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# SAFETY AND HEALTH AT THE HEART OF THE FUTURE OF WORK

A Compilation of Think Pieces



**SAFETY AND HEALTH  
AT THE HEART OF  
THE FUTURE OF WORK**

**A Compilation of Think Pieces**

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## GENDER PERSPECTIVES ON THE IMPACT OF TECHNOLOGICAL CHANGE IN MINING

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The purpose of this think piece is to reflect on how the implementation of new technology, such as digitalisation and automation, at industrial workplaces, engender changes in work and organisation and how this may challenge existing gender systems in work life and also effect of the development of safety and health at work (OSH).

**Gender, especially the industrial worker form of masculinity, and the male-dominated work organisations, are involved in the complex processes of both resistance and change when meeting the digitalization.**

### Digitalization in traditional male-dominated organisations

The underground workplaces in the Swedish mining industry is a context where such processes are extra visible. Step-by-step the mining industry moves toward a vision of automated and digitalized mines and recently we can see an accelerated pace of change. These are essentially technology-driven changes with optimistic (almost naïve) visions for future work. Even if the development will not be as the visions predict, there will be new types of industrial work, new types of work environments and contexts, and thus new work environmental problems. In the mining context, we will see new types of work tasks, new ways of organising, new competence demands and a move from the underground to high-tech control rooms above ground. In other words, quite large changes in the mining work and new conditions for what constitutes work in a mine. But this transition is not easy, and not without restoring responses and resistance in the workplace cultures. Some of the resistance is understandable when considering the issues of skills, personal integrity and new work environmental problems, but also because it encroaches on the areas of the power and control. Parts of

the re-sistance are more difficult to understand because it can be hindering OSH development and, as I will argue in this think piece, it is connected to the gender systems at the workplaces.

Large-scale industrial mining has long been a male-dominated and homosocial work context, in Sweden (85-90% of the mining workers are men) as well as globally, where the gender marking as masculine is seemingly stable, both when it comes to work identities and workplace cultures as well as the technology itself. Entering the mining environment is, or at least has been, like stepping into the very heart of a classic masculinity construction, the blue-collar masculinity. The current local mine worker masculinity has its roots in the old mining work and is still to a great extent constructed around the aura of dark, dangerous, heavy, and dirty work, manual competences and the mystery of the rock. Although some may argue that the extreme form of this masculinity (macho, boyish, risk-taking) is practically outdated and no longer exists, it re-mains commonplace. It is a form of masculinity that serves as a safe and stable reference point depicting what a “real man” is, or should be; even for people, professions and masculinities that have quite different expressions, experiences and attitudes. In the mining workplaces, this means that women face high risks of being subjected to restrictive and stereotype norms, open resistance, harassment, discrimination, as well as difficult work situations.

**One of the hopes of the technological change is that it will allow for changed gender patterns: a better work environment combined with higher qualification demands will enable more women to work in the male-dominated industry, and by that creating better gender equality.**

But research shows that the picture is not so clear-cut. At many industrial workplaces with

a high degree of digitalization as well as at established IT-companies, it is quite common that the digital technology and its related work and competencies is clearly associated with men and masculinity (even if it is another kind of masculinity than the mining worker masculinity). From this perspective, it is quite difficult to see how the male-dominated digital technologies and professions introduced in an old male-dominated industry should be able to change the gender patterns.

## A reluctant context that is changing

**The changes that come (or will come) from the digitalization of mining work has so far mostly been met by a reluctant context.** We can see how the men express hesitant attitudes and passive resistance to the new technology or almost do some kind of sabotage. They rather want to hang on to the old technology, perhaps as an attempt to be 'real' miners, to be the same as those that work in a dirty and more dangerous environment underground. It is difficult to maintain the image of the mystic and macho mine work in a control room. We can also see processes where activities, work tasks and people connected to the new digital technology is perceived as weaker and womanish. There are examples of how new automation technologies and robot machines underwent a process of feminization and became women's work, that men refuse to do. This can appear to be paradoxical because technology, especially new technology, such as digitalisation, robotisation, computerising and other high-tech areas of development, are in other contexts largely associated with men, and general constructions of masculinity. It is, however, easier to understand when related to the importance of old mining work for the construction of mine worker masculinity.

Similar gendered processes can be seen in the resistance, or rather nonchalant attitudes, towards safety; such as the tendencies to take risks and to chastise men who attempt to follow safety praxis, but perhaps mostly to exaggerate the old technology, the difficult work environment, the dangers and the risks of the work. The discourse of dangerous mine work functions to protect the status of the work and retain the old identity of the real miner, including, of course, the possibility of appearing as heroes and real

men. The growing expectation that the individual must take responsibility for safety, quality, and sustainability and learn new skills is also threatening for the old local masculinity.

In relation to this, diversity and gender equality initiatives are also met with resistance and negative attitudes. There are gender stereotypes and the essentialist notions of what women and men are and openly negative attitudes towards women in the workplace. The more different kinds of people that work in the mine, the harder it becomes to maintain the old mine worker masculinity, the homo-social workplace culture, the feeling of uniqueness and the links to the stories of old mine work. The physical strong and rough male body is still considered a prerequisite for mining work at the same time as the new technology is repeatedly perceived as an enabler for the employment of more women at the mine in the future.

It appears as though the workplace culture and mineworker identity are, or at least have been, lagging behind, in a similar way that long-distance travellers can be jet-lagged and experience being in the wrong time zone. The symbolism of mining work, the mineworker identity and culture, have for a long time stayed in an old-fashioned mode in many aspects, at least in relation to what the new technology such as digitalisation and automation imply. The connections between mining work and masculinity, and the specific macho-form of masculinity, probably make the lagging resilient and extensive – and creating more restoring responses and resistance to change than necessary.

But just like after a period of jet-lagging, one eventually reaches the same time zone. The new technology is gradually gaining ground in all parts of the mine, and it is likely that in the future mine worker masculinity will change to reflect this. At least new things are important today, as compared to yesterday. We can already see that adaptations and changes are happening.

In fact, **a tendency of change in relation to gender has occurred at the mining work-places over the past few years, at least in Sweden. This can be seen in an increasing number of women as mine workers (from 5 to 15% in 10 years) as well as a changing workplace climate that includes more inclusive attitudes.**

These small yet observable changes can be attributed to the companies' gender equality interventions as well as general processes towards increased gender equality in the Swedish working life. However, they are also associated with changes in mining work that are related to automation, remote-control technology and digitalisation, improvement of the work environment and safety.

## Concluding remarks

We can conclude that the workplace culture, the mine worker identity and what real mine work is, are gradually changing, in content and character, to suit the requirements set by the digitalized technology, the new qualification demands and new organizational forms. And that in these processes, changes of masculinity and the ways how men are doing (and perhaps undoing) gender are very much involved. We do not yet know how and in what directions. Perhaps we will see processes of re-gendering where mining work and its technology continues to be just as manly as before, only digitalised and linked to a different type of masculinities and different ways of doing gender. Another scenario can be that the link between mine work and masculinity is removed or at least reduced thanks to the demands of new digitalised technology and a new kind of societal context. The most probable development lies somewhere in-between these scenarios. By analysing both the scenarios and the whole scale between them, future research can expand knowledge about how processes of gender, technology and change are interlinked in different ways and affect, in positive or negative ways, opportunities for development towards better OSH, a sustainable and gender equal working life.





## HEALTH, SAFETY, WELL-BEING AND ECONOMIC SECURITY IMPLICATIONS OF GIG WORK: AN INTERDISCIPLINARY PERSPECTIVE

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We agree that worker health, safety, well-being and economic security are complicated issues, so how are we addressing them? Single-pronged solutions are most common: training programs, wellness programs, mobile apps, or coaches, for example. But have we moved the needle? To do better, we need interdisciplinary solutions that will integrate the best knowledge and practice in order to create work and work environments that ensure healthy and safe behavior, facilitate well-being, and promote economic security.

This is not easy to do. An interdisciplinary approach is not a  $(1+1+1) = 3$  solution...essentially single solutions layered on top of each other. Alternatively, an interdisciplinary approach triggers interactions across disciplines where the weaknesses of one discipline are complemented by the strengths of another, building new knowledge and new insight:  $(AxBxCxD) = 10$ . If we cross-pollinate the right disciplines, each addressing the same issue but from different and complementary angles, we can achieve holistic, integrated solutions that solve health, safety, well-being and economic security problems more completely and sustainably. To engage in interdisciplinary problem-solving, one has to give up favorite go-to answers.

To highlight the need for interdisciplinary approaches to solve critical problems, I want to focus on a rising issue that needs our immediate attention. As economic uncertainties grow across countries, an increasing number of workers are voluntarily and involuntarily looking for ways to support themselves independent of traditional employment to mitigate job insecurity. In response, “gig work” is growing dramatically. This form of work has important implications for the general prosperity of society and perhaps more importantly for the health, safety, well-being and economic security of gig workers.

What is “gig work?” For our purposes, I mean “forms of contingent work arrangements that require digital platforms...” (JOEM, April, 2017, p. e63). Theoretically, gig work means work that is arranged between a company that wants a service performed and a person who is willing to perform that service, facilitated by an end-to-end, cloud-based, online platform or mobile app that enables peer-to-peer transactions. Important characteristics include: work that utilizes a user-based rating system, offers workers flexibility in determining their hours, and places responsibility on workers to provide whatever tools or assets are necessary to accomplish their work (US Department of Commerce).

How “good” is gig work? Princeton University estimates the hourly rate for Uber drivers to be \$17US to \$22US, whereas Uber claims the median hourly income of New York drivers is \$30US. Both estimates do not take into account expenses including gas, insurance, maintenance and taxes (JOEM, p. e64). Further, gig workers in the US pay their own payroll taxes (called self-employment tax) at a rate of 15.3% that no employees have to pay. With respect to worker rights, gig workers are not covered by any employment-related laws that provide benefits such as workers compensation, sick and family leave, overtime, health insurance, retirement, vacation, and health and safety rules. Basic civil rights protections regarding retaliation, wrongful termination, discrimination, and harassment are nonexistent. Gig workers cannot negotiate rates or work contracts, and they have no protection against wage theft.

On the positive side, gig workers often report that they enjoy the autonomy they have regarding when they work and how much they work. Gig drivers also report enjoyment from the social interactions they have with passengers and freedom from a boss and office setting (Tran, 2018). Gig workers can start work quickly with minimum paperwork and vetting. Job control, reduced hassles, payment by the “piece,” self-management, and seemingly unlimited autonomy are psychologically desirable attributes of gig work that maintain gig workers’ interest in such work.

There is a dark side, however. One, the algorithmic management system used in digital platforms forces the gig worker’s hand. The company controls who gets the gig and at what price. The worker is not given future gigs if customers’ ratings are low. Two, the expenses incurred performing as a gig worker can easily exceed revenue. Expenses include worker-supplied equipment and tools (e.g., vehicle), insurance, maintenance, and amenities for the customer (e.g., water), which sometimes cannot be recouped. Three, major job stressors are present in gig work: long work hours, adversarial relationships with platforms, dangerous work and working conditions, unpleasant customer interactions, and sleep deprivation. Four, when hurt or sick on the job, gig workers have full responsibility for their recovery and loss of work. It is the latter two aspects of gig work that I turn to.

**What are the health, safety, well-being and economic security implications of gig work? Without the safety nets built for regular employees, gig workers and society in general are at great risk.**

This work is stressful. We know from scientific studies that job insecurity, poor working conditions, toxic relationships, unemployment, long work hours, shift work, low wages, and poor management can lead to significant illness and needless death (Pfeffer, 2017). These elements can be present in gig work. Gig transportation and all other occupations that require significant lengths of time sitting and immobility carry all the dangers of prolonged sedentary behavior. Gig work involving lifting, carrying, moving, and pushing/heaving objects without proper safety equipment, tools and training sets up workers for injury and potential long-term disability. We need to view gig work the same way we view dangerous

work in traditional employment settings without the training, safety equipment, supervision, guidance, tools, and rules that protect regular employees.

**Gig work will dominate global economies in the future. We should address the health and economic risks of gig work now.**

An interdisciplinary approach could determine how gig workers’ basic needs could be met through changes in work design and the development of worker support systems such as employer-funded gig workers compensation, community policy and planning to facilitate gig work, legislation to provide basic protections for gig workers, and technical expertise for building better apps. By building a system that supports gig work economically, psychologically, physically, and socially, gig work could be a viable economic and fulfilling career path for workers regardless of race, gender, national origin, religion, disability status, and socio-economic status.



## MAINSTREAMING OSH: PUTTING PEOPLE AND THEIR WORK AT THE CENTRE TO ENSURE HEALTHY AND SAFE WORKPLACES FOR THE FUTURE

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International Industrial Relations

For the business community that I represent, the health, safety and wellbeing of workers are very important. Safe working conditions are an essential element for the quality production of goods and provision of services. Addressing health and safety provides opportunities to improve business efficiency as well as safeguarding workers. Taking calculated risks is part of being successful in business. Prevention is the most rational means to protect against risk. Prevention allows the elimination or reduction of uncertainties, although it cannot guarantee total safety or zero harm.

The protection of workers from harm has been at the core of the ILO's mandate since its inception in 1919. The early focus on standards aiming at protecting against specific risks and persons in high risk situations and in particular, branches of economic activity, was necessary and proved to be a successful starting point. When the limitations of that approach became obvious we moved towards a systems approach to occupational safety and health (OSH), based on the assessment of risks and prevention principles. And recently we embedded that in national strategies and programmes.

After 100 years of work in this area, we observe immense improvement. Despite what we achieved together, the potential for further improvement is still vast. The results are also not at the same level in all parts of the world and some branches of the economy are much better performers than others. The same is true for individual enterprises. Progress to reach the level of protection we really want is slow. Strategies and policies are often not having sufficient impact. It is therefore time to rethink our approach and to explore new ways to obtain results in a more effective and efficient way.

**The world faces a vast array of global economic, social and political challenges. All the changes and challenges present their own set of opportunities and threats, some of which are familiar and some of which are not.**

Addressing these issues requires an innovative and creative approach that leaves behind preconceived ideas and out-dated paradigms.

In that context we have to ask ourselves where the OSH community is. Is it on the forefront? Is it part of transition decisions, processes and management? Does the OSH community have any impact on important management decisions or on Member-States' socio-economic policies? The answer is no and my statement is strong and certainly thought provoking: "OSH as a discipline is a barrier to progress for the health and safety of workers in itself!" It is still considered as an add-on, not as an integral part of business activity or economic activity in general.

The challenge is to mainstream OSH in all segments of economic activity from conception, to planning, to execution and delivery of goods and services. We have to put the people and their work at the centre of our OSH policy. Decent work encompasses working in a safe way with no harm to health. OSH should not be a separate measure, service or discipline. It's not OSH; it's all elements from the overarching world of work.

So, what approach should we take? What is our business case? If we launch programs and policies, it is with the aim of having impact. If we want impact, we should aim for a 'decent place to work'. The key question therefore should be 'How to create an organization where people are able and willing to do their best work?' This approach transcends health and safety and focuses on all aspects of work, now and in the future.

When you observe and analyse good and best practices you will see that success does not stem from a 'technical' approach with risk assessment, prevention measures and procedures, but from a much broader action that puts people in the centre. Employers, as driving forces in our society have an important responsibility and we consider it essential that they demonstrate leadership in the area of OSH by making it an integrated part of work in the future! The starting point to create organizations where people are able and willing to do their best work is to continuously seek a balance between the individual worker with his or her capacities, skills, personality, values and aspirations and his or her working situation. The elements that constitute the working situation are the work content, the working conditions, the work environment and the work relations within a frame of systems and processes that constitute the work organisation. Authentic, supportive leadership, respect and trust are enhancing factors to get to the above result.

A decent workplace is one built on trust. Trust drives sustainable engagement and engagement drives business performance. The benefits speak for themselves for both employers and workers. Trust is not something which is merely "nice-to-have". Rather, trust is a hard-nosed business asset, which can deliver quantifiable economic value. When trust is high, speed of execution goes up and costs go down. For that and other sound reasons, it makes good sense to consistently find ways to enhance trust levels both within and external to an organization.

Enthusiastic workers, people that work with deep affection and pride - that is where the win-win lies for companies and workers. We must strive to deploy people based on their talents and skills. Craft jobs around people's capacities, taking into account their personal needs and aspirations. No longer simply 'command and control' by management, but a facilitating work environment. Authentic leadership, servant leaders, that is the model of the future and a huge lever for healthy workplaces. It means leadership aimed at personal development and support. Traditional management and leadership is about arranging and telling; true authentic leadership is about nurturing and enhancing.

Do not simply rely on a collective approach; don't be afraid of looking at the individual. No collective system, no risk assessment tool is capable of capturing the true needs, personality and aspirations of individuals. So, allow individual workers, within a certain frame, to decide when, where and how to work to get results. Design jobs for autonomy, meaningfulness, progress and competence. That is participation, involvement and engagement in the true sense of the words.

Exceptional companies create a high performance culture allowing them to thrive in our ever-changing world. Exceptional people are able to develop winning strategies and ensure their execution. They allow for organizational growth and profitability, more creativity and innovation and more satisfaction and a more engaged and better-developed workforce. Failure is normal and success is the ability to go from failure to failure without losing your drive and enthusiasm.

It is easy to criticise the above by saying: "That might work in developed countries but no way this would work in the developing world." But then I ask you: "What does 'the right to a safe and healthy working environment' mean in the informal economy or even in the formal one if people lack the proper skills and competence for the job, if they lack the proper and safe tools and equipment, if no (personal) protection is provided?" Even in such a situation with all its limitations it is possible to improve and create a better work environment based on the above mentioned approach... in a more effective way than the traditional OSH approach!

Technology constitutes an important lever for decent work and safe and healthy working conditions. There was and is resistance to approaches based upon 'a culture of prevention' and 'behaviour based safety' as some see it as shifting responsibilities to workers. Without completely abandoning the underlying ideas, technology will help to overcome the barriers and resistance to a better safety (and work) performance. Technology can substitute or assist people working in dirty, dull, heavy duty, repetitive, monotonous, unhealthy jobs or dangerous environments. It can help to reduce physical, ergonomic and psychosocial risks. If properly used and introduced in a participative way, (digital) technology will empower workers and will lead to an augmented

workforce. And remember, the people and their work in the centre and the technology built around that, not the other way.

