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ORIGINAL ARTICLE

The economics of occupational health and safety

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Abstract

This special Themed Collection of The Economic and Labour Relations Review examines the 'Economics of Occupational Health and Safety' (OHS). The economics of OHS looks at how economic structures and incentives, including labour markets and production processes, influence the health and wellbeing of workers and the communities where they live. It is a large and diverse subject that has been viewed from multiple different lenses. This thematic issue can only touch on some of these but will remind readers how economic incentives and industrial competitive pressures affect OHS. This editorial will take the form of an article which explores some of these intersections and places them in a wider context. To do this, the economics of OHS will not only be examined in terms of economic welfare and microeconomics at the industry and workplace level, but also from an historical perspective, as well as the intersection of these levels, thus providing a useful framework to shape research and discussion.

Keywords: occupational health and safety; history of safety regulation; trucking / long distance truck drivers; economics of industrial safety; industrial/employment relations policy; long-distance truck drivers; safe rates; contract employment

JEL Codes: J28; N30; R41

Introduction

Occupational health and safety (OHS) traditionally has been understood as derived from specific industrial practices and risks present in the workplace, drawing on disciplines like psychology, ergonomics, industrial hygiene, engineering, law, economics, industrial relations, and sociology. The relative contribution of these disciplines has varied over time, with psychology occupying a more dominant influence in recent years. Overall, the discipline of economics has been a modest influence on the field, with contributions ranging from those seeking to explain OHS in terms of the behaviour of individuals within markets to the more critical political economy of OHS literature of Carson and Nichols (see Nichols and Walters 2013), which argues that OHS is shaped by the social relations of production under capitalism. The economic approaches to OHS in the papers in this issue identify externalities and suggest that incomplete market analysis has created an inappropriate permission to ignore uncompensated costs in labour, product, and service markets; these incomplete markets lead to greater social risk as well as inefficiency. More integrated understandings of OHS are challenging but research performed without them leads to narrow and partial understandings. One might, for example, focus on worker fatigue due to excessively long work hours without addressing the underlying economic forces motivating either these drivers to work long hours, or the firm to permit or

encourage the worker to work excessively long hours. We need to understand the systematic economic forces – the interests of both principals and agents – that motivate these long hours, which lead to fatigue with both safety and health consequences. In other words, without this understanding we tend to overlook the economic framework within which the work takes place.

This paper is divided into a number of sections. The first section of the paper provides an overview of how economics intersects with OHS, focusing on the national and global level including the impact of supply chains. The second section demonstrates why it is important to put these understandings into a historical context and some of the important insights that can be drawn from this, including the impact of neoliberal policies. The third section then focuses on economic interactions with OHS at the industry and workplace level. Reference is made to other papers in this theme at relevant points but especially in Sections 1 and 3. In so doing, the paper tries to contribute to a number of critical policy debates as well as how and why recognising economic influences on OHS, and vice versa, is important.

The economic dimension of OHS

In some academic disciplines, scholarly effort is limited to understanding environmental influences or work processes. While these are important, they tend to look downstream of the root cause and, in so doing, overlook the markets and business processes that lie upstream; it is these latter which create risk factors and cause the industrial community to accept and internalise certain practices as merely an inherent element of the acceptable set of risks associated with the work. Research findings aimed downstream suggest ways the worker as an individual can mitigate issues such as the effects of working excessive hours. The properly conceived economic approach, on the other hand, looks upstream at the economic forces that make the consequences of these risks inevitable (Belzer 2020). Public policy can more readily address these upstream root causes and change these outcomes systemically, by changing the regulatory framework within which these economic processes operate. This raises an important question – What underlying pressure contributed to this risk, and how should we understand the negative externality associated with this risk?

Let's start with an illustration. One well-known systematic example of this is 'lean manufacturing' specifically, and the 'lean supply chain' more generally. In the 1980s, it became fashionable to look with awe on the competitiveness of the Japanese manufacturing and distribution model. This model clearly set the tone for industrial management and advanced industrial process (Womack et al 1990), and managers rushed to implement various aspects of this system in their own operations without fully understanding the cultural and institutional context within which 'lean' was embedded. That is, the Japanese model was constructed on the *keiretsu* – a model of both vertical and horizontal monopoly that essentially wrapped corporate investment from the bank to the industrial product and its distribution into one firm that controlled the whole economic environment. This vertical and often horizontal monopoly – generally considered an illegal conspiracy in restraint of trade in the United States, Europe, and elsewhere in the neoliberal world – had a cultural dimension unique to Japan and certain other East Asian nations.[1]

While the Japanese model created a very tight cooperative bond among supply chain participants, it also created an internal regulatory process based on interlocking corporate networks that put cultural and institutional boundaries on collusion while somewhat limiting the negative consequences in the workplace. We say 'somewhat' because the Japanese process that was so productive also contributed to *karoshi* – death by overwork.

In Japan, collective bargaining is widespread, but it is embedded in an enterprise union framework incorporating all enterprises within a larger corporation and requiring significant collaboration among unions. The annual *shuntō*, or 'spring wage offensive',

involves all enterprise unions within federations of workers from each firm and industry in a nation-wide bargaining offensive that creates a structure for pattern bargaining across all sectors. While this process does not definitively create worker power, it does provide an institutional framework that creates countervailing power for the industrial process. It represents a counterweight to the institutional control of the tightly organised corporations.

