramatic deterrence afforded by threat of licence revocation. However, Gunningham (2011) notes that there is also room for fostering unsolicited voluntary compliance, which can be boosted by use of rewards and incentives (alongside deterrent approaches). He refers to a review of American OHSA's cooperative, voluntary programs (GAO,

CASR Road Safety Research Report | What can work health and safety learn from road safety?

21

2004), which found that cooperative programs were preferable to coercion as they not only improved WHS, but led to improved productivity and industrial relations. Safe Work Australia (2013) also notes that voluntary and incentive based approaches can improve safety outcomes, but that little is known about the kinds of such schemes that work best.

Rewards and incentives are commonly employed by Australian WHS authorities (Mischke et al., 2012). Annual Safe Work Award schemes, for example, operate in Queensland, South Australia, NSW, Victoria, Tasmania, Western Australia and nationally, and are chiefly directed at anyone who has made a significant contribution to achieving WHS excellence. There is useful writing on the general effectiveness of rewards and incentives as inducements to compliance and product improvements. Safe Work Australia (2013), for example, examined four studies of offering rewards to improve company safety outcomes and concluded that they can be effective although more research is needed. On the other hand, Williams (2012) notes we ought to know not just if a reward or incentive produced a desired result, but also whether the improvement would have occurred had no reward been offered. She adds we should also question if the reward had been of a different size or nature, would the improvement have occurred more quickly, or could the improvement have been an even better one? Answers to such questions, when taken together, would afford a substantial basis for informing conclusions about reward effectiveness. Unfortunately, there is a paucity of research into such questions, although Williams suggests three suitable evaluation approaches would be using case studies, historical data and field experiments. It is worth noting in this context that an Intervention Protocol currently being conducted by the prestigious Cochrane Collaboration (Miller et al., 2013) aims to assess the effectiveness, including cost-effectiveness, of incentive-based approaches in WHS on injury event rates; to ascertain any adverse or unintended effects; and to investigate attributes of incentive schemes that may be conducive to beneficial behaviour change.

Traditionally, offering rewards and incentives has been widely practised based on past findings on the effects of reinforcement programs. However, there is evidence that offering rewards and inducements can be counterproductive, such as when they reduce someone's intrinsic motivation to perform a task. Such effects were found, for example, by Rosenfield, Folger and Adelman (1980) in an experiment on university students who either underperformed or over performed in a word game, and by Titmuss (in Mellstrom & Johannesson, 2008) in a field experiment involving payments for blood donations. The resultant decreases in intrinsic motivation can be explained by self-perception theory, which posits that a person attributes causes about their behaviour based on external factors. Consequently, people pay more attention to an external reward for an activity than to the inherent enjoyment and satisfaction from performing the activity.

An increased focus on external rewards undermines any pre-existing intrinsic motivation for performing the activity. Moreover, once rewards are no longer offered, interest in the activity and intrinsic motivation to perform it often wane, such that extrinsic rewards must be continually offered, and perhaps increased in size, in order to sustain the activity (Carlson & Heth, 2007). In this light, rewards and incentives can actually be perceived as coercive approaches because they decrease intrinsic motivation through removing any sense of self-determination in whether a task is performed. In Braithwaite's view (2002), extrinsic rewards not only undermine intrinsic motivation, but they can foster game playing and defiance in response to such attempts to control.

Given that much doubt surrounds the contexts and extents in which rewards and incentives can be effective, should they constitute a major player in the broad compliance field? Braithwaite (2002) notes that, in the context of his pyramid, the risks attendant on rewards are such that rewards should only be used as a base-level item in the pyramid but in association with the more effective other levels of the pyramid. Gunningham (2011) agrees, saying that voluntary approaches should be offered in conjunction with the threat of sanctions. While incompetent companies may benefit from rewards and

CASR Road Safety Research Report | What can work health and safety learn from road safety?

22

incentives, reluctant compliers or the recalcitrant are unlikely to comply without the regulator demonstrating willingness to implement more coercive approaches if need be.

5.2.1 Rewards and incentives in road safety

In road safety, considerations about and use of rewards and incentives would appear to match the above perspectives of Braithwaite (2002) and Gunningham (2011). External rewards exist, for example in the form of no-claim bonuses in the motor insurance industry and New South Wales has a gold driver's licence scheme which offers licence fee discounts to drivers who accumulate offence-free driving periods. The latter, and other schemes like it, have not so far been shown to improve driver safety records. Such schemes are both costly and administratively complex to run and it could be said they simply reward drivers who drive infrequently and for shorter distances, thereby increasing the opportunities for remaining offence-free.

In particular, Queensland Transport operated a voluntary Safe Driver Award Scheme for about 45 years, ending it in the mid 1990s. For periods of 1, 1-5, 10, 15, 25 years of offence-free driving, participants (who paid $5 to join) received, respectively, a key ring, a certificate, a chamois, a first aid kit, a pen, or a gold watch, in addition to an annual awards dinner. In 1995, an internal evaluation survey of the program (personal communication, 2005) found that many scheme members and non-members felt that the awards were not sufficiently attractive to act as an incentive for safe driving behaviour. The evaluation studied the crash records of scheme members (compared with an age and gender matched set of drivers in the general population) and found that, not only were members of the scheme twice as likely to have been involved in a crash, but were also 73% more likely to have been at fault in the crash. It was also found that:

- the scheme was administratively cumbersome and cost-inefficient;

- the awards were mainly received by drivers who would otherwise be considered safe drivers over a 10-year period;

- many elderly drivers hung on to their licence, even though they had ceased actually driving, merely in order to receive the awards.

A review by Haworth, Tingvall and Kowaldo (2000) into best practice road safety initiatives by companies and businesses concluded that incentive/reward schemes (such as free licence renewals and/or insurance premiums) may be effective among employees who drive in their work. However, some of the programs reviewed had negative effects (increased crashes after the incentives were provided). The authors concluded that,

> Incentive programs appear to be most effective when the time period in which the desired outcome is expected is short, and their power to prevent accidents is increased once they have been earned. [However]…there is evidence to indicate that drivers with good records who are given a reward either show no difference or an increase in crash rate. (p.20)

More recently, in Denmark, a trial of intelligent speed adaptation (ISA) technology offered 51 participant drivers rewards in the form of gift baskets (each worth €40) and free satellite navigation kits if they voluntarily slowed down when the ISA device fitted to their vehicle issued information and warnings about the vehicle's speed in relation to the prevailing speed limit. It was found the rewards failed to curtail speeding behaviour over time and the researchers concluded that more intervening ISA systems were needed (that is ones that electronically force the vehicle to slow down) (Agerholm, Tradisauskas, Juhl, Berthelsen & Lahrmann, 2012).

CASR Road Safety Research Report | What can work health and safety learn from road safety?

23

Safe driving, like safe work, has elements of intrinsic motivation in which driving safely brings its own reward. External rewards for safe driving run the risk of weakening its intrinsic aspects, as discussed earlier. Consequently, rewards and incentives in road safety are generally viewed as adjuncts to much broader and more substantial coercive approaches involving the use of demerit points, fines and licence sanctions. It is suggested that the use of rewards and incentives within WHS may profit from a re-consideration of their role being limited to those circumstances where they may serve to increase rather than decrease intrinsic motivation to work safely.

5.3 Optimal use of WHS violation data

Where WHS compliance interventions involve reported violations, data is generated for potential use in studying trends, causes and solutions for violations, beyond merely providing grounds for pursuing court prosecutions. In 2009, Alper and Karsh conducted a systematic analysis of 13 selected reviews of WHS violations in industry. They reported a general paucity in studies of rule violations in workplaces and even fewer studies of the causes of those rule violations. Alper and Karsh considered this to be 'an alarming gap in the literature', as some industries report up to 70% of workplace accidents as being due to rule violations. Safe Work Australia (2013) noted that systematic collection and analysis of data on prosecution outcomes can be used to inform compliance and enforcement policy, although to date only a small number of such studies have been conducted.

Alper and Karsh (2009) posit that WHS violation causes are rarely studied in detail because of a common misperception that violations are acts committed by intentionally 'bad' employees and more fundamental or systemic WHS failings are frequently overlooked when investigating such incidents. None of the 13 studies reviewed by Alper and Karsh examined how investigating violations can lead to improved system performance and safety. In a similar vein, Purse and Dorian (2011) note that what research on WHS exists to date has been predominantly based on administrative sanctions and has omitted any consideration of WHS convictions (although Reeve & McCallum (2011) have studied WHS court cases, as discussed later). Purse and Dorrian also note a dearth of studies on the effect of improvement or prohibition notices on compliance and injury rates.

5.3.1 WHS violations and system problems

While not all violations lead to harm and nor are all violations detected, there is also a need to recognise that commonality in violations can make the WHS system unsafe, just as system failings can contribute to increased opportunities for individual violations. Moreover, just as a prosecution does not necessarily cure a contravention, a prosecution also does not scrutinise the social and economic processes underpinning WHS (Johnstone 2012).

If an analysis of violation patterns reveals changes needed for a WHS system, the violations should not necessarily be classified as 'wrong' actions committed by individual employees. A WHS system needs to be sufficiently robust to allow feedback loops that inform the system constructively (Alper & Karsh, 2009). A range of issues and potential consequences for safety can emanate from incomplete feedback experiences in WHS contexts (Voirin, Pierlot & Llory 2012). Robust feedback loops for improving the system will flourish if the WHS systems create and maintain an environment where people can own up to honest mistakes without necessarily having to fear blame (Byrne, 2012), or criminalisation (Dekker, 2011). There is important input from road safety here. Wundersitz and Baldock (2011) report that relatively few road crashes are the consequence of wilful, extreme behaviour, as the vast bulk should instead be interpreted as failings of the broader road system. This additionally serves to emphasise the need to look widely at a system-level when exploring causes of WHS violations.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

24

Goode (1994, cited in Dekker, 2011) wryly observes that pursuing the prosecution of individuals for their work errors is often a preferred pathway as it can be a cheaper action than repairing the system. But while we are seeing a reduced emphasis for WHS prosecutions, McCallum et al. (2010) argue that prosecutions should remain an option, if only to dissuade employers, particularly owners of small businesses, who believe they do not have a duty to provide safe workplaces as any incidents would be due to employees' own failings or 'fate'. In this context, prosecution is seen as serving a specific deterrence on an individual company or person to deter them from re-offending, as well as a general deterrence to other companies and individuals as potential offenders (Purse & Dorrian, 2011). While both effects should be sought, Purse and Dorrian (2011) found that specific deterrence has the greater effect.

In the view of Alper and Karsh (2009), tackling workplace violations should move away from assigning individual blame to examining the system for problems because most violations are not intentional acts but rather symptoms of system malaise. As a consequence of WHS's restricted consideration of the nature and causes of violations, these researchers believe WHS has a poor evidence base for identifying and establishing interventions to improve safety performance.

Aside from, although not unrelated to, examining patterns of violations, Labib and Read (2013) ask how WHS can learn from systematic study of catastrophic, system-wide safety failures. Using a series of case studies that include the Titanic sinking, the Chernobyl disaster and the space shuttle Columbia incident, Labib and Read identify ten generic WHS lessons from which they have developed a model process to maximise learning from safety failures. They conclude (2013, p. 410) that their paper:

> … provides a framework for a holistic view regarding coping with failures. It is acknowledged that individual human beings are naturally programmed to learn, whereas organizations are not. Therefore, our approach provides a framework by which both individuals and organizations are able to learn from failures.

Thus, irrespective of whether single WHS violations, system-wide failures, or patterns among either are studied, WHS stands to gain considerably from such explorations.

5.3.2   Young workers' violations

One specific area in which the causes of violations could be profitably explored is in relation to young workers. Safe Work Australia (2012a) data show that in 2009-2010, the injury rate for workers aged 15-24 was nearly twice that of some other worker age groups. A high proportion of the young workers sustained injuries due to hitting or being hit or cut by an object, compared with muscular stress as the most common injury cause for other age groups. It is not unreasonable to assume, given the relative inexperience of young workers, that for these injury cases the employers/supervisors of the young workers would be more likely to have been deemed to have committed WHS violations than the young workers themselves. This seems particularly so, given the preponderance of injuries being caused by hitting or being hit/cut by objects.

Young road users feature significantly in the overall road toll, but particularly as drivers and riders. The causes and contributing factors for their deaths and injuries have been the subject of extensive research and evaluation world-wide for the best part of the last thirty years. New Zealand and most jurisdictions in Australia, North America and Canada have adopted forms of graduated licensing schemes for young drivers. These schemes involve placing restrictions on young drivers early in their licensing (e.g. upper speed limits, no night driving) that are successively lifted or relaxed as the young drivers gain driving experience. The restrictions are relevant to the known common causes of young

CASR Road Safety Research Report | What can work health and safety learn from road safety?