The 'Future of Work' offers opportunities to create conditions for sustainable and inclusive economic growth, shared prosperity and decent (safe and healthy) work for all. All of us have a role to play to work this out, but in order to have impact and overcome ideological and mental barriers we have to build trust first. Only a genuine dialogue between all actors, based on trust and respect, can help us to gain control and steer the boat we all share, not to a precise destination, but at least in the direction we want. A ship is always safe at shore but that is not what it's built for. Let's all try to be captains not afraid of troubled waters but skilfully moving ahead with evidence-based precision.





## THE WORK STRESS CONUNDRUM

**Maureen Dollard and Daniel Nesar**

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Asia Pacific Centre for Work  
Health and Safety  
University of South Australia



**Daniel Nesar**

Student Activist, Student of Economics,  
University of Adelaide

Work stress and its impact on mental health is an infinite problem in capitalist societies. This is because under capitalism there is a constant struggle between management and labour. For management the goal is profits and productivity; for workers it is decent, meaningful and well-paid work.

For workers to meet the demands for profits and productivity, resources are required; and within a capitalist system investment in resources for workers is continually reigned in as they are a cost to company profits and productivity. The problem is that work stress and mental health issues arise when work lacks meaning, and job demands exceed the resources workers have to manage them.

In recent decades, unprecedented attention has been given to the issue of worker mental health and wellbeing by policy makers, tripartite agencies, social partners (workers, governments and employers), and academics, largely in developed economies. Major stakeholders such as the WHO, ILO and the OECD have called for policy responses by drawing attention to the link between poor quality work and the parlous state of worker mental health.

**If we are to seriously consider the prognosis of mental health in future work we must come to grips with the crisis of mental health that has accelerated in the modern work environment over the past few decades.**

The crisis must be conceptualised as not based on the development of new industry or technology, but in the way that work is organised within a capitalist context by an unequal employer-employee relationship.

Understanding the precise factors that influence the individual experience of poor mental health stemming from work is not a simple process. In

fact, there are many reasons, micro and macro, for the decline in workers' mental health.

At a direct micro level the relationship between poor work conditions and poor mental health is borne out by significant evidence. Research demonstrates a clear link between psychosocial determinants— such as level of control over work, work autonomy, work pressure, power imbalances, bullying, a profound lack of meaning, alienation, and dehumanisation — and work stress, burnout, physical health problems and death. How jobs are designed (the amount and type of resources allocated to manage demands), the organisation and management of work, and the workplace social context are all aspects that potentially affect worker mental health.

In Australia the main reasons for mental health workers' compensation claims are work pressure, work-related harassment and/or bullying, and workplace violence. In the UK, the main reasons cited for work-related stress are workload, lack of managerial support and organisational change.

Although not featured in these statistics, the increasingly insecure nature of work is also damaging. Danish research shows that when healthcare workers perceive insecurity through exposure to organisational changes such as mergers, employee lay-offs, budget cuts and changes in management, rates of prescriptions for psychotropic drugs such as antidepressants were 1.14 times higher in the following 12 months compared to those not experiencing change.

Yet poor work quality is not immutable. Decisions made by management about work design impact on worker mental health. Therefore there is scope, looking forward, to influence or otherwise force a change to how work is constructed and managed.

Our research yields a useful explanation of work design by exploring what we call Psychosocial Safety Climate (PSC) – reflecting the corporate climate for worker mental health. PSC levels assessed by workers are indicative of the priority that management gives to worker mental health versus productivity, evident in policies, practices, procedures, and systems for the protection of worker mental health.

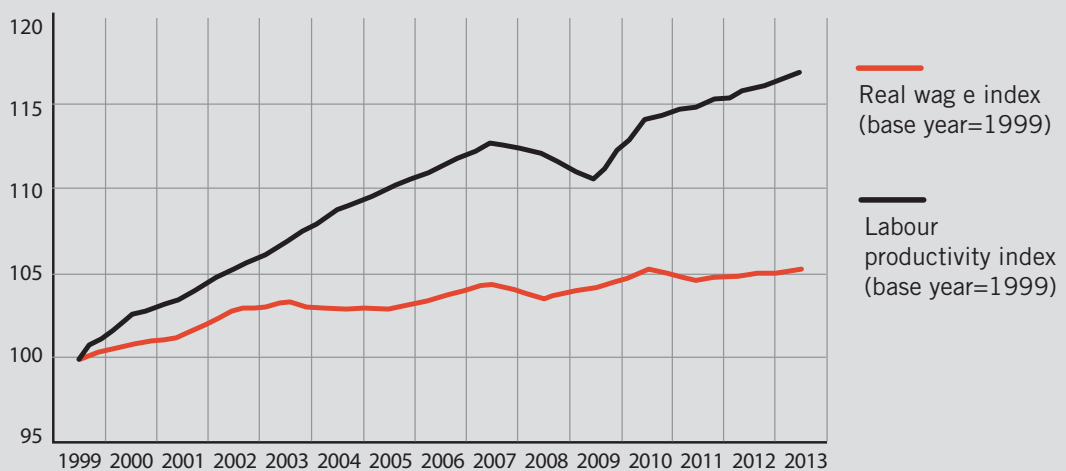
PSC is formulated as a “cause of the causes” of work stress – a precursor to work stress in a given job. PSC reveals management methodology and predicts the quality of work on offer – the level of demands (work pressure, stressful exposures), the levels of resources (autonomy, wages, job flexibility) and the social relational aspects of work (harassment, bullying, social support). The link from PSC to work conditions to mental health is shown in many studies.

But at a macro-level, managers operate in a capitalist political economy, which requires and values competition, productivity, and profits. Corporate boards and shareholders demand profits. But these foundational aspects, and the attendant work conditions, that they give rise to (insecure work, work pressure, monitoring, lean resourcing, low power) are the very elements of work that create work stress which can cause or exacerbate

mental health concerns. Therefore, we see work stress as a recursive and growing problem in a capitalist political economy which relies on resource acquisition, competition, profits and productivity growth by employers and society.

Management decisions are influenced, boosted and constrained in broader economic and political circumstances. For instance, across the EU, at a national level union density is positively related to workplace PSC levels. Yet the era of neoliberalism has progressively attacked and eroded union membership across the globe. Hence the macro power to influence work conditions and industrial protection in workers’ interests has eroded. Wages which could be used to access mental health care are restrained, and social services pared back. This era, captured succinctly by an ILO sourced graph (see Figure 1), is characterised by business growth predicated on reducing the costs of labour relative to productivity. At the same time executive salaries have been exorbitantly ratcheted up. UK top executives earn 133 times more than the average UK worker – within 4 days the average executive earns the average annual salary of a worker (High Pay Centre). Resources are clearly flowing upwards contributing to global income and wealth inequality – “the richest 1% own half the world’s wealth” (Credit Suisse).

**FIGURE 1. PRODUCTIVITY AND WAGE INDEX (G20 ADVANCED ECONOMIES)**



Note: Labour productivity is defined as GDP per employed person and uses GDP in constant 2005 PPP\$ for all countries. G20 advanced economies include: Australia, Canada, France, Germany, Italy, Japan, the Republic of Korea, the United Kingdom and the United States. Both indices are based on a weighted average of all the countries in the group that takes into account labour productivity and the size of paid employment. Source: ILO staff estimation, using data from the ILO Global Employment Trends reports and the ILO Global Wage Database, revised and updated.

If the trends embodied by neoliberal economics are to continue, then there is a bleak outlook for addressing the causes of mental health crises via future work arrangements. The material contradiction is that allocating more job resources, more services, and better conditions for workers, to increase worker mental health is a cost to productivity. Ironically, as mental health becomes an increasing focus for its impact on worker output, any productivity-driven framework will come up against its own limits (i.e. profit margins) and will be unable to positively impact the core causes of mental distress.

Decisions to increase worker mental health therefore need to be based on humanitarian grounds. Because the improvements required to do this threaten net productivity, a new kind of economy is required that values humanity and measures value in terms other than company profitability and GDP.

In essence, the warning signs are already here in modern industries. Amazon's Fulfilment Centres and Tesla's car production lines – technologically advanced, highly mechanised and touted as a vision for the future of work – simply demonstrate some of the most advanced examples of trajectories already present in modern working life. That is, increased precariousness, low pay, lack of meaning, high job demands, extreme hostility to unionisation and collective resistance, and surveillance, vigorously guided by intensive productivity management through various means (just-in-time Fordism or excessive managerialism) – all the while generating huge annual company profits. The levels of burnout among Silicon Valley's tech workers are extremely high in cutting edge skilled work on precarious piece-rates.

**No doubt new technologies such as robotics, 3D and 4D printing, artificial intelligence, virtual reality, augmented reality and autonomous vehicles will change the nature of work, but the stress fundamentals remain.**

Social policy shifts such as a basic universal income seems promising, to enable life quality without reliance on the labour market, and may drive up the demand for quality and meaningful work (not just any kind of work). Increases to wages need to be a priority for any meaningful change in working conditions.

With our understanding of PSC we argue that an immediate reallocation of resources and power is required to swing the balance towards prioritising humanity and quality working conditions. Substantive changes in work conditions can improve PSC. For example, a NZ company recently trialled a 4 day working week with no reduction in salary which increased PSC, reduced job stress and increased job satisfaction. With sound knowledge of PSC evidence, workers, unions and advocates can more effectively articulate the impact of corporate climate in their efforts to better mentally healthy conditions for workers.

In the here and now, if PSC (which can be measured and has benchmarks that predict future job strain and worker depression) is normalised as a lead indicator of psychological health and safety (as a safety key performance indicators, for instance), it could act as a fulcrum, helping to improve and protect worker mental health through increased provision of 'decent work.'

If we are to avoid a serious epidemic of mental illness in our workplaces, we need to consider the overall trajectory of how and why we produce, question the existing focus on productivity, and rapidly move to change it. What matters for mental health is not so much the industry and its particulars, but how workers are treated and how highly their humanity is valued and centred in their work. Otherwise we are heading for an increasingly and permanently mentally unhealthy world of work, with flow on effects to families and communities around the world.





## CRITICAL PERSPECTIVES ON OSH MANAGEMENT SYSTEMS AND THE FUTURE OF WORK

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This think piece raises issues of the effectiveness of OSH management systems (MS):

1. Voluntary MSs are different in nature from mandatory OSH management (OSHM).
2. MS/OSHM practices focus more on procedures and documents than to control risks
3. Workers' representative participation is essential for effective MS and OSHM.
4. Growing irrelevance of employment based MS and OSHM to control OSH risks.  
Finally, how to improve MS and OSHM within OSH policies will be discussed.

### 1. MS have different origins, objectives and implementation than OSHM

OSH risks kill some 2.3 million workers per year (2.0 million occupational diseases) at a cost of some 4 per cent of the GDP. If the long term erosion of work ability is included, costs may be over 10 per cent (Takala et al., 2014).

**To reduce this huge burden of poor OSH, the strategy has shifted from detailed requirements ('what to do') towards a proactive prevention ('how to get it done'), through OSH management systems (MS) and systematic OSH management**

(OSHM; Dalrymple et al., 1998; Frick et al., 2000). Yet MS and OSHM are not clearly defined and are frequently used alternatively. Shifting between the concepts, Nielsen (2000) found that MS are not "well-defined, with no clear boundaries between OSH activities, OSH management, and OSHM systems." A review of MS-interventions' effects showed mixed results of a voluntary MS and of a regulated OSHM (Robson et al., 2007).

However, this interchangeable use confuses major differences in origin, aims and implementation of MS and OSHM (Frick and Wren, 2000; Frick,

2011). Nearly all MS (e.g. OSHAS 18001 and ISO 45001 and corporate MS such as by Du Pont) are highly complex privately produced and marketed standards aimed for a few large (often high risk) organisations. They are normally implemented through the commercial certification and monitoring of auditing firms (with the ILO guidelines, 2001, as an exception).

OSHM refers instead to public regulations on systematic OSH management (e.g. EU's Framework Directive; 89/391/EEC; and California's §3203, 1991; Walters et al., 2011) for all employers to implement. As 95 per cent are micro or small firms (MSEs), OSHM's procedural requirements are far fewer than in MS and hardly constitute a separate 'system' in the (mini)organization (cf. the definition in ISO 45001). The employers' compliance is normally promoted, monitored and enforced by the labour inspection. Private MS and regulated OSHM can overlap, e.g. in the Seveso Directive (from 1982, now Seveso III, 2012/18/EU) that mandates genuine OSHM-systems of high-hazard facilities. OSH authorities may also use MS-certifications in their promotion of OSHM (e.g. in Australia, Denmark and the US). But this does not change the different nature of private MS standards and publicly mandated OSHM (Frick, 2011).

### 2. Paper compliance is easier than integrated management control of work risks

Mandatory OSHM is defined by its results. "The employer shall take the measures necessary for the health and safety of workers" (89/391/EEC, article 6:1). Voluntary MS mostly requires compliance with all OSH regulations. Hence they too are goal-defined. If there are risks at work, there is not (full) compliance with OSHM/MS. To achieve, or at least approach, this zero-risk goal,

OSHM requires some and MS many systematic steps in how to manage OSH, such as risk assessments and action plans. However, it is easier to understand and introduce the prescribed procedures and documents of OSHM and MS than to integrate a quality control of OSH in the total management. The procedural means therefore easily become ends in employers' OSHM/MS-implementation, while serious risks may remain unresolved.

The compliance to MS requirements (with zero risk goal) is normally to be secured by MS auditing and certificates, mainly OSHAS 18001 and now ISO 45001. However, even in countries with strong OSH traditions and actors, many certificates have more paper than preventive value. In some cases, MS mainly unburden the risks on workers or aim to bust unions. In all, firms and sites with MS-certificates may well have good prevention but how much this is the case is an empirical issue, mainly depending on why managers pay for MS (Frick, 2011; and mechanisms in Zoller, 2003).

OSHM is a duty for all employers to implement. Their compliance is mostly indicated by manager surveys, e.g. ESENER 2 in the EU (EU-OSHA, 2016). However, these surveys are neither valid nor reliable. They may ask for general compliance ('have you implemented OSHM?') or mostly for some procedures (notably risk assessments) but fail to link these to how risks are prevented, which is the legal compliance criterion. The reliability is also mostly poor through very low response rates (around 20 per cent in ESENER 2). With mainly extra-interested managers' self-reports on only some formal requirements, the results grossly exaggerate the OSHM-compliance. ESENER 2 claimed that 70 per cent of EU's establishments (from five employees) had written risk assessments. However, 70-80 per cent of these are MSEs and EU-OSHA's own large SESAME-study demonstrated OSHM to be all from completely to severely lacking in these firms (Walters et al., 2018a). Robson et al. (2007) equally took Norwegian manager surveys at face-value and claimed that "there was an increase from 8% to 47% of workplaces fully implementing the IC" [OSHM] "requirements over the period 1 year to 7 years post-intervention". Yet Internal Control (of OSH) is also defined by its results. For 47% to fully comply means that the

dominating MSEs have no risks at work, which is completely at odds with Norwegian OSH-surveys that demonstrate widespread risks in all industries.

A valid evaluation of OSHM-compliance has to use qualitative methods to trace the implementation process (the 'programme theory' of Pawson and Tilley, 1997). This was done in a meta-review for the Swedish Work Environment Authority (SWEA). It used a general model of performance management by Johanson (2013) to analyse the OSHM in some 220 case studies (Frick and Johanson, 2013). The results were anchored in quantitative data on e.g. inspection and injury statistics and from OSH risk and health surveys. The reliability of the results were further increased by their remarkable consistency. These found formal procedures in medium and large employers, where CEOs mostly had delegated OSHM away to line managers but with scant resources, monitoring and support. The limited compliance partly improved the prevention of technical risks but not much of organizational ones. The 95% MSEs had at best only started OSHM as their managers lacked competence and didn't try to get it (Frick, 2014). Yet SWEA (2015) dismissed these results. Based on their inflated compliance assessments and poor survey data, it claimed that some 80 per cent of Swedish MSEs assess all risks, which again flies in the face of all research.

### **3. Worker's representation is fundamental in effective MS and OSHM**

The objective of work is efficient production. Even benevolent employers have other main goals than healthy work. Nor do they control every aspect of the production. Workers' views are hence necessary to define risks and prioritize measures, to design and implement workable upstream remedies and to monitor and fight for effective OSHM and MS. Such a critical bottom-up perspective, through worker influence, is essential for good OSH results. It also a legal right in most countries and prescribed in MS-standards, though with different national rules and practices (Frick, 2011).

Walters and Nichols (2007) demonstrated that direct worker participation improved OSH results, workers' safety representatives achieved more but union trained and backed safety reps were the most effective (Gallagher et al., 2001; Hall, 2016; Walters and Wadsworth, 2017). The some 95 per cent MSEs have severe OSHM problems and receive little support in this from labour inspectorates or OSH-services. The only OSH-actor to reach them is trade unions' regional-territorial safety reps, who successfully promote better OSHM and OSH in MSEs in overwhelmingly good cooperation with owner-managers (Frick and Walters, 1998; Walters et al., 2018b).

#### **4. MS and OSHM cover less and less of precarious work and its health risks**

Mandatory OSHM is a duty within the employment relation. Voluntary MS are not restricted to this but are normally applied within organizations. Worker influence is also based on employment and a long term relation is crucial for effective union safety reps. Yet more and more work is done in other forms, such as self-employment – also in platform work – and hired labour (plus much non-declared work). Workers in supply chains, at franchisees, who are posted and other migrants, or on temporary or zero-hour contracts have employers, are bound to implement OSHM. Yet their employment relation is mostly weak and it is completely lacking to the outside corporations that in reality decide much of their working conditions.