We suspect that the neoliberal economic and political model has played a significant role in contributing to the negative outcomes evident in modern occupational health and safety. While lean manufacturing and tight coordination among firms have contributed significantly to productive outcomes, it has weakened the bargaining power of workers within every nation, especially in the context of the neoliberal economic and political model.

The neoliberal model undermines the ability of national institutions to govern the market process, which in turn seems to have led to worsening OHS outcomes across industries and occupations within nations and across the world. Free trade, and the free movement of goods and services as well as financial resources and investment, allows global firms to whipsaw national regulators as well as workers against one another, further putting the interests of firm profits above all other values. All of this means that the efforts of worker representatives in each firm and industry, and within countries – to the extent that they exist – will be frustrated by the fact that markets are not only global but operate within this institutional framework that companies can control and governments and regulators struggle to resist (see Slobodian 2018 for background on the intellectual framework and move to use trade and global capital mobility to weaken national worker representation institutions among others).

This is the framework that this special-themed issue attempts to address. For example, the paper by Ryley and Belzer, **Truck driver relative pay and motor carrier safety performance**, approaches the economics of safety in the US trucking industry by examining firm-level safety data from the intrastate trucking industry. It uses nationally collected firm-level safety data on intrastate trucking companies from the Motor Carrier Management Information System and combines those data with county-level median household income estimates of 'Heavy and Tractor-Trailer Truck Driver' median annual earnings estimates at the 'core-based statistical area' (CBSA) level, which includes metropolitan statistical areas (MSAs) and non-metropolitan areas. Ryley and Belzer look only at heavy and tractor-trailer truck drivers in these areas, using these data as a proxy for truck driver compensation at the local level. While the proxies are noisy, they find that 10% greater pay is associated with 2% fewer crashes. While the impact is somewhat small, the economy is at core a 'complex system' and the result is highly significant and represents real and tangible evidence suggesting that higher-paid truck drivers are safer, controlling for other available factors and putting the onus on data quality.

In their article, **The impact of the Korean Safe Rates System on work environment and road safety**, Baek, Jeong, Liem, and Kim document the results, as best as the data allow them to determine, of a trucking rate regulation policy established in South Korea in early 2020. Their task is complicated by several important factors over which they have no control. First, by law, all truck drivers in South Korea must own their own trucks but work for trucking companies just as if they were subject to employer-employee direction. We might consider them 'dependent contractors' because their 'economic employers' hold and control their truck licence as well as their access to freight and operations, so they depend on the economic employer and are indubitably not independent owner-operators. Secondly, the policy they seek to evaluate was disrupted by COVID-19 (the rate regulation policy was implemented in January 2020) and was structured from the beginning as a temporary policy; it ended automatically because the new conservative government invoked an automatic sunset clause in the law allowing them to end the policy at the end of 2022. Thirdly, the policy only covered a small fraction of the trucking industry (intermodal containers and cement haulers), and government data on traffic volume and safety did not

match the features of the regulatory change. Given all these limitations, the authors still implemented a driver survey to determine the drivers' experience and found that higher pay afforded drivers the time to rest, reduced excessive hours of work, gave them greater transparency in contracting and compensation, and reduced the pressure under which they work. All of these findings suggest that an economic approach to safety changed how they work so that the job was more sustainable.

In a *Contested Terrains* paper in this issue, entitled **No where else in the world? The Korean Safe Rates System in global context**, Liem and Baek review 'Safe Rates' campaigns and policies with a global perspective. The concept of Safe Rates was developed initially by trade unionists and their colleagues in Australia, and has since been extended throughout the world. They situate the South Korean Safe Rates campaign in the context of a global campaign in response to neoliberal deregulation that has favoured intense competition in road freight transport. They discuss the significance of the global effort as it culminated in tripartite negotiations, led on the worker side by the International Transport Workers Federation under the auspices of the International Labour Organization. They have written this *Contested Terrains* paper in part to respond to the claim made by South Korean opponents of rate regulation, who have claimed that rate floors exist nowhere else.

The U.S. trucking industry has energetically claimed that they cannot afford to pay truck drivers more money to attract experienced drivers and provide safety incentives. A large national non-union truckload company, JB Hunt, decided to take a high-road strategy and shift from hiring workers without trucking experience and training them (while paying them very low wages to offset the cost of recruiting and training) and discovered that the higher wages directly led to more than 50% lower crash rates and fatalities (Belzer et al 2002; Rodriguez et al 2003; Rodriguez et al 2006). Faulkiner and Belzer (2018) discovered that the annual net present value of these higher-paid experienced truck drivers was more than US $10,000 greater than the net present value of low-paid inexperienced drivers, because the experienced drivers consistently delivered 1,000 miles more output each month than the inexperienced drivers – making them about ten per cent more productive. They conclude that 'safety pays'. Trucking companies that insist on hiring the lower paid drivers are probably leaving US$10,000 on the table every year for every driver, which is a substantial sum. Why do they do this? Our best guess is that they are being irrational. We think the best explanation, frankly, lies in the intersection of the short-term microeconomics of their situation – their focus on profit maximising – and their ideological framework. If business is a zero-sum game, which most business leaders seemingly believe, then if they pay truck drivers more than the market clearing rate, the money simply comes out of the company's own pocket, so they behave irrationally and struggle with high turnover, high crash rates, and an inability to recruit and retain qualified truck drivers.