25

driver crashes. Evaluations of the graduated schemes have repeatedly shown they reduce young driver deaths and injuries (Russell, Vandermeer & Hartling 2011; Williams, Tefft & Grabowski, 2012).

Within WHS contexts, it should be possible to determine in which industries young workers are most likely to be injured and consider either adopting or strengthening any stepped acclimatisation to work in that industry, such that work restrictions placed on a young worker early in their job would be successively lifted or relaxed as the worker becomes more adept. Such a graduated approach for young workers would ideally be standardised within any one industry, and could apply to novice workers of any age. It should also place due emphasis on the employer/supervisor's role, for example in conducting a required risk assessment on the new employee as part of their induction, in terms of what risks might be rendered more hazardous for a novice worker by virtue of their inexperience. Such information could indicate what types of training courses, supervision or graduated work controls might be advisable.

5.4   Chains of responsibility

In the earlier discussion on commonalities between WHS and road safety, it was noted that a focus on individual and behavioural responses is inconsistent with modern road safety and workplace safety management. However, for WHS, this may be manifested more in theory than practice, as there is evidence, as mentioned earlier, that some Australian employers dispute the extent to which they should be held responsible for recklessly unsafe behaviours of employees, whether deliberate or unintentional, and regardless of whether the employee concerned or others are placed at greater risk (Reeve & McCallum, 2011). These employers sometimes argue that they have delegated safety responsibilities to their employees and that they should not be held liable for employees' actions as they [the employers] have taken all reasonably practicable measures to fulfil their safety obligations (ibid).

Reeve and McCallum (2011) examined how well this and similar arguments fared when tested by courts of law in various NSW and Victorian cases. They found that, despite differences in the WHS statutes in both states, the courts tended to,

> …locate the central cause of workplace risks in the broader social and organisational context of work, rather than in the specific actions of individuals. This is part of the NSW and Victorian courts' focus on risk management, which requires that employers be proactive and systematic in identifying, eliminating or minimising risks. The courts tend to link the reckless or careless behaviour of employees to a failure by employers to implement safe systems of work…. (p. 211)

The researchers added that the courts emphasise that employers must take measures to protect employees from their own unsafe behaviours, as well as from unsafe behaviours of others in the workplace. The two key messages are firstly that employers need to demonstrate that they already implement a safe system of work if they want any chance of countering liability for employee behaviour, and secondly workplace risk must be seen in terms of wider organisational, cultural and management factors that impact on and shape those risks.

5.4.1   Chains of responsibility in road safety

In 2008, Australia implemented chain of responsibility legislation which extended the general liability for on-road offences to all parties in the transport sector supply chain (NTC, 2008). This particularly affected not just heavy vehicle drivers, but also those arranging for the sending of cargo as well as those receiving it, those loading or unloading the vehicle, employers of drivers and loaders, and those who timetable delivery schedules, thus recognising the broader social and management context of transport goods carriage. Under the laws, everyone in the supply chain must take reasonable steps to

CASR Road Safety Research Report | What can work health and safety learn from road safety?

26

prevent driver fatigue, speeding and substance abuse, with penalty scales appropriate to the person's seniority and connection with an offence. It is up to the courts, when hearing a prosecution, to determine whether those involved in the chain have taken reasonable preventative steps, although codes of practice and other forms of guidelines are available as points of reference.

5.4.2   Chains of responsibility in WHS

There may be scope within WHS circles to implement more chains of responsibilities and accountabilities for specific high risk industry categories than currently is the case. However, it is noted there is already a generic impetus in this direction at the high policy level through the federal *Workplace Health and Safety Act 2011*, which broadens and deepens the notion of duty of care and all those in the 'chain' deemed to hold responsibility for a worker's safety. Commendably, the *Australian Work Health and Safety Strategy 2012-2022* goes a step further by championing advocacy duty of care roles throughout supply chains, beyond their former more basic safety responsibilities. While the concept of a responsibility chain bears some similarity with the broader concept of a supply chain, there are nonetheless some features of supply chains that can make it difficult to delineate lines of WHS responsibility along a chain. These include that supply chains can traverse national and even international agents, there may be multiple legal identities involved, and some links in the chain may be fluid, unstable or go out of business (Quinlan, 2011).

5.5   Looking beyond regulatory solutions

While Professor Löfstedt's recommendations for Britain's WHS regulation have generally been well accepted, they have not been without criticism. Bibbings (2012), for example, points out that the ministerially required focus on regulation prevented Löfstedt examining non-regulatory ways to deliver better and more cost effective WHS performance. In an earlier piece, Bibbings (2011) tackled the difficulties posed for businesses by the 'reasonably practicable' requirement of WHS and commented:

> …the affordability of specific measures does not relate to the financial status of the individual [WHS] duty holder but it is a broad social judgement, e.g. looking at what might be generally affordable, say across a sector. You cannot plead poverty and get away with a lower standard of safety. (p.32)

There is a need to search widely for cost-effective solutions to WHS issues when financial imperatives limit the availability of any one approach. This situation was familiar to the Government of South Australia (2012) when it developed its road safety strategy for the coming decade. The strategy recognises that road infrastructure of a standard capable of safely permitting high speed travel (comparable with such roads in Germany, for example) is very expensive to build for the long distances encountered in Australia. Consequently, the strategy indicated a different main approach to achieving the road toll reductions sought:

> Reductions in average travel speed across the [road] network is the most effective and swift way to reduce road trauma and would produce significant and immediate road safety benefits. (p. 14)

The strategy goes on to outline various ways proposed for achieving reductions in travel speed (not all of which are regulatory based); the impetus for this whole consideration is grounded in best practice as advocated by an Adelaide Thinker in Residence, Professor Fred Wegman, who was instrumental in the SUNflower project discussed in the next section. Thus, while explorations of what is reasonably practicable to improve workplace safety as well as non-regulatory solutions may be hindered to some extent by cost considerations, this is an insufficient justification on its own for *not* proceeding with such explorations. Safe Work Australia (2013), for example, has identified at least two potential non-regulatory approaches to secure better compliance: considering restorative justice approaches and

CASR Road Safety Research Report | What can work health and safety learn from road safety?
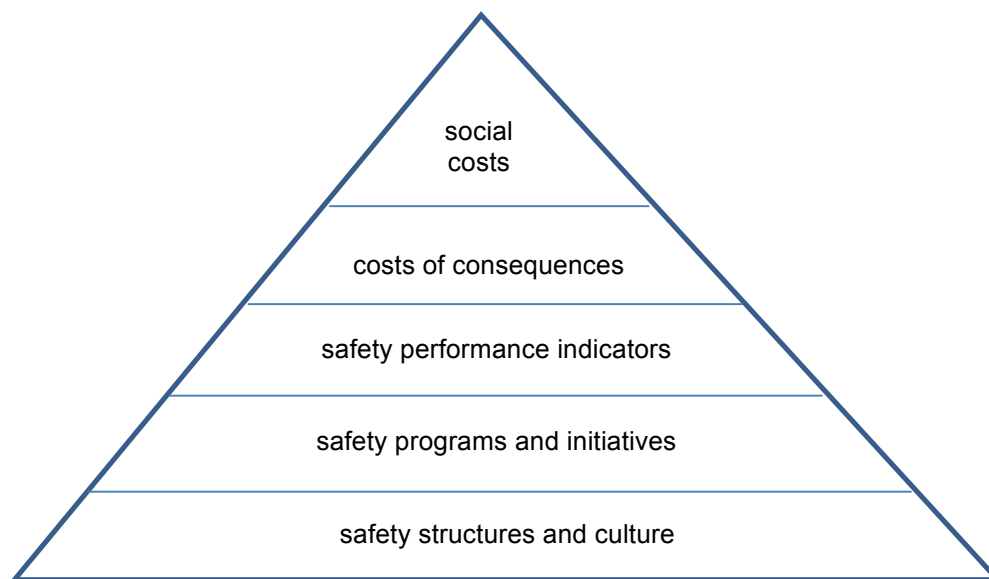
27

enforceable undertakings (discussed earlier) as alternatives to court proceedings. Other non-regulatory approaches include governments fostering information exchange between the research and practice communities to ensure a comprehensive evidence-base for future WHS policy and practice. This approach is evident in workplace road safety initiatives such as Driving for Better Business (DfBB) in the United Kingdom, the Network of Employers for Traffic Safety (NETS) in the United States, and the compliance assistance offered to employees in Australia through a collaboration between Victoria's Transport Accident Commission and WorkSafe Victoria (Stuckey, Pratt & Murray, 2013).

5.6   Improved WHS processes in data collection and analysis

Alper and Karsh (2009) are not the only researchers calling for improvements in recording and analysing WHS incident data for contributions to evidence bases for WHS policy and action. MacDonald, Driscoll, Stuckey and Oakman (2012), for example, report improvements are needed in data recording, particularly work-related vehicle incidents, work-related exposures to carcinogens, and older worker injuries, so that their risk management can be more evidence-based. Stuckey, Pratt and Murray (2013) suggested there is a need for recommended core elements in data collected across Australian jurisdictions. There are also criticisms that WHS incident data tends to focus on incident frequency rather than severity, and in any case may be un-representative of the true picture of WHS performance due to it sourcing data from workplace insurance claims, which tends to exclude motor vehicle crashes and injuries (ACRS, 2012).

By contrast, improved road safety data collection has been pursued for some time. It is not just data accuracy in road safety and consistent approaches across jurisdictions that are key focuses, but also the use of various data sources in complementary fashion such as using forensic science registers, emergency services records, insurance claim data, and including electronic linking of databases across health agencies for sound understanding of road crashes (OECD/ITF, 2011).

As well, the types of data should be extended beyond simply fatality and injury numbers. An international road safety collaboration called the SUNflower project (between the best road safety performance countries of Sweden, United Kingdom and the Netherlands, hence 'SUN') developed a hierarchy of approaches to advance their countries' road safety directions still further (Koornstra, Lynam, Nilsson, Noordzj, Petterson, Wegman & Wouters, 2002). Although this hierarchy was based on a target model originating in New Zealand in 2000, the SUNflower approach has since been adopted by nine European countries in total (Wegman, Eksler, Hayes, Lynam, Morsink & Oppe, 2005).

Road safety data collection model (Koornstra et al., 2002)

Koornstra et al's data collection hierarchy is represented triangularly. At the apex are the social costs of road crashes, specifically those socio-economic consequences that can be expressed in monetary figures. The second data level includes all consequences that are considered undesirable and to be prevented: medical costs, production loss, quality of life costs, material costs and settlement costs. The third level involves data related to safety performance indicators in Safe System areas, for example mean traffic speeds, seatbelt wearing rates, traffic volumes and distances travelled. The fourth level involves performance measures related to broad safety programs and initiatives, while the fifth (bottom) level concerns various indicators of safety structures and culture (for example psycho-social data). Data collection models showing a diversity of performance indicators such as in the Koornstra et al. (2002) model have much potential to enrich WHS data collection.

Another indicator of WHS progress, useful for both monitoring WHS trends and in WHS goal setting, is to report not just on mortality and injury rates but also premature deaths and injuries expressed as how many years of future life and work hours are lost to the workplace and to society. RoSPA (2013) notes that public health agencies are now beginning to do this and that WHS agencies should follow suit.

5.7   Optimal use of WHS auditing / inspection programs

Workplace inspections and auditing are valued for the reductions in injury severity, and injury and compensation costs they bring, and for their specific and general deterrence effects (Safe Work Australia, 2013). As with the Haddon (1972) matrix, WHS auditing and inspections call for a systematic appraisal of injury risks. However, just as financial auditing (the original function of auditing) has been shown to be insufficient on its own for preventing corporate financial collapse, it is known that WHS audits have failed to identify important safety risks, resulting in some notable safety disasters (Blewett & O'Keefe, 2011). A decade ago, when reviewing the Longford gas plant tragedy in 1998, Hopkins (2000, in Mooren et al., 2012) remarked that even when WHS audits demonstrate company diligence in complying with detailed safety rules and procedures, an organisation can still be negligent if it does not *proactively* seek to identify hazards. It was not until 2012 that this point finally became enshrined in Australia-wide WHS legislation and strategy, as mentioned earlier.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

29

According to Blewett and O'Keeffe (2011), WHS auditing becomes ineffective where there is a lack of worker participation in the auditing, paperwork is completed for the sake of an audit, and where there is confusion over audit criteria and lack of auditor independence. This can lead to audits becoming mere ritual rather than a means of achieving WHS improvements (Mooren et al., 2012). But the chief limitation of WHS auditing is that it reduces auditable items into standardised rational and linear cause-effect constructs, which can result in a preference for standardised solutions to complex safety problems (ibid). A similar view is that WHS audits can affect the structure and content of a WHS system itself, for example by a narrow focus on objectively measurable and easy-to-access WHS issues (Hohnen & Hasle, 2011). This can deny the dynamic psycho-social relations in workplaces, and discourages innovation, flexibility and personal judgment in solving WHS issues (Hohnen & Hasle, 2011; Mooren et al., 2012). By contrast in road safety, the psycho-social construct of shared ownership of road safety problems and solutions, in addition to perceiving that someone in authority is responsible for safety, is associated with better safety outcomes (Banks, Davey & Biggs, 2010).

