

# SUPPLY CHAINS AND NETWORKS



Michael Quinlan – July 2011

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# Supply chains and networks

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## **PROJECT BACKGROUND**

This paper was initiated as part of the development of the Australian Work Health and Safety Strategy 2012–2022 (Australian Strategy). Supply chains and networks have been identified as important and potentially effective means for achieving positive health and safety outcomes, particularly in hard-to-reach small businesses. The purpose of this paper is to critique current evidence and concepts on supply chains and networks as they apply to work health and safety in the transport, agriculture, construction, manufacturing, and health and community services sectors, as well as any other relevant examples. The paper focuses on the labour side of supply chains, and not the plant, equipment and substances aspects.

## **EXECUTIVE SUMMARY**

Supply chains are an elaborate set of successive contractual arrangements designed to provide a good or service for a principal organisation such as agricultural produce to a large supermarket chain. The succession of contracts is not simply the result of uncontrolled subcontracting; rather, a supply chain is a network, with contract conditions and oversight so that the principal can retain control of the quality and timeliness the goods provided. Supply chains can be either national or international.

Supply chains can enable buyers to assume a dominant market position where they could dictate critical aspects of production and service delivery (notably cost and timing), which can result in poor work health and safety outcomes in supplier firms.

Supply chains typically involve subcontracting, and can entail movement of work into the home (including homecare).

The research into work health and safety in small business often ignores that many small businesses (from farms to electronic service providers) operate at bottom of a supply chain and the resulting contractual arrangements play a pivotal role in affecting working conditions.

Likewise, research into the health and safety experiences of vulnerable workers such as immigrants and children often overlooks that they are congregated in jobs at the bottom of supply chains.

The outsourcing or subcontracting of work typically involves the use of contingent workers such as self-employed subcontractors, home-workers, labour hire and casual employees (including seasonal labour), foreign guest-workers and (especially in developing countries) informal sector workers and child labour. These work arrangements are clustered at the bottom of the supply chain.

Influencing supplier health and safety management is more effective where it is supported by adequate monitoring and penalty regimes and where it occurs within collaborative and trust-based supply relationships.

Three aspects of supply chains affect health and safety:

1. the economic and reward pressures that become successively greater towards the bottom of the supply chain
2. disorganisation due to the small size of the work setting, use of precarious workers, the fragmented and complex nature of production, and the inability of workers to organise to protect themselves; and
3. regulatory failure due to jurisdictional gaps (especially when international supply chains are involved).

Those at the bottom of the supply chain often have little if any scope to respond to work health and safety requirements.

While supply chains have the potential for positive effects on health and safety at work, much of the available research across a range of industries—such as transport, construction, manufacturing, community services and agriculture—has found that the subcontracting and other aspects of work arrangements associated with supply chains have had a negative effect on work health and safety.

### **Issues for consideration in the Australian Strategy**

Supply chains can leverage good health and safety practices amongst firms in dependent positions (as with quality and timeliness of supply). Corporate social responsibility (CSR) leverage tools include procurement strategies and protocols; licensing/ certification and competency assurance; communication and contractual oversight; and monitoring and auditing.

Challenges to policy-makers include the very complexity of the arrangements and the difficulty of identifying all elements in the chain—exacerbated when some organisations have multiple legal trading identities, where some links in the chain are small/fluid or go in or out of business on a regular basis, or where work is carried out in remote and difficult-to-find locations. Where supply chains extend beyond the bounds of a jurisdiction or internationally these problems are magnified, regardless of legal requirements.

Responses to problems caused by supply chains include community responses; adoption by some corporations of ethical or CSR codes for labour and work health and safety standards of their domestic and international suppliers; 'light touch' regulatory regimes by governments and international agencies to encourage improved labour standards, including work health and safety; the setting of minimum labour standards as a condition of tender for subcontractors; and finally, mandatory regulatory requirements.

Supply chains represent a challenge to existing regulatory regimes and health and safety inspectorates. However, introduction of 'person conducting a business or undertaking' and 'workers' in the general duty provisions under the model work health and safety legislation have the potential to help address these challenges.

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## ***INTRODUCTION***

Supply chains refer to a networked succession of contracts designed to provide a good or service for a principal organisation such as the provision of agricultural produce to a large supermarket chain, the transport of goods or the provision of garments to a fashion retailer.

While there is a growing body of research into the health and safety effects of supply chains there is limited direct evidence based on systematic research. There is, however, a large body of indirect evidence on a number of industries and this evidence tends to suggest a consistent pattern of effects relating to safety and health (both physical and mental) outcomes.