There is some coverage by MS and OSHM for such precarious work. OSHM is often to cover all at multi-employer sites, such as in construction. This duty may extend to hired labour and they may be covered by the sites' safety reps. There is an upstream preventive duty for producers and suppliers of materials and machinery and partly also for designers and planners (again, mainly within construction; James et al., 2007; Walters and Wadsworth, 2017; Walters et al., 2018b). As mentioned, regional-territorial safety reps support OSHM on MSEs in some countries. OSH authorities have also sometimes used inspections as strategic tool to make corporations at the top of supply chains improve OSHM at all sites they in practice control (AV, 2003). Yet, by and large, the direct line of command, top

management commitment and worker influence, necessary for effective OSHM and MS is lacking in a large share of the present and future work. OSH risks and ill-health are worse in this precarious work in less managed production (Quinlan, 2011; Walters et al., 2018a).

#### **5. Understand, apply and extend the quality control logic of OSHM and MS**

a. *More resources*: Poor OSH directly costs some 4-5% of GDP, but with long time erosion of work ability it costs around 10% (Takala et al., 2014). OSH authorities and other actors are severely under-resourced and under-staffed for this challenge.

b. *Understand and apply quality the control strategy*: OSHM-MS must focus on effectiveness and not only on means-procedures. To change this, engineers, lawyers and medics in authorities and other OSH actors, with little organizational competence, need training and added management expertise. The quality control logic of OSHM/MS must be applied throughout. Inspection injunctions and the like should not go to line managers but to the employer-CEO with the duty to organize OSHM-MS and to secure that it works. This includes going for the top in the frequent multi-site organizations and not inspect each site separately (AV, 2003; Walters et al., 2011; Bruhn & Frick 2011; Frick and Johanson, 2013).

c. *Micro and small firms through strengthened intermediaries*: MSEs are far too many for the labour inspection to improve their poor OSHM, even with more resources. Intermediate actors need also to be strengthened. The often mandatory OSH services need much better OSHM-competence but also stronger supervision not to sell inferior services to MSEs. The effective system of union appointed regional-territorial safety reps should be spread (Frick and Walters, 1998; Walters et al., 2018b).

d. *Major actors in network production need OSHM-responsibility*: The outsourcing of risks in network production (4 above) should have regulated preventive OSHM-duties for purchasers, suppliers and others in proportion to their influence on working conditions (James et al., 2007). Work deregulation to maximize flexibility must be balanced

against the resulting huge OSH costs and suffering (Quinlan 2011). Those with power in networks should be supervised for the OSHM of all participants (cf. AV, 2003). Unions' safety reps (including regional-territorial) need increased rights and access to also contribute to better OSHM, and hence OSH, in network production.

e. *Supervise and sanction MS-auditors to make their certificates credible*: Accrediting bodies need more, and often more competent, staff for a stricter supervision and sanctioning of the auditing and certifying firms to make it unprofitable for them to sell non-valid MS-certificates. Increased supervision is required also of other voluntary OSH certificates within network production, as a focus on procedures instead of on effective prevention is easier and economically tempting.

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## THE FUTURE OF WORK AND OCCUPATIONAL CANCER

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Occupational cancer has always been an important but slow-moving issue. Amongst all the work-related conditions, cancer is the one with the longest delay between the time when the occupational exposure occurs and the time when the resultant disease appears. In the case of asbestos and mesothelioma, the gap can be more than 40 years, while for ionizing radiation the risk of leukaemia peaks at about 10 years after exposure. This delay before the effect of exposure becomes apparent means that the incentive to prevent occupational cancer is less obvious to the worker and the employer than for conditions which have an immediate effect on the worker and their productivity, such as injuries, skin conditions or asthma.

The temporal separation between the work exposure and the cancer has also meant that our understanding of the carcinogenic effect of workplace agents has been slow to accumulate. It takes many decades for enough data to accrue in order to be reasonably certain that a particular agent causes a particular cancer. Much of the evidence we have now comes from large studies of cohorts of industrial workers, who were followed for decades. Thanks to the researchers who did these studies and painstakingly documented the occurrence of cancer, in this centenary year of the ILO we can say that we do have a good understanding of many of the major cancer risks in workplaces. For example, we have plentiful evidence that asbestos (all forms), respirable silica, diesel engine exhaust, formaldehyde, and solar ultraviolet radiation cause cancer. Importantly, we also understand how we can use the hierarchy of control to reduce exposure to these agents, by eliminating or substituting the agent, using engineering controls to separate the worker from the carcinogen, changing the way people work to limit exposure, or using personal protective equipment.

As we go into the second century of the ILO, however, there are increasing numbers of newly-created chemicals which are introduced into workplaces every year, and very few of them have been comprehensively assessed for carcinogenicity.

**We cannot wait for decades to know that a substance in wide use is going to cause cancer.**

Going forward, we will need to rely on more laboratory-based mechanistic evidence regarding whether a new chemical is similar to known carcinogens, or exhibits characteristics which are associated with cancer. Ideally, these investigations should be done before the chemical is introduced into the market, and not many years later.

As we understand more about carcinogens, there is often a lag in the application of our knowledge base. Globally, the future of occupational cancer can be seen as two diverging streams, with hugely different work experiences in high- and low-income countries.

### High-income countries

In high income countries, manufacturing and production jobs have virtually disappeared, with the majority of workers now employed in the service industry. Occupational health and safety (OHS) in the remaining manufacturing, agriculture and mining jobs has been improved, particularly in large companies, and levels of exposure are declining steadily. However, outsourcing of jobs to individual contractors often occurs, with less oversight of the OHS in those workers. Indeed, an increasing proportion of the workforce in high-income countries is working in small and medium sized businesses, where OHS may not be a priority.

With fewer and fewer people involved in manufacturing or other “dirty” jobs, and many of those who do work in exposed jobs having little formal training in OHS, there is less understanding on a societal level of the risks of long term conditions such as cancer. Just as a lack of personal experience of vaccine-preventable diseases is resulting in a dismissal of the need for vaccines, workers in office jobs, who have no contact with workers who are exposed to carcinogens, can dismiss the need for an OHS system which controls risks of long-term conditions like cancer.

The loss of societal memory of work-related cancers in high-income countries has led to the re-emergence of conditions that we thought were controlled, such as black lung in coal miners and silicosis in those cutting engineered stone. These re-emerging health concerns reflect serious underlying flaws in the systems of hazard control in industry and will inevitably be followed by increases in occupational cancer.

Thus, in the future, high-income countries must ensure that emphasis is placed on ensuring that our existing body of knowledge continues to be applied and is made relevant for a new generation, who do not have personal experience of the industrial cancer tragedies of the past.

## Low-income countries

In low-income countries the structure of the workforce is changing in the opposite direction to that in high-income countries. The share of the workforce employed in large manufacturing plants has increased while the number of workers in small scale cottage industries and subsistence farming is decreasing.

The drivers in low-income countries are primarily economic: the workers need to provide basic needs for themselves and their families; the companies need to make their product more cheaply than the competition so the international buyers don't go elsewhere. In this high pressure environment, OHS issues are often of low concern, especially in relation to cancer, the risk of which is distant and seems theoretical and consequently is easily overridden by short term demands.

The local regulatory OHS framework in some low-income countries is rudimentary or, even if

the regulations are well-designed, they may be poorly enforced. With limited funding for managing OHS, serious safety risks or major human rights issues will obviously take precedence over longer term risks. International aid agencies also tend to concentrate on the immediate risks, which results in a gap for prevention of long term conditions such as cancer.

Sadly, none of this needs to happen. Almost all exposure to carcinogens is completely avoidable through the hierarchy of control, and the reduction in exposure prevalences and levels in high-income countries demonstrates that we are able to make workplaces cancer-free. An example of what could happen is given by the developments in the communications field, which can be thought of as happening in three broad stages: 1) letters; 2) telephones and the significant costs of their physical land lines; and 3) mobile phones which require much less infrastructure. Low-income countries have jumped from stage 1 to using mobile technology and thus avoided the need to build the substantial infrastructure for land lines. Similarly, OHS could be thought of as developing in three stages: 1) cottage industry and subsistence farming with mainly low level exposures; 2) industrial revolution with high level exposures but no OHS; 3) implementation of OHS to make workplaces cleaner and safer. The future of occupational cancer is brighter if the dirty and unhealthy conditions of the Western industrial revolution are omitted, and clean, safe workplaces are instituted everywhere in the world. We need international pressure to make this dream a reality.

## Conclusions

In both high- and low-income countries there is currently a lack of emphasis on prevention of long-term conditions, particularly occupational cancer.

**There is an urgent need to re-emphasize the risks and increase the general public's understanding of carcinogens in the workplace. Humanity needs not just jobs, but cancer-free jobs.**

The future can be free of occupational cancer if we just learn the lessons of the past 100 years and apply them globally.



## MAKE HEALTHY EMPLOYEES A PRIORITY AND PREVENT CHRONIC DISEASES

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## The importance of healthy employees

Work has a major impact on our physical and mental health. Working in a healthy environment boosts the health of employees. Having a job also has great many benefits: it provides an income, offers structure, often contributes to a person's feeling of self-worth, and can therefore lead to better health. Physical impairments often occur an average of 5 to 7 years later in employees who enjoy a healthy lifestyle, and the number of unhealthy end-of-life years is significantly lower. On the other hand (new) working conditions can negatively affect the health of employees. Flexible working, e-working, working longer, the combination with a busy family life and leisure time: all this can cause employees to suffer from increased pressure and stress at work. In many countries, the number of employees unable to work due to musculoskeletal and mental disorders is on the rise. Employees with health issues take more time off work, are more likely to leave the job market, and retire earlier. Businesses lose all that potential of experienced employees. So healthy employees are important for a variety of reasons.

Occupational medicine services can play an important preventive role that extends further than merely preventing work accidents and job-related illnesses. After all, they are also working to improve employee wellbeing.

**Wellbeing is a broader concept than health. It covers all aspects of work, ranging from the quality and safety of the work environment to the work experience of the employee.**

According to the International Labour Organisation, decent work is extremely important, to guarantee not only the health of employees but also a sustainable,

innovative and productive economic activity. While occupational health is generally well developed in Western countries, it is far less common in developing countries because of the political and economic challenges. However, the provision of occupational health has enormous potential to reduce inequality, protect vulnerable groups (such as immigrant workers, different ethnicities), and support equal access to healthcare. In many regions, the workplace has the potential to provide good and sometimes the only access to healthcare. In addition, the obligatory nature of some occupational health programmes (such as health screening programmes or fitness for work examinations) can prevent employees who are less aware of or concerned for their health (which can be linked to a lower socio-economic status) from developing more illnesses vis à vis their “healthier” colleagues.

## A statement of the issue and the scope of the problem

Traditional disease prevention endeavours to eliminate the causes of certain illnesses or make an early diagnosis so as to reduce the adverse effects for health. However, disease prevention is not a sufficient response to the so-called ‘lifestyle-related diseases’ in Western countries, such as cardiovascular diseases, high blood pressure, obesity, type 2 diabetes, and the growing number of mental disorders. After all, such lifestyle-related diseases are largely defined by lifestyle factors such as smoking, unhealthy diet, alcohol abuse, lack of exercise, and factors in the social and physical environment. The focus on the workplace is therefore being extended from risk prevention to promoting the best possible health of employees in all its aspects. Health promotion is therefore not an alternative to disease prevention but rather a supplement, especially in developed countries.



## Health promotion at work: challenges and opportunities

**Health-promoting initiatives offer employees a basis from which to make 'easier' choices for a healthy (or healthier) lifestyle, and acquire the skills to do so in an adapted workplace.**

Below we will outline some of the criticisms about health education, an important part of health promotion. We will also look at a number of initiatives.

### Health education is still important, but is inadequate.

Given that many employees spend a large proportion of their day at work, the workplace can play an essential role in promoting a healthy lifestyle. Health promotion is aimed at every employee, including those that are often more difficult to reach. Employees with a lower SES take more risks with their health. They smoke and drink more, their diet is unhealthier and they do less exercise and sport. Few other settings in our Western society offer such unique opportunities to implement health promotion.

Nonetheless, we should be aware that (more) information does not result directly in a transition from unhealthy to healthy (healthier) behaviour or a healthy lifestyle. The (expected) outcome of information and explanation is found primarily at the level of 'health literacy': employees have to be able to read and critically evaluate the health information, and communicate on an equal footing with healthcare providers. Only then is there a basis for behavioural change. It goes without saying that vulnerable employees, often those with cognitive and physical impairments, are less successful in this area.

Moreover, health promotion at work must connect with the life experience of employees. The employee population in Western companies is becoming increasingly diverse. Health messages at work must take this into account both in terms of form and content. The chance of the information actually being absorbed also depends on how much employees trust the messenger, and the

way in which the message is delivered. Characteristics of the organisational culture, such as engagement, leadership, constructive consultation between social partners, and attention to prevention, can all play an important role here.

Finally, effective awareness-raising based on science and facts is important. We should therefore stop using methods that do not fulfil this criterion (e.g. scaremongering information).

### Health-promoting measures in the workplace: everybody on board!

Measures concerning health promotion can be implemented easily and relatively cheaply at work. For example, an effective way of encouraging employees to use the stairs and do more exercise is the use of 'point-of-decision prompts' (e.g. cartoons, signs next to the lift and stairwell). Exercise breaks and available sports infrastructure enable employees to be active during the working day, and also increase the chance that employees will opt for an active form of home-work travel. A sustainable mobility policy (stimulating cycling, walking and the use of public transport to and from work) also helps increase the number of fit(ter) employees. A healthy and varied range of foods in the canteen makes it easier for employees to avoid eating unhealthy snacks every day. Putting water in the fridge at eye level makes us reach for the soft drinks less frequently. And don't limit the offer of non-alcoholic drinks at work parties to the usual fruit juice; offer alcohol-free alternatives such as mocktails.

However, be careful to avoid one-shot campaigns: they are not enough to make employees do more exercise, eat healthier, or drink less alcohol. Systematic and comprehensive is the message. Good planning increases the chance of more effective interventions. Evaluation is also equally important. It tells us why certain interventions work or not, and gives us leads on where to make improvements. There is often a lack of evaluation, especially process evaluation.

Health-promoting initiatives are often action-oriented (e.g. reducing alcohol consumption), when the employees being targeted don't yet

have any intention of changing ('What's the problem?'). Such initiatives are doomed to fail. Intention is necessary for behaviour to change, and it only comes about if you are sufficiently motivated. Motivation is defined by knowledge (e.g. I know that exercise has a positive effect on my health) and a high degree of self-efficacy (e.g. I can do sport during my lunch hour, even if it's raining). Finally, the effect of environment is also important (my colleagues, managers, think it's great that I'm doing sport). So motivation can be improved by providing knowledge and working on attitude, employees' own efficacy and social support. Furthermore, communication and cooperation are also needed to facilitate health promotion. So, small and medium-sized enterprises in a business park can hire a joint exercise coach.

Management support is crucial not only for starting up initiatives concerning health promotion, but also for sustaining them in the long term. In addition to providing an adequate budget, managers must also lead by example (e.g. participate in the weekly jog; drink an alcohol-free drink at the New Year reception). It is also important for businesses to have a certain return on investment (ROI).

In addition, participation among employees in health-promoting activities must always be voluntary. It is important to make employees aware of the benefits of a healthy diet, regular exercise, sufficient sleep, limited alcohol consumption, no smoking: it is in their best interests. For example, let employees do sport, rather than forcing them to, but show them what the options are. Effective initiatives require motivation and an active input from both sides: employers offer healthy organisational conditions and a healthy work environment, and employees actively participate in health promotion at work.

Finally, political policymakers must also take on their role by issuing supportive legislation, a higher prevention budget and offering infrastructure. One good example is stimulating home-work travel by bike. Apart from its positive health on employee health, it also solves numerous other problems (e.g. congestion and environmental pollution). Drastic changes to infrastructure are needed for this, e.g. bike highways, but these

must then connect up with the city cycle networks. Copenhagen is a pioneer in this area. Here, most people choose to cycle simply because it's the fastest way to get to work.

## **A new challenge: personal(e-) health empowerment**

The availability and personal use of information and communication technologies has increased dramatically over the last two decades, especially in Western countries. Nowadays, practically every employee has a smartphone. New technologies are being promoted as a cost-effective means of delivering behavioural health interventions and consequently preventing non-infectious diseases. This technical digital revolution has led to an increase in the amount of research into electronic health (eHealth) and mobile health (mHealth). The research is mainly aimed at the efficacy, engagement and acceptability of different technologies such as mobile phones and/or text messages, digital games, internet, smartphone and/or tablet applications, social media, gamification functions and fitness trackers with regard to exercise, sedentary behaviour and diet.

Important obstacles to the implementation of these new technologies in the workplace include the high cost price, the limited usability, and the lack of standardisation and evidence on the efficacy. There is also some concern as to whether all employees will be able to correctly process and interpret this overload of information. Finally, there are a great many questions about the privacy and use of the data being collected. Employees are worried that all this available data, in addition to health and physical activity parameters, could also be used to monitor how hard they are working. The challenge is to introduce this to the workplace in a correct deontological, ethical and legal way. One possible solution is, for example, to make these data available to the employee, with a direct link to the occupational health file, allowing for confidential monitoring and coaching by an occupational doctor. These data would then be protected by medical confidentiality.

## **Concluding recommendations**

- Provide health education that connects to the life of your employees
- Provide info to create or to enhance the motivation to change
- The support of management for health-promoting measures in the workplace is crucial
- Work systematic and comprehensive
- Use the new e-health technologies as an opportunity



## OCCUPATIONAL SAFETY AND HEALTH (OSH) PROFESSIONS: WHO ARE THEY AND WHY DO WE NEED THEM?

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### 1. Introduction: changing professions in the OSH field

In the last 50 years occupational safety and health (OSH) professionals have become a prominent fixture in the world of work in most industrial countries. They are employed by companies directly, or are hired in on a part-time contract basis from OSH services. We have seen a huge increase in the numbers of people making a lifetime, or at least a second career out of work in this area. National professional associations have grown to represent them. They seek to codify the entry requirements, education and training needs and career paths for these aspiring OSH professionals and to establish professional codes of conduct and ethics for their advisory and monitoring work. This is a step to gaining recognition as full-blown professions, alongside medicine, law, different branches of engineering, accountancy and many others. In the last 30 years national professional associations have come together at European and International levels<sup>1</sup> to compare and seek to harmonise these requirements and take the aspiring profession to another, global level of service.