Also relevant here is the work of Gunningham and Sinclair (2009), who explored how a mine company's WHS system was differently interpreted at nine different work sites. They also explored difficulties presented by a general lack of positive worksite safety culture across the company. The study found that, despite a heavy emphasis by external regulators (i.e. government) and internal regulation (corporate) on the company's management-based regulation, that emphasis was often resisted at the local site level where 'ritualistic responses' and resistant subcultures served to thwart effective change. This, together with the absence of a sound safety culture, may also have led to safety problems being relocated elsewhere, both within and outside the company, rather than to direct attempts to solve those problems.

5.7.1 Auditing in alternative compliance contexts

Reflecting the importance of a collective sense shared ownership of safety among broader workplace processes are alternative compliance approaches within the heavy vehicle transport industry, such as TruckSafe. TruckSafe was introduced on the premise that government regulators cannot assure heavy vehicle safety simply by enforcing (one size fits all) road rules and regulations (Mooren et al., 2012). The essential element of TruckSafe is that it allows some pre-negotiated flexibility in maximum periods of driving hours and driver scheduling to allow companies some ambit for adjustment according to their specific delivery operations. This negotiated tailoring may reduce some of the above disadvantages of WHS auditing reported by Blewett and O'Keeffe (2011).

Companies have to be accredited before they can implement such alternative compliance systems, although the National Transport Commission (NTC) (2009) describes TruckSafe as an audit-based compliance program rather than as an alternative compliance program. There is some evidence that TruckSafe accredited companies have lower insurance claim rates (Baas & Taramoeroa, 2008), although Mooren and Grzbieta (2010) note this may be due to companies with already good safety records becoming accredited with TruckSafe, rather than achieving good safety records through accreditation processes.

5.7.2 Alternative compliance approaches in WHS

In WHS circles, some thought has been given to how to allow risk-assessed limited modification to safety rules where appropriate, for example a construction company should generally require hard helmets to be worn everywhere on site, but excluding areas such as the board meeting room (Hopkins, 2010). As another example of an alternative compliance approach, companies with excellent compliance records may not be required to submit to WHS authority inspections of company

CASR Road Safety Research Report | What can work health and safety learn from road safety?

30

worksites if the companies are willing to engage private consultancies to conduct the inspections (Mischke et al., 2012).

However, there is a much broader high policy level impetus for alternative compliance approaches in WHS. Safe Work Australia (2013) notes in its review of intervention effectiveness:

> By understanding why interventions work in terms of how they influence the internal factors that motivate business compliance behaviour or mechanisms, regulators can design interventions that more precisely focus on influencing these mechanisms in order to increase compliance. (p.6)

The review goes on to point out that this understanding of how interventions work best can be used to tailor interventions to accommodate different subgroups of businesses and industry sectors, for example regulatory models that work for large businesses may not work so well for smaller ones, and vice versa. Tailored approaches and providing for greater flexibility have been explored in relation to compliance with both tax and privacy laws (ALRC, 2012).

Black (2007 in ALRC 2012) notes that such alternate approaches permit a degree of 'future proofing', enabling a regime to respond to new issues and scenarios without having to create additional new rules. At the same time, they allow entities to honour the spirit of the regulations by developing policies or other mechanisms that simultaneously comply with the regulations as well as meeting the entity's needs (ibid). Black (2007), however, cautions that such alternative approaches can create ambiguity, which can undermine intended protections and accountability, allowing firms to get away with the minimum level of conduct possible, thus providing inadequate protection to consumers and others. This suggests that alternative approaches are not appropriate in all WHS situations, and certainly as in the case of Trucksafe, negotiated WHS commitment at all levels in the chain is likely to lead to successful implementation of the alternative approach.

5.7.3   Targeted/randomised auditing programs

It is becoming increasingly common, at least in North America and Canada, to target audit or inspection programs at industry sectors or specific employers that have demonstrated "…high concentrations of risk or regulatory non-compliances…" (Mustard, 2012). As noted earlier in the present report, scarce availability of resources for WHS enforcement may be the drivers of policy and practice for such targeting rather than any specific evidence basis for doing so. However, intentions to target those companies more likely to transgress WHS requirements can be thwarted by insufficient data to enable their identification in the first place (Alper & Karsh, 2009).

Regulators mapping various risk circumstances for the likelihood of a work entity's non-compliance, and hence deserving of a targeted inspection, is now required under the United Kingdom's statutory *Code of Practice for Regulators* (2007). However, there is an important caveat for such risk mapping approaches. Gunningham (2011) notes the danger of focussing on a small number of large risks to the exclusion of under-enforcement of a large number of low risks. Reflecting such wisdom, and based on sound research on the crash-reduction potential, some road safety authorities in Australia (including in South Australia) have re-focussed their enforcement initiatives on speeding behaviour to pay greater attention to common 'low-level' speeding than on the relatively fewer incidents of excessive speed.

While there is a paucity of Australian research into the effectiveness of targeted/randomised WHS audits and inspections (Mischke et al., 2012; Safe Work Australia, 2013), some overseas evidence suggests that they are effective. Mustard (2012), for example, discussed the well-designed evaluations of targeted WHS inspection programs in Ontario, California and Washington State. The evaluations of the first two programs involved randomised assignment of employers, while in

CASR Road Safety Research Report | What can work health and safety learn from road safety?

31

Washington high risk firms were compared to average performances for their industry sectors. In California, the State's High Hazard Enforcement Program (HHEP) deliberately targets high risk sector employers, but in the HHEP employers are already randomly targeted for inspection as part of that program's regular operation. In Ontario, the employers were initially targeted for inspection by that province's High Risk Firm Initiative, but within that were randomly assigned for purposes of the evaluation study. The Californian and Washington studies both reported a greater reduction in work injury among firms selected for inspection compared to firms not selected for inspection. No effect was found in the Ontario study, although there was a much greater likelihood that firms not targeted for inspection had recently been inspected outside of the targeting program (ibid).

A recent North American study (Levine, Toffel & Johnson, 2012) found that a program of randomised inspections by the national OHSA agency led to a 9% reduction in injury rates and a 25% reduction in workers' compensation costs. Safe Work Australia (2013) noted that the researchers did not investigate reasons for the reductions, although they did advocate further work on the issue. However, from examining some other overseas studies of WHS inspection effectiveness, Safe Work Australia (2013) suggested that different approaches to inspection may have different outcomes depending on the size of the work entity. Given the paucity of Australian research in this area, WHS bodies could consider promoting research into the effectiveness of WHS targeted auditing interventions as a nationally significant topic in future WHS research planning.

5.8   Non-traditional WHS performance indicators

Whereas a common adverse reaction to WHS regulation has been to consider it an unwelcome burden for business (at least within Britain), some UK WHS analysts have begun to explore a counter approach by way of demonstrating to business and industry not just the financial losses that can ensue from WHS performance failings, but as well the financial benefits that come with WHS compliance.

Byrne (2013) points out that there are three fundamental drivers to WHS improvement: legislation, ethical arguments and financial benefits. The financial benefits, Byrne says, should be fully costed, covering reduced sick days and pay, lower insurance premiums, reductions in damaged stock or equipment and improved productivity, among other markers. Bibbings (2012) commends Löfstedt for pointing out that the costs for businesses of *failures* in WHS policies and procedures are estimated to be £20 billion a year, very much more than the industry sector's own estimation of its costs in administering WHS policies and procedures within industry and business. A focus on the calculated financial benefits to a company of spending on safety improvements may turn out to be a better incentive to improve company safety than a focus on the much greater costs of any WHS failures.

One way of convincingly presenting this cost contrast to industries is to use examples of Return On Investment (ROI) calculations estimated using various public health data collections (RoSPA, 2011), such as:

- £1 spent on smoke alarms saves £69
- £1 spent on bicycle helmets saves £29
- £1 spent on child safety seats saves £32
- £1 spent on poison control saves £7 (ibid).

Within Australia, there are various case studies showing that companies that implement preventative road safety measures for their employees tend to not perceive these measures as costs, but simply as good business, affording increased efficiency and reduced operating costs among other benefits (Carslake, Cureton & Potter, 2012).

CASR Road Safety Research Report | What can work health and safety learn from road safety?

32

An allied approach to ROI estimates also aiming to place monetary value on life is to use willingness-to-pay calculations based on surveys of population samples. Willingness-to-pay is being used increasingly in road safety cost analyses to support policy development and is widely regarded in road safety and other circles as a superior methodology (BITRE, 2009). In the approach,

> Estimates are based on the amounts that individuals are prepared to pay for reduced risk (or to accept in compensation for bearing risk). For a particular type of risk, a value for society is generally calculated by aggregating and averaging values obtained from a representative sample of individuals…. When it comes to making decisions, particularly on road infrastructure projects, this would be expected to increase the economic justification for projects with a substantial safety component (ATC, 2009).

Further explanation on discussion on willingness to pay can be found in BITRE (2009) and Perovic and Tsolakis (2008).

There are other examples from road safety on alternative forms of monitoring performance. The Centre for Automotive Safety Research at the University of Adelaide produces an annual report of enforcement and associated road safety publicity performance indicators (with the latest by Doecke & Grigo, 2012). These reports afford data for year to year comparisons in such aspects as the numbers of drivers breath tested for illegal alcohol/drugs in relation to the numbers who test positive. This information can be disaggregated in terms of whether the testing was done via a mobile or stationary operation. In WHS circles, for example, it may be similarly possible to analyse the effectiveness of random inspection programs in relation to non-random inspections.

6.   Insights into WHS regulation in South Australia

Preceding chapters of this report provided a detailed discussion of the evolution of WHS and road safety, highlighting similarities in the approaches adopted by both. Drawing on successes in the field of road safety a number of solutions for problems identified with regulation in the WHS domain were also discussed. The following section endeavours to shed some light on the current approach to WHS regulation in South Australia in order to provide a more practical understanding of WHS regulation with a focus on policy and legislation, enforcement, the use of rewards and incentives, and the use of data (both collection and analysis). With the exception of data analysis, each of these elements can be mapped to the Regulatory Pyramid discussed in section 5.1.2. Although the collection and analysis of data is not a direct component of the Regulatory Pyramid it is an important component of regulation with regard to informing and monitoring regulatory actions. Through a more in-depth examination of current approaches and practices to WHS regulation it is possible to obtain a better appreciation for the task of regulation, the problems faced by regulators and how lessons learned in the field of road safety may benefit WHS.

The information used to inform Chapter 6 was obtained through a series of interviews conducted with a number of SafeWork SA personnel having expertise and knowledge in the relevant areas. Each sub-section begins with a brief summary of the purpose of the interviews and the information sought followed by a statement of findings. Additional comment on a number of WHS regulatory practices is also provided.

6.1   WHS data collection and analysis

6.1.1   Purpose of the interviews

One strength in road safety is its use of various data sources to monitor safety trends. While police-report crash data is commonly used, road safety researchers rely on various other sources, including hospital data, Coroner's data, forensic data, emergency services records, and insurance claims data. The collated information is used to monitor key performance indicators (KPIs) in road safety, identify areas for intervention (e.g. problematic intersections), and evaluate (to a limited extent) the effectiveness of various road safety strategies.

Our intent in the interviews was to identify the extent to which such data collection and analysis approaches are used in the field of WHS. Selected WHS personnel were asked about the KPIs they use, and the data obtained to monitor those KPIs. To draw further comparisons with the field of road safety, an understanding of the sharing of information and data between jurisdictions was also explored. We were also interested in the use of data to evaluate WHS interventions and actions.