## ***WHAT ARE SUPPLY CHAINS?***

Supply chains refer to an elaborate set of successive contractual arrangements designed to provide a good or service for a principal organisation such as the provision of agricultural produce to a large supermarket chain, the transport of goods or the provision of garments to a fashion retailer. A key aspect of the supply chain is that the succession of contracts is not simply the result of uncontrolled subcontracting. Rather, a supply chain is a network with contract conditions and oversight so that the principal can retain control of the quality and timeliness of the goods provided (such as just-in-time delivery to avoid warehousing costs).

The arrangements are generally elaborate in the sense that they can entail a significant number of steps (contracts) between the originator and the actual producer of the good or service (seven or more steps is not unusual in fashion garment supply for example). The multi-tiered contracting involved is also often a pyramid with numerous producers at the bottom (such as farmers) moving through various intermediaries to a final single consumer (such as a large retailer). Supply chains can be either national or international; the latter has become increasingly common. Supply chains are not a new phenomenon but, they have become more prevalent over recent decades, spawning their own field of specialist debate and study (for example organisations have been formed to represent the logistics industry and there are now research journals dealing with supply chains and logistics).

## ***HOW DO SUPPLY CHAINS AFFECT WORK HEALTH AND SAFETY?***

There is a growing body of research into the health and safety effects of supply chains. In a review undertaken for the Institute of Occupational Safety and Health, Walters & James (2009) identified 250 studies, most dealing with the indirect effects of supply chains on health and safety. Noting that supply chains enabled buyers to assume a dominant market position where they could dictate critical aspects of production and service delivery (notably cost and timing), they found there was substantial evidence that this made a significant contribution to poor work health and safety outcomes among supplier firms. Summarising their findings Walters and James (2009:8-9) observed:

...the research reviewed suggested that the precise effects of supply chains can vary, even within the same sector of activity, as a result of differences in such factors as the attitudes and objectives of both buyers/clients and suppliers, the balance of power that exists within the relations of supply, and the degree to which these relations are based on trust and mutual co-operation. It also, however, further suggests that the potential which exists to use supply chains as a source of improved health and safety is unlikely to be widely harnessed on the basis of narrow, market based business considerations alone. The wider supply chain literature reviewed, for example, was found to indicate that proactive, voluntary, attempts on the part of buyers to protect and improve health and safety standards in their suppliers, are likely to be relatively uncommon, and to be concentrated in supply relationships where these standards are of high relevance to the satisfactory delivery of demanded goods and services. Meanwhile, the best examples identified of supply chains being used to positively influence health and safety were found to exist in contexts where action of this

type was encouraged and supported by external pressures stemming from wider social, political and regulatory sources that serve to engender 'reputational risks'.

There have been other reviews of research dealing with aspects of work organisation associated with supply chains such as the extensive subcontracting of work. Supply chains typically involve subcontracting, and can entail movement of work into the home (including homecare). There is a body of international scientific research into the health and safety effects of subcontracting and the shifting of work into home-based settings. In 2008 a review of this research was undertaken which, after imposing a series of quality filters, obtained 25 studies—16 of outsourcing and 9 of home-based work. Analysis revealed that 92 per cent of the studies found poorer work health and safety outcomes (using a range of measures) and two studies had mixed results (Quinlan and Bohle, 2008). Importantly, no study identified either no effect or a positive effect on work health and safety outcomes.

Some existing bodies of work health and safety research have unfortunately ignored relevant supply chain aspects or only touch on it tangentially. For example, extensive research into work health and safety in small business often ignores that many small businesses (from farms to electronic service providers) operate at bottom of a supply chain and that the resulting contractual arrangements play a pivotal role in affecting working conditions (Ram et al 2011).

Similarly extensive research into the health and safety experiences of vulnerable workers such as immigrants and children often overlook that they are congregated in jobs at the bottom of supply chains (for an exception see Benach et al, 2007). Charles Woolfson (2007) has undertaken extensive research into the health and safety effects of industry relocation and large scale movements of immigrant workers from the Baltic states to other parts of the European Union (for generally short-term jobs in harvesting, tourism etc.), finding it has been associated with undermining labour standards in both source and host countries. Sargeant and Tucker (2009) have suggested the layering of vulnerability as a useful framework for understanding the complex interconnections between precarious employment/labour market insecurity, immigrant status and inadequate regulatory protection.

Contingent work and vulnerable workers are relevant to any general discussion of the work health and safety effects of supply chains for two reasons. First, as the industry-specific evidence discussed below demonstrates, the outsourcing or subcontracting of work typically involves the use of contingent workers such as self-employed subcontractors, home-workers, labour hire and casual employees (including seasonal labour), foreign guest-workers and (especially in developing countries) informal sector workers and child labour. Second, these work arrangements are clustered at the bottom of the supply chain and often (though not always) draw on the most vulnerable groups in the labour market such as immigrants/foreign workers (including internal immigrants in countries like China), women, and both the very young and older workers.