While the Hunt study looked at the rate of mileage-based pay (piecework), another big issue is pay for non-driving work. Surveys show that, on average, US long-distance truck drivers are forced to work about 20–25 hours per week without pay. This has been a longstanding problem that has been well documented (Belzer, 2000; Belman et al 2005; Chen et al 2015) and remains an ongoing issue (Belzer, 2024).

Unpaid work hours in trucking create a deadweight loss that reduces Gross Domestic Product while increasing risk for drivers and for society – a classic economic externality. The Inspector General of the U.S. Department of Transportation has estimated that unpaid trucker detention time is associated with higher crash rates and costs the economy billions of dollars every year. Accepting an assumption that truckers should be required to give away two hours of free time loading and two hours of free time unloading on every trip (up to four hours per day), a delay that exceeds two hours by 15 minutes is associated with a 6.2% higher crash rate. This inefficient excess detention time costs commercial motor vehicle drivers in the truckload sector between $1.1 billion and $1.3 billion annually (in 2018 US dollars). For trucking companies in the truckload sector, they estimate that

detention reduces net income by $250.6 million to $302.9 million annually (also in 2018 US dollars; Office of the Inspector General, 2018). Unpaid work time – a form of wage theft – costs drivers and firms billions of dollars a year. Every period of detention time greater than two hours also includes unpaid detention time for those two hours, and because in the U.S. interstate drivers do not have a legal right to overtime pay, the carriers have no responsibility to document that time. Unpaid work time is a negative externality, created by institutions, which creates deadweight loss in the economy.

Most recently, the US National Academies of Science, Engineering, and Medicine published a consensus report that finally dismissed as 'spurious', decades of claims by the trucking industry that they have a 'driver shortage' that requires government help to overcome. Instead, the Committee agreed with the Biden Administration, arguing that the problem is one of recruiting and retention. While the Committee lacked adequate data to confirm their view that trucking's safety risk stems from the industry's low pay, the inability to hire and retain qualified workers has economic roots. The safety problems that result from this inappropriate 'driver shortage' argument have real costs and consequences (Committee for a Study of the Impacts of Alternative Compensation Methods on Truck Driver Retention and Safety Performance, 2024)

The failure to look at the upstream economic pressures underlying the workplace causes an analytic failure that leads to an incomplete understanding of the root causes of occupational health and safety risk.

The historical and collective dimension of OHS

How societies organise themselves has profound implications for specific realms, such as the health and safety of working people. This was true for feudal society in the Middle Ages where unfree labour was the norm and for nominally communist societies in the mid-20th century – most marked by a focus on boosting industrial production. However, the slow emergence of capitalism from the 14th century in Europe, which accelerated from the late 18th century, marked a significant development because capitalism prioritised the accumulation of individual wealth along with predominantly free labour (unfree labour declined slowly, but unfree or coerced labour remains a feature today). Labour was just another commodity, albeit one explicitly subordinated in the employment relationship. Employment was and remains a contractual agreement by workers to serve a master or an employer whether it is an individual, firm or corporation, and arguably regardless of whether the worker is an employee or a dependent subcontractor. Wage employment became the dominant form of labour market engagement by the mid-19th century, with self-employed workers who often laboured in equally subordinated subcontracting arrangements, such as the relationship governing clothing outworkers, who often worked in sweatshops. Dependent subcontracting has not disappeared. Indeed it has undergone a renaissance in the digital age as the platform economy, epitomised by Uber-type arrangements, enabled firms to engage workers who, while purportedly self-employed, could be engaged, monitored and disciplined remotely via an app, just like employees. The market-driven neoliberal institutional model, along with the widespread abdication of governance by governments that have delegated governing to corporations, has helped this structure spread throughout the economy, from micro-tasks of individuals to systematic worker misclassification in many occupations, but especially freight and passenger transport.

Unregulated markets exacerbate the inherent tension between firms' need for productivity and profit, and workers' need for earnings and occupational health and safety. They must make a trade-off between two conflicting needs. Truck drivers, for example, will work to meet their target earnings (what they need to pay their bills). If their rate is low, they will take more work even though they are fatigued and working illegally long hours,

but if their rate is high, they will turn down dangerous excessive work and protect their health and safety (Belzer and Sedo, 2018; Kudo and Belzer, 2019). They also will choose whether to optimise their health and safety or their earnings (Grossman, 1972; Kudo and Belzer, 2020). Whether workers are employees or contractors, their effort and assumption of risk depend on these economic trade-offs.