6.1.2   Findings

The database used by SafeWork SA to monitor WHS trends contains data from a number of sources. Information regarding work injuries is based on claims data provided by WorkCover SA. Information generated by SafeWork SA's investigations and activities is stored on an internal system known as *InfoNet*. SafeWork SA also has memoranda of understanding (MOUs) to seek information from other authorities that fall within the regulatory powers of SafeWork SA, including South Australia Police (SAPOL), and hospitals. Additionally, SafeWork SA also shares information with the State Coroner.

Safe Work SA's KPIs for injury trends are monitored using data derived from WorkCover compensation claims. The performance of SafeWork SA in meeting key targets in core activities, (e.g.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

34

the completion of investigations, intervention activities, and the issuing of Prohibition or Improvement Notices) are monitored using *InfoNet* data.

Injury data provided by WorkCover SA are based on information generated at the initiation of a claim for an injury sustained at work and includes information on claims that are:

- Active (i.e. compensation is being paid)

- Pending (claims that are almost active – around 95% of pending claims become active)

- Withdrawn (claim is no longer paid)

- Rejected (the claim did not meet criteria for WorkCover), and

- Incidents.

SafeWork SA monitors both Active and Pending claims. The data collected covers a range of variables, including occupation, industry, date of injury, mechanisms of injury, nature of injury, worker description of injury, number of work days lost due to injury and the cost of the injury or incident. The primary indicator monitored by SafeWork SA is the total number of claims with greater than 10 days' remuneration, which is indicative of a severe injury, a classification that is used both nationally and internationally.

As with many databases, there are a number of limitations to Safe Work SA's database. First, the primary aim is to track information about WorkCover claims; as such the information it contains is limited to that collected *as part of the claims process*. The nature of the data collected and how it is recorded is not primarily intended for monitoring overall injury trends. For example, as the data is derived from claims there is no record of work injuries for which no claim has been lodged.

Second, only the most severe injury is recorded, which limits the utility of the data as valuable information regarding the mechanisms or nature of other injuries is not included. It is also possible for the most severe injury to change over time, for example, a severe physical injury may heal to a certain extent while the mental trauma caused by the injury may remain significant such that compensation is made for the mental trauma rather than the physical despite both arising from the same incident. This also has implications for monitoring trends in injuries.

Third, employer organisations that do not meet the criteria for WorkCover are not included. This includes small organisations (e.g. sole traders) and "invisible industries" such as prostitution, as only legal businesses are covered by WorkCover.

Fourth, there is the potential for errors arising from inaccuracies in coding – a problem with any database – particularly where the data is recorded or reported by untrained people. This is important to keep in mind where data is derived from forms submitted by members of the general public. Other coding issues that also affect the interpretation of the data and the ability to monitor trends in the data include changes in coding, such as the way in which injuries or occupations are coded in the database.

Finally, changes to the Workers Rehabilitation and Compensation Scheme or the business practices of WorkCover SA can also affect incident or injury reporting rates. For example, there was a noticeable increase in claims following a change in the payment of compensation, such that it was of greater benefit to report injuries sooner (within two days). The increase in claims does not reflect an increase in compensable injuries but rather a change in reporting practices following the change in the management of claims.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

35

When queried with regard to SafeWork SA's use of injury data to inform activities and monitor injury trends, interviewees indicated that such data usage was reasonable given the above limitations.

When discussing the evaluation of WHS activities, comment was made that the effect of various safety activities is difficult to determine, particularly with regard to gauging the unique influence of different safety activities on SafeWork SA KPIs. It was also commented that previous attempts to evaluate the benefits of different programs have found that improvements in injury rates are more correctly attributable to the regression to the mean statistical phenomenon, than the actual effects of any given program. This may highlight the need for better data to monitor the outcomes of programs and/or better planning with regard to considering evaluation in the design and implementation of safety interventions. This includes aspects such as using appropriate and relevant outcome measures and the collection of data pre- and post intervention. The field of road safety has experienced similar difficulties when evaluating the effectiveness of interventions.

On the topic of data and information sharing, it was revealed that each jurisdiction provides data to Safe Work Australia, who then normalises the data for comparison and produces an aggregate report that is distributed to each of the jurisdictions. It was commented that a more useful approach would be the adoption of inter-jurisdictional metrics and shared benchmarking, with the latter being considered to have the most value. At present there are inconsistencies across jurisdictions with regard to data although, following the introduction of the new national WHS legislation, discussions regarding the harmonisation of data across jurisdictions were conducted. At present, plans for data harmonisation have been deferred in order to allow the new legislation to endure 'a teething stage', during which jurisdictions will also have an opportunity to become familiar with the legislation and how this impacts on operations.

6.2 Rewards and incentives

6.2.1 Purpose of interviews

The bottom tier of the Regulatory Pyramid suggests that persuasive techniques such as rewards and inducements should be the first level of regulation. As such, the primary interview aim was to identify how incentives (such as award ceremonies or prizes) are utilised in the regulation of WHS, and secondly to determine the effectiveness of these.

6.2.2 Findings

The main form of reward utilised by SafeWork SA is the annual Safe Work Awards scheme that recognises and rewards businesses and individuals who demonstrate excellence and innovation in WHS. In order to be in the running for an award, businesses and individuals need to complete a nomination, including a submission showing systems that have been put in place and addressing other criteria for the category for which they have nominated. The Safe Work Awards are associated with some prestige as they are presented at a gala awards ceremony in the presence of representatives from government and industry, and other nominees. Winners are able to make use of the Safe Work Awards "livery" on corporate documentation to further self-promote their success. As minimising the impact of workplace injury on operating costs is itself a valuable reward for the business, the ability to identify as the winner of a Safe Work Award may also offer a competitive advantage to businesses who tender for contracts. An official award acknowledging safe work practices indicates to prospective clients that the risks of delays or increased costs caused by incidents in the workplace are reduced, which may make the business more attractive than their competitors. This may be the case, particularly for lucrative contracts where the proposed work entails some degree of risk, such as large-scale construction projects. It should be noted that, apart from the

potential benefits with regard to awarding of future contracts and the savings and increased productivity associated with a healthy, injury free workforce, there are no financial rewards or incentives for winning a Safe Work Award.

Having established the nature of the reward provided by the Safe Work Awards, the ability of the Awards to serve as an incentive to improve WHS systems was explored further. While CASR was not in a position to comment on the rationale behind decisions to nominate (or not) for an award, some aspects of the process might be influential on whether a nomination is made. The act of nominating for an award suggests that the business (or individual) believes that they have some chance of winning (i.e. have a good WHS record), they have some interest in winning the award, and are able to allocate resources to this end (i.e. personnel to complete the nomination process). The Awards may thus offer more incentive for those businesses who can spare the resources to complete the nomination process and have a good WHS record, while those that cannot easily spare the resources (e.g. a small business), or who have a poorer WHS record may be less likely to enter. Also, the extent to which the awards encourage other businesses to improve their WHS systems and practices is, at present, unknown.

The effectiveness of the awards in improving WHS has not been assessed in that no follow-up with previous winners with regard to the maintenance or continued improvement of WHS systems, or safety record following receipt of the award has been conducted. However, interviewees noted that recipients win an award because they demonstrate a good safety record, they are not made safer simply because they win the award. It would be desirable to have some manner of determining WHS performance in the years following an award to provide partial indication of the short and long-term effects of an award, such as in benefits to safety operations (e.g. effect of an award in attracting competitive contracts). As noted in the literature review, the act of providing an award may reduce the intrinsic motivation for continuing to improve WHS such that a business may simply maintain the status quo or even allow standards to slip following receipt of an award. An interesting observation with regard to intrinsic motivation was made during one interview where it was suggested that the awards process rewards employers and employees for doing something that they should be doing anyway. That is, everyone should strive for a safe workplace with safety as the incentive, rather than the possibility of some form of reward. Another point from the literature review is that rewards must be continually offered and potentially increased in size in order to maintain interest and activity. While in South Australia the Safe Work Awards are an annual event, a decline in nominations may lead to the cessation of the Awards, as has happened in other jurisdictions. Additionally, in South Australia the nature of the reward has remained unchanged and it is not clear as to how this may affect the future actions of recipients, particularly when there are no further benefits to be gained.

Other aspects that may reduce the incentive of the Safe Work Awards scheme is that part of the assessment process may involve a visit by SafeWork SA inspectors in order to assess safety performance and other aspects of the nomination (e.g. WHS systems that are in place). While this is a necessary part of the process — given that the awards are intended to recognise excellence in WHS it is prudent to ensure that potential recipients actually have adequate WHS systems in place — the prospect of a visit by inspectors may be sufficient to deter some businesses from nominating, unless they believe they have nothing to fear. This may be linked to SafeWork SA's position as the regulator and enforcer of WHS in South Australia, particularly among those for whom some aspects of WHS are perceived as a burden.

Finally, SafeWork SA does not identify and nominate well-performing businesses or individuals for awards, so there is no recognition or reward for those with good WHS records unless they nominate themselves. From a motivational perspective this may have some benefits as those who do the right thing may maintain their intrinsic motivation, while those who require some external motivation are

CASR Road Safety Research Report | What can work health and safety learn from road safety?

37

able to seek this. Should this be the case, the Safe Work Awards have the potential to provide those who require extrinsic motivation with an incentive to improve WHS, however it is not known whether the award itself is sufficient to achieve this. It is likely that the degree of incentive will vary across businesses and individuals.

6.3 Enforcement

6.3.1 Purpose of interviews

The enforcement of road traffic law plays an important role in road safety. Regular enforcement activities (e.g. roadside and random breath testing for drink and drug drivers, safety cameras, etc.) and the presence of traffic police in conjunction with a range of penalties of varying severity (e.g. fines, demerit points, vehicle impoundment, disqualification, and prison sentences) are intended to encourage compliance. Another enforcement aspect in road safety is the introduction or amendment of laws to improve safety (e.g. seat belts, helmets for cyclists, etc.) and to address new risks (e.g. the use of mobile phones). Also, the various approaches to enforcement (i.e. fines, prosecution, etc.) comprise the upper levels of the Regulatory pyramid. Given all these points, it was considered important to identify the role of enforcement in WHS, including the nature of enforcement strategies and activities, and the types of penalties utilised.

6.3.2 Findings

The SafeWork SA approach to enforcement activities encompasses both persuasive and punitive techniques of the Regulatory Pyramid through the key tasks of prevention, compliance, and investigation and prosecution. These will be discussed in turn.

Prevention

SafeWork SA undertakes a range of activities as part of a strategic effort to prevent workplace injuries. These activities make use of persuasive and other enforcement methods to ensure compliance and improve WHS across all industries. SafeWork SA prevention activities generally fall into two categories: targeted prevention and general prevention. The former is more persuasive in nature, while the latter involves a more traditional enforcement approach incorporating elements of deterrence theory.

Targeted prevention

There are two approaches to targeted prevention. The first targets poor performing businesses, while the second focuses on either a specific problem (e.g. musculo-skeletal injury) or safety concerns for a specific industry.

1. Targeting poor performing businesses approach

SafeWork SA's Industry Improvement Program targets businesses that contribute disproportionately to workplace injury and illness. The identification of poor performing businesses varies based on the size of the business. The performances of medium and large businesses are based on the injury frequency rates for the preceding three years, the rate of remuneration, and the number of claims, including injury maintenance claims. Given differences in risk across industries, industry averages are used as a benchmark for these indicators. The primary aim is to identify and target businesses where injuries incur a high cost (i.e. remuneration) and who have a high number of claims. Where a business may have multiple worksites (e.g. a chain of supermarkets) the general approach has been to target intervention at the "location level" (i.e. the workplace identified as the worst performing or most

problematic). However, a shift in direction has seen the trial of prevention strategies targeted at the "employer level" (i.e. addressing all workplaces, such as all stores in a supermarket chain). The latter approach has the potential to introduce changes that will benefit multiple work places rather than one. Once a target business has been identified they are audited with regard to compliance and their systematic approach to WHS (or lack thereof). A plan to improve performance in these areas is developed and the workplace's performance in these areas is monitored. This is achieved using inspectors (compliance) and WHS advisors who work closely with the workplace to advise on addressing problems and risks in order to improve WHS.

Poor performing small businesses (those with 20 or fewer employees) are identified as those having made more than three claims. The approach to prevention differs to that used with medium and large businesses and includes educating employers and employees about safe workplace practices, and educating employers about the benefits of a systematic approach to WHS. The owners of small businesses are often invited to industry forums where they can learn more about how WHS is handled by others with similar needs.