### ***CURRENT EVIDENCE IN PARTICULAR SECTORS:***

There is evidence of supply chain effects on work and health in a range of industries or economic sectors.

#### **In the transport sector**

There has been research along with an extended public policy debate with regard to supply chains in the road transport sector, particularly long haul freight. Studies (Mayhew & Quinlan, 2006; Saltzman & Belzer, 2007) have linked client demands for tight time schedules, long hours (and poor queuing practices that reduced opportunities for drivers to rest) and low returns (as elaborate pyramid subcontracting is used to reduce freight rates/returns to drivers). In turn, the intensification of these pressures in an already competitive industry has resulted in unsafe and unhealthy work practices such as excessive hours of work, increased use of kilometre or trip-based payment systems, speeding, drug use (to combat fatigue) and cuts to maintenance. For example, large studies by Williamson and colleagues (Williamson et al, 2000; Williamson, 2007)

found an association between contingent/trip-based payment and both fatigue and drug use. In Australia (National Transport Commission, 2008) other evidence (coronial investigations, court proceedings etc.) has reinforced the connection between pay (including rates paid to self-employed drivers) and safety. In the United States (US) too extensive research has established a clear link between low pay and poorer safety outcomes in road freight (see for example Rodriguez et al, 2006). There has been far less research into the effects of outsourcing on short-haul/light truck driving or passenger services although one Danish study (Netterstrom & Hansen, 2000) found that the outsourcing of bus driving operations had a significant adverse physiological effect on drivers.

Supply chains have been increasingly used in other modes of transport including rail as a result of privatisation (Baldry, 2006). Walters and James (2009:99) identify maritime transport as perhaps the most extreme example in this regard. The industry has experienced major changes to its workforce and how it is recruited (notably via crewing agencies—the equivalent of labour hire firms) to the ownership of ships (increased use of flag of convenience and second registers), and to freight handling methods (such as containerisation). Seamen are recruited from third world countries (for example the Philippines) by crewing agencies under short term contracts to work on ships managed by ship management companies. Their

working conditions are extreme by land-based standards, involving long working hours, shift work and intensive work patterns as well as serious physical hazards (Walters & James, 2009:99).

Drawing on an array of evidence Walters and James (2009:99-100) go on to argue that the key role of merchant shipping in global supply chains has resulted in work intensification (smaller crews, faster ships, containerisation, shorter turn-around times) which in turn has resulted in high morbidity and mortality rates. The consequences of these changes

are further seen in the high incidence of shipping incidents ascribed to seafarer fatigue, and the range of psycho-social health effects caused by working patterns and the social isolation experienced among seafarers, both at sea and in modern port facilities (Walters & James, 2009:100).

There appears to be no parallel research in air transport although the Australian Research Council has recently funded a project to examine the skill and safety effects of the outsourcing of heavy aircraft maintenance by a research team at the University of New South Wales.

As in a number of other industries such as agriculture work health and safety is but one of a range of related concerns (including environment and security issues) that have arisen in connection to supply chains in the transport sector (Belzer & Swan, 2011).

### **In the agriculture sector**

Supply chains are a well-established feature of the agriculture/horticulture industry, including long-standing methods that are particular to individual countries (such as the gang-master system in the United Kingdom (UK) which originated in the early 19<sup>th</sup> century if not before). While supply chain research in the agriculture industry largely focuses on food safety issues some studies have examined changes in working conditions. For example, a study by Rogaly (2008) of the British horticulture industry highlighted the increased use of immigrant workers under the gang-master system as one element of the intensification of production and concentration of retailer power (which placed stringent quality controls on producers that were passed on to workers through the imposition of penalty systems). There are studies of health among contingent agricultural workers however, such as a study of health among immigrant workers on organic farms in the UK (Cross et al, 2008). On occasion government reports have pointed to the implications for the health and safety of roving gangs of 'harvest labour', especially those that are family-based. For example the use of children in casually employed immigrant family groups of farm-workers (mainly working on crops) in the southern US was investigated by the US Government Accountability Office (2000:6)



which found clear evidence of children as young as six years being employed and who were subjected to serious health risks from exposure to pesticides.