This contribution looks briefly at where the demand for OSH professions has come from. Why can't line and top managers deal with all OSH demands based on their existing authority, knowledge and skills? If separate OSH staff are needed, how has that demand been structured, what professional groups have become involved and how has the demand and response changed over the last 200 years? Finally, what does that all say about the future of the OSH professions?

### 2. Why dedicated OSH staff?

The first people to work substantially full-time in jobs focussed on occupational safety and health were the four inspectors of factories appointed in 1833 in Britain and reporting to the central government. They were charged with enforcement of the law passed that year regulating, in designated industries, the minimum age of employment, the hours and conditions of work of children and young persons and the provision of education for them. Central government enforcement was deemed necessary because there was no other stakeholder powerful enough to protect young persons without it. As regulation became more voluminous and complex and as it spread to ever more complex safety and health issues demanding more specialist knowledge, the inspectors had to spend more time explaining what the law meant and how it could be complied with, before enforcing it.

From the late 19<sup>th</sup> Century large and especially hazardous companies began to designate dedicated OSH staff, whose work mirrored that of the inspectorate. They took on monitoring roles in support of their line and top managers, inspecting OSH hardware and rule compliance, being one step ahead of the government inspectors in their information and enforcement roles. This was the beginning of the road to professionalisation, as these dedicated OSH staff found each other and began to compare notes and strategies. For small, relatively low hazard companies the employment of dedicated OSH staff was too expensive. Some countries, such as Germany, have recognised this and allowed top managers in such small companies to take on the full OSH role, provided that those managers follow an approved training course. Others, like the Netherlands, have taken another road. They required companies to hire in OSH services staffed by a

<sup>1</sup> European Network of Safety and Health Professional Organisations (ENSHPO) and International Network of Safety and Health Practitioner Organisations (INSHPO)

designated range of specialists – safety specialists, occupational hygienists, occupational physicians and work and organisation specialists.

### 3. The development of generalist and specialist OSH professions

The early developments sketched above soon gave rise to some questions and conflicts. Given the tendency of aspiring professions to stake a claim to ownership of specific tasks, models and methods, which should be permitted to own what? Was the knowledge of the full range of hazards and their prevention across all industries so broad that it was beyond the capability of one specialist to understand and advise on it? If so, how could that breadth of knowledge be best divided between those competing professions to ensure a viable depth in each area coupled with effective communication and collaboration across the divides between them?

The solution which seems to be emerging, at least in countries which have been influenced strongly by the developments in the UK, is to set up a matrix. One professional group concentrates on a broad, but relatively shallow expertise, in this case the OSH professionals. Where that profession lacks the depth to cope adequately with the presenting hazards, prevention techniques or OSH management, they call upon supporting OSH professional groups and individual consultants to assist. These second-line professions include at least occupational hygiene, occupational medicine, occupational health nursing, physiotherapy, ergonomics, structural (and other branches of) engineering, risk analysis, change management, industrial relations, organisational design and many more.

There is a useful parallel to draw with the way medical diagnosis and treatment are organised for the general public. General Practitioners (GPs) deal with a whole range of health problems in society, but refer complex and rare cases to specialist consultants based in hospitals or other health centres. The advantage of such GPs is that they are more likely to see their patients holistically, rather than focussing on just one body system or disease. The generalist OSH practitioners should have this same broad vision of the overall OSH of the enterprise for which they work and the same emphasis on diagnosis, learning and system design.

**The last 100 years has seen OSH expand from a largely technological base, concerned with machinery guarding and later with chemical safety and occupational hygiene.**

Concerns with human behaviour, training, accident proneness and rule compliance were added from the 1920s, ergonomic design in the 1950s and safety management from the 1970s. Research has shown that quite a few countries now recognise two levels of generalist OSH professional, one at technician level concentrating on tactical technological and behavioural issues centred around the workplace, and one at a strategic management level focussing more on organisational issues

Meanwhile industrial companies have been experimenting with combining OSH with environmental hazards in combined staff departments, sometimes with quality, sustainability and even security as additional objectives. They pointed to the great similarities between the ISO standards for quality management, OHS management and environmental management, all based on variants of the Deming Circle (Plan, Do, Check, Adjust). But is this resemblance enough to combine those staff departments and give them to the OSH professional, with the support of a range of new second-line specialist professions to cope with the complexity of organisational design and management?

### 4. The future

In this piece I have shown that the OSH professions, ever since their inception, have adapted to changes in the developing technology of work, the understanding of the resulting hazards and their controls rooted in technological, behavioural and occupational design and management.

**What of the future? What challenges can we see to their future role?**

1. This piece and recent research sketch one possible solution, namely one generalist profession functioning as the GPs of OSH and several deeper, but narrower professions acting as support and specialist competence, in the same way that the general medical practitioner refers difficult cases to the hospital specialist. Do all the professions (both first line generalist and second line specialist) recognise and accept this description of their relative roles or are they still

fighting territorial battles? Does this structure offer a framework for comparing, evaluating and learning from the effectiveness of functioning of different national structures for OSH professions? How can we research such comparisons?

2. Is the generalist role becoming too broad for any one person to advise on competently? We have seen debate over the last decennia about extending the OSH generalist's role to include environmental risk, security, quality and sustainability. Where are the boundaries we should work within relating to these company objectives? Is an acceptable solution to have two levels of OSH professional, one strategic and one tactical? With the shift of emphasis taking place now, from purely physical injury and damage to psychosocial and mental health risks (bullying, stress, over-work, absence, etc.) should this be part of the OSH professionals' territory, or does this belong to 'human resources' professions?
3. There is a strong push in developed countries, particularly those influenced by the UK systems of professional certification, to regulate entry to professions by defining exclusive education and training requirements and to require that retention of membership in the professional body and career progressions depend on continuing professional development. Does this ossify the professions and erect unnecessary barriers to entry and progress, or is this a vital step towards quality control of the professions? Are these systems suitable for developing countries? Would it suffice to have general requirements to consult experts, without defining in advance what 'expert' means in each case?
4. This piece sketches a period of over 200 years for the OSH professionals in developed countries to get where they are now.

**Can the developing world fast-track that development to arrive at the same spot, or do they need to find radically different paths to a different maturity?**





## SAFETY AND HEALTH IN SMALL BUSINESSES – BETWEEN A ROCK AND A HARD PLACE

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Small businesses constitute the backbone of the global economy providing economic growth and employment, yet they are often depicted as a pitiful place with hazardous working conditions and a business on the verge of collapse, but such a picture is neglecting that skilful entrepreneurs on a daily basis are securing jobs and survival of their business. Whereas small businesses are often emphasised for their limited access to resources, it is important to keep in mind that they also have resources – without they would not survive for long. The owner-managers have to be action-oriented and able to navigate in difficult business environments and at the same time secure a stable and committed work force, otherwise collapse of the business will be lurking in the future.

However, there are also good reasons for the opposite picture. Small businesses are often squeezed by stronger market players and they do have limited resources compared to larger companies. Globalisation has provided strong business opportunities for both multinationals and large national firms, but a key element in these opportunities is the ability to squeeze small businesses. Key activities are outsourced to subcontractors who have no power to negotiate reasonable conditions. It happens in almost all sectors. In construction, the general contractor outsources to several layers of subcontractors down to labour-only companies; in logistics, the transport is outsourced to haulage contractors owning a single lorry; in hotels, cleaning, restaurants and the reception desk are out-sourced; in restaurants, franchising chains control the individual owners; and in retail, supermarket chains dominate the individually owned shops.

In meeting these business challenges, owner-managers are hampered by their restricted access to financial resources for both investment and credits. Furthermore, the entrepreneur is often the sole owner and also the manager of the business. He or she needs to take care of all managerial tasks as well as most support activities such as ordering supplies, writing tenders and invoices, accounting, paying salaries, hiring staff, and many owner-managers also participate in the production of goods or services. Management resources are therefore always a restricted resource in a small business.

The consequence of market pressure and limited resources is that owner-managers are often trapped between their wish for a high road strategy with an expanding business and good working conditions and a low road strategy where they – in order just to keep floating – accept almost loss-giving order, extend their own working hours, reduce their personal income and put pressure on their workers in terms of low salaries, precarious employment conditions and a risky work environment.

### How to do – not how to find out

Unfortunately, the effect of this trap is well documented.

**Workers in small businesses carry a higher risk for accidents and occupational diseases.**

They simply have a risk of fatal accidents several times the risk of their colleagues in large companies. There is therefore more than good reason to give a special priority to improvement of the work environment in small business, and even though they face serious business challenges, there are also opportunities.

As already pointed out, owner-managers are skilful and action-oriented people with qualifications necessary to keep their business running and when convinced about taking specific steps to improve the work environment, they simply take action.

They are also social human beings who wish to maintain an identity as decent and respectable persons who treat their workers fairly and secure a safe workplace. Local conditions and culture influence the specific form of the identity but owner-managers generally need as all other people to be accepted by other human beings. In the business context they need acceptance through social relations with stakeholders – customers, workers, peers, neighbours and others. Owner-managers therefore express in interviews that they really want to take action and keep their workplace safe and healthy, but also that they need to know what to do to secure an acceptable safety level. As they do not have the resources to search for knowledge about the work environment, they look around to their peers – what do they do to be acceptable, they listen to request from their workers – but the workers often abstain from raising their voice both from fear of consequences and because they also know the business challenges, and owner-managers look to the requirements from labour inspectors – whom they rarely meet, but take the stories from peers who have been inspected.

While this fundamental approach to safety and health opens for fast action when the owner-managers learn that specific control measures are needed to reach an acceptable level of risk, it also leaves the small business with the standard generally maintained by peers in the specific sector and local area, which most often is far too low to secure safe and healthy workplaces.

**Support from society is therefore necessary, and such support must be tailored to the specific needs of small businesses.**

In developing a strategy for such support it is necessary to break with the dominating paradigm of risk assessment as the overall key to control of the work environment. The paradigm builds on the sound and rational argument that it is necessary to know the risks to control them in a systematic manner. It fits well to the larger companies which can allocate professional staff to carry out such risk

assessment, but in the small business the owner-manager does not have anyone to carry out risk assessment except for him or herself. Their key priority, however, is to fight for survival of the business. In spite of the drive to develop an identity as a decent person, safety and health comes far down the list of priorities, and furthermore the owner-manager does not have the skills to carry out a traditional risk assessment. It is therefore not particularly helpful to prepare risk assessment methods which are just simpler versions of the traditional methods. The small businesses do not think in such a manner, and they will not use even the simple versions of risk assessment. If forced by authorities, they may tick a checklist, but without any consequences for tangible workplace improvements.

**Rather than being told how to find out, the small businesses want to know what to do. What tangible measures should they take to keep their workplace safe and healthy?**

They need to see peers taking such measures, or they need to be told what to do by inspectors, OHS advisors, equipment suppliers or others in a respectful and relevant manner. Hence, the system needs to be tailored in such a manner that it can provide this specific form for support, tailored to the needs of the small business.

## **Towards tailored support systems**

It is therefore necessary to develop strategies for how to tailor support systems to match the context of small businesses. Such strategies build on a foundation of legislation and actors which have to develop their effort in a particular manner to reach the small businesses. The overall strategy can be illustrated by a house model.





Any society expects workplaces to be safe and healthy, and that expectation is expressed in the national legislation, but legislation needs enforcement to be given priority by citizens as well as business, and so it is with small businesses.

Enforcement by labour inspectors is therefore key to the priority of health and safety, but in most countries small businesses almost never meet a labour inspector. In countries where inspection in small businesses are given priority, owner-managers – in spite of a general resentment towards authorities – react positively to inspectors who do not only tell what is wrong but also how it can be corrected. By doing so, inspection has not only value for the inspected small businesses but a dissemination effect to other workplaces through peer to peer communication.

Peers are an important key to small businesses. Authorities and consultants are often viewed with reservation whereas small businesses have an inclination to trust their peers and they will most often have a small close network of peers with whom they both share experience and business in case where they for instance lack capacity. In some countries small business associations, chambers of commerce or employers' associations provide advice on health and safety to their members.

Small businesses need support to find the right solutions, but it is in general too expensive for small businesses to pay for consultancy services. Most small businesses therefore do not have access to support, but some countries have developed systems which provide valuable advice to small businesses. One example is Sweden where regional work environment representatives visit the small businesses. It is a skilled worker in the specific sector doing the visits – a mechanic in auto repair, a car-penter in construction and a hairdresser in hairdressing. The system is co-funded through collective agreements between employers and unions and the government. Other countries have insurance systems where the compulsory workers' compensation fund visits to workplaces.

It is evident that there is not a single actor or method which can secure a broad impact on the work environment in small business. It is necessary to have an integrated or orchestrated approach using all possible means to reach out to the small businesses. In doing that, the pillars in the house are the clue to design of the systems. They need to be directly tailored to the (sub)sector. General information does not work. The stronger the relation to business goals, the easier it will be for the small businesses to relate to the necessary fight for survival of the business. Solutions need to be low cost and simple to be applied.

Finally and not least – small businesses live from personal social relations. They meet their customers personally – face to face or by phone, owner-manager and workers work together on a daily basis and they listen to advice from trusted persons – their spouse, business partners, accountant, suppliers, key customers and others. It is therefore most likely that they will listen to personal advice for improvement of the work environment than any other type of information. The chance that they will search for written information from anywhere else is in most cases slim. New digital generations - also in small businesses - may have the internet much more integrated in their activities. It opens new possibilities, but with the owner-manager as the only one to take decisions and without any deep knowledge of the work environment, he or she will still need to get advice from someone about what to choose also when it is from the internet.

To conclude: work environment actors – authorities, professionals, advisors, employers and unions have a huge task to improve the support for improvement of health and safety in small businesses. It is possible to be more efficient in reaching out to the small businesses, but much more resources are needed in order to achieve a widespread impact on the huge number of small businesses and the employees working there.



## SICK PAY, COMPENSATION AND THE FUTURE OF WORK

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In what follows the author argues that the provision of sick pay and compensation to ill and injured workers should be conceived from the perspectives of health inequalities and human rights rather than through the lens of employment rights. He does so on the grounds that such perspectives are more supportive of actions aimed at combating the growing proportion of workers falling outside the coverage of existing arrangements.

This argument is pursued in three stages, with a focus on the situation in developed economies. Initially, the varied ways in which sick pay and compensation schemes are funded and provided internationally are briefly discussed. Following this, attention is paid to how changing patterns of employment are leading to increasing numbers of workers failing to meet the eligibility criteria governing access to such benefits. Finally, the implications of this trend are highlighted in relation to current understandings of human rights and health inequalities.

### **Sick pay and compensation: a brief overview of variety**

Illness and injury not only affect the physical and mental health of workers. They also generate financial costs and risks to workers and their families. These costs and risks raise questions about their scale and important issues of policy about how they are distributed between workers and their families, taxpayers and employers. In doing so, they more specifically raise questions about how, and through what means, workers have access to sick pay and other forms of compensation. These latter questions are complex and difficult to resolve. Their discussion inevitably involves exchanges informed by widely differing moral and ethical positions. Their resolution also

confronts the challenge of accommodating a world of work in which patterns and forms of employment have become more diverse and fragmented and the nature of work-related harm has shifted, not least as a result of a growing recognition of the damage caused by psychosocial risks.

**The systems in place to provide sick pay and other forms of compensation to the victims of work-related harm currently vary widely in terms of their structure, scope and generosity.**

As a result, there is an almost endless way of seeking to classify them for comparative purposes. Distinctions can be drawn, for example, in terms of how far schemes focus attention on the prevention of illness or injury, the provision of financial support (and security) and the rehabilitation and return to work of workers who have experienced ill health and injury. Further distinctions can be drawn regarding the degree to which they focus exclusively on forms of work-related harm, the extent to which they provide harmed workers with the ability to sue employers for fault-based compensation, and the sources of their funding - employers, the state, workers, or some combination of these, and the relationship between schemes and the wider social security ones. And, so the list goes on...

### **The issue of declining coverage**

Against this background of complexity and variation, the rather technical issue of eligibility criteria, who qualifies for scheme benefits, tends to loom relatively low in comparative discussions. Yet it is in this area where the adequacy of schemes is coming under profound challenge as the nature of work in the modern, globalised world of work changes. Self-employment and a host of different

forms of atypical or non-standard patterns of work have grown dramatically over the last three or four decades, with a corresponding rise in the proportion of workers falling outside existing eligibility rules. Meanwhile, in countries like the United States and the United Kingdom, where relatively limited forms of state-based financial schemes exist and are supplemented by voluntary employer ones, the shift of employment to small and medium sized enterprises has acted to reduce the extent of this supplementation. Trends that have been argued, albeit in a rather conceptually imprecise way, to be giving rise to a 'precariat' of insecure and low paid workers, often working in informal settings.

Clearly it is beyond the scope of a short 'think piece', to map out a detailed approach to resolving this problem of growing exclusion from access to sick pay and compensation. It is possible though to highlight and explore the value of conceptualising the role of such arrangements in public health and human rights terms and thereby view the benefits provided under them as citizen rather than work-based rights. This is done below via a focus on the provision of sick pay to ill and injured workers.

## **Sick pay, public health and human rights**

At an international level social security has long been accorded the status of a human right, including under the Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights (ICESCR). More particularly, it has been formally acknowledged that the right under the ICESCR to social security encompasses protection from a lack of work-related income caused by sickness and employment injury.

As has already been suggested, worker entitlements to sick pay when unable to attend work due to illness and injury vary considerably across the world in terms of such matters as how it is funded, the proportion of wages replaced or covered, the maximum period for which it is provided, whether there are non-paid 'waiting days' and qualifying conditions. These variations in effect mean that access to an important human right is both conditional and variable.

**In the absence of sick pay, workers effectively are faced with choosing between protecting their health and protecting the financial security of themselves and their families.**

This moreover is not an idle piece of speculation. The number of working days lost due to sickness has been noted to be lowest in countries like the UK and USA which have the most limited sick leave benefits. However, contrary to the assumption that this simply supports the view that such benefits encourage malingering, there is good evidence that an important reason for this is that workers attend work when ill, thereby potentially damaging their health and running the risk of contaminating work colleagues. An ILO study by Scheil-Adlung and Sandner, for example, points to a study of the impact of the 2009 H1N1 pandemic that in the meant that such work attendance led to the infection of some 7 million co-workers at a time when Germany, a country with one of the most generous benefit regimes, reported its lowest level of sickness absence ever.