Once a target business has been identified, SafeWork SA then works with that business to improve WHS systems and practices, a process that is conducted over the course of a year. Following the intervention, the business is left alone but is targeted for a review of compliance, usually no earlier than two years after the intervention. Those businesses identified as "worked with before and still poor performing" are subjected to further audits and enforcement actions as per the SafeWork SA compliance regimen discussed below (under Compliance).

2. Targeting identified problems approach

The targeting identified problems approach involves the development and design of initiatives and use of compliance campaigns to reduce the risk of injury associated with problems identified at the state and national levels. State-based programs are based on triggers such as fatalities, but can also arise from issues identified through other sources of intelligence, such as audits and investigations. At the national level the HWSA committee (Heads of Workplace Safety Authorities) has identified three WHS topics as raised as areas of concern by various jurisdictions. For example, in 2013 the areas for national focus included injury reduction and prevention in: the road transport industry (driven by NSW), the aged care industry (driven by Victoria), and the agriculture industry (driven by South Australia).

General prevention

Whereas the targeted prevention activities are somewhat reactive in nature (i.e. based on identified problems), the general prevention activities of SafeWork SA are somewhat pro-active in that they seek to encourage businesses to employ good WHS systems and practices or have problems addressed *before* they cause injury. This is achieved through engagement with industry and an inspection and compliance program.

1. Engagement with industry

One of the key approaches to prevention adopted by SafeWork SA is the development of relationships with industry businesses. The goal of this is to encourage and support industry and businesses to become more proactive in WHS matters by offering advice and support when needed. This is achieved both formally and informally in a number of ways. The formal aspect includes the issuing of safety and hazard alerts to industry. These alerts highlight an identified problem, outline employers' responsibilities with regard to the issue, and provide a recommended solution to the problem. These alerts provide businesses with an opportunity to respond to an identified issue before it affects them. As an informal approach, SafeWork SA's prevention team also produce information sheets that offer

guidance on various aspects of legislation and to help industry address a range of generic and industry-specific safety risks. Another activity may be to attend workplace meetings as either a guest or in a more official capacity to present information, offer advice, or answer questions. The prevention team also supports other industry committees and associations with regard to WHS matters, and also assists with the development of WHS strategies and systems for infrastructure developments of major significance to the State. The presence and involvement of SafeWork SA demonstrates to industry that SafeWork SA is committed to improving WHS and to helping businesses improve their WHS, rather than simply serve as the regulator who just punishes a business when they do the wrong thing.

2. Inspection and compliance program

The inspection and compliance program undertaken from the prevention perspective is more in line with traditional conceptions of enforcement. The process is in many ways similar to road safety's RBT (random breath testing), safety camera, and traffic patrol practices undertaken by police in that the process provides a deterrent to businesses potentially doing the wrong thing. WHS inspectors undertake a 'blitz' style compliance campaign where they inspect three to four sites per day over the life of the campaign, which may last for two to three months. Following this activity, it may be as long as six months before the industry is targeted again. The blitz style approach is adopted in order to make best use of limited resources (i.e. inspectors) and allows other industries and workplaces to be targeted during the 'off' periods. From a deterrence perspective the approach provides both specific deterrence for non-compliant workplaces and a general deterrent for all workplaces due to the possibility of being inspected. On the Regulatory Pyramid this approach would predominantly be classified as an enforcement activity, however a persuasive approach is also employed. Following an inspection campaign, the SafeWork SA prevention team provides feedback to industry bodies with regard to the number of notices, enforceable undertakings, et cetera, that were given, and also details of common problems that were identified by inspectors. Industry bodies are able to use this information to monitor WHS performance, but also to raise awareness of these issues and endeavour to develop solutions without further involvement from SafeWork SA. From the perspective of SafeWork SA, it is most desirable for industry to develop their solutions to WHS issues — something that this approach seeks to achieve — rather than seeking solutions through compliance from enforcement actions.

A second aspect of the inspection and compliance program involves responding to issues that arise from other sources, such as coronial findings, SafeWork SA investigations, or other sources of intelligence, including problems that have been identified in other jurisdictions or by Safe Work Australia. Interviewees indicated these inspections are conducted on an as-required basis and may involve "quick and dirty" inspections with a singular focus on a specific problem (as opposed to a complete workplace inspection), for example checking for the presence of guards on a particular piece or type of machinery.

Compliance

Compliance activities are undertaken to ensure that WHS systems and practices are compliant with WHS legislation. The most common compliance activity is an audit or workplace inspection. Audits are primarily driven based on intelligence from a number of sources:

- Injury data provided by WorkCover SA is monitored to identify trends with a focus on recognised industry hazards and risks

- Historical data regarding previous SafeWork SA activities

- Trends and issues based on national data and identified by HWSA to provide further intelligence on which to develop an audit program.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

40

Audits may also be triggered by investigations of a workplace incident. A compliance action may also be initiated by sources such as reports or complaints lodged via the SafeWork SA Help Centre phone line. Unions sometimes contact SafeWork SA with regard to an issue of workplace safety, however in acting on information from a union, SafeWork SA are mindful of the possibility that the contact is part of a broader political agenda.

Inspectors have a number of compliance tools at their disposal. These include:

- Improvement prohibition notices where work or use of machinery must cease until the problem has been rectified. These are issued only when an inspector identifies an immediate risk of injury and are not used to punish non-compliance.

- Improvement notices are issued when an inspector identifies a risk that is not life threatening. Work may continue, however improvements are required to be made to reduce the identified risk.

- Inspectors are also able to issue verbal direction to rectify risks that can be reduced through immediate, simple action (e.g. clearing a mess).

- The commencement of the *Work Health and Safety Act 2012* on January 1st, 2013 saw the addition of infringement notices to the compliance repertoire, providing inspectors with the power to issue expiation notices. The size of the expiation fee is commensurate with the risk or hazard, it is specified within the *Work Health and Safety Act 2012* and *Work Health and Safety Regulations 2012*, and it is applicable to an individual or corporate body.

In all cases, failure to comply with any type of notice issued by a SafeWork SA inspector is subject to a penalty in the form of a fine.

Another mechanism of compliance, although one that is not directly linked with SafeWork SA, is the activities of the workplace Health and Safety Representative (HSR). A HSR is able, among other things, to conduct workplace inspections and investigate the WHS complaints of workers, and monitor a PCBU's compliance with the *Work Health and Safety Act 2012*. The HSR also has the power to issue a provisional improvement notice where the PCBU is not compliant with a provision of the Act, stop unsafe work, or call in SafeWork SA inspectors as needed.

Investigation and prosecution

SafeWork SA's Investigation and Legal team are responsible for investigating incidents (injuries, occurrences, and fatalities) and to recommend compliance actions based on their findings. The type of actions that may arise from an inspection, in addition to those arising from audits (e.g. prohibition notices, etc.) include warning letters, enforceable undertakings and prosecution. A number of factors influence decisions with regard to the action taken, including the nature of the incident or non-compliance, level of injury, and the need for deterrence. Another outcome from the investigation process may be the decision to issue an industry wide hazard alert, an action that is clearly more persuasive and preventative in nature.

Prosecution is the highest level of enforcement action possible and can result in a criminal penalty in the form of a fine, a term of imprisonment, or both. A court is also able to impose orders on an offender, in addition to any penalty imposed or other action. These orders can include:

- Adverse publicity order — requires the offender to publicise their involvement in an offence, the consequences arising from the offence, the resulting penalty, and any other related matter specified by the court.

- Orders for restoration — requires the offender to remedy matters arising from the offence (e.g. compensation for injury).

CASR Road Safety Research Report | What can work health and safety learn from road safety?

41

- Work health and safety project orders — requires the offender to undertake a project to improve WHS.

- Injunctions — an order requiring the offender to cease the offending behaviour.

- Training orders specifying that workers undertake specific training.

- Court-ordered WHS undertaking — an enforceable undertaking (see below) ordered by the court.

The *Work Health and Safety Act 2012* heralded the introduction of more significant penalties for breaches of WHS obligations that are considered more than sufficient as both a punishment and a deterrent. The increase in penalty is expected to make people more aware of both the importance of WHS and the need to ensure a safe workplace in order to avoid severe penalty. Some of the drawbacks seen by interviewees with regard to the new, more severe penalties include that significant effort needs to occur in order to drive this recognition (i.e. an incident needs to occur, the offender needs to be prosecuted, and a significant penalty needs to be applied). With such effort, companies can become more litigious and reduce co-operation with investigators. Courts may also be reluctant to apply maximum penalties which may reduce the deterrent effectiveness of the tougher penalties.

Also, prosecution is a lengthy and costly process but is undertaken in cases where it is most warranted. Factors that influence decisions to prosecute include:

- The likelihood of success — based on the quality of evidence and the availability, reliability, and credibility of witnesses

- The amount of political or community interest in the case — whether the prosecution is in the interests of the community

- The need for specific (i.e. offender) and general deterrence.

At the time of writing there have been no prosecutions since the introduction of the *Work Health and Safety Act 2012.*

Another action arising from the investigation of an incident is an enforceable undertaking. This is a high level sanction that may be used as an alternative to prosecution, except in cases where the offence involves reckless conduct. An enforceable undertaking is usually proposed by the offending party, who must provide a written proposal for the undertaking that must provide benefits to the workplace, industry and community. Other mandatory aspects of the undertaking include a commitment to cease the offending behaviour, ensure ongoing and effective management of WHS risks, to disseminate information regarding the undertaking to affected parties and other stakeholders, and to participate in compliance monitoring activities. The offending party must also cover the legal and administrative costs associated with the undertaking that are incurred by the regulator, SafeWork SA. Failure to comply with the terms of the undertaking is punishable by fine, and may also result in the commencement of legal proceedings regarding the original offence.

While the nature of investigations is purely in reaction to an incident, the information obtained can be used to identify issues and provide intelligence to drive prevention efforts. The legal repercussions arising from an inspection, including the possibility of a criminal conviction, may also deter non-compliant behaviour.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

42

6.4   WHS Policy and Legislation

6.4.1   Purpose of interviews

The approach to road safety by many governments has been highly regulated and typically involves high levels of enforcement supported by legislative changes and mass media campaigns. Policy also plays a role by providing the strategies that are followed in order to address key issues. Policy also influences other aspects such as funding allocation and the priorities for intervention. Road safety strategies are implemented at the state, national, and international levels and are constantly evolving in line with advances in knowledge, theory, and practice. As legislation and policy are integral components of any regulatory system the intent of the interviews was to identify how these aspects shape the regulation of WHS.

6.4.2   Findings

Legislation

South Australia's *Work Health and Safety Act 2012* introduced a number of major changes to the regulation of WHS in South Australia, although the basic duties and responsibilities with regard to WHS remained the same. Perhaps the most notable change associated with the introduction of this legislation is its contribution to harmonisation of WHS laws across Australia and New Zealand that has seen a reduction in unique WHS schemes from nine to three (Western Australia, Victoria, and the National scheme, which also includes New Zealand). It should be noted that Western Australia is expected to ratify the national approach in the future, while the new legislation adopted nationally is itself modelled on the Victorian approach. It is expected that the harmonisation of WHS laws will improve the consistency of enforcement and regulation nationally. Other benefits of harmonising WHS laws nationally seen by the interviewees included: cross-border consistency for companies which should increase compliance by making processes easier (i.e. following one set of rules). As well, the harmonisation simplified and introduced the potential for collaborative work with interstate inspectorates, which includes the ability for interstate inspectorates to collect or provide evidence to other jurisdictions.

One of the most significant changes to WHS regulation introduced in the new legislation is the move from the concept of "employer" to "person conducting a business or undertaking" – the PCBU. While the duties of the PCBU are essentially unchanged to those of the employer under the previous legislation, the concept serves to clarify what constitutes a PCBU (a PCBU includes an employer, corporation, association, sole trader, partnership, and some types of volunteer organisations) and in so doing clearly establishes who is responsible for WHS.

Another means seen by interviewees through which the new harmonised legislation has clarified and simplified WHS responsibilities is through the concepts of due diligence and shared responsibility. The spirit underpinning these changes is the premise that if an individual is able to influence safety outcomes then they should be required to do so. While a PCBU has primary responsibility for WHS, an officer of the PCBU (someone who is involved in making decisions that may have an effect on the financial standing of the business or undertaking) is also required to demonstrate due diligence in order to ensure the PCBU complies with WHS requirements. The notion of due diligence requires all officers of a business or undertaking to take an active role in WHS in terms of acquiring the necessary WHS knowledge (e.g. responsibilities, etc.), understanding the hazards and risks associated with the business or undertaking in order to identify and monitor these, and ensuring that the PCBU takes appropriate action to eliminate or minimise those hazards and risks. Furthermore, the introduction of

due diligence for officers ensures all officers are personally responsible for WHS and cannot delegate this responsibility to another individual.