There appears to be no parallel evidence on supply chains and work health and safety in the agriculture sector in Australia (a study of subcontracting and hazard exposure in horticulture is about to commence) although there is a growing awareness of rural/agriculture work health and safety more generally. What is notable is that the workforce is geographically isolated and in some areas at least (the same point can be made with regard to regionally based food processing) increasingly composed of potentially vulnerable foreign workers (such as s457 visa holders, Pacific Islanders and backpackers). Several studies have made reference to serious incidents involving foreign workers engaged in harvest activities (such as s457 visa holders) as well as an effort to provide work health and safety information to these workers by several state inspectorates (Quinlan, 2004; Guthrie & Quinlan, 2005; Toh & Quinlan, 2009).

The problems just described can be magnified when production is outsourced to poor countries with weak regulatory regimes. For example one study found that the US and several other developed countries continued to produce and export dibromochloropropane (DBCP) and other banned pesticides to developing countries where their use is still permitted, including countries where children were engaged in spraying. This together with the complex subcontracting networks of small jobbers used to sell the pesticides to local growers (who may also be contractors) meant sales often proceeded without the barest safeguards to minimize health effects of spraying (for this and other evidence see Benach et al, 2007).

### **In the construction sector**

Elaborate subcontracting networks are a centuries-old feature of construction although the length of these chains has arguably increased with the increased use of materials manufactured off-site and associated changes in mass assembly construction techniques (such as the use of tilt-up construction). A number of studies in the US, UK, Australia and elsewhere (see for example, Glazner et al 1999; Quinlan and Bohle, 2008) have linked subcontracting to poor work health and safety outcomes as well as poor incident and injury reporting practices. The situation appears to be especially acute where foreign workers, especially those with limited residency rights (such as guest-workers) or illegal/undocumented workers are involved (Toh & Quinlan, 2009).

In their own review Walters and James (2009:97) concluded that wider

studies of subcontracting and management arrangements for health and safety in the construction industry from a variety of countries, as well as of contractor selection and the management of small building works, have similarly suggested that poor health and safety outcomes may be related to failures to manage supply chains effectively. As have repeated Government commissioned inquiries into the performance of the industry, trade union publications, the recommendations of parliamentary Select Committees and other independent reviews.'

### **In the manufacturing sector**

Supply chains are a long-established feature of the production of some items such as garments, textiles and leather goods and have become more dominant in areas like food processing (Benach et al 2007). A study of clothing outwork in Australia found that cost, quality and time pressure from major retailers/fashion-houses cascaded through a series of subcontracting arrangements resulting in the mainly immigrant workforce experiencing low pay, long hours and pressure from 'middlemen'. Comparing outworkers to a similar group of factory-based workers, the study (Mayhew & Quinlan, 1999) found the former reported three times as many work-related injuries and were also subjected to more threats and abuse (from middlemen). In a study examining three meat processing plants in the UK Lloyd and James (2008:713) found that there were widespread problems of ill-health associated

with repetitive and, in some cases, heavy work regimes. Supermarkets play a contradictory role in that they provide incentives to improve health and safety while at the same time their price and delivery demands have a detrimental impact.

Small retailers and franchise operations also increasingly rely on supply chains such as the provision of pre-prepared sandwiches into coffee shops but this area has received little attention from researchers (Holgate, 2005).

Elaborate networks of subcontracting to home-based production can be even found in advanced electronics. For example, in 1999 a joint state and federal Labor Department and Occupational Safety and Health Administration (OSHA) taskforce was established to investigate contractors to major electronics firms in Silicon Valley that were paying Asian immigrants piece-rates to assemble electronic parts in their homes. The state agency probe identified widespread underpayment, and media accounts of insecurity, piecework, the use of child labour, and hazardous work practices would have had a familiar ring for readers a century earlier (Quinlan, et al, 2001).

Multi-tiered subcontracting has been linked to catastrophic incidents in major hazard facilities such as chemical factories and refineries (and other types of workplaces such as offshore oil rigs). For example, a parliamentary inquiry identified the fracturing of responsibility related to subcontracting as a leading cause of an explosion at the AZF chemical factory in Toulouse France in 2002 which killed 30 people, including 21 workers—13 of whom worked for subcontractors.

### **In the health and community services sector**

Outsourcing of activities (such as catering and laundry) as well as the use of agency labour in nursing and homecare (sometimes as employees and other times as self-employed contractors) has become increasingly common in the health and community service sector. A review of available international research found that the outsourcing of homecare health, aged care and disability services was typically associated with a deterioration of work health and safety outcomes (Quinlan & Bohle, 2008). Increased interest in the homecare sector reflects concerns with work health and safety and other effects (such as service cost, quality and effectiveness) in the context of an emerging debate over outsourcing, de-institutionalisation and healthcare provision policies which have played a significant role in the growth of home-care (Cloutier et al 2008; Mancinati, 2008; Amorim & Dimenstein, 2009; Gong et al 2009).