The social relations of production under capitalism create a fundamental tension between profit and work because of the imperative to accumulate a surplus from labour; an extensive body of research by Nichols and others has demonstrated how pivotal this tension is to understanding OHS outcomes (Nichols and Walters, 2013). Worker outcomes were especially egregious during the *laissez-faire* period of capitalism from the late 18th century to 1880, during which time markets were largely unregulated, and across multiple countries, while the state apparatus went to some lengths to subordinate workers through laws epitomised by the Master and Servant acts. Notwithstanding the shift to wage labour, most jobs were insecure and many were casual, like those of dockworkers and teamsters as well as those of factory workers, like those in meat packing houses (Sinclair, 1906). A substantial number of vulnerable workers, including women and children in subcontracting arrangements like home-based work, made clothing, boxes, and other items for sale, and the economic system took advantage of sweated labour (Schmiechen, 1984). In short, precarious work was the norm and there is substantial evidence that these work arrangements have significant adverse effects on the health, safety and well-being of these workers due to the hazardous nature of the work, long hours and low and irregular pay, and fatigue, poor accommodation, and poor diet and malnutrition. Low income and poor housing flowed on to families (including resorting to child labour) and flowed onto communities where they lived. The situation was accentuated for vulnerable subcontractors, including home-based workers, as were the flow-on effects including susceptibility to the spread of infectious diseases like tuberculosis and scarlet fever. Diseases such as the latter could affect the wider community because clothing made at home or in small sweatshops could become infected. These connections were extensively documented in government inquiries into sweating, reports in medical and health journals like *The Lancet*, newspaper investigations and a wealth of other sources (Quinlan, 2013a, 2013b and Gregson and Quinlan 2020). Then, as now, subcontracting, including multi-tiered subcontracting, flourished because it was a means of driving down labour costs even if this also entailed serious costs to worker's health.

While capitalist economies' trend toward larger-scale production favoured a shift to wage labour, which could be more closely supervised from the late 19th century, neither this nor associated changes in technology, were the key drivers of improvements in OHS. Indeed, technological innovations can introduce new risks, particularly as the primary rationale for them is to boost productivity. Mining provides a number of good illustrations of this. The increased mechanisation of mines reduced the number of workers underground but increased exposure to dust and noise as well as dangers of the machinery itself (a trend still evident today with large-scale mining equipment). Even the introduction of safety devices initially had adverse effects. The introduction of the Davy safety lamp in the early 19th century initially resulted in more fatalities because it was used to mine areas previously deemed too dangerous (Dwyer, 1991, 17–20). This is an example of how economic incentives initially undermined OHS improvements, and a similar scenario played out in the 1950s when rock-bolting replaced timber in ground support in mines. In mining, the key driver for reducing fatality incidence (especially mass fatalities) in rich countries from the late 19th century was interrelated development of more stringent legislation following union campaigns and greater union involvement in the industry more generally (Quinlan, 2014).

The same pattern played out in other industries. Campaigns by an increasingly organised labour movement and its allies like anti-sweating leagues in Western Europe, North America, and Australasia, especially from the late 19th century, secured significant changes in regulatory and institutional architecture that affected OHS directly and

indirectly. This included the introduction of legislation regulating working conditions, health and safety in ships, mines, factories, construction sites, and shops. Unions also were instrumental in ensuring these laws were strengthened and adequately enforced by government inspectorates, even supplementing this with their own inspectors in mining (Tucker, 1990; Walters and Quinlan, 2019). Reform was slow and fragmented, and reformers fought against bitter resistance from politically powerful vested interest groups like ship-owners and coal mine owners, which often only gave ground following the public outrage accompanying maritime or mine disasters (like loss of the Titanic in 1912, and the 1887 Bulli and 1902 Mount Kembla mine disasters in Australia). Revised factory legislation included provisions regulating home-based work. Union campaigns to reduce working hours, including the eight-hour day campaign, were equally important in promoting OHS. Also important was securing a weekly half holiday (the beginning of the weekend) and the early closing (of shops and retail outlets) movement.

As an important aside, the early closing movement provides an important object lesson about debates over the economics of OHS. During the 1970s and 1980s, government bodies in Australia and elsewhere repeatedly claimed OHS was good for business. At this and a number of other junctures, both economists and OHS academics mused whether better OHS is good for business, and if so, why didn't more businesses actively pursue this? Dorman (2000, 351–365) provided an explanation but so does historical evidence, including the history of the early closing movement. In the 19th century, the hours of retail workers were often 12 or more hours a day six days a week with well-understood deleterious effects on their health and well-being (exacerbated by gas or kerosene fumes in the period prior to electric lighting). Retail workers' efforts to shorten their hours by limiting trading hours (the only viable approach given their weak bargaining position) began in Australia in the 1840s (predating the eight-hour day movement) and even earlier in the UK. The approach used was one of moral suasion by persuading retailers in a town to agree to sign an agreement on closing earlier (often around 6pm) and later to close at 1pm for a half holiday once a week (often a weekday but which eventually became Saturday). Many retailers saw advantages in this and signed the agreement. It was widely accepted that longer hours were inefficient because the same amount of goods were sold in shorter hours and at less cost to the retailer because they used less lighting. Aside from the health effects, the additional time available for recreation (including sport, concerts and the like) and self-improvement (e.g. attending classes at the Mechanics Institutes) had wider community benefits (Quinlan, 2020a). The early closing struggle is not an isolated example of instances where unregulated working time (or flexible labour markets to use modern parlance) yielded suboptimal economic, OHS and social outcomes.