Another of the more prominent changes brought about through the *Work Health and Safety Act 2012* has been to explicitly require PCBUs operating in the same workplace to equally share responsibility for WHS. While this was implicit under the provisions of the previous Act, the new Act brings this requirement to the foreground, removing any confusion or doubt as to shared WHS responsibilities between PCBUs.

A number of changes have also been introduced with regard to WHS enforcement. While many of these have been discussed above (see section 6.3.2), they are mentioned here as features of the legislation that were identified during the interviews, and an alternative perspective to that of enforcement is provided:

1. Penalties in general have increased, with some of the higher increases associated with penalties for workers.

2. The introduction of enforceable undertakings provide SafeWork SA with a way of working with a PCBU to address a contravention without putting the PCBU out of business. Another positive of this approach is that the money goes towards improving WHS rather than into legal costs.

3. Expiation notices — the inclusion of power to use expiation notices is a new provision under the *Work Health and Safety Act 2012.* Areas where expiation notices are considered to be appropriate include contraventions such as failure to register plant or machinery, et cetera. Interviewees noted that the Australian Capital Territory has embraced the use of expiation notices and has increased the number of contraventions for which an infringement notice may be issued. Expiation notices are yet to be used by SafeWork SA inspectors for a number of reasons. These include:

    • Issues regarding the administration of the expiation system are yet to be resolved as SafeWork SA considers the best approach to manage the system. For example, should follow up to the expiation be the responsibility of SafeWork SA or the South Australia Police fines unit?

    • There is uncertainty as to where expiation notices fit within the scheme of regulatory tools. One aspect of this is determining the evidence an inspector needs in order to prove the contravention that precipitated the issuance of an expiation notice. SafeWork SA also has a preference for changing the behaviour of PCBUs voluntarily rather than through punitive measures.

    • SafeWork SA has so far not resolved policy around the use of expiation notices and the perceived concern of "revenue raising". This concern has plagued the field of traffic enforcement and generally impacts on the perceived validity of an enforcement method, which has further implications for deterrence.

4. Training orders, as specified under the new Act, give SafeWork SA the power to order workers to undertake necessary training and to also check the competence of workers. The inclusion of training orders was seen by interviewees to be more prominent than its coverage under the previous legislation.

As with any significant change, SafeWork SA is still coming to grips with the practical implications of the new legislation with regard to enforcement and compliance. As time passes and SafeWork SA gains experience with the new legislation and becomes familiar with its idiosyncrasies, interviewees

CASR Road Safety Research Report | What can work health and safety learn from road safety?

44

considered the tasks of enforcement and compliance should become clearer. At present, a lack of familiarity with the new legislation is responsible for inspectors adopting a cautious approach to enforcing provisions. With experience, inspectors are expected to gain a better understanding of the evidence needed to prove a contravention and the amount of enforcement is expected to increase.

Prior to the commencement of the *Work Health and Safety Act 2012,* in SafeWork SA the transitional period preceding the change was framed in two ways. For those businesses not compliant the changeover period was expressed as an opportunity to catch up (i.e. become compliant) before the changes (including increased penalties, etc.) came into effect. It was considered those businesses who were already compliant under the old Act would likely remain compliant under the new with little or no additional effort required on their part. SafeWork SA also undertook a number of educational activities intended to both raise awareness of the changes associated with the new legislation and to address any questions raised by people affected by the changes (e.g. PCBUs, officers, and workers). These activities included:

1. Many of the sessions conducted as part of SafeWork Week in 2012 addressed various issues surrounding the changes to WHS legislation.

2. There were also 'open house' sessions: 10-12 sessions held during December and January 2012-2013. Employers were invited to SafeWork SA to attend the sessions. These were conducted at SafeWork SA and structured such that attendees were able to move between various stands/displays providing a range of information including a basic introduction to the new laws while other stands provided more detailed information for specialist areas (e.g. asbestos removal).

3. SafeWork SA also developed and delivered PowerPoint presentations to businesses who made a special request to SafeWork SA for more information. A number of presentations were also made to the general public. SafeWork SA also delivered the presentations across an entire industry sector, for example 10 sessions were conducted for local governments.

4. Transitional education visits to 10,000 workplaces in total. These were mostly targeted at businesses that might have more than a simple question with regard to the new legislation. A proportion of these visits was targeted at certain areas, with the remainder of workplaces generally selected at random. The educational visits were undertaken with consent from the workplace.

5. SafeWork SA also utilised radio and print media to raise awareness about the changes. Additionally, SafeWork SA's Facebook page was created as another avenue for providing information about the new legislation.

SafeWork SA has received positive feedback with regard to their approach to education and assisting businesses with the transition to the new legislation. It is also believed that awareness of WHS has increased as PCBUs have had to re-visit the legislation to ensure they would be compliant when the new legislation started.

Policy

The overarching principle underpinning the development of policy by SafeWork SA is to stop people being killed or injured in the workplace, principally through the elimination of risk or managing exposure to risk where elimination is not possible. Other principles include that WHS should be a shared responsibility, and that there should be a reduction of 'red tape' associated with meeting WHS obligations for both businesses and the regulator. Policies regarding enforcement and penalty regimes

CASR Road Safety Research Report | What can work health and safety learn from road safety?

45

are underpinned by the principles of deterrence theory, and by the belief that SafeWork SA activities should also endeavour to build continuous improvement and support the improvement of WHS through other compliance measures (e.g. prevention activities, improvement notices, etc.).

A current trend in WHS policy is the concept of shared responsibility, which has been formalised with the introduction of the new legislation. The intent of this approach is to reframe the current conception of WHS as being the responsibility of a designated person/entity and to shift towards a community concept of WHS. This ethos of collective responsibility is relatively new in the field of WHS and a shift to this way of thinking has yet to be achieved in the community. Interestingly, it was perceived in the interviews that road safety had successfully established that everyone has a responsibility for road safety.

With regard to the development of policy to address identified problem areas for WHS, SafeWork SA has established its Industry Improvement Program to target poor performing businesses (see Section 6.3.2). Other targeted policies include addressing nationally agreed areas for compliance and targeting priority industries and issues identified in the national WHS strategy. In addition to addressing areas of national interest, SafeWork SA also targets areas of more local concern if such an approach is required.

Discussion of policies that have had a major impact on WHS identified the introduction of the Robens approach in the mid 1980s as the first major policy shift to have a significant impact on WHS. It was also suggested that the introduction of the nationally harmonised legislation modernises the Robens approach and introduced a number of changes to the regulation of WHS that are expected to have a positive effect on WHS outcomes. Another policy development noted by interviewees was the establishment of SafeWork SA in 2005. Where previously WorkCover SA managed both injury compensation and regulation of WHS, the creation of an agency with the sole responsibility of regulating WHS was of operational significance with regard to the manner in which WHS was regulated. SafeWork SA is able to have a more focussed approach to the prevention of workplace injuries or illness than was possible under the previous arrangement.

On the review of policies, there was a general sense among interviewees that policies are not reviewed to the extent they should be, and not all policies are subjected to a review. Due to the number of factors that influence WHS, it is difficult to determine what impact a policy or activity has had on WHS or the role that these have played in reducing injury (if they have). SafeWork SA standard operating procedures are reviewed every two years and written policies tend to be reviewed to ensure they remain up to date and relevant. Occasionally, the operational structure of the SafeWork SA inspectorate is reviewed and has transitioned through several structures based on geography and industry sectors, and is presently based on function (i.e. 'prevention, response and investigation'). In terms of review, SafeWork SA monitors a number of KPIs with regard to key business activities such as the number of:

- prevention initiatives delivered

- key intervention activities

- investigations finalised

- investigations finalised within 180 days

- the percentage of telephone calls responded to in less than three minutes, and

- the number of prohibition and improvement notices issued.

Performance in these areas is measured against specific targets and is reported to the Department of Treasury and Finance. The ultimate evaluation and KPI with regard to the effectiveness of SafeWork

CASR Road Safety Research Report | What can work health and safety learn from road safety?

46

SA policies and activities is the reduction of workplace injury and illness. At present, evidence indicates that South Australia is trending well in these aspects.

Section 277 (Part 14, Division 4) of the *Work Health and Safety Act 2012* stipulates that a review of the operation of the Act should be conducted as soon as practicable after one year from its commencement. A further review after the third year is also required. Section 277 also stipulates that the review should specifically report on how the addition of the provision allowing Union right of entry has been utilised. It is also expected that the review will include the many WHS codes of practice. Codes of practice are guidelines for managing a range of workplace risks in order to be compliant with the legislation.

6.5 Discussion

The intent of this section is to provide further commentary on two regulation and compliance issues identified in the interviews, specifically the use of rewards in WHS and Safe Work SA's Industry Improvement Program.

SafeWork SA holds its Safe Work Awards annually. It is a gala event that recognises businesses and individuals who have contributed to or achieved high WHS standards. The approach is intended to reward people for their WHS efforts and to provide some incentive for others to improve. It was noted in section 5.2.1 in this report that the use of incentives or rewards can have varying degrees of success, depending on an individual's motivation for a behaviour. More specifically, it was suggested that providing rewards and other inducements can reduce intrinsic motivation for the desired behaviour, in essence restricting the desire to improve safety for the sake of safety. Within SafeWork SA there is a perception that the Safe Work Awards may, in essence, be rewarding people for doing something that any decent employer or employee should be doing anyway: promoting and providing a safe workplace. Given the doubts regarding using awards for improving WHS, careful consideration of the positioning of the Safe Work Awards, or any incentives-based program is required, particularly if the awards are to be used as a regulatory tool. However, the concept of an award scheme may be more useful as a publicity tool and serve to promote WHS in the community while at the same time allowing SafeWork SA to build relationships with industry through positive interactions rather than enforcement activities. The use of an awards ceremony to these ends has some merit, and the potential for positive exposure and awareness may also yield benefits for WHS, although further research is needed to evaluate that possibility.

The primary preventive measure adopted by SafeWork SA is its industry improvement program, which endeavours to redress the shortcomings of poor WHS performing workplaces. While much has been made of the success of the program, there remain some doubts as to its actual effectiveness. One of the strengths of the program is that it is targeted at workplaces that contribute disproportionately to injuries as identified using WorkCover SA statistics. A similar approach has been adopted in the field of road safety where young drivers have been found to be over-represented in crash statistics, leading to strategies targeting this population. However, where road safety appears to depart from WHS is that it has been possible to identify factors that contribute to young driver risks and implement strategies to ameliorate these (e.g. the Graduated Licensing System). Following from this, it is possible that the effectiveness of the industry improvement program could be improved through better targeting, something that will require a better understanding of the factors that increase the risk of injury in high-risk workplaces. Improved targeting will require data with capabilities beyond simply identifying increased injury rates. Furthermore, research investigating the factors that are associated with an increase in risk is also warranted and will likely highlight the data needed to identify high risk workplaces. A starting point may be the systematic and in-depth review of any inspections, audits, or other activities undertaken as part of the industry improvement program.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

47

While the above suggests there is scope for development in the way the industry improvement program is targeted, it is also worth keeping in mind that the intervention itself likely improves the WHS systems and practices of workplaces at which it is targeted. Some consideration should be given to determining if this is the case, while further research into the long-term effects of the program may also prove useful.

7 Conclusions

This study has identified a number of broad areas where WHS policy and practice could be reviewed in relation to road safety, primarily in the areas of compliance and data collection, though there are some aspects of overlap between these areas. It is suggested that the initial aim of such a review should not be to identify areas of WHS policy and practice that necessarily require substantial change. Rather, the aim should be to examine these areas to gauge if current WHS policies and practices strike appropriate balances. If an imbalance is identified it may be of some benefit to undertake further examination of the issues in the light of experiences from the field of road safety. Based on the evidence compiled up to here in the report, a number of areas where a review of practices may identify further benefits for WHS have been identified and are outlined in more detail below.

Regulation and compliance form an essential component of both WHS and road safety strategies but both disciplines have adopted somewhat different approaches. Whereas WHS has adopted the Roben's style approach of self-regulation and duty of care, by contrast regulation and compliance in road safety has followed a more traditional approach involving significant levels of enforcement supported by legislative changes and mass media. Hence, with regard to regulation and compliance, WHS may benefit from a review of the following elements:

1. The role of enforcement in WHS, through examining successful road safety enforcement practices in conjunction with police with respect to:
   - The effect of both specific deterrence (individual instances) and general deterrence (effect on others) of various enforcement approaches
   - The durability of different enforcement approaches (such as mixes of targeted and randomised audit/inspection programs)
   - How the above may be best explained in terms of enforcement theory
   - The role of advertising campaigns in supporting enforcement initiatives.