Statistics on access to sick pay in the United Kingdom graphically demonstrate the extent to which workers are likely to experience such trade-offs between considerations of health and income security. These show that at the end of the 1980s around 90% of employers offered at least some of their staff access to sick pay. Since then, however, this percentage has declined significantly, with the latest available figures indicating that less than half of employers (and a much smaller proportion of private sector ones) now operate such schemes. As a consequence, around 30% of employees, along with many of those working casually and in various forms of, at times false, false self-employment, do not have access to sick pay. Those so excluded are potentially entitled instead to Statutory Sick Pay (SSP). This is only the case though if their pay as an 'employee' exceeds a minimum threshold. Furthermore, if this threshold is passed, the payment provided amounts to just £89.35 a week from the fourth day of absence for up to a maximum of 28 weeks. For employees on the National Minimum Wage who work 35 hours a week, and are aged between 21 and 24, this means that they only receive around one-third of their normal income. This proportion is even lower in the case of those aged 25 and over. Meanwhile, those not working under a contract of employment have no entitlement and hence effectively lose all their pay if away from work ill.

This lack of access to decent sick pay has important implications for health inequalities. It is well established that sickness absence internationally varies with socio-economic status. This variation in turn has been found to reflect how those from the lowest socio-economic backgrounds tend to experience more ill health and to die earlier. Existing evidence further indicates that poor working conditions make an important contribution to this. In other words, those most prone to ill health tend to be labouring in work situations less supportive of good health. That is in work contexts marked by low pay and security, high work demands and low levels of control, poor effort-reward relationships, shift working and exposures to physically demanding tasks and harmful substances.

The problem is that these same people are the ones most unlikely to have access to decent sick pay arrangements by virtue of the nature and form of their employment. So those who are most likely to need such pay tend to have least access to it. Indeed, to return to the situation in the UK, some workers in the so-called gig economy not only have no access to sick pay but must find a replacement worker if they cannot attend work or face a financial penalty for failing to do so. This means that they may actually lose more than their normal pay when absent!

Such situations cannot be deemed in anyway civilised. They compound already disturbing levels of health inequality between different socio-economic groups. They also breach an internationally recognised human right to decent treatment when ill. They are in short unacceptable.

## Conclusion

**Current trends in employment mean that increasing numbers of workers are falling outside the scope of existing sick pay and compensation arrangements with adverse implications for both their health and that of their co-workers. Ironically, it is further clear that this lack of access to such benefits is most likely to be experienced by workers who are most likely to need them.**

At the aggregate level it is therefore compounding the marked health inequalities that internationally have been found to exist between different socio-economic groups.

Exclusion from sick pay and compensation must for these reasons be viewed as both a health and a human rights issue. It is recognised that viewing it in these terms will not magically lead to the taking of appropriate remedial actions by governments. It arguably will, however, add weight to pressures aimed at ensuring that emerging patterns of work are not associated with a growing cadre of excluded workers, not least because the language of health and human rights is one that is more likely to resonate with policy makers and the public.

The fact nevertheless remains that systems of sick pay and compensation are ultimately ameliorative in nature. Reforms to their coverage will as a result only very partially address the role that work plays in generating illness and injury, as well as inequalities in how they are experienced, in the absence of wider ones focussed on the more widespread provision of good, decent and humane working conditions and jobs of the type falling within the scope of the ILOs Decent Work agenda.



## INTEGRATING THE OSH MANAGEMENT SYSTEM WITH THE GENERAL PERFORMANCE MANAGEMENT SYSTEM

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During the last decades, an increasing interest has been devoted to the management of OSH. For example, the journal *Safety Science* calls for the development of new frameworks to analyze and design OSH management (e.g., Podgórsky et al, 2015; Sinelnikov et al, 2015; Tappura et al, 2015). Additionally it has been an ongoing discussion about how to make a difference with respect to integrating OSHM in the general performance management process. Most recently, the latter issue has been even more pronounced under the corporate social sustainability agenda. However, the impression from the discussions concerning corporate social sustainability (including OSH) as well as in *Safety Science* is that the debate so far has been too basic and immature. One example concerns the legal provisions in the Nordic countries with prescriptions on how to tackle work environment management. The legal paragraphs address items that are easy to obtain but the legislation is formulated from a basic viewpoint that OSH has not to do with the business perspective in itself.

In another think piece Frick distinguishes between mandatory and voluntary OSH management systems. Neither of these systems are linked to the general performance management of an organization. In this think piece the proposal is that OSH has the potential to be significantly improved if it is integrated in the general performance management system. The latter comprises financial as well as non-financial issues related to a specific private or public organization. A brief framework for analyzing and designing a performance management system which integrates OSH will be suggested. A number of elements that need to be considered will be suggested.

After an analysis of almost 300 Swedish case studies we (Frick & Johanson, 2013) concluded that the OSHM processes did not work sufficiently. The results from this analysis demonstrated different deficiencies of the OSH management system. Among others missing clear contracts of responsibility between the various management levels and counteracting reward processes were identified as barriers for an improved OSH. These and other factors indicate that the basic views of a good working environment had less weight than a short-term profit ideal. The short-term financial results were often superior to OSH. OSH management then became more a matter of following the prescribed procedures (on risk assessment, meetings, plans etc.) than achieving the aim of a better OSH environment.

**The integration of OSH management with the general performance management of every organization (private or public, small or big) is a precondition for a result- and resource-efficient OSH management.**

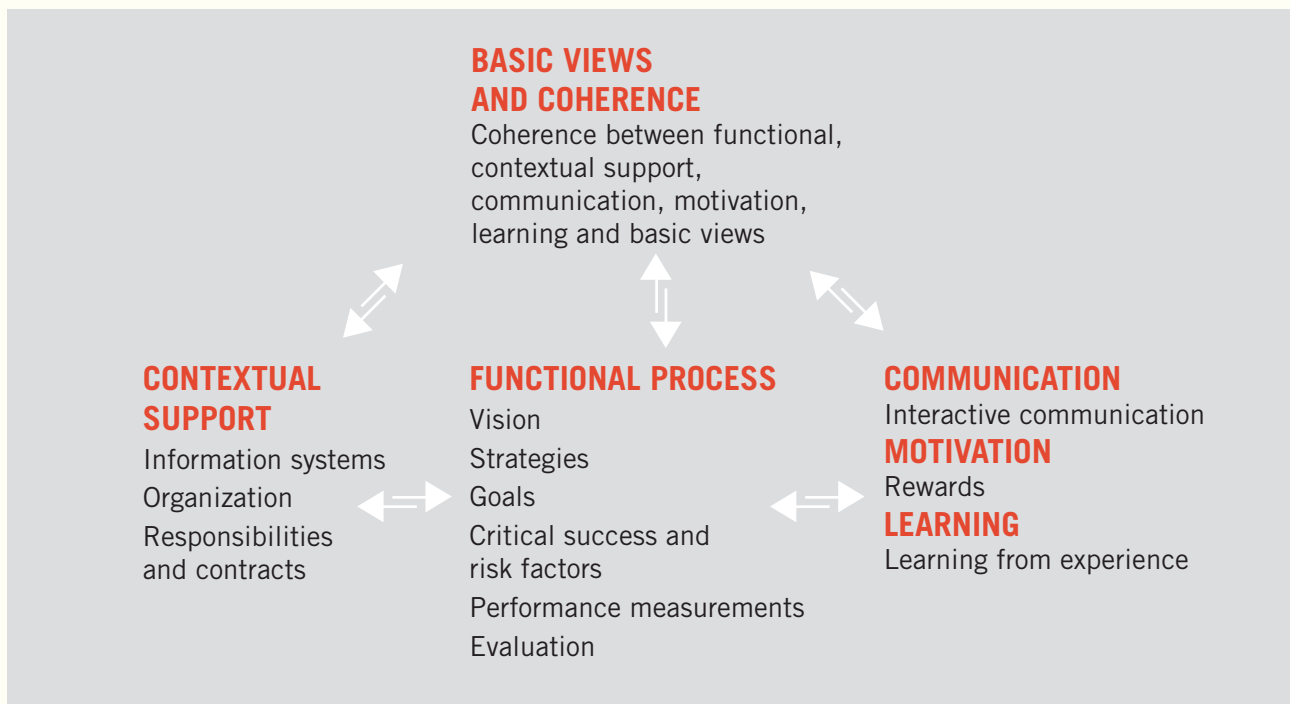
To promote such a work environment, where routines are not ends in themselves, but means to manage towards a good working environment with reduced risks and improved health, it was from the study by Frick & Johanson obvious that there were a number of knowledge gaps that need to be addressed.



Therefore, the development of OSHM ought to be based on a point of departure that includes internal as well as external factors. The present paper focuses the internal perspective. It is suggested that OSHM can learn from the performance management debate which has been active for the last 10-15 years<sup>1</sup>. Together with colleagues I (Johanson et al, 2019) have suggested the following framework for analyzing performance management. It builds on experience from the analyses of the Swedish work environment cases (Frick & Johanson, 2013).

Sometimes responsibilities are clarified in some kind of contract. Even these can be of a formal character or just informal (Johanson et al., 2001).

**A well working performance management system is normally based on interactive communication between people involved. The interactivity is a precondition for a continuous learning process regarding the content of the functional process but also with respect to a continuous adaption of the complete performance management system in itself.**



In the middle of the figure is the central functional process, which exists in almost every performance management system. It comprises the Vision, Strategies, as well as concrete Goals and targets. Furthermore, it includes Critical success and risk factors, Performance measurements and Evaluation. These functional processes include both financial and non-financial elements.

The functional processes are supported by contextual issues, such as organization and information systems, but also by responsibilities. The latter could be of different kinds, formal or informal.

Rewards is another very important condition for an efficient system. The rewards could be of an extrinsic or intrinsic character. The rewards do not just refer to salary and bonus items, but also to, for example, top management demand and benchmarking (Johanson et al., 2001a).

**A well working performance management system is normally based on interactive communication between people involved. The interactivity is a precondition for a continuous learning process regarding the content of the functional process but also with respect to a continuous adaption of the complete performance management system in itself.**

<sup>1</sup> Important inputs to this discussions originate from a number of sources primarily Malmi and Brown (2008), Ferreira and Otley (2009), Broadbent and Laughlin (2009), and Johanson et al (2001). They all have suggested broad frameworks for analyzing and developing performance management systems.

Rewards is another very important condition for an efficient system. The rewards could be of an extrinsic or intrinsic character. The rewards do not just refer to salary and bonus items, but also to, for example, top management demand and benchmarking (Johanson et al., 2001a).

All organizations and all management systems (including OSHM), are based on some kind of basic views and values. Sometimes these views and values are explicit but sometimes they are not. Nevertheless, they are extremely important because as a point of departure all other management processes are designed and put into practice with the basic views and values in mind. The absence of expressed basic views encourages an instrumental approach to the performance management system, where barriers between the basic presumptions and the design deteriorate the complete system. (The latter was observed made by Frick & Johanson, 2013.) In the present text basic views refers to what is seriously expressed concerning what should be obtained by the design and the use of the system whereas values are the fundamental shared values (i.e., fundamental ideas and principles) which exist but which are not always pronounced. The values can even remain unconscious, which makes it impossible, or at least difficult, to reveal.

If the different components of the performance management system do not fit well together, the system will not work sufficiently. This means that it is important that, not just functional but all other processes are coherent with each other and with basic views and values.

The framework's constructs are not, and could never be, an ideal classification system. It is not exhaustive in the way that all possible factors are included. Neither, the categories are exclusive. It is difficult or even impossible to sharply distinguish between the different categories. Further, the framework does not prescribe anything about linear causality. Rather, every system is comprised of a number of mutual interactions that may vary in different contexts. It is a framework that has the potential to achieve 'a rich understanding' (Broadbent and Laughlin, 2009) of the performance management system.

I hold that the above suggested framework could be a useful point of departure for an increased understanding of how OSHM can be integrated in the ongoing performance management of an organization regardless of if it is public or private, big or small. To improve the framework's capability to guide organizations towards better and healthier workplaces I also suggest that further practise based research should be performed in two areas;

- (1) A further development of the OSH performance management framework to include even factors and processes external to organisations.
- (2) Investigate the validity and reliability of the OSH performance management framework in different contexts i.e., different kinds of private and public organisations.

Huge efforts are spent on preventive OSH measures, but how to integrate all this necessary and important research in everyday practise and operations inside organizations is seriously neglected. When external regulations are discussed and change the internal performance, management systems need to be further understood as well as taken into consideration!

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## ALCOHOL AND DRUGS AT WORK: THE INTERFACE BETWEEN SAFETY AND HEALTH AND HEALTH PROMOTION

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Alcohol or other drug use by employees is a private matter. However, it's a different story when it comes to work-related use: alcohol and drug use during the hours (immediately) before work, at work (including during lunch breaks), during 'specific occasions' at work (such as company parties), and during travel to and from work. It may have a negative impact not only on the employees themselves, but also on their colleagues, and on their environment. A preventive alcohol and drug policy endeavours to prevent such problems or deal with them in good time. It is in everyone's interest to prevent or tackle such problems. Given the impact of substance use on public health, it is also a topic for health promotion.

## A combination of health promotion & safety and health ...

Employees who are in good health are more productive and take less sick leave. They are more likely to be motivated and more engaged at work. Healthy employees reduce the cost for employers. So they in particular can benefit from ensuring that their employees are and remain healthy. It is therefore advisable to promote a healthy lifestyle, including a focus on alcohol and other drug use.

However, given the obvious effects of alcohol and drug use on the daily functioning of employees, the topic is not limited to promoting health.

**Problematic substance use can jeopardise the health and productivity of the employees and their environment.**

Problematic users are sick and absent more often, and perform less well. The employee is less accurate, makes mistakes, and has arguments with colleagues. Contrary to popular belief, it is occasional problem use that usually leads to problems with functioning at work.

Colleagues may also feel unsafe due to the increased risk of a work accident. Somebody who is drunk will find it difficult to assess risks. At work it may result in accidents and bad decisions. Excess alcohol use dramatically increases the chance of (road) accidents. The risk of a fatal accident goes up 2.5 times at 0.5 per mille (parts per thousand), 4.5 times at 0.8 per mille and 16 times at 1.5 per mille. This is an important finding, given how much time employees spend on the road. Drivers under the influence of cannabis, the most commonly used illegal drug, also double their risk of causing an accident compared to sober drivers. Cannabis use affects the skills needed to drive a car. Reaction time slows, as does the ability to observe what's going on around you. Motor skills and the capacity to accurately assess speeds are also impaired.

## ... And a focus on re-integration

**In addition to musculoskeletal disorders, psychological complaints such as burn-out, depression and problematic substance use, are the main causes of long-term sick leave in Western countries.**

To prevent employees ending up unemployed or on invalidity leave due to illness or impairment, and thus to keep these employees, companies need to devise a practical re-integration policy. Disability Management is aimed at job retention and re-integration of these employees, in the first instance at the employee's workplace. At the business level, it is important to link up Disability Management to related policy domains such as programmes for health promotion and prevention and protection of wellbeing at work, including an alcohol and drug policy.

## Challenges and opportunities

### Develop a practical alcohol and drug policy

**With the right policy, functioning problems resulting from alcohol or other drugs can be prevented or spotted in good time, thus increasing the chance of recovery.**

It is crucial to translate this policy into specific initiatives, if it is to be efficient: managers must know what is expected of them, and employees must know how the company reacts to problematic use and what the possible consequences are. Everyone must know whether, where and to what extent alcohol or other drugs are permitted. The implementation of roles, rules and procedures should not only be 'right' in the sense of 'practical' (does it deliver?) but also correct (with respect to the employees concerned, and out of respect for privacy and confidentiality). For such a policy to be successful, there is also a need for adequate training and information in order to raise awareness among employees and support employees with a functioning problem.

### Job performance is the key word

It is not easy to deal with employees who are problem users. There is a suspicion of alcohol or drug problems and there are consequences at work. From a work perspective, it is best to focus on work-related behaviour: changes in performance of the person involved lead to intervention. Such an intervention is objective and correct: an employee is always presumed to have done his work properly. It is also more efficient: approaching people with a suspected alcohol or drugs problem usually leads to a negative response and results in denial. When alcohol and drugs problems become functioning problems, they must also be treated as such. However, in many organisations the definition of 'good functioning' is by no means obvious, even when there are suitable functioning systems in place.

### An essential role for occupational health

Occupational physicians (OPs) could be important actors in the prevention and management of substance abuse among workers. They are regularly in contact with a significant proportion of the working population, mostly in a preventive medical setting. This puts them in a unique position to intervene early when problems in the workplace occur due to substance abuse. When discovering alcohol- or

drug-related harm, OPs can invest in appropriate advice and brief intervention, and they **can play** an important role in the rehabilitation of workers with substance abuse by understanding and supporting them. They can also take into account the work-related context in which this substance abuse has developed, e.g. the relationship with work stressors and shift work.

However, occupational doctors are not therapists. They do form a bridge between the organisation and the line management on the one hand, and the external healthcare providers on the other (GP, specialist healthcare providers). OPs can screen for alcohol and drug use with the requisite confidentiality, and motivate employees to deal with their problem. They can contact the GP and/or external healthcare providers and draw up agreements for possible treatment and/or re-integration. Respect for the privacy of the person involved and the confidentiality and independence of the doctor are necessary preconditions if this is to work.

### Can they and do they want to take on this role?

Most OPs believe they can play a leading role in raising awareness among employees about the negative effects of substance abuse, and/or in tackling problematic use. Precisely because of the consequences of alcohol and drug use on the safety and health of employees, it is usually not the attitude of the doctor that is a problem. After all, it is the OP's job to address this. His knowledge will also be invaluable. In practice, OPs know quite a lot about the effects of alcohol and psychoactive medication, but less about illegal drugs, for example new synthetic drugs. Moreover, it is not easy to talk to employees with substance abuse problems. There is often denial and resistance among employees. OPs then feel powerless in many cases. Specific communication skills and sufficient time may help them to handle a conversation with the employee, and make the right referral. The support of the company is also important. Therefore, contextual factors such as the prevention culture in the company and a developed alcohol and drug policy would facilitate the OP's role. In addition, because of the overlap between health promotion and safety and health at work, it is better to integrate health promotion as much as possible in the existing structures surrounding safety and health at work, rather than creating something completely new.