Voluntary early closing (including weekly half holiday) agreements seldom lasted more than a few years (often only months) before the competition of a few dissident retailers caused it to collapse. This cycle repeated itself many hundreds of times in Australia (and elsewhere too) until 1885 when, following a union campaign, Victoria became the first jurisdiction in the world to enact mandatory legislation on trading hours. While it was flawed and poorly enforced, the law was improved over the next decade and the approach was copied by other jurisdictions in Australia, the UK, New Zealand, and elsewhere (Quinlan and Goodwin, 2005). Legislation was essential to enforce compliance because while no retailer would lose business if trading hours were shortened by all, and the health and well-being of retail workers would improve, the logic of this alone could not succeed while a few retailers saw an advantage in trading late. Legislation in Australia set a level playing field for economic competition and one that better safeguarded workers. Indeed, small retailers, given a degree of exemption, became strong supporters of the law, something they lost when, in the neoliberal climate of the 1980s, shop trading laws were relaxed much to the benefit of larger retailers (by this time retail employees hours were regulated by industrial awards). The key lesson is that working hours are a public good and

leaving trading/working hours to the market yielded adverse OHS effects. The problem with leaving things to the market is reinforced by a number of papers on trucking in this thematic issue, as does the paper on contracting in the mining industry.

Other historical lessons can be drawn about the relationship between economics and OHS. Unions were pivotal to securing workers' compensation regimes that safeguard workers and their families. These laws mandated that employers needed to provide a specified level of income protection and treatment to workers injured during the course of their employment, though not one that necessarily maintained the worker or their family's economic situation. Attempts to obtain redress at common law (using the tort of negligence) since the mid-1830s had conspicuously failed given reluctance of courts to interfere with the viability of business as had highly circumscribed Employers' Liability laws enacted in the 1880s. No-fault workers' compensation was only secured from the late 1890s (on a German model enacted in 1880) by further labour movement struggles. While considerably widening the ambit of protection coverage, benefits were still limited by government fears of impinging on business viability (Cowan, 1997). Nonetheless, workers' compensation was the first major form of social insurance and it remains a large area of social protection to this day, dealing with hundreds of thousands of cases every year in Australia alone. Initially there were hopes that obliging employers to bear some of the costs of injuries in their workplaces would act as an incentive for them to improve OHS, but again the historical evidence is that, with perhaps the exception of serious injuries, this did not occur. With regard to disease and mental illness, coverage was and remains so partial that financial incentives remain limited even though these result in, on average, far longer and more costly absences from work (and more deaths in the case of disease). Workers' compensation and late elements of the welfare state such as aged and disability pensions, did indirectly affect OHS by preventing the aged, infirm and disabled being forced to work (as opposed to choosing to work), which, prior to these regimes, could force down wages or undermine other aspects of working conditions, something only the richest craft unions could in any way safeguard through their own benefit schemes (Quinlan, 2020a).

Perhaps most important of the union struggles to indirectly affect OHS were those for the right to bargain collectively, restrict precarious work arrangements (including penalty rates for casual work), and establish laws regulating minimum wages and setting maximum hours of work. In Australia and New Zealand, awards regulating hours and wages limited avenues for hyper-exploitation of workers that undermined OHS standards. Indeed, the 1896 Victorian Wages Board determinations targeted six sweated trades including baking, clothing and boot trades which were rapidly expanded and provided a model for arbitration tribunals in other states and federally. The new wage-fixing regime in Australia and New Zealand was the subject of interest in the USA and UK, including an inquiry commissioned by the UK House of Commons conducted by Ernest Aves (1908). Aves found that minimum wages did not lead to the loss of employment, as was much warned about and a catchcry that continues to this day by neoliberal economists and employer and industry groups. It did lead to a dramatic decline in child labour, as better-paid parents did not need to send their children to work, thereby avoiding the debilitating effects this had on their health and well-being, as well as on their education, which is the best predictor of lifetime earnings (Aves, 1908). The Aves report served as the model for setting minimum wages in the UK, and minimum wage laws were enacted elsewhere. Setting minimum pay and maximum hours had significant OHS benefits. The tensions between profits and safety didn't disappear as studies by historians in the USA, Australia, and elsewhere (see e.g. Rosner and Markowitz, 1989) repeatedly showed. It also was evident in special OHS issues of the journal *Labour History* in 1997 and 2020, which examined intense struggles over OHS in particular activities including the adverse effects of piecework (Burns, 2020). After World War II, Keynesian full employment and mixed economy policies, particularly in Europe, Australia, and New Zealand, strengthened the bargaining power of labour and aided union campaigns to remove some pockets of casual labour like dockwork, though others remained (especially a number

where women dominated like cleaning, retail and hospitality work). Between 1970 and 1990, another push by the union movement and its allies in the health sector secured further enhancements to OHS laws in Western Europe, North America, and Australasia (further strengthen in the latter by the national model laws which explicitly regulated the broader construct of work and workers rather than employees).