2. WHS research programs, with respect to obtaining Australian data on the effectiveness of WHS targeted interventions.

3. The effectiveness of other (non-prosecution) compliance measures, such as improvement and prohibition notices, and adverse publicity orders.

4. The role of rewards and incentives with a view to limiting their use to those circumstances where they are likely to increase, but not decrease intrinsic motivation to work safely; this work should include monitoring the Cochrane Collaboration's current study on the effectiveness of incentive schemes in WHS.

5. How applicable the Regulatory Pyramid is as a tool to plan WHS intervention strategy, beyond using it simply as a description of the range of available interventions.

6. Systematic examination of the causes of violations, both at individual and system-wide levels, and in patterns of violations.

7. The establishment of robust feedback loops for improving WHS systems, particularly where people can own up to genuine mistakes without necessarily fearing blame or legal action.

8. Whether more chains of WHS responsibilities and accountabilities, particularly for high risk industry categories, should be established.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

49

9. Is there a balance of cost-effective solutions to WHS issues as distinct from just regulatory ones?

10. Whether there are possibilities for adopting alternative, worker — management negotiated forms of compliance, where enforcing 'one size fits all' regulations can be operationally problematic.

Data plays an important role in the development of policy, the monitoring of performance and injury trends, and the guidance of enforcement activity. As such, these areas may benefit from a review of how data is collected and analysed. Potential areas for review include:

11. The possibility of a more substantial evidence base for WHS policy and action through improved WHS data collection and analysis, particularly with respect to:

    • Linkages with other relevant databases

    • Considering a wide range of performance indicators beyond just deaths and injuries, for example: the outcomes of covert versus overt WHS inspection operations, or random versus non-random inspections

    • Psycho-social relationships and safety culture in workplaces, including feedback mechanisms for identified safety problems

    • Calculating the financial benefits of spending on safety improvements, not just the costs of WHS failures; this can include willingness-to-pay calculations.

12. The manner in which participants are identified for the Industry Improvement Program. This might involve a review or investigation of factors associated with increased risk, and the characteristics of high-risk workplaces. This could be further stratified to identify industry-specific risk factors.

13. The data collected on novice worker deaths and injuries, particularly for workers aged 15-24, with a view to determining the need and feasibility of a more graduated acclimatisation to work, especially in industries where novice workers appear to be at most risk.

14. Whether WHS worksite audit provisions could be tailored to accommodate alternative, negotiated forms of compliance.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

50

Acknowledgements

CASR Road Safety Research Report | What can work health and safety learn from road safety?

51

References

Agerholm, N., Tradisauskas, N., Juhl, J., Berthelsen, K. & Lahrmann, H. (2012). *Intelligent speed adaptation for involuntary drivers — final results*. 19th ITS World Congress, Vienna.

Alford, J. & Speed, R. (2006). Client focus in regulatory agencies: oxymoron or opportunity? *Public Management Review 8(2),* 313-331.

Algie, J. & Rossiter, J. R. (2010). Fear patterns: A new approach to designing road safety advertisements. *Journal of Prevention and Intervention in the Community (38)*, 264-279.

Alper, S. J. & Karsh, B-T. (2009). A systematic review of safety violations in industry. *Accident Analysis and Prevention, 41*, 739-754.

Australian Law Reform Commission (ALRC). Regulating privacy. *Australian Privacy Law and Practice.* ALRC Report 108, part 4. Accessed on 28 February 2013 at: <www.alrc.gov.au/publications>

Australasian College of Road Safety (ACRS). (2012). *Submission to Safe Work Australia: Draft Australian Work Health and Safety Strategy.* Canberra: ACRS. Accessed on 18 February 2013 at: http://acrs.org.au

Australian Transport Council (ATC). 2011. *National Road Safety Strategy 2011-2020.* Canberra: ATC.

Ayres, I. & Braithwaite, J. (1992). *Responsive Regulation: Transcending the Deregulation Debate.* New York: Oxford University Press.

Baas, P. & Taramoeroa, N. (2008). *Analysis of the Safety Benefits of Heavy Vehicle Accreditation Schemes.* Report AP-R319/08. Canberra: Austroads.

Banks, T. D., Davey, J. D , Biggs, H. C. (2010). The influence of safety ownership on occupational road safety outcomes. *Journal of the Australasian College of Road Safety 21(4),* 36-42.

Bibbings, R. (2011) Goldilocks rules OK? *The RoSPA Occupational Safety & Health Journal*, September 2011, 32.

Bibbings, R. (2012) Ragnar reregulates! *The RoSPA Occupational Safety & Health Journal*, January 2012, 34-35.

Bjørnskau, T. & Elvik, R. (1990). Can road traffic law enforcement permanently reduce the number of accidents? In: *Proceedings of road safety and traffic environment in Europe.* Gothenberg, Sweden, September 26-28, 1990, VTI rapport 365A.

Black, J. (2007). *Principles Based Regulation: Risks, Challenges and Opportunities.* London: London School of Economics and Political Science.

Blewett, V. (2009). *OHSW Research Strategy for South Australia.* Safework SA, Adelaide.

Blewett, V. & O'Keeffe, V. (2012). Weighing the pig never made it heavier: Auditing OHS, social auditing as verification of process in Australia. *Safety Science* 49, 1014-1021.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

52

Bliss, T. & Breen, J. (2008). The evolution of road safety management for results. In *Implementing the Recommendations of The World Report on Road Traffic Injury Prevention Country guidelines for the conduct of road safety management capacity reviews and the related specification of lead agency reforms, investment strategies and safety programs and projects*. Global Road Safety Facility, Washington World Bank. Relevant section accessed on 26 November 2012 at: <http://ec.europa.eu/transport/road_safety/specialist/knowledge/rsm/the_road_safety_management_system/the_evolution_of_road_safety_management_for_results.htm>.

Borys, D. (2000) Seeing the wood for the trees: a systems approach to OH&S. Proceedings of the *First National Conference of Occupational Health and Safety Management Systems*. Sydney.

Braithwaite, J. (2002). Rewards and recognition. *Journal of Law and Society 29(1),* 12-26.

Bureau of Infrastructure, Transport and Regional Economics (BITRE). (2009). *Cost of Road Crashes in Australia 2006.* Report 118. Canberra: BITRE.

Byrne, R. (2012). Creating a just culture. *The RoSPA Occupational Safety & Health Journal.* July, 2012. 27-29.

Byrne, R. (2013). Costing accidents. *RoSPA Occupational Safety & Health Journal.* January, 2012. 13-15.

Carlson, R. N. & Heth, C. D. (2007). *Psychology the Science of Behaviour.* New Jersey: Pearson Education.

Carslake, J; Cureton, J. & Potter, J. (2012). Corporate initiatives to improve road safety and the associated productivity and environmental benefits. Proceedings of the *12th International Symposium on Heavy Vehicle Transport Technology*. Sweden.

Christie, R. (2011). *The Effectiveness of Driver Training/Education as a Road Safety Measure.* Melbourne: Royal Automobile Club of Victoria.

Corbett, C. & Simon, F. (1992). Police and public perceptions of the seriousness of traffic offences. *The British Journal of Criminology, Delinquency and Deviant Social behaviour, 31*(2), 153-164.

Cullen, W. D. (1996). *The development of safety legislation.* Royal Academy of Engineering and Royal Society of Edinburgh Lecture. Accessed on 12 November 2012 at: <http://www.scribd.com/doc/57924918/THE-DEVELOPMENT-OF-SAFETY-LEGISLATION>.

Dekker, S. (2011). The criminalization of human error in aviation and healthcare: A review. *Safety Science, 49,* 121-127.

Department of Business Enterprise and Regulatory Reform. (2007). *Code of Practice for Regulators.* London: Her Majesty's Stationery Office.

Department of Environment, Transport and the Regions (DETR). (2000). *Road Traffic Penalties: A Consultation Paper*. London: Her Majesty's Stationery Office.

Doecke, S. D. & Grigo, J. L. (2012). *Annual Performance Indicators of Enforced Driver Behaviours in South Australia.* Report CASR 104. Adelaide: Centre for Automotive Safety Research.

Elvik, R. & Vaa, T. (eds). (2004). *The Handbook of Road Safety Measures*, Chapter 8: Police enforcement and sanctions. Oxford: Elsevier.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

53

Evans, L. (1991). *Traffic Safety and the Driver*. New York: Van Nostrand Reinhold.

Frick, K. & Zwetsloot, G. (2007). From safety management to corporate citizenship: An overview of approaches to managing health. In Johansen, U., Ahonen, G. & Roslender, R. (Eds) *Health & Management Control*. Stockholm: Thomson International.

Goode, E. (1994). Round up the usual suspects: crime, deviance and the limits of constructionism. *American Sociologist, 25*, 37-52.

Government Accountability Office (GAO). (2004). *Review of the United States Occupational Health and Safety Cooperative Programs.* Washington DC: GAO.

Government of South Australia. (2012) *Towards Zero Together — South Australia's Road Safety Strategy 2020.* Adelaide: Government of South Australia.

Gunningham, N. (2011). *Regulatory Compliance Best Practice Review.* Melbourne: National Transport Commission.

Gunningham, N. & Sinclair, D. (2009). *On the Limits of Management Based Regulation.* Regulatory Institutions Network (RegNet). Working Paper 69. Canberra: Australian National University.

Haddon, W. (1972). Reducing highway losses: a logical framework for categorizing highway safety phenomena and activity. *Journal of Trauma, 12,* 193-207.

Haight, F. A. (1986). Risk, especially risk of traffic accident. *Accident Analysis & Prevention 18(5),* 359-366.

Hasle, P. & Zwetsloot, G. (2011). Editorial: occupational health and safety management systems: issues and challenges. *Safety Science 49*, 961-963.

Haworth, N., Tingvall, C. & Kowaldo, N. (2000). *Review of Best Practice Fleet Safety Initiatives in the Corporate/Business Environment*, Report No. 166, Melbourne: Monash University Accident Research Centre.

Hestridge, J., Homel, R. & Mackay, P. (1997). *The Long-Term Effects of Random Breath Testing in Four Australian States: A Time Series Analysis.* Report CR 162. Canberra: Federal Office of Road Safety.

Hohnen, P. & Hasle, P. (2011). Making work environment auditable – a critical case study of certified occupational health and safety management systems in Denmark. *Safety Science 49*, 1022-1029.

Homel, R. (1988). *Policing and Punishing the Drinking Driver: A Study of Specific and General Deterrence.* New York: Springer-Verlag.

Hopkins, A. (2000). *Lessons from Longford: the Esso gas plant explosions.* Sydney:CCH Australia Ltd.

Hopkins, A. (2010). *Risk Management and Rule Compliance Decision Making in Hazardous Industries.* Regulatory Institutions Network (RegNet). Working Paper 72. Canberra: Australian National University.

Howard, P. K. (1994). *The Death of Common Sense: How Law Is Suffocating America.* New York: Random House.

Hughes, B. (2010). *Workplace Transport Safety: The Mobile Financial Crisis.* Curtin-Monash Accident Research Centre, Curtin University of Technology, :Perth.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

54

International Organization for Standards (ISO). (2012). *ISO 39001: Road traffic safety (RTS) management systems – Requirements with guidance for use*. Geneva: International Standards Organisation. Accessed on 26 November 2012 at: www.iso.org/iso/catalogue_detail?csnumber=44958

Jessop, D. C. & Wade, J. (2008). Fear appeals and binge drinking: A terror management theory perspective. *British Journal of Health Psychology (13),* 773-788.

Johansson, R. (2009). Vision Zero — Implementing a policy for traffic safety. *Safety Science, 47*(6), 826-831.

Johnston, I. R., Muir, C., & Howard, E. W. (2014). *Eliminating Serious Injury and Death from Road Transport: A Crisis of Complacency*. CRC Press. Florida.

Johnstone, R. (2012). *Decriminalisation of Health and Safety at Work in Australia.* Regulatory Institutions Network (RegNet). Working Paper 86. Canberra: Australian National University.

Johnstone, R., Bluff, E. & Clayton, A., (2012). *Work Health and Safety Law Policy*. 3rd edition. Riverwood, New South Wales: Thomson Reuters.