There has been little research into this in Australia. A report on self-employed labour hire workers engaged in disability and aged homecare prepared for the South Australian Office of the Employee Ombudsman (Bohle et al, 2009) identified problems with irregular hours, failure of agencies to carry out risk assessments prior to placement, failure to inform workers of hazards, the absence or inadequacy of OHS policies & procedures, the absence or inadequacy of OHS training and uncertainty about workers' compensation entitlements. This pilot study is being followed up with a more extensive independent study by researchers at the University of Sydney funded by the Australian Research Council.

### **Other examples**

Supply chains have become a prominent feature in a wide range of other industries, including hospitality, defence, mining, cleaning and information technology (for evidence on outsourcing by industry see Walters and James, 2009). For example, the labour hire agency labour is now extensively in room cleaning in hotels (for study of health and safety among hotel cleaners see Siefert & Messing, 2006). Unfortunately in a number of these there is little or no research into the health and safety effects. This is the case with defence although there is growing public debate about the effectiveness of extensive outsourcing of maintenance and other activities, and subcontracting has been linked to serious incidents such as the fatal fire on the *Westralia* (Johnstone et al, 2001). Overall, there is less evidence on the work health and safety effects of

supply chains in the service sector, including increasingly prominent ones like the outsourcing of call centre activities to India.

The evidence that does exist for other industries is broadly consistent with that already described in relation to industries like agriculture, construction, manufacturing, transport and community care (see for example a Finnish study of injuries across a range of industries by Salminen et al 1993). In mining—as in construction, major hazard facilities and offshore oil and gas rigs—the health and safety problems that can be posed by subcontracting have been identified by both research (see for example a Swedish study of mining by Blank et al, 1995) as well as investigations into serious incidents and government reports (Western Australian Prevention of Mining Fatalities Taskforce, 1997; McAteer, 2001). The introduction of the internal control regulatory regime in Norway was in part a specific response to the breakdown of work health and safety on oil rigs highlighted by the Alexander Kjelland oil rig disaster (Lindoe in Frick et al, 2000).

Waste disposal, including hazardous waste disposal, has also been an activity where extensive outsourcing and subcontracting has occurred. A Norwegian study found that the privatisation/outsourcing of refuse collection had adverse effects in terms of health and safety, including stress and sickness leave (Saksvik & Gustafsson, 2004; Gustafsson & Saksvik, 2005). A recent UK study (Hinks et al, 2009) found substantial differences in the understanding of safety labelling for chemical disposal amongst groups representing four tiers in the chemical supply chain (manufacturers, vendors, workers and consumers). This finding raises obvious concerns about the implications for both work and environmental health and safety.

The last point is relevant to another area of supply chain relationship with potentially serious consequences for safety and health identified by Walters and James (2009:112), namely the supply and use of hazardous substances such as toxic chemicals. Pointing to the widespread use of chemicals, their proliferation and limitations in knowledge as their health effects they observe:

Hazardous substances are supplied for use in many workplaces. If used appropriately, the risks to health represented by their hazards can be minimised. However, this requires certain preconditions concerning the effectiveness of risk communication to be present in the supply chain between suppliers and users. Key factors in influencing the existence and operation of these preconditions in the business relationships involved would seem to be the dependency of one end of the supply chain upon the other and the unevenness of the market power wielded at each end... It has been estimated from EU aggregate data that nearly one third of all occupational diseases recognised annually in the EU are related to chemical substances. Accidental workplace exposures to larger quantities may also have more acute toxic effects, including poisoning, burns and asphyxiation.

## **Conclusion**

Overall, there is limited direct evidence on work health safety in supply chains based on systematic research. There is, however, a large body of indirect evidence pertaining to a number of industries and this evidence tends to suggest a consistent pattern of effects relating to safety and health (both physical and mental) outcomes. This paper reviewed the evidence relevant to the scope of a discussion of the work health and safety effects of supply chains.

Drawing the available evidence together, there appear to be three aspects of supply chains that affect health and safety. First, the economic and reward pressures (low or irregular rewards, time constraints, overload) that become successively greater towards the bottom of the supply chain (these are not contracts between equals in terms of power) can lead to compromises of safety and health. Second, these arrangements appear to often entail an element of disorganisation due to the small size of the work setting, use of precarious workers (including temporary immigrants and subcontractors) and the disarticulation of any overall health and safety management regime due to the fragmented and complex nature of production and the inability of workers to organise to protect themselves. Third and finally, there exists an element of regulatory failure due to jurisdictional gaps (especially when international supply chains are involved). The very complexity

of these arrangements is conducive to regulatory ambiguity and risk-shifting; and the scattered location of workplaces also presents a serious challenge to regulatory agencies with limited resources. Again, vulnerable workers can find it difficult to assert their rights under health and safety legislation even if they are fully conversant with them.