The rise of neoliberalism from the mid-1970s, however, marked a shift back toward the laissez-faire era, including government policies which abandoned full employment as a policy; re-prioritised private markets over institutions (Belzer, 2000); empowered the private sector through privatisation, outsourcing and self-regulation; made taxation significantly less progressive by lowering rates for the rich and introduced regressive sales taxes; shifted risk back to individuals (Belzer, 1995); weakened collectivist industrial relations regimes (for a report on the current state of collective bargaining in US trucking, see Belzer, 2024), all of which thereby reversed the previously described reforms. Many of the changes just described had an adverse effect on OHS. For example, there is now a very substantial body of research linking outsourcing, privatisation, increased job insecurity (due to repeated rounds of downsizing and restructuring) and growing use of precarious work arrangements (including temporary agency workers, labour hire, gig workers and contract labour) to worse outcomes as measured by injury frequency rates, workplace disasters, and poorer physical and mental health including suicide (for summaries of some of this evidence see Quinlan, 2015 and Saltzman and Belzer, 2007). Since the late 1980s, a raft of government inquiries examining aspects of changes – including labour hire, sham contracting, short-term visas, heavy vehicles, the gig economy and insecure work – invariably identified concerns, especially in the area of OHS. The problems were often similar to those identified by inquiries into sweated labour (i.e. those working long hours for minimal pay) like that of the UK parliament a century earlier. However, perhaps the only government inquiry to explicitly recognise this occurred in New Zealand, which conducted a second sweating inquiry in 1990 precisely 100 years after its first, following much the same agenda (Bunkle, 1990). In short, labour market flexibility came with significant social and human costs that almost all those advocating it should have expected, given historical experience, but it was neither acknowledged let alone addressed.

A number of the contributions to this Themed Collection examine the OHS implications of changes under neoliberalism. One example is the contribution of Qureshi and colleagues who review international research on the vulnerability of transport workers to infection during the COVID-19 pandemic, highlighting their vulnerability as precarious workers who, being deemed essential workers, were obliged to keep working even during lockdowns. Their findings are consistent with research on infection risks and transmission amongst often poorly paid and generally precarious workers in other sectors (like warehousing and food processing) during the pandemic. Neoliberal policies had magnified the adverse health consequences of the pandemic because they had been associated with a reduction in pandemic planning (despite decade-old predictions of such an event and several 'warning signals') and cuts to both public health infrastructure and staffing that accentuated the risk to health care workers and the community more generally. Neoliberal policies also encouraged the growth of precarious work arrangements, multiple job-holding (in aged care, e.g.), and crowded households, which inhibited restricting the spread of the disease. The risk was not new or novel, as the association between precarious work and the spread of infectious disease had been known since the 1870s (Quinlan, 2021). As Qureshi, Harris, Jegasothy, Seale, Chughtai, and Quinlan note in their article here, **Transport industry workforce risk and exposure to COVID-19 and other related respiratory pandemic diseases: A scoping review**, infection control training was introduced for some transport workers during the pandemic but this was largely a reflexive response by larger firms. In Australia, recent amendments to industrial relations legislation provide an opportunity to introduce infection control training on a more

systematic basis into the industry – something arguably essential for both routine and pandemic infection risks. Their study is but one example of how neoliberalism has trumped historical experience, evidence, and policy learning. For example, in the 1980s a mantra of removing 'red tape' resulted in changes to regulation and its enforcement (commonly built on the evidence of past death and tragedies) the consequences of which were starkly identified by inquiries into the 2010 Pike River mine disaster (29 miners killed) in New Zealand (Royal Commission on the Pike River Coal Mine Tragedy 2012) and the 2019 Grenfell Tower fire (72 killed) in London (*ABC News* 4 September 2024; Moore-Bick et al 2024).

The de-collectivisation of industrial relations in rich countries in terms of lower union presence, weaker minimum standards, and enforcement has had other effects on health, including a growth of multiple job-holding (to offset lower wages), and wage theft, as well as unpaid traineeships and internships, and unpaid overtime. At least some of these changes, notably wage theft and unpaid work time as well as unpaid overtime (which arguably constitutes wage theft), have been linked to poorer mental health outcomes (see e.g. Shahidi et al 2024).

Moving production and hazardous activities like waste recycling offshore from rich countries to poorer countries, and the growth of global supply chains, effectively amounted to transferring work hazards and environmental risks to the latter. Peter Dauvergne (2022) argues that far from greening production, the application of artificial intelligence is actually facilitating this process – analogous to how digitalisation via platform work has corroded working conditions. Global offshoring of production and other activities also increased the overall toll of poor OHS because poor countries were marked by weaker unions and regulation, most dramatically illustrated by the 2013 Rana Plaza disaster in Bangladesh where a building collapsed killing 1300 workers, most of whom were female clothing workers in factories supplying clothing to rich countries (Anner, 2020). As Jackson and Quinlan in **Contract labour in mining and occupational health and safety: A critical review** in this issue note, the economically driven outsourcing and subcontracting of tasks via global supply chains has undermined OHS and environmental health and regulatory oversight in critical minerals processing (Kalantzakos 2020; Le Billon and Spiegel, 2022). Shifting production offshore was predicated on the lower costs in terms of wages and reduced regulatory oversight and reduced worker rights, implementing coercive forms of engagement that on occasion included forced labour (LeBaron & Gore, 2020). In response to evidence of hyper-exploitation and appalling OHS, corporations introduced corporate social responsibility (CSR) protocols – essentially voluntary forms of private governance. While endorsed by the United Nations (UN), these measures, arguably aimed at heading off mandatory regulation, not only have partial coverage but also a series of studies have found them to be ineffective in practice (LeBaron et al. 2022; LeBaron & Lister, 2022). As an important aside, it is worth noting that CSR had parallels with the neoliberal push for 'light touch' economic incentive-based regulation which also proved ineffective in OHS, taxation and corporate and financial practices. In many instances, such as the outsourcing of aircraft maintenance (Quinlan et al 2013), the neoliberal world of work also undermined public health and safety. Indeed, the health vulnerabilities of societies that had become overly dependent on precarious workers (some holding multiple jobs) and living in often crowded households, together with neoliberal-inspired winding back of healthcare infrastructure and planning (including pandemic plans and resources), became manifest in the COVID-19 pandemic, which still has not ended (van Barneveld et al 2020; Quinlan, 2021). However, despite some regulatory interventions following the pandemic, there is little evidence of learning from the pandemic let alone other evidence of deleterious effects of supply chains.