Kallberg, V-P. (2012). Traffic law enforcement. In European Commission (ed.), *Best Practices in Road Safety: Handbook for Measures at the Country Level.* Mauritius: European Union.

Koornstra, M. J., Lynam, D., Nilsson, G., Noordzj, P., Petterson, H., Wegman, F. & Wouters, P. (2002). SUNflower: *A Comparative Study of the Development of Road Safety in Sweden, the United Kingdom and the Netherlands*. Leidschendam, The Netherlands: Institute for Road Safety Research (SWOV).

Labib, A. & Read, M. (2013). Not just rearranging the deckchairs on the Titanic: learning from failures through risk and reliability analysis. *Safety Science 51*, 397-413.

Leathley, B. (2013). What is… reasonably practicable? *Health and Safety at Work.* 31 January.

Levine, D. I., Toffel, M. W. & Johnson, M. S. (2012). Randomized Government Safety Inspections Reduce Worker Injuries with No Detectable Job Loss. *Science* 336(6083), 907-911.

Lewis, I., Rowland, B. & Wishart, D. (2012) The role of, and key considerations for, advertising campaigns and educational awareness workshops within the work-related road safety context. Proceedings of the *1st Occupational Safety & Transport Conference*. Gold Coast, Queensland.

Löfstedt, R. E. (2011). *Reclaiming Health and Safety for All: An Independent Review of Health and Safety Legislation.* London: HMSO. Accessed on 4 February 2013 at: www.dwp.gov.uk/docs/lofstedtreport.pdf

MacDonald, W., Driscoll, T., Stuckey, R. & Oakman, J. (2012). Occupational health and safety in Australia. *Industrial Health, 50,* 172-179.

McCallum, R., Schofield, T. & Reeve, B. (2010). *Reflections on General Deterrence and OHS Prosecutions.* Regulatory Institutions Network (RegNet). Working Paper 75. Canberra: Australian National University.

McCluskey, M., McGarity, T., Steinzor, R., Shapiro, S. & Shudtz, M. (2012). *The Next OHSA: Progressive Reforms to Empower Workers.* White Paper No. 1207. Massachusetts: Center for Progressive Reform. Accessed 3 December 2012 at: www.progressivereform.org/articles/Next Generation_OHSA_1207.pdf

CASR Road Safety Research Report | What can work health and safety learn from road safety?

55

McGarity, T., Steinzor, R., Shapiro, S. & Shudtz, M. (2010). *Workers at Risk: Regulatory Dysfunction at OHSA,* Washington: Center for Progressive Reform. Accessed 3 December 2012 at: <www.progressivereform.org/articles/OSHA_1003.pdf>

McKenna, F. P. (2007). The perceived legitimacy of intervention: A key feature for road safety. *Improving traffic safety culture in the United States: The journey forward*. Washington, DC: AAA Foundation for Traffic Safety, 165-75.

Mellstrom, C. & Johannesson, M. (2008) Crowding out in blood donation: Was Titmuss right? *Journal of the European Economic Association 6(4),* 845-863.

Miller, P. S. J., Biddle, E. A., van Dongen, J. M., van Tulder, M. W., Tompa, E. & Shemilt, I. (2013). Economic incentives to enhance safety behaviour in workers for preventing occupational injuries. *Cochrane Database of Systematic Reviews, 4,* Art. No. CD010474.

Mischke, C., Verbeek, J. H., Job, J., Morata, T. C., Alvesalo-Kuusi, A., Neuvonen, K., Clarke, S. & Pedlow, R. I. (2012). Occupational safety and health regulation and legislation enforcement tools for preventing occupational diseases and injuries. *Cochrane Database of Systematic Reviews 2012*, Issue 12. Art. No. CD010183. DOI: 10.1002/14651858.CD010183.

Mooren, L. Grzbieta, R. (2010) Review of Australian alternative compliance schemes. Proceedings of the *90th Transportation Research Board Annual Meeting.* Washington.

Mooren, L., Grzbieta, R. & Williamson, A. (2009). Lessons from occupational safety for work-related road safety. Proceedings of *Australasian Road Safety Research, Policing and Education Conference.* Sydney.

Mooren, L., Searles, B., Benc, A., Creef, K. & Wall, J. (2012). Benchmarking for effective work related road safety management. Proceedings of the *1st Occupational Safety & Transport Conference*. Gold Coast, Queensland.

Mustard, C. (2012). *The Effectiveness of Targeted Labour Inspections in Occupational Health and Safety.* Issue Briefing September 2012, Institute for Work & Health (IWH). Toronto, Canada: IWH. Accessed 27 February 2013 at: www.iwh.on.ca/issue-briefings

Nævestad, T. & Bjørnskau, T. (2012). How can the safety culture perspective be applied to road traffic? *Transport Reviews: A Transnational Transdisciplinary Journal, (32)2),* 139-154.

Nader, R. (1965). *Unsafe At Any Speed.* New York: Grossman Publishers.

National Occupational Health and Safety Commission (NOHSC). (2002). *National OHS Strategy 2002-2012.* Canberra: NOHSC.

National Transport Commission (NTC). (2009). *Accreditation Policy Review.* NTC. Accessed on 5 February 2013 at: www.ntc.gov.au

National Transport Commission (NTC). *Chain of Responsibility.* NTC. Accessed on 5 February 2013 at: www.ntc.gov.au

OECD/ITF (2011). *Reporting on Serious Road Traffic Casualties.* Traffic and Safety Data Analaysis Group. Organisation for Economic Cooperation and Development / International Transport Forum.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

56

Perovic, J. & Tsolakis, D. (2008). Valuing the social costs of crashes: is the community's willingness to pay to avoid death or injury being reflected? Proceedings of the *Australasian Road Safety Research Policing and Education Conference,* Adelaide.

PIARC (World Road Association). (2012). *Best Practices for Road Safety Campaigns*. Paris: PIARC. Accessed on 18 February 2013 at: www.piarc.org

Purse, K. & Dorrian, J. (2011) Deterrence and enforcement of occupational health and safety law. *International Journal of Comparative Labour Law and Industrial Relations 27(1),* 23-39.

Quinlan, M. (2011). *Supply Chains and Networks.* Canberra: Safe Work Australia.

Reeve, B. & McCallum, R. (2011). The scope of employers' responsibilities under Australian occupational health and safety legislation. *Australian Journal of Labour Law, 24*(3), 189-213.

Regulatory Institutions Network (RegNet). (2012). *Overview of Work Health and Safety Regulation in Australia.* Canberra: Australian National University. Accessed 21 May 2012 at: <http://regnet.anu.edu.au/nrcohsr/overview-work-health-and-safety-regulation-Australia>.

Robens, A. (1972). *Report of the Committee on Safety and Health at Work 1970-1972*, London: HMSO.

Robson, L. S., Stephenson, C. M., Schulte, P. A., Amick, B. C. III, Irvin, E. L., Eggerth, D. E., Chans, S., Bielecky, A. R. …Grubb, P. L. (2012). A systematic review of the effectiveness of occupational health and safety training. *Scandinavian Journal of Work Environment and Health, 38(3),* 193-208.

Rosenfield, D., Folger, R. & Adelman, H. F. (1980). When rewards reflect competence: A qualification of the overjustification effect. *Journal of Personality and Social Psychology 39(3),* 368-376.

RoSPA. (2011) *Response to the Department of Health's White Paper Healthy Lives, Healthy People: Our Strategy for Public Health in England*. London: Royal Society for the Prevention of Accidents.

RoSPA. (2013). Accident prevention should be public health priority, says RoSPA. *RoSPA Occupational Safety & Health Journal.* January.

Rumar, K. (1999). *Transport safety visions, targets and strategies; beyond 2000*. 1st European Transport Safety Lecture, Brussels: European Transport Safety Council (ETSC).

Russell, K. F., Vandermeer, B. & Harling, L. (2011). Graduated driver licensing for reducing motor vehicle crashes among young drivers. *Cochrane Database of Systematic Reviews:* CD003300.

Safe Work Australia. (2009). *How to manage work health and safety risks: Code of Practice.* Canberra: Safe Work Australia.

Safe Work Australia (2012) *Australian Work Health and Safety Strategy 2012-2022.* Canberra: Safe Work Australia.

Safe Work Australia. (2012a). *Australian Work-Related Injury Experience by Sex and Age 2009-10.* Canberra: Safe Work Australia.

Safe Work Australia. (2012b). *Australian Work Health and Safety Strategy 2012-2022.* Canberra: Safe Work Australia.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

57

Safe Work Australia. (2013). *The Effectiveness of Work Health and Safety Interventions by Regulators: A Literature Review*. Canberra: Safe Work Australia.

Sherriff, B. (2011). *Promoting Effective Health and Safety Leadership. Using the Platform in the Model Work Health and Safety Act.* Canberra: Safe Work Australia.

Stewart, A. E. & Lord, J. H. (2002). Motor vehicle crash versus accident: a change in terminology is necessary. *Journal of Traumatic Stress 15*(4), 333-335.

Stuckey, R., Pratt, S. G. & Murray, W. (2013). Work-related road safety in Australia, the United Kingdom and the United States of America: An overview of regulatory approaches and recommendations to enhance strategy and practice. *Journal of the Australasian College of Road Safety 24(3*), 10-18.

SWOV. (2009). *Fear-based information campaigns.* SWOV Factsheet. The Netherlands: Dutch Institute for Road Safety Research. Accessed 12 March, 2013 from: <www.swov.nl/UK/Research/factsheets.htm>

Tingvall, C, (1995). *The zero vision. I*n: van Holst, H, Nygren, A. & Thord, R. (1995) (Eds). *Transportation, Traffic Safety and Health: The New Mobility.* Proceedings of the 1st International Conference. Gothenburg, Sweden: Springer-Verlag, 35-57.

Voirin, M., Pierlot, S. & Llory, M. (2012). Availability organisational analysis: is it a hazard for safety? *Safety Science 50,* 1438-1444.

Walters, D., Johnstone, R., Frick, K., Quinlan, M., Baril-Gingas, G. & Thébaud-Mony, A. (2011). *Regulating Workplace Risks: A Comparative Study of Inspection Regimes in Times of Change*. Cheltenham, UK: Edward Elgar.

Watson, B. (1998). The effectiveness of drink drive licensing actions, remedial programs and vehicle based solutions. *Proceedings of the 19th ARRB TR Conference*. Sydney: Australian Road Research Board (ARRB).

Wegman, F. (2012). *Driving Down the Road Toll By Building a Safe System.* Adelaide: Adelaide Thimkers in Residence, Government of South Australia.

Wegman, F. & Elsenaar, P. (1997). *Sustainable solutions to improve road safety in the Netherlands*. Leidschendam, The Netherlands: Institute for Road Safety Research (SWOV). (SWOV Report D-97-8).

Wegman, F., Eksler, V., Hayes, S., Lynam, D., Morsink, P. & Oppe, S. (2005). *SUNflower+6: A Comparative Study of the Development of Road Safety in European Countries*. Leidschendam, The Netherlands: Institute for Road Safety Research (SWOV).

Williams, A.F. (1999). The Haddon matrix: its contribution to injury prevention and control. In McClure, Roderick (Ed.) *Third National Conference on Injury Prevention and Control*, 9-12 May 1999, Brisbane, Queensland.

Williams, A. F., Tefft, B. C. & Grabowski, J. C. (2012). Graduated driver licensing research, 2010-present. *Journal of Safety Research 43*, p. 195-203.

Williams, H. (2012). Innovation inducement prizes: Connecting research to policy. *Journal of Policy Analysis and Management 31(1),* 1-25.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

58

World Health Organisation (WHO). (1946). *Preamble to the Constitution of the World Health Organization* as adopted by the International Health Conference, New York, 19 June - 22 July 1946. (Official Records of the World Health Organization, no. 2, p. 100).

WHO. (2001). *Proceedings of WHO Meeting to Develop a 5-Year Strategy for Road Traffic Injury Prevention.* Geneva: WHO.

Wundersitz, L. (2011). *Best Practice in OHSW Mass Media Campaigns.* Adelaide: Centre for Automotive Safety Research.

Wundersitz, L. & Baldock, M. (2011). *The Relative Contribution of System Failures and Extreme Behaviour in South Australian Crashes.* Report 092. Adelaide: Centre for Automotive Safety Research.

Zaal, D. (1994). *Traffic Law Enforcement: A Review of the Literature.* Report No. 53. Melbourne: Monash University Accident Research Centre.

CASR Road Safety Research Report | What can work health and safety learn from road safety?

59