Bringing a number of these points together, what the evidence repeatedly shows is that those at the bottom of the supply chain have little, if any, scope to respond to work health and safety requirements, even where regulators may be involved. Again, this has clear implications for improving work health and safety in small businesses who—be they a farmer, manufacturer, franchise operator, labour hire firm or self-employed subcontractor—are often at the bottom of a supply chain. Research also highlights the power hierarchy inherent in most if not all supply chains and suggests a more effective approach to improvement could be made at the peak or at least higher up the power hierarchy.

At the same time, supply chains cannot be ignored in policy interventions, given their increased centrality to modern work arrangements and the evidence of their adverse effects. Indeed supply chains could provide a focal point to address the problems associated with them. They could provide an effective means of improving work health and safety, particularly in small and micro businesses, as well as addressing the work health and safety problems confronting especially-vulnerable groups of workers in the community.

### ***BARRIERS AND ENABLERS***

In their report and subsequent article Walters and James (2009, 2011) note that supply chains simultaneously afford both potential enablers and barriers in relation to enhancing health and safety.

On the one hand, supply chains can provide a useful means of leveraging good health and safety practices amongst firms in dependent positions (mirroring what already often occurs in relation to quality and timeliness of supply). Such an approach could encourage key players to voluntarily promote a business case for good practice rather than relying on regulation. In dealing with the 'new economy' such an approach can also be used to access the 'hard to reach' (large numbers of small and geographically dispersed suppliers including those working at home) and address networks of production and services rather than traditional employer/employee relations. This approach also has the potential to bypass jurisdictional limits to regulation and relieve demands on poorly resourced inspectorates.

Commonly linked to corporate social responsibility (CSR) the types of tools typically deployed in this regard include procurement strategies and protocols; licensing/certification and competency assurance; communication and contractual oversight; and monitoring and auditing. On the other hand, as Walters and James (2009) also observe there is also a growing body of evidence on the limitations of CSR-based approaches, namely that they do not secure universal/pervasive coverage; monitoring/auditing/enforcement is often inadequate; there are issues with performance indicators and problem shifting; schemes can be undermined by secret outsourcing or corruption; and that schemes are not an alternative to mandatory regulation (see also Benach et al, 2007 and next section).

Reviewing the available evidence, Walters and James (2009, 2011) concluded that influencing supplier health and safety management was more effective where it was supported by adequate monitoring and penalty regimes and where it occurred within collaborative and trust-based supply relationships. Such conditions were in turn more likely to exist where buyers and suppliers have worked together for a relatively long period; the wider institutional context was supportive of them; and there was some form of regulatory scrutiny in place. Alternatively, efforts to influence supplier health and safety management were less successful where risks of non-compliance were seen as relatively low by suppliers; and where regulatory oversight was minimal/sanction-free or compliance essentially voluntary. The most difficult case of the latter were global supply chains

because labour standards were excluded from trade and commercial agreements (WTO/ILO), unenforceable and have been labelled as ‘hidden protectionism’ (Walters & James, 2009; Benach et al, 2007).

### ***POLICY IMPLICATIONS AND RESPONSES TO CONCERNS***

Dealing with any adverse effects of supply chains on health and safety presents serious challenges to policy makers. These include the very complexity of the arrangements and the difficulty of identifying all elements in the chain—exacerbated when some organisations have multiple legal trading identities, where some links in the chain are small/fluid or go in or out of business on a regular basis, or where work is carried out in remote and difficult to find locations (such as home-based work or small workshops). Where supply chains extend beyond the bounds of a jurisdiction or internationally, these problems are magnified even where there is some overarching legal requirement for work health and safety (as in European Union), but worse where this doesn’t apply. In some cases even the principal’s efforts to maintain work health and safety standards among its suppliers can be undermined by a combination of poor standards in the country of source and corruption/regulatory failure. But the more general point to be made is that at present there are no effective mechanisms to protect labour standards (including work health and safety) in either developed countries or those where production or service provision has been ‘off-shored’ (Benach et al, 2007; Singh, 2007). While the International Labour Organisation has sought to develop global standards on decent work, maritime working conditions and home-based work, and to assist with the harmonisation of global practices in relation to chemical safety (Obadia, 2003), there are no enforcement mechanisms (including sanctions or incentives) to secure any baseline observance.

The problems that can be posed by supply chains, including exploitation and health and safety problems have spawned a number of responses. First, community groups, including religious bodies and ethnic associations, unions, and NGOs, have sought to garner public support (including consumer boycotts) to pressure industry and government into taking action on the worst abuses of employment practices in both developed and developing countries. Examples include informal worker alliances in developing countries and the “fair-wear” garment workers and anti-child labour campaigns in Europe, the US, Latin America, and Australia.