The contribution of Walters, James, and Johnstone**, Effects of economic drivers on work health and safety in global supply chains: a discussion of the effectiveness of regulatory strategies and their economic contexts**, offers a valuable overview of evidence on the OHS effects of supply chains and policy remedies to this thematic. The paper highlights how economic drivers underpin the growth of global supply chains and

how these practices are commonly associated with poorer OHS outcomes. Their main focus is on the tensions between the economic drivers of global supply chains (GSCs) and regulatory strategies. They seek to understand the role and effects of economic logics at both macro- and micro-levels in determining the nature of OHS practices and outcomes among suppliers, and whether current global and local regulation of work health and safety (WHS) is sufficient to counter the adverse effects of the profit-orientated corporate business strategies of lead firms in GSCs on the WHS practices and outcomes of their suppliers. The paper argues that to achieve the transfer and sustainability necessary to ensure the more widespread impact of measures to improve OHS in production at the ends of GSCs requires guidance from political institutions and policies that address the health inequalities arising from these economic logics.

Industry and workplace level

While most forms of work arrangements entail some degree of economic or production pressure which may affect OHS, some, most notably piecework and contracting have been linked repeatedly to worse outcomes in terms of injury, physical, and mental health. Work pressure specifically has been linked to the likelihood that truck drivers will be judged responsible for the last action (or failure to act) that led to a crash (Belzer, 2018). Piecework and other forms of incentive payment, including *faux* subcontracting to workers who are managed just like employees even as they pay the operating costs of the businesses with which they contract, can undermine OHS by encouraging corner-cutting on safety or hazard exposures, over-exertion (including longer hours), and increased stress. Such a connection was even noted by Adam Smith, and, not surprisingly, the Australian union movement has generally opposed piecework because of its adverse effects on OHS and efforts to reduce working hours (Quinlan, 2020a). A longstanding and extensive body of research has found an association between piecework specifically and incentive payment systems generally, and poor OHS as measured by an array of indices or hazardous behaviour, including drug use (see e.g. Johansson et al 2010; Premji et al 2008; Williamson 2007; Thompson & Stevenson, 2014).

Contracting out (and subcontracting) is a business and work arrangement designed to use asymmetric bargaining and market power in a 'lean' environment, to squeeze every drip out of the labour supply chain. This has similar effects because it links payment to output and is conducive to intense competition) and often incorporates forms of piecework payment (like trip-based pay for road transport workers). Consequently, it has been opposed by unions, with some exceptions like that of the Teamsters in the US, both historically and today. In their contribution to this thematic issue, Jackson and Quinlan review research on contract labour in mining, noting a global growth of the practice in recent decades – for which economics were the critical driver. They find that both quantitative and qualitative research conducted across the globe has overwhelmingly found that contracting is associated with poorer OHS, including injuries, fatalities, and exposure to hazardous substances. Outcomes were worst in countries with weak regulation and unions but uniformly adverse; this finding is consistent with research into contract labour in other industries. They point to a number of gaps in the research literature and methods but several of these mean the findings might actually understate the consequences of contracting. They also explore the reasons for this using the 10 pathways and Pressure, Disorganisation, and Regulatory Failure (PDR) model, arguing the economic pressures are a key driver, contributing to both hazardous forms of disorganisation and regulatory failure. This point is reinforced by an examination of some typical serious incidents in Queensland coalmines. The 10 pathways model can guide more effective preventative measures by companies, regulators, and unions. The model

has been promoted by the Western Australian mines inspectorate, though not Queensland which has preferred the High Reliability Organisation approach, which arguably is inapplicable to the mining industry because it is predicated on a stable technology, market, and workforce. Jackson and Quinlan note that evidence indicates the continued growth of contracting is corroding OHS in the industry notwithstanding rhetoric of zero harm and enhanced occupational health and safety management systems. At a more general level, it is worth noting that economic pressures have played a recurring part in causing or exacerbating catastrophic events in workplaces like the Fukushima nuclear power station tsunami-related inundation as well as disease-outbreaks, earthquakes, fires, and environmental and climate catastrophes (Quinlan, 2020b).