## A consensus guideline as scientific backing

Unlike general practitioners (GPs), OPs have very few guidelines to help them in their daily work. The first guideline was made available in Belgium in 2017, but is limited to alcohol use. The guideline assists OPs when screening for high-risk alcohol use. Screening for alcohol use among employees can be organised during various OP examinations (e.g. during recruitment examination, availability examination) and/or in the context of a survey about employee lifestyle. Screening offers the OP the possibility to inform employees about their alcohol use and where necessary to take preventive measures. The OP can also spot risky and harmful use as well as possible alcohol disorders. The Belgian guideline is based on the AUDIT-C (Alcohol Use Disorders Identification Test – Consumption), the abridged version of the AUDIT questionnaire. Depending on the score, the complete AUDIT is taken. In addition, short-term interventions can be offered (e.g. referral to GP). The idea behind it was to raise the quality of the OP approach so that they could address the alcohol problem among employees (more) efficiently. Consensus and standardisation via a guideline with a decision tree was necessary for this purpose.

In order to reach this consensus, various World Cafés with occupational physicians were organised. A World Café is a structured conversation process, intended to facilitate an open and lively debate. During these meetings, the importance of guidelines in general practice medicine was elucidated and their application by OPs was discussed. Various screening tools for alcohol and other drug use were explained. Feedback was also sought from participants on screening and short-term interventions, and possible obstacles were listed, as well as conditions for implementing this initiative. The organisation of a World Café is an evidence-based approach in which stakeholders (in this case OPs) actively participate. In the short term, it leads to faster and better implementation of change and creates a feeling of involvement and ownership.

## Concluding recommendations

- An integrated alcohol and drug policy is appropriate.
- In the prevention and early detection of alcohol and drug problems at work, there is a key role for occupational physicians. Guidelines can support them in executing their role.

**Source:** Lambrechts MC, Ketterer F, Symons L, Mairiaux P, Peremans L, Remmen R, et al. The Approach Taken to Substance Abuse by Occupational Physicians: A Qualitative Study on Influencing Factors. *J Occup Environ Med.* 2015;57(11):1228-35.





## THE OSH CHALLENGE: UNDERSTANDING OUR EMERGING WORLD AND ITS WORKFORCE DEVELOPMENT NEEDS

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Are organizations prepared to address OSH challenges and companion workforce development needs brought about by emerging markets and technologies, the rising disaggregation of work and shifting social systems? Let's explore what we know, what we don't know, and what we can only surmise.

### Emerging New World —The Landscape

#### In the Developed Parts of the World:

There are generally five significant trends that are changing our world and impacting business and life in general—**demographics, technology, institutions, relationships** and **speed**<sup>1</sup>.

**Demographic drivers** and trends are transforming the future -the megatrends include the growth of the world population, aging of the population, and the effects of migration urbanization leading to mega-cities<sup>2</sup>.

- There are 7.6 billion people on earth today, with about one billion more expected by 2030. The global population is aging as fertility declines and life expectancy increases. The result is that the number of older people is likely to double by 2050, while the population under 15 is expected to stay relatively stable throughout the century.

- The world's regions vary considerably in population size and density. Asia and Africa, the most populous regions of the world, account for 75% of the global population.
- And finally, the contribution of the net international migration to population growth varies by region. It is projected that after 2020, the population in Europe is expected to decline, while Africa, Asia, Latin America and the Caribbean will see a net increase.

**What will be the impact on less developed countries and economies who will need to interface with the older populations in developed countries? How will younger workers adapt to a work force with growing proportions of older workers, especially if it restricts their prospects for advancement?**

To complicate matters, and as it relates to OSH specifically, in the developed world, OSH professionals are getting older and not seeing new people replace them in adequate numbers.

In addition, generational fault lines are at work, with the future belonging to the Generation Z (born between 1995 and 2015). How will they reboot our world? The historical induction time between the evolution of a culture change and its actual realization has all but evaporated.

<sup>1</sup> Lance J. Descourouez, MA, MSOD, Coach, Master Chair, Vistage International, San Francisco, CA Presentation to the California Industrial Hygiene Council (CIHC), December 3, 2014, San Diego, CA, "Understanding Our Future".

<sup>2</sup> United Nations, Department of Economic and Social Affairs, Population Division (2017), World Population Prospects 2017- Data Booklet (ST/ESA/SER.A/401)

**Emerging business and technologies** are already disrupting traditional work as we know it. This includes robots, 3D printing, displays for smart phones, social software, smart meters (sensors), environmental and personal sensing, on demand services, human augmentation, artificial intelligence, big data, the internet of things, cybersecurity, increased digitalized and intelligent downstream supply chains, sales to nonmanufacturing supply chains, the rapid rise of distributed manufacturing and micro factories, and machine to machine communication.

In many cases, we are evolving from mechanical processes to information and technology based processes, with new ways of combining materials (both traditional and advanced), new ways of controlling processes, and mass customization on local levels<sup>3</sup>. With these changes comes the need for rapid and responsible assimilation of new knowledge and research, responsible development of reproducible practices and reliable products, understanding of risks we have not yet identified or quantified, and the development of social and business relationship networks we have not yet appreciated. It is also vital that mature businesses and economies who recognize the value, if not critical need, for incorporating responsible OSH practices into their businesses export that thinking and those skills to developing economies.

Some of these technological trends have already led to **disruptive shifts in work and relationships**, shifts characterized by the following movements:

- from businesses that were “geographically limited in scope, community outreach and demographics” to businesses that are “larger than countries”;
- from “employees” to a growing number of “entrepreneurs” not allied with a specific organization but supporting many organizations;
- from “permanent” to “Velcro” relationships;
- from “outsourcing” to “crowdsourcing”;
- from “reliance/faith in physical infrastructures” to “reliance on digital infrastructures”;

- from “desktops” to “devices”;
- from a reliance on “career ladders” to the desire for “experience portfolios”;
- from recognizing the “importance of organizations” to “increased reliance on social community and virtual networks”;
- from “protecting knowledge” to “sharing knowledge”; and finally,
- from “sharing data and knowledge” to “creating context for persuasive conversations”.

And finally, **traditional institutions** are changing and, in many cases, falling short of expectations. These institutions include health care, education, criminal justice, government, trust in big business and unions. These gaps need to be bridged by other entities or community social infrastructures and relationships.

#### **In the Developing, Emerging Economies:**

The contrast is what takes place in many emerging economies. In the developing world, the OSH issues are often huge, there is a general absence of OSH infrastructure and not enough qualified people to help organizations solve their problems.

While most future innovations are expected to come from the highly skilled who reside in developing countries and emerging markets<sup>4</sup>, a number of these same emerging economies experience challenging OSH issues, issues the developed world and its economies have allegedly mitigated, but now moved offshore for economic, resource and labor reasons (lead, silica, asbestos, among others).

In many cases, emerging economies do not have the resources (skilled workforce or OSH practitioners) to receive an advanced technology that is being imported from a mature organization. The belief is that standards and practices can be easily duplicated, which is seldom the case. We have already seen modern, sophisticated manufacturing facilities for semiconductors or pharmaceuticals in the same neighborhoods that hold smoldering landfills of e-waste.

3 Charles Geraci, Jr. PhD, CIH, FAIHA, Associate Director for Nanotechnology, NIOSH, Cincinnati, Ohio, Presentation, 2017 Fall AIHA Conference, Tampa, Florida, October 30, 2017, “21st Century Manufacturing—The Challenge of Emerging Manufacturing Technologies for the OSH Practitioner.”

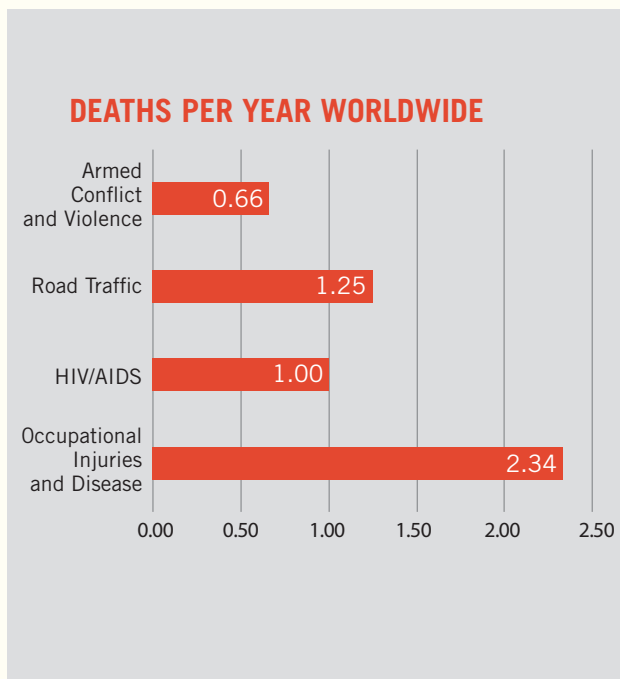
4 Lance J. Descourouez, MA. MOSD, December 3, 2014

## The Global OSH Burden

More people die each year from occupational injuries and diseases than from other major causes that are much more visible... and increasing.

The ILO and WHO statistics reflect that **global fatalities** are as follows<sup>5</sup>:

- 2.78 million workers die each year from workplace causes, with 2.4 million of these dying from occupational diseases.
- By comparison, 381,000 of these die from occupational injuries. The total global fatalities amount to 7,600 deaths every day (or 1 death every 11 seconds).



These official statistics do not reflect other growing trends<sup>6</sup>, such as:

- Environmental impacts of workplace agents.
- Environmental impacts of and diseases exacerbated by workplace agents (e.g. silica-TB; asbestos-smoking).

- Blurred lines between workplace, home and community: exposed family, especially young and old vulnerable members.
- Workers in the developing economies who are not employed in formal sectors. Employment in the informal sector which could reach 70%.
- Few medical facilities and treatment in emerging economies.
- Nonexistent public health registries for major illness and industry types.
- The reality that, while fatal illnesses outnumber the injuries, it is still “injuries” which are studied in detail, not “illness”.

Lucchini and London<sup>7</sup> stated that global OSH must be an international development priority. The reasons are compelling - economic globalization is leading to an increased occupational health gap; in the developing countries, the absence of OSH infrastructure amplifies public health and development problems and typically the occupational health institutions that exist underfunded. Additionally, only 5-10% of workers in developing countries have access to OSH practitioners; and economists generally assume (shortsightedly) that OSH is a later step in the sequence of development and should normally be undertaken once the economy is strong enough to absorb the additional expenses required by preventive action.

Business leaders who have learned how to incorporate proactive/preventive health and safety into business plans and models from the beginning must share how this will avoid the misperception that “safety is an additional expense”. It is a business expense, the same as raw materials, and needs to be considered in the direct and indirect costs and savings associated with a business return on investment (ROI) metric. It is a business expense, the same as raw materials.

5 ILO, 2013; WHO, 2013 and 2016; Armed Conflict, 2016 + Homicide, 2012 (WHO) + Terrorism, 2016 (Statista)

6 Marianne Levitsky, Past-President, Workplace Health Without Borders (WHWB), Sr. IH Associate, ECHO Management, Mississauga, Ontario, Canada

7 Global Occupational Health: Current Challenges and the Need for Urgent Action Roberto G. Lucchini and Leslie London, 2014, <http://dx.doi.org/10.1016/j.aogh.2014.09.006>

## The Challenge

### CHANGING BUSINESS CLIMATE TRENDS, DRIVERS AND WORKFORCE DEVELOPMENT NEEDS

In general, the changing business climate trends and drivers share the following characteristics:

- Globalization (smaller world)
- Improved global supply chains
- Downsizing & consolidation
- Digital technology
- Cost & cycle time reduction (cheaper & faster)
- Multigenerational teams
- Fewer new regulations

- Increased offshore manufacturing
- More part-time, temporary and contract workers
- Better strategic plans & better execution
- Fewer silos-- work, personal life and community issues
- Weaker unions
- Robust measurement & analysis of organizational processes

- Consistent global corporate culture (large global companies)
- Operational system emphasis (ISO, 6 Sigma, Quality)
- Creation of business funded learning organizations

As the market and business change, so must OSH managers. Marketplace trends suggest the following OSH workforce development needs for OSH managers today:

- Communication skills, group work skills and cross-cultural competency;
- Leadership skills (ability to influence) based on strong personal anchors;
- Being able to share and create knowledge;
- Organizational know how-leveraging resources and relationships;
- Science, Technology, Engineering & Mathematics (STEM) competency;
- OSH technical competency (certifications critical, preference for generalist vs. specialists);
- Understanding how operational, service, product and community issues integrate into an organization's seamless fabric (customer-centered focus), but also getting things done within diffuse power structures;
- Curiosity, passion, enthusiasm and a lifelong learning mind set.

Somehow we need to build 'business skills'. We teach our MBA students all about sustainability and stewardship, but why don't we teach our OSH students about basic business management? Being 'a part of the business' has to be more than being called in to meet with business managers to explain the latest incident, crisis and related risks.

### Our Call to Action

The work world we knew is no more; it is being replaced by transformational challenges and opportunities. Stepping up OSH investments in people at all levels and in all market segments of society is the only way to ensure "capability". It is the new benchmark we work towards to make a sustainable difference in global OSH challenges and the promise of a brighter future.

Each venue (and culture) will require varying OSH approaches to making progress, but clearly, technical competency is no longer enough. Professional technical competency now requires strengthening with organizational and relationship capability, a tripartite (government, workers and employers) approach to issues, a commitment to lifelong learning, and a holistic view of worker health and well-being (Total Worker Health concept). The ability to assimilate lots of complex data and information under rapidly

changing circumstances to identify enterprise risk priorities and opportunities, and then act on them, is the new OSH managerial capability benchmark we need to work toward.

One of the more, if not most challenging issues before the ILO, is how to reach the worker population not included in the traditional tripartite discussion. Unless we figure out a way to reach and advocate for workers worldwide, we will continue to miss the greatest need and opportunity. As we consider the many changes in our perceptions about technology evolution and business development, we need to have similar thinking about how to deliver the message about basic OSH—simply, how it can be effective, how business owners can/need to change perceptions of ‘safety’ such that it is a basic business premise and not an economic burden alone, how regulatory agencies can adopt a facilitating approach versus being perceived as compliance-only driven, how we ensure adequate numbers of capable OSH professionals and managers, and how workers are engaged in operational OSH delivery and implementation.

There are several organizations globally who provide OSH education. One effort to help bridge some of the needed OSH training includes the Occupational Hygiene Training Association’s (OHTA’s) freely downloadable week-long training modules ([tinyurl.com/y4c5kd83](http://tinyurl.com/y4c5kd83)) which were developed to promote better standards of occupational hygiene technician level practice throughout the world. These modules help improve the capability to manage and control health risks from the work environment. OHTA also promotes an international qualifications framework so that all occupational hygienists are trained to a consistent high standard recognized in participating countries. Another effort is Minerva Canada’s Safety Management Education freely downloadable modules which were designed for undergraduate engineering students.

Also, there are a number of other organizations that provide quality OSH fee-based training. Two examples--in process is national American Industrial Hygiene Association’s (AIHA’s) e-conversion of the basic OHTA Principles of Occupational Hygiene module designed to make fundamental education more readily accessible to many. The American Society of Safety Professionals (ASSP)

also provides a number of OSH training courses for a fee.

It goes without saying that successful businesses and organizations worldwide integrate OSH into their core businesses from a design, operational, delivery and impact standpoint. While the actions required to run effective organizations are many and must be implemented in parallel, education is one critical component that holds promise for operational managers, OSH professionals and workers alike. As Nelson Mandela said wisely “Education is the most powerful weapon which you can use to change the world.”





## SAFETY, AND SAFETY SCIENCE, PAST, PRESENT AND FUTURE

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This contribution will focus on three items: 1/ Our understanding of minor and major accidents, 2/ From occupational and high-tech-high-hazard risks to global risks, and 3/ Managing risks

### Our understanding of minor and major accidents

During the last 150 years, our understanding of minor and major accidents has changed radically. Safety started in the UK, with a technical explanation of accidents, halfway the 19th century. Safety technique enclosed moving parts of machinery, and fenced elevated workplaces. Also in the beginning of the 20st century in the US during the Pittsburgh survey, accident causes were considered to be external: as an interaction of unskilled workers and dangerous machines. This changed just around World War I, when behaviour, accident proneness and unsafe acts were seen as primary causes. The 1910s-1920s was a remarkable time. Firstly, the attribution of causes of unsafe acts of workers can be seen as a sign of emancipation of the working class.

**Previously, workers were simply part of an undefined group of 'the poor'. Now they were a group that deserved attention, both for reasons of health, and occupational safety.**

The attention to behavioural aspects of accidents will stay dominant in occupational safety for a very long time, and got a renewed attention when concepts as safety climate and culture became popular. Secondly the main concepts of what later became safety science were already published in the 1920s: hazard (energy), sequence of events (scenario), sloppy management, accident as a process, probability of accidents, exposure to hazards, and prevention by reducing hazards, and installing barriers.

After World War II occupational safety was influenced by ergonomics, an upcoming discipline, and like the results of the Pittsburgh's' survey putting attention to man-machine interactions: process disturbances and workers' stress in coping with these disturbances are seen as a main cause of accidents. Also the barrier concept was further developed in the 'hazard-barrier-target' model, as well as strategies for accident prevention. From the 1960s-1970s onwards there is an increasing concern with human factors. Major disasters are showing that ensuring safety in complex technologies was not just a matter of getting people to follow simple safety rules. Competent and well-intentioned operators could fail to control risks in unclear or unexpected circumstances. Again, attention was focussed on 'risk-blindness' of management, by not understanding major accident scenarios. The 'accident-incubation' theory was born, a forerunners of what later is called the socio-technical approach of safety. In this period safety was incorporated as an academic domain. Later, in the 1980s-1990s, theories and models have developed to understand disasters, and occupational accidents. What made an activity, or a process out of control, is the main question. There was an integration of both a technological, and an organisational explanations. The 'normal accidents' theory pointed to inherent complexity of technology. The 'drift to danger' model considered external forces as main drivers of disasters: aggressive markets, and dominant technological developments. The Swiss cheese metaphor, and the Tripod theory showed latent factors in organisations as drivers of accident scenarios. Finally the bowtie metaphor depicted multiple scenarios, central events where hazards became uncontrollable, and management delivery systems which adequately, or not, controlled barrier quality.