Second, of their own volition or in response to community pressure, a number of private corporations (such as large retailers) and NGOs have adopted ethical or CSR codes in relation to labour and occupational health and safety standards of both their domestic and, more importantly in the case of developing countries, international suppliers. A study by van Tulder et al (2009) highlighted the role that regulatory environment and unions influenced the presence of work health and safety provisions. They compared the inclusion of work health and safety issues in the codes of conduct of 30 companies involved in International Framework Agreements (IFAs) between unions and multinational enterprises with those of a benchmark sample of thirty-eight leading Multinational Enterprises in comparable industries. The study found IFA codes were more likely to address work health and safety and these codes were most likely among firms based in the EU (the leading region in terms of ratifying ILO conventions), leading them to conclude ‘there is a relationship between home country regulation and international supply chain strategy’.

Beyond the inclusion of health and safety provisions, compliance with voluntary codes has often been problematic due to less than rigorous monitoring and enforcement on the part of the corporation or evasion on the part of suppliers—frequently a subcontractor multiple steps removed from the original contract (Jenkins 2001; Locke et al. 2006; Fig, 2007; Utting 2007; Lum 2003). Sometimes evasion occurs with the active connivance of government officials in the country/region where outsourcing has relocated production or service delivery (Benach et al, 2007). Evidence indicates voluntary codes, though of some value especially in terms of initiating international protocols, are not an alternative to mandated standards due to serious limitations in coverage and compliance (Sobczak 2003; Pattberg 2006). For example, a recent review of

voluntary labour initiatives in the global banana trade (Robinson, 2010) found that while some improvements had occurred, ongoing efforts by major retailers to drive down costs continued to compromise the working conditions of already vulnerable workers in third world countries.

Third, governments and international agencies have developed 'light touch' regulatory regimes (relying primarily on incentives or voluntary industry codes) to encourage improved labour standards, including work health and safety, in supply chains. One approach has been for governments to set minimum labour standards as a condition of tender for subcontractors they engage. A longstanding example is provisions to this effect in the *Fair Labor Standards Act* (FLSA 1938) in the US. A more recent example is that of the Federal Safety Commissioner in Australia which seeks to enforce work health and safety in the construction industry through the supply chain via an audited accreditation scheme on all government work over a certain value. The Commissioner has periodically updated audit assessment criteria. These systems only apply to government tender work (of itself substantial but leaving private tender work untouched). Further, to be effective such systems require rigorous oversight and enforcement with serious sanctions for those failing to comply. In the US there is evidence (including a review undertaken by the Government Accountability Office) of widespread abuse/evasion of the requirements by contractors (Johnstone et al 2001). This is not to suggest such problems must invariably apply. However it does suggest systems similar to those of the Federal Safety Commissioner can benefit from independent evaluation.

Another recent example of was the establishment of the Gangmasters Licensing Authority and development of a code for food suppliers in the UK following public outcry over the drowning of a group of Chinese cockle pickers in Morecombe Bay. However, as Walters and James (2009:105) observe, this initiative has had limited effect, with the Authority itself acknowledging limitations in its ability address a wide array of complex arrangements and its limited reach either as a regulator/adviser. Similarly, the United Nations Global Compact on corporate citizenship is essentially a voluntary exercise and, while formally targeting both forced and child labour (found at the bottom of a number of supply chains), has not addressed gender inequality in developing countries even though women make up a disproportionate share of precarious and informal employment (Kilgour 2007). Nor does the system have any mandatory aspect, and as a result it suffers the limited reach of other essentially voluntary approaches (Benach et al, 2007).

Fourth and finally, beyond these voluntary measures there are mandatory regulatory requirements. At one level, the general duty provisions of work health and safety legislation in Australia, the UK and a number of other countries clearly address contracting relationships, including labour hire. The model work health and safety Act includes principal contractor duties that enunciate a clear set of responsibilities with regard to subcontractors. This approach has been longstanding in some jurisdictions (such as Victoria and Queensland) and provided a template for managing complex subcontracting arrangements that has been introduced with some success in the construction sector—at least on larger construction sites. Efforts were also made in Queensland to address the residential building sector by requiring all builders to prepare a safe work plan prior to commencing a project. This approach might serve as a model for other industries. At the same time there has been recognition of the difficulty of regulating multiple multi-tiered subcontracting where work is being carried out in a large number of remote or difficult-to-find locations and where the 'principal contractor' is not readily identifiable.