Multi-tiered subcontracting has been used to drive down labour costs in road transport, home-based clothing manufacturing and other areas of work. The connection between low pay and poor safety is inconsistent with the notion of wages containing a compensating differential for hazardous tasks once popular amongst some economists even though never having much in terms of an evidentiary basis (Dorman & Hagstrom, 1998). A number of contributions in this thematic address the pay-safety connection in road transport in the USA and South Korea. The association has also long been known in Australia through academic research and a number of government inquiries leading to one longstanding state regulation (Chapter 6 in NSW) and two more recent federal regulatory interventions setting minimum rates for contract drivers – the short-lived Road Safety Remuneration Tribunal (2012-16) and from 2024, a Fair Work Commission panel established under the 'closing the loopholes' industrial relations legislation. The 'closing the loopholes' legislation provides for a similar mechanism for workers employed in the platform economy under Uber-like arrangements like food delivery workers, where evidence pointed to connections between poor pay, job insecurity, and poor OHS – indeed they are in many respects analogous to sweated labour of a century ago.

Finally, but by no means least, it is worth returning to the question of why the economic costs of poor OHS are continually and significantly under-estimated and whether a better appreciation of this might drive more effective interventions. An exemplar of this is poor mental health outcomes at work due to bullying and harassment, which has attracted considerable media attention, although it is arguably a subset of a much larger problem. Psychosocial hazards have been found to be ubiquitous in the USA, Australia, and indeed most countries for which there is data, and therefore immensely costly (see e.g. Stephan-Recaido et al 2024). Loh, Dollard, and Friebel tie the growth of psychosocial hazards to poor work organisation and industrial relations more generally in their article**, Economic costs of poor PSC manifest in sickness absence and voluntary turnover**. As Loh et al point out, much work-related stress and poor mental health fail to result in workers' compensation claims, so that the economic costs of mental illness are grossly under-estimated, even though the costs of those few who do claim have led to substantial rises in workers' compensation claims in recent years. Just like work-related diseases, psychosocial injury has tended to result in long absences from work. Using the Psychosocial Safety Climate (PSC) index that measures worker perceptions of how corporate/workplace OHS safeguard their psychological health and well-being, they conducted a study to estimate the costs of low PSC due to sickness and turnover in a multinational company. Unlike workers' compensation costs, which is a lag indicator, PSC is a lead indicator and therefore can be used more effectively to develop interventions to reduce the prevalence and costs of poor psychosocial working conditions. The study found the costs of low PSC were substantial and could be an incentive for improvements by companies but also if it was utilised by unions and government inspectorates. Their paper highlights the conundrum that can be found throughout this editorial article, namely that economic drivers repeatedly compromise OHS even though OHS costs are substantial (and extend to the wider community), and healthier and safer working conditions are compatible with

economically productive societies. The latter, as history and contemporary evidence indicate, cannot be secured through unregulated market forces but requires informed regulation and other policy interventions.

Conclusion

Multiple papers in this Themed Collection highlight the economic factors underlying occupational health and safety. Commonly, the health and safety literature in general, and the industrial health and safety literature in particular, fails to acknowledge the significant contribution that economic forces make to the outcomes experienced – for better or worse – in the workplace context. For example, it is easy to recognise and focus on the downstream consequences of economic pressure, in the form of transport worker health and safety consequences, while ignoring the upstream factors that drive these outcomes. Truckers are not on the highway for a Sunday drive or a personal errand; the highway is their workplace; their occupational illness, injury, and death are direct consequences of economic pressure on the job. The same thing is true for miners, construction workers, so-called 'gig' workers delivering food and other products, and workers in every other occupation and in every niche in the global supply chain.

As we have also tried to indicate, the role of economic influences needs to be placed in a historical context. Contract labour and other forms of precarious work are not new, and like piecework, there is abundant evidence that these forms of work organisation, driven by economic incentives, have long had adverse OHS effects. The failure to recognise/accept this evidence results in periodic and disarticulated rediscovery of the pay/safety connection - the most recent being with regard to gig/platform workers who are predominantly subcontractors paid on a piecework basis. This represents a costly and sad failure to learn in academic research and in policy deliberations. The historical contract is also important in indicating how particular interests (especially the struggle between organised labour and capital) shaped regulatory intervention and how regulation can set a level playing field for competition that would otherwise default to a race to the bottom or hyper-exploitation that will undermine OHS. The growth of global supply chains and free trade agreements represents just a recent attempt (along with the growth of platform work) by particular interests, to evade labour standards and other regulatory protections in some countries. It is time to move beyond a historical perspective if we are to fully understand how economics influences OHS.

The editors hope that this Themed Collection **The Economics of OHS** in this issue of the *Economic and Labour Relations Review* stimulates researchers and policy makers to look for the root cause of OHS problems in the modern workplace. That root cause can often be found right under our noses, in the forms of industrial organisation that characterise the supply chain.

Note

1 In South Korea, the analogous oligopolistic framework is called the *chaebol* – a similarly tight but in this case family-controlled set of interlocking firms across wide swathes of private industry. Both of these institutions have enormous domestic political power and also run counter to the free market model (Kwon and O'Donnell, 1999).

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