**In many countries with a large informal industrial sector, a lack of knowledge on health and safety creates deplorable working conditions with noise, perilous chemicals and ergonomic hazards as a main concerns.**

Labour laws, mostly coming from a colonial period are hardly adequate. Working conditions show some resemblance with the industrialized countries during the start of the 20st century. Also in China conditions are similar in the 1960s-1970s. But here strict laws and 5-years plans seem to create a positive change.

## **From occupational and high-tech-high-hazard risks to global risks**

The development of safety models and research as an academic discipline is a product of the 1970s and 1980s, during which a 'golden age' is witnessed, producing some of the mainstream ideas introduced above. These include the idea of incubation period, of migration or drift of systems beyond the boundaries of safe performance but also the category itself of safety critical or high-risk systems. It is in the middle of the 1980s that systems as aviation, nuclear power plants or railway become specific and independent objects of study. The cost of failure of such systems can be very high for companies, societies and ecosystems. The distinction between occupational and industrial safety is built on this divide in the field between an analysis of large technical systems as a way of understanding their properties because of the threat they pose to societies (Chernobyl, Piper Alpha, Bhopal), and local working situations in which people can get hurt (trips, falls...) but without endangering the lives of many or of other external parties.

But a global turn in the past two to three decades has modified our perception, analysis and understanding of occupational and industrial safety in this context. By global, two aspects can be added to the traditional perspectives of the field as described in the previous section, first global as globalised or globalisation in the sense of powerful modifications of the operating landscape of public and for-profit organisations and second, global as ecological in the sense of situating humanity from a cosmological, geological and biological point of view. The implications of this

move to the global are immense but only little studied because of the difficulties it raises from an empirical point of view. Let's introduce some possible orientations to structure these recent trends, but also how they can materialise in the future and the challenges they create.

First, global as globalisation is a product of the transformations of the past two to three decades, produced by powerful Anglo-Saxon Western states which favoured the free circulation of flows designed by liberalisation of trade and finance, deregulation, privatisation and the revolution of information and communication technologies (combined with transport). The flows of money, people, goods, information and images associated with these developments of the 1990s onward have profoundly impacted societies in the world, and occupational and industrial safety with it. Let's comment very briefly their most visible consequences, with three examples. One has been the tendency for multinational to transform their business models into commodity chains which explore possibilities of production using cheap labour in third world or developing countries at the expense of safety (the collapse of the Rana Plaza in Bangladesh in 2013 in the context of the fashion industry is an illustration). Another is the financialisation of strategy and management of corporations and public institutions, which is not always aligned with the importance of thinking long term when it comes to safety of high-risk systems. Cost cutting to satisfy shareholders return on investment in financialised business environment can prove detrimental (e.g. the story of BP between 1997 and 2010). Finally, a last example concerns the creation of a new category of risk to accompany the increase of flows: the category of systemic risks. By allowing ripple effects of events throughout a diversity of networks to operate on a very large scale across continents, systemic risks have become a new issue for safety: cyber, financial, natural and terrorist threats are now very much part of the picture of the management of organisations.

Second, global as ecological entails a wider consideration of the conditions which would allow the maintenance of our current lifestyles following the expansion of human industrial activity. The Anthropocene indicates that humanity now acts as the equivalent of a geological force that modifies the planet's climate and ecosystems,

introducing the risk of societal collapse. A redesign of our production modes is to be expected, which will modify in return current high-risk systems, and work situations, with digitalisation playing a leading role in reshaping this evolution.

## Managing risks

In the last quarter of the 20th century major accident enquiries were pointing to management control, to weaknesses in safety management, to various latent factors, and to inadequate regulatory frameworks covering risks of industrial disasters. A managerial focus implies that both technical and human failures are seen as things organisations can predict and control by a robust design and safety management system. Although there is a growing consensus on the structure, and elements of safety management systems, its scientific basis is still very small.

Management systems seem to create an extensive bureaucracy, because of a standardisation trend derived from certification and self-regulation regimes. Managers do not understand the complexity of present day high-tech-high-hazard processes. It is said 'we have a fifth generation of technology, and a second generation of managers'. One way of addressing hazards and risks of these processes is a closer focus on accident scenarios. These scenarios can be followed, and predicted. It all starts with an overview of all possible major accident scenarios, barriers in, for instance a high-tech-high hazard chemical plant. Installations in these plants have various indicators on pressure, temperature, flow, and level. These indicators provide information of the safety status of equipment and installations. Activation of these indicators will present signals on control boards, followed by operator actions. When a sequence of these indicators are directly linked to scenarios, it offers opportunities to follow the advancement of scenarios in real time, giving management and workers an overview of the safety state of their processes, and a clear relation between management and workers' activities and (major) accident processes.

But new challenges for safety management derive also from the global trend briefly described above. From top down nationally based regulatory regimes and hierarchical structures of corporations, there has been a shift in the past

decades towards networked governance model of regulation and horizontal configurations of multinationals spreading worldwide. Regulating and managing networks across continents to prevent sociotechnical events, work accidents but also systemic and existential risks as sketched above necessitate new globalised regimes of coordination, cooperation and control. To remain with the examples indicated earlier, preventing the Rana Plaza as it happened in Bangladesh requires for multinationals to care for the working conditions of sub-contracted employees situated at the end of the value chain of their business models, which depend on this cheap labour precisely because of the limited regulatory constraints. Because there is no transnational regulation to control multinationals' behaviour and how they manage their commodity chains, there exists blind spots of globalisation in this respect, gaps to be filled because of their safety implications.

Similarly, financial rewards to executives based on short term strategies for the benefit of shareholders should be curbed by regulations in order for infrastructures and high-risk systems to operate in the right balance of production versus safety imperatives, unlike what happens with the BP story briefly introduced above. This, again, is not necessarily an easy task considering that multinationals have reached a very influential status in current globalised capitalism, which allows them to limit attempts to regulate their activities by states and international organisations. In general, systemic and existential risks as they will potentially unfold in the future also requires a renewal of the global institutions which contribute to the cooperation, coordination and control of for-profit and public organisations across the world. Therefore, one future challenge for occupational and industrial safety is to design adequate transnational mechanisms of governance.



## MAJOR CHANGES IN WORKING LIVES AND THE ILL HEALTH THIS MIGHT BRING

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The world of work is rapidly changing and that may create new occupational health risks. To prevent subsequent health effects in workers, it is important to predict or at least recognize in a timely manner these new risks to open up possibilities for intervention and if possible prevention.

**But how can we foresee the risks we will be facing? Obviously one can expect certain occupational risks to occur when studying major developments in work and working conditions. But there will also be the unexpected risks, coming from unforeseeable events or yet unknown consequences of changes in work or working conditions. How can we prepare for both expected and unexpected risks in the future of work?**

### Expected and unexpected ill health in the future of work

A common approach in risk assessment is to predict potential health consequences from already identified or expected risks. In this way identified and expected changes in future work can help to predict changes in work-related ill health. An example of an already identified change is the digitalization of work with its fast introduction of new information and communications technologies. We can recognize its profound impact on work and life. Many workers will embrace the positive aspects of digitalization. The constant connectivity enabled by it, allows us to work at any time and from almost anywhere. This comes with greater working time autonomy and a possibility to collaborate with people all over the world. But we have to realize that being connected 24/7 may also have harmful aspects, such as a tendency to lengthen working hours and the growing interference between work and private life. With increasing demands to be “on” all the time the levels of work-related stress will rise with potentially serious implications on workers’ health. It is safe to predict an increase in psychological problems like burnout, depression

and anxiety. But since the balance between work and rest is jeopardized, it may also increase certain chronic diseases. We are for example losing sleep: in 1942, we slept 8 hours a night, but currently the average number of sleeping hours is under seven; in Japan even under six. Worrying, because many chronic diseases have a strong causal link to deficient sleep, including Alzheimer, cancer, obesity, and diabetes.

An example of an expected change is the rising of the global temperature through climate change. Research has made it clear that the expected rise of at least 1.5-2.5°C in the coming decades can have severe consequences. The expected increase in occupational heat strain (i.e. the effect of environmental heat stress on the body) threatens workers’ ability to work and live healthy. Rising daytime temperatures will regularly breach physiological limits and make sustained work increasingly difficult or even impossible, especially during the day. This may threaten the work of approximately one billion people, mainly in regions around the equator. It will also increase work-related diseases connected to heat strain, such as cardiovascular and kidney disease. Another effect of climate change are regional shifts in the occurrence of infectious diseases, in particular vector-borne (tick, mosquito) and water-borne diseases. These “tropical” diseases will start to appear in moderate temperature regions due to even small changes in temperature and precipitation.

But there will also be work-related diseases one cannot really foresee, among other the diseases caused by exposure to chemical substances in the workplace. It is estimated that about a thousand new chemical substances are introduced in work each year. They come on top of the approximately 100,000 chemicals already in use. And although we know a lot about the hazards and risks of chemicals for workers’ health, there is even more we don’t know. Thus, although

the occurrence of new work-related diseases caused by chemical exposure is to be expected, it is hard to predict their precise nature beforehand. There will be known diseases caused by new substances: each year new sensitizing agents are identified causing skin disease or asthma. But also known substances may cause new disease or cause disease in new work settings. Recent examples are the well-known solvent styrene being more and more implicated as carcinogen and cases of silicosis in workers cutting artificial stone for kitchen benchtops.

## **Challenges and opportunities to predict future health risks**

There is a wealth of research on major changes influencing work in the future such as the effects of digitalization and climate change. To cope with these expected risks there are well-defined methods of risk assessment and management. Although far from perfect, hazards can be identified and risks calculated from exposure. Consequences can be reduced by limiting exposure to hazards and providing appropriate treatment when such exposures occur. On the other hand it is more difficult to prepare for the unexpected hazards and risks. These might be only detected when workers present with disease and providing this is recognized as potentially work-related. It calls for vigilant health professionals prepared to investigate further to establish a relation between disease and work. Often, this is difficult and it may well be disputed. Nevertheless detecting signals of new work-related disease should be appreciated as an early warning sign. A sign that something is out of control in the workplace - an occupational sentinel health event. In the end, coping with unexpected risks is little different from coping with expected ones. The main difference is the extra step needed to establish a causal connection between health effect and exposure.

## **Conclusion and recommendations**

**Prevention of work-related ill health in the future of work is only possible if we find ways to prepare for expected as well as unexpected risks.**

We urgently need proper risk assessment and management. But we also have to develop a complementary approach in which the occurrence of diseases in workers will be a warning sign and a starting point for action.

**It is necessary to strengthen the link between the assessment of hazards and risks in the workplace, clinical alerts from occupational medicine, epidemiological research and policy actions.**

This starts with collecting, sharing and disseminating information on diseases as well as exposures to raise alert on emerging health problems earlier, thus triggering timely prevention.



## OPERATIONAL EXCELLENCE AND SAFETY MANAGEMENT: REFLECTIONS FROM THE LONGEST SERVING ADMINISTRATOR OF THE US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

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As the Assistant Secretary of Labor for the US Occupational Safety and Health Administration (OSHA) from 2009 to 2017, I received daily reports about occupational safety and health successes and failures, often involving workers being killed, at every sort of workplace across the country. We had the opportunity to engage many companies and meet with executives of firms of almost every type and size, from CEOs of the nation's largest corporations to owners of companies with a few dozen employees.

With my staff, we dissected the approaches different companies took to safety management, taking advantage of data from a large cross-section of firms. OSHA inspectors visit more than 30,000 workplaces each year, and its consultation program provides free no-penalty inspections and technical assistance to thousands more. The agency enrolls hundreds of companies that voluntarily embrace safety management in voluntary programs.

Based on this experience, it is apparent to me that many business leaders have an implicit but unfounded belief that, while it is necessary to reduce workplace injury risk, there is a trade-off between profits and expenditures necessary to keep workplaces safe. Presumably, these leaders try to find the right balance - trying to spend enough money to prevent most injuries, without sacrificing profits.

However, it is very clear that this belief represents a fundamental misunderstanding, and that **safety management and operational excellence are, in fact, intimately linked.**

Firms where the injury risk is high are firms where production is not being controlled tightly. Businesses that strive for operational excel-

lence are better, safer places to work, and the process of making them safer has made them more productive and more profitable. This relationship is recognized by the CEOs and top managers of some of the largest and most successful firms. It is also seen in the empirical literature. One recent study concluded that there is "plenty of evidence that worker health and safety are a foundation of managing manufacturing facilities that are globally competitive, even if they face a wage disadvantage." Furthermore, the authors reported there is no evidence that protecting the workforce harms competitiveness.<sup>1</sup>

When I ask corporate leaders why they are committed to preventing serious injuries and deaths among their workers, most say they care about their employees and don't want to see anyone hurt. They'll also assert that "safety pays" in reducing costs, or admit they fear reputational damage following a significant incident at their company.

While these are all important and valid reasons to prevent work injuries, it is my observation that the actions of most managers who advance these rationales are shaped by that misbegotten safety/productivity trade-off. Given this trade-off, managers believe, there will be times when safety must take the back seat to production.

This belief in this trade-off seems to have powerful face validity. It is almost never stated so boldly, both because it seems inherently true, but also because to assert it is to admit that perhaps the safety of a firm's employees might be at risk because of production pressures or inadequate investment in safety. In fact, there is no evidence that finds a trade-off between safety and profitability.



The true value of managing for safety goes beyond simply the reduction in direct and indirect cost of serious injuries or avoidance of catastrophic events. Firms that manage for safety are more successful and more sustainable because they are focused on operational excellence. Injuries and catastrophic events are signs of deviations in the management system, indications that production is not being managed correctly.

Of course, failure to manage for safety has tremendous risk, especially in high hazard industries. Those firms who fail to control risk may incur substantial costs, enormous reputational damage, and in some cases, sacrifice the very future of their firm to the goal of maximizing short term profits. Look at Union Carbide and Bhopal, or BP after the Deepwater Horizon explosion.

When a business is managed for safety, the firm experiences more efficient production, produces a higher quality product, and provides higher returns for investors. There are corporate executives who understand this, who recognize that working safely must be a core component of their firm's operational culture, and that managing for safety improves the bottom line.

Based on the thousands of death and serious injury cases I have reviewed, I am confident in my assertion that many work injuries are a sign of poor management. In situations of operational excellence, when operations are managed well, where well-trained employees follow the rules and equipment is well-maintained, there should be few or no injuries. When production is tightly controlled, there are fewer mistakes, there is less wastage of both materials and labor, and the firm produces a higher quality product.

Managing for safety is a process involving the implementation of a Safety and Health Management System (SHMS). The workings of a successful SHMS are not a secret, and there is no need to invent your own. There are currently several widely applied SHMS standards like the ISO 45001, ANSI Z10, and the OHSAS 18001. They all have similar components and are all based fundamentally in the plan-do-check-act model for continuous improvement. The most important components of SHMS are management commitment and worker participation; without these, no safety management program can succeed.

Many business executives will tell you about their safety culture, but I have seen too many examples when "safety culture" and "operations culture" clashed and, not surprisingly, "operations culture" won.

**From the CEO down, the message to all employees should be that "Doing it right means no one gets hurt."**

Take safety as seriously, if not more seriously, than anything else you do. To be truly excellent, safety must be not just a priority, but the principle at the core of everything the firm does.





## ASBESTOS: LIMITLESS, ENDLESS CONTAMINATION – WITH COMPLETE IMPUNITY

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The facts have been known since the end of the nineteenth century: regardless of the variety (amphiboles or chrysotile), asbestos causes illness and death. But the effects are delayed! Excluding the signs of pulmonary fibrosis, known as “asbestosis”, which can appear at a relatively early stage in the event of heavy exposure to this mineral fibre, the clinical symptoms of the cancers linked to asbestos appear a long time, even a very long time, after contamination (in the order of several decades).

While manufacturers have known this since the 1930s, it was not until the work of Irving Selikoff and his team (*Mount Sinai School of Medicine, New York City University*) at the start of the 1960s that the scale of the epidemic of asbestos-related diseases became a public certainty. The working conditions in asbestos factories at the beginning of the 1970s were catastrophic, as evidenced by the account of Josette Roudaire, a former worker at the AMISOL asbestos textile factory (Clermont-Ferrand, France)<sup>1</sup>.

It was also around this time that the largest asbestos mine in Latin America was being opened in Brazil, a country that had not used asbestos prior to the opening of this mine at Cana Brava (State of Goiás) in the late 1960s. Over the course of the following decades, the mine would

make Brazil the third-largest producer worldwide, to the benefit of two European multinationals: Eternit (Switzerland) and Saint-Gobain (France).

**On a global scale, of the 182 million tonnes of asbestos produced between 1900 and 2004, 80 per cent was produced after 1960 – that is, when its serious and fatal health effects were already known.<sup>2</sup>**

Currently, thanks to a movement of citizens, trade unions and associations, present on all continents, 55 countries have banned asbestos. However, its production and use continue, with the most recent figures indicating a total of 2.03 million tonnes every year. In January 2019, Eternit-Brazil, which still operates the Cana Brava mine, announced that it was ceasing production for the Brazilian domestic market, but would continue exportation, notably to countries in Asia.<sup>3</sup>

**The scale of the epidemic of asbestos-related diseases is well known, although it has been significantly underestimated due to the lack of diagnostic options and the poor reliability of statistical sources in many countries.**

The latest estimate (regarding mortality) is 255,000 deaths caused by asbestos each year on a global scale, 233,000 of which are linked to work-related exposure.<sup>4</sup> Incident cases are not recorded and the victims rarely receive compensation.