In response to the latter, there have been a number of more targeted efforts to impose a mandatory regulatory regime on supply chains in order to protect the health, safety and wellbeing of workers. These have extended to the general duty provisions on subcontracting just described, as well as recognising the need to integrate or dovetail requirements under work health and safety, industrial relations and workers' compensation legislation. Several innovative examples of this can be found in Australia (Quinlan and Sokas, 2009). For example, laws introduced to protect clothing outworkers in Australia not only mandate and integrate minimum labour standards (wages, hours), work health and safety, and workers' compensation entitlements but focus legal

responsibility at the top of the supply chain or subcontracting pyramid (in this case, fashion houses and retailers) rather than on “middlemen” intermediaries. Compliance is ensured through a notification regime (entailing union involvement) that matches each stage of commercial contracting arrangements with presumptive obligations<sup>1</sup> so as to discourage evasion (Nossar et al 2004).

A similar though less-developed regulatory regime has been introduced into the long-haul trucking industry which includes a NSW-based fatigue regulation and industrial award as well as a national safe payment regime for both employed and self-employed truck drivers (James et al, 2007; National Transport Commission, 2008). There is now an array of state and federal regulatory requirements which impose a ‘chain of responsibility’ with regard to fatigue, overloading and speeding. The notion of imposing a chain of responsibility has also been picked up in Europe and North America (see for example, Pratt, 2011; Plehwe, 2011).

In March 2012 additional measures to regulate supply chains were undertaken at the federal level in Australia with the introduction of the *Road Safety Remuneration Act* (setting ‘safe rates’ for both self-employed and employee truck drivers) and the *Fair Work Amendment (Textile, Clothing and Footwear Industry) Act* (protecting home-based outworkers). Both sets of legislation represent innovative efforts to protect the health and safety of vulnerable workers at the bottom of supply chains.

Yet another example has been an industrial award designed to protect subcontracted operators in the cash-in-transit industry. In keeping with observations made earlier about barriers and enablers, it is important to note that the clothing outworker and transport initiatives were the result in no small way of a community mobilisation and union campaign, and there is a level of independent scrutiny to reinforce implementation of the process (Kaine & Rawling, 2010; Quinlan & Sokas, 2009). While the initiatives just outlined (and others) may seem exceptional, a number simply build on “supplier” obligations already found in the general duty provisions of work health and safety legislation in Australia and other countries, or more general requirements with regard to risk assessment or transport safety.

Recent chemical controls in the European Union (REACH) also have important supply-chain provisions affecting smaller operators, and the European Chemicals Agency has produced detailed guidance material for downstream users on its implementation (ECHA, 2008). As with other initiatives mentioned, these developments have encountered opposition from some industry groups and attempts to “water down” requirements (Watterson, 2006). The implementation of risk management amongst small operators has also proved challenging (Walters, 2008). In the US a mixture of safety, security and environmental concerns, and community mobilisations associated with this, were the impetus for intervention in relation to trucking on west coast docks (Quinlan & Sokas, 2009; Belzer and & Swan, 2011). Weil (2009) provides a valuable overview of sector-based initiatives to protect vulnerable workers where supply chains play a critical part. Taken as a whole, the mandatory regulatory regimes avoid the limitations of voluntary schemes identified above but the effectiveness of their implementation requires investigation—something that might also identify areas where improvements could be made and broader lessons to be learned from supply chain regulation.

In addition to the responses just mentioned there is a growing recognition that supply chains represent a challenge to existing regulatory regimes and health and safety inspectorates. For example, the more fractured work arrangements and use of ‘non-employees’ creates difficulties in terms of the traditional framework of employer-focussed duties and employee-focussed

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<sup>1</sup> The top of supply chain is presumed to be responsible for any unpaid wages or workers' compensation claims (to stop risk shifting). The technique of rebuttable presumption (with regard to disputed wages and workers compensation claims) ensures that the top of the supply chain (mostly fashion houses and retailers) cannot escape their legislative responsibilities. (Johnstone et al, 2012)

participation/consultation mechanisms under work health and safety legislation in Australia, New Zealand and elsewhere (with regard to the latter see Johnstone et al 2005). At the same time, the focus on the person conducting a business or undertaking' and 'workers' in the general duty provisions under the model work health and safety legislation has the potential to address these issues.

Supply chains can be seen as part of broader changes to work organisation that are receiving increased attention from regulators in Australia (Quinlan et al, 2009) and elsewhere. For example, the European Commission has initiated a project to examine how labour inspectorates deal with new and emergent health risks, including those associated with supply chains and other changed work arrangements. Responses by inspectorates include the preparation of guidance material and codes of practice, other efforts at information provision and targeted enforcement/prosecutions (for example on the use of labour hire in industries like manufacturing and agriculture).



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