1 Josette Roudaire, *Mémoires de luttés: quelques constats et réflexions* [Memories of struggles: some observations and reflections], intervention at the Women, Work & Cancer Conference, European Trade Union Institute (ETUI), Brussels, 4 December 2018.

2 Jock McCulloch & Geoffrey Tweedale, *Defending the Indefensible. The Global Asbestos Industry and its Fight for Survival*, Oxford University Press, New York, 2008.

3 <http://www.ibasecretariat.org/press-release-jan-15-2019.pdf>

4 Sugio Furuya & al, « Global Asbestos Disaster », *Int J Environ Res Public Health*. 2018 May; 15(5): 1000. Published online 2018 May 16. doi: 10.3390/ijerph15051000

In relation to asbestos, there are three major public health and justice challenges on both the national and international agenda. First, the epidemic needs to be stopped by preventing the creation of new victims. To do this, it is necessary to establish a definitive global asbestos ban, which is what the ILO strongly recommended at its General Conference in 2006.<sup>5</sup> The main international vehicle for achieving this is the Rotterdam Convention, with the prospect, if this is implemented in 2019, of chrysotile asbestos being added to the Prior Informed Consent (PIC) list.<sup>6</sup> However, given the large quantities of asbestos dispersed in public and private buildings, water supply systems, and many industrial and commercial facilities, banning asbestos will not solve everything. Measures must be taken to ensure that the management of asbestos in place and from waste is carried out in conditions that guarantee the protection of workers and residents, preventing any new contamination caused by dust from asbestos removal worksites or due to the incorrect storage of waste.

The second challenge is justice for the affected workers and their loved ones. In their *Outline for the development of national programmes for elimination of asbestos-related diseases*,<sup>7</sup> the ILO and the WHO recommend establishing “a central registry of all workers exposed to asbestos, including past exposures”. They also state that “medical surveillance should be organized for early detection of any symptoms and health conditions resulting from asbestos exposure”. If such an approach had been taken 30 years ago, accurate, official records of victims would have given the latter access to the rights associated with the recognition of and compensation for an occupational disease, in addition to other forms of compensation (through mechanisms such as inexcusable conduct by the employer, or compensation funds for asbestos victims). Medical

monitoring should also be extended to cases of domestic and environmental exposure, with the victims concerned benefiting from the same rights in terms of compensation.

Finally, the last challenge, and by no means the least, is to secure the recognition of the criminal liability of manufacturers in this global health catastrophe. On 3 March 2004, the French high court for administrative justice, the *Conseil d'État*, recognized the liability of the State due to its “culpable failure” to take measures to prevent the risks associated with workers’ exposure to asbestos dust. However, despite the accumulated evidence of active and deliberate strategies to conceal the health effects of asbestos – strategies that have been honed over decades by the directors of the multinational companies that produce and process asbestos<sup>8</sup> – these directors have thus far escaped criminal conviction.

5 <http://www.ilo.org/public/english/standards/reIm/ilc/ilc95/pdf/pr-20.pdf>.

6 <http://www.pic.int/TheConvention/Overview/TextoftheConvention/tabid/1048/language/en-US/Default.aspx>

7 [https://www.who.int/occupational\\_health/publications/elim\\_asbestos\\_doc\\_fr.pdf?ua=1](https://www.who.int/occupational_health/publications/elim_asbestos_doc_fr.pdf?ua=1)

8 McCulloch & Tweedale, op. cit.; David Michael, *Doubt Is Their product. How Industry's Assault on Science Threatens Your Health*, Oxford University Press, New York, 2008; Annie Thébaud-Mony, La Science Asservie. Santé Publique: *Les Collusions Mortifères entre Industriels et Chercheurs*, [Science Enslaved. Public Health: the Deadly Collusion between Manufacturers and Researchers], La Découverte, Paris, 2014.



## THE ESSENTIAL CONTRIBUTION OF HUMAN FACTORS/ERGONOMICS TO THE FUTURE OF WORK WE WANT

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Human Factors/Ergonomics (HFE) contributes to effective and sustainable work systems through a unique combination of three substantive drivers of intervention: (1) it takes a systems approach; (2) it is design-driven; and (3) it focuses on optimizing two closely related outcomes, performance and well-being. HFE can be described as a multi-disciplinary, user-centric ‘bundling science,’ in that it applies theory, principles, and data from many relevant disciplines to the design of work systems, taking into account the complex interactions between the human and other humans, the environment, tools and equipment, and technology to enhance human performance and well-being in the world of work (Wilson, 2000). Multiple HFE methodologies are available for the creation and evaluation of effective work systems, addressing not only their physical demands and constraints but also the sociotechnical attributes of the organization comprised of its personnel, technological, and operational characteristics (Hendrick, 2008). The philosophical foundation of HFE is congruent with that of the ILO, as practitioners recognize the need for participation of all stakeholder groups (i.e., participatory ergonomics) in system design. Effective HFE is indispensable to support our life and work in the 21st century; without attention to HFE in design, work systems will not be human-centered, and will not support the sustainability of workers, organizations, or societies.

### Challenges – Threats to effective HFE for safety and occupational health in the future of work

**The world of work today comprises a wider disparity in work situations than ever before, resulting from the simultaneous processes of globalization of economies and new information and communication technologies affecting countries and their societies.**

*Multiple types of work arrangements* present new opportunities for enterprises – but also interfere with the management and regulation of HFE issues at the organizational level. Internet-based businesses flourish, allowing the development of new types of enterprises operating in the web without being legally constituted in any country. New labour practices and forms of contracting have enabled the proliferation of an informal or ‘gig’ economy, and in combination with disruptive technologies such as app-based work or crowdsourcing (Zink, 2019), has fostered the development of a new and endangered worker class that is growing worldwide: the precariat (Standing, 2011). Members of the precariat class generally earn little money and have no job certainty, and no protections or HFE provisions for safety and well-being. These phenomena are affecting millions of workers in many countries and specifically industrially developing countries (IDCs), which are less resilient to the impact of new global and economic dangers. IDC weaknesses in the capacity to react to different observed changes in work practices (low resilience) can be observed, for example, in the lack of updated national employment laws and regulations able to deal and control new working practices, platform economies, or dangerous use of new chemicals and nano-substances. A weak union culture and the resistance of employing organizations and, sometimes, of their governments, make it even more difficult for workers of the precariat to organize themselves to defend their rights to safe and healthy work conditions. Moreover, these phenomena impact organizations, affecting enterprise sustainability and, by extension, damaging social contracts between labour partners.

*Technological advances* such as new information and communication technology, robotics, artificial intelligence, and digitalization also pose new major challenges to effective HFE in the world of work. Human tasks are being increasingly auto-

mated or robotized; production is digitized and work is accomplished through digital platforms. Humans are teaming with robots or automation rather than other humans. Jobs are being profoundly transformed, often with little attention to the impact of changed job requirements on stress, workload, and worker sustainability – all of which are HFE concerns.

Because of the wide range of new work situations, ILO Codes of Practice and OSH standards and guidelines must address HFE issues that range from physiological threats such as musculoskeletal disorders or injuries from physical work, especially in IDCs, to cognitive and psychological threats stemming from new information technology, robotics, artificial intelligence, and digitalization. Moreover, the impact and rhythm of the introduction of these global phenomena are different for countries and world regions and their labour practices.

## **Responding to the challenges – collaboration between IEA and ILO for the Future of Work We Want**

**The ILO Centennial Anniversary – which is also the 60th Anniversary of IEA - offers a singular opportunity for tackling these challenges and launching projects to create sustainable work systems.**

ILO has systematically developed relevant OSH standards, innovative guidelines (i.e., ILO-OSH 2001 on Management Systems) and many practical Codes of Practice to improve quality of working life and labour practices for protecting workers, as well as work organization processes to ensure enterprises' sustainability and productivity. In parallel, the International Organization for Standards (ISO) created HFE standards for human-centered organizations (ISO 27500, 27501). However, new work practices such as those described above impact job profiles and definitions; the ILO and IEA need to work collaboratively to conceive and create new socio-technical approaches for the world of work and apply them through innovative projects and efficient programs that achieve concrete results as soon as possible – especially in IDCs. The “human-centred agenda” recently outlined by the ILO Global Commission on the Future of

Work (2019) highlights HFE issues such as the requirement for safe and healthy work conditions and the need to harness and manage technology to ensure that the human is always in command. These challenges must be met in order to ensure sustainable work systems.

We propose a collaborative effort between ILO and IEA to engage stakeholders and to design and implement sustainable work systems for the Future of Work We Want. This collaborative approach would involve not only the traditional ILO tripartite alliances of governments, employers and workers organizations, but also universities, international and/or national HFE societies that have an institutional mission and professional mandate linked to decent work, the quality of working life, OSH, organizational justice, and the social dialogue approach. IEA can offer its specialized Technical Committees, Federated Societies (52 member societies in North America, Latin America, Europe, Asia, India, and Oceania), institutional regional networks in Europe, Asia, and Latin America, and individual experts and practitioners worldwide including IDCs. IEA members are willing to be involved in alliances and projects and to actively collaborate on ILO initiatives. IEA can also help ILO to establish fluid contacts with universities teaching HFE in IDCs.

Potential joint initiatives and activities include:

- 1) establish new ILO web links with institutional HFE sites
- 2) give lectures in postgraduate HFE courses in IDCs or participate in open discussions with researchers, professors and students on ILO and OSH key current issues
- 3) accept invitations to participate in university HFE research activities, including studies on sustainable work systems
- 4) invite HFE specialists to identify local needs related to the world of work and design joint ILO-IEA projects with ergonomics components, including participatory ergonomics approaches for organizations using digital platforms and other new forms of work.

- 5) encourage and support the founding of HFE observatories for monitoring changes and innovations in the working world – and for advertising success stories where effective HFE has had a positive impact
- 6) conduct workshops to engage stakeholders and identify projects, using methods such as the tool developed by IEA. The tool uses a stepwise approach to demonstrate the value proposition of HFE and to specify and develop HFE initiatives (IEA Executive Committee, 2018).
- 7) organize new international conferences on HFE, similar to the renowned joint ILO/IEA International Symposium on Ergonomics in Developing Countries, Jakarta, November 1985.

Clearly, ILO and IEA have many shared values, approaches and goals that lend themselves to collaborative possibilities. The role of the ILO as set forth in the ILO Global Commission report is unique and indispensable for the success of these and other collaborative proposals. Attention to the HFE perspective through these types of joint initiatives will create more opportunities for decent work, better quality of working life, effective OSH practices, proactive organizational justice, and improved social dialogue – and thus will enhance the sustainability of work systems and help to achieve the future of work we all want.

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## GLOBAL UNION STRATEGIES ON OSH AND THE FUTURE OF WORK - TRADE UNIONS SAVE LIVES- A STRATEGIC APPROACH TO OHS IN THE MINING INDUSTRY

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Beyond the usual sound bites and press statements, there is a danger that the mining industry might have gone numb, unfeeling and almost unresponsive, to the avalanche of mining deaths in the mining industry. These sound bites and press statements, by governments and mining companies referencing both public and private policy statements seems at odds with the reality experienced by mine workers and society.

Several geographically dispersed calamitous events around the world in the mining industry have focused the attention of the world on health and safety on the global mining industry. The dramatic rescue of 33 trapped miners from the depths of a mid-sized copper mine in Chile, the gruesome deaths of 29 miners at the Pike River coal mine in New Zealand, the death of 29 miners at the Upper Big Branch mine in the state of West Virginia, Mexico, Turkey, Pakistan, China, Afghanistan etc. come to mind.

Beyond these calamitous events, almost hidden from the world, mineworkers continue to die in the course of their work from a slow painful and imminent death resulting from occupational diseases. The re-emergence of black lung disease recently, a disease proudly proclaimed by the mining industry as a disease of the past - completely eradicated from the face of the earth - is an indictment on the industry, confirming the lack of meaning in their sound bites and press statements.

Though the adoption of The Safety and Health in Mines Convention, 1995 (No.176) by the International Labour Organization (ILO), was a welcome development, with a concomitant decrease in the rate and frequency of fatalities in the mining industry, a worrying upward trend in fatalities is emerging, with Pakistan and China as the epicenter of this upward trend. South Africa, another important mining country indicator of occupa-

tional health and safety performance has seen a downward performance trajectory in mining fatalities in the recent past.

**The Safety and Health in Mines Convention, 1995 (No.176) is central to achieving the ILO's decent work agenda and a decent future of work, and is the key to resolving the challenge of occupational safety and health in the mining industry.**

Global Trade Union strategies on Occupational Health and Safety have proven to be effective contributors to the achievement of the decent work agenda of the ILO and they stand ready to contribute to the future of work. Global trade unions have proved that "Trade Unions Save Lives" with their strategic approach to occupational health and safety in the mining industry. These global trade union strategies are best guarantors of the future of work agenda with their insistence on the link between occupational health and safety and sustainability underpinned by the "Just Transition" concept.

The resolution of the inherent tension engendered by the future of work imperatives such as accelerated technological advances, as in industry 4.0 or the Internet of things (IoT) that best describe the future of work must of necessity be resolved by considering the impacts of the future of work on workers, their families, and the communities that depend upon them. A trade union proposal exists to address the implications of new technologies for labour – the Just Transition concept. This must become central when policy options are adopted by governments on the question of the implementation of new technologies and the mitigation of their social impacts, particularly in the mining industry.

Trade Unions have an organic relationship with workers, who are mostly alienated from the production process in a globalised work environment



– an alienation that is likely to become more acute as Industry 4.0 transformations play out. The intimate relationship that workers have with the trade unions facilitates the critical role played by trade unions in health and safety in the workplace, the decent work agenda and the future of work. The Institution of Occupational Safety and Health (IOSH)'s global study on *“The role and effects of representing miners in arrangements for safety and health in coal mining”*, confirms the critical importance of workers' voices and influence on employers' arrangements for their safety and health.

The comparative study, led by Professor David Walters from Cardiff University, and assisted by a team of researchers that included Professor Katherine Lippel from Canada, Professors Michael Quinlan and Richard Johnstone from Australia, and Professors Syamantak Bhattacharya and Phil James and Dr Emma Wadsworth from the UK, provided strong evidence for the correlation between effective workers' representation and high standards of health and safety performance.

The study, conducted in five countries (Australia, Canada, India, Indonesia, and South Africa) also found that worker health and safety representation in coal mines suffers from the absence of an active facilitating role of management. This is despite statutory arrangements for workers' representation and consultation on occupational health and safety (OHS) being in place during the last three decades of the 20th century in most jurisdictions, and the provision of ILO Convention 176, with its emphasis on worker representation and the rights of worker health and safety representatives.

This is a very most welcome and overdue validation by evidence based research that trade unions save lives and *play a critical role in health and safety education and training and awareness raising*. Within the context of ILO Convention 176 it is the trade union that ensures that the health and safety rights inherent in the Convention are upheld and realized; and that management is held accountable in respect of its obligation under the convention. This puts further emphasis on the importance of global ratification and implementation of the Convention.

The study is an important contribution to the body of scientific research work that proves that trade unions do make a difference in mine safety – what is referred to as the trade union safety effect.

## The Importance of Health

Despite many expert assessments that occupational diseases kill far more workers than accidents, it is the sudden, violent accidents that attract attention most of the time in the occupational health and safety field. This is particularly evident when a major catastrophe occurs that kills larger numbers of workers at one time.

Jukka Takala and his associates have several times and in several papers made the point that occupational diseases kills as many as four to five times the number of workers that accidents kill. These diseases include the full range of chronic and acute maladies that result from work, from organ failure to systemic toxicity to cancer. The problem of identifying these diseases definitively is complicated by the lack of a clear cause-and-effect picture for most of them; particularly in

**The trade union movement has long demanded that occupational diseases be better recognized (and compensated).**

The medical profession, and the sciences of toxicology, ergonomics, and industrial or occupational hygiene have not reliably taken up the workers' cause, however.

A bit of history: the occupational hygiene (aka industrial hygiene) field, and to a lesser extent the other occupational health sciences, exists principally because of the demands of the trade union movement, particularly in the 1970s, for a greater professionalization of the field of occupational health and safety. Up until then, most “safety professionals” were burnt-out managers given the title of safety manager to tide them over until retirement. Trade union demands led to the creation of industrial hygiene schools at many universities and colleges.

Unfortunately, despite effectively owing their careers to the trade union movement and having professional codes of ethics that make reference

to worker health being their primary duty, it is frequently the experience of workers that a majority of occupational hygienists, once hired by industry, swiftly transform into industry hacks and apologists.

Hiding behind specious claims of confidential business information, workers are still denied full knowledge of the hazards of the substances they work with. Despite disclosure laws such as the Globally Harmonized System guaranteeing material safety data sheets, labels, and the like the truth of the matter is that this (when it is complied with) only guarantees the provision of specific information in specific categories, and only when that information is known. This last point is the most problematic: of the 200,000 or so chemicals in widespread industrial use, substantive and reliable human health information exists for only about 1,000.

Demands that this situation be rectified have been met with strong resistance from the chemical industry.

The ILO might provide an avenue to push hard for a meaningful “right-to-know”. We must also insist - absolutely - that no risk assessment is legitimate unless those facing the risk have participated meaningfully in the risk assessment process. By meaningful participation, the labour movement means that workers must have the deciding vote or voice.

In conclusion, the big problem of occupational diseases is that they are widely under-diagnosed, misdiagnosed, contested, concealed, and denied. The general level of cooperation that trade unions receive from employers to properly investigate suspicions of occupational disease is approximately zero. The information is often simply unavailable, and the link between exposure and disease is almost always contested. Employers control the amount and quality of information, and governments have abandoned their role as regulators and enforcers in many jurisdictions. A well-written ILO Code of Practice on occupational hygiene could be beneficial to workers. However a badly-written one would actually set us back.

That is why the three principle rights of workers in occupational health and safety are considered to be:

- the right to know, fully and completely, everything about the hazards of their work and receive the necessary information, training, and education to do the work safely;
- the right to refuse to perform, or to shut down, unsafe work with a guarantee of no reprisals of any sort when this right is exercised in good faith;
- the right to participate fully – and indeed to have the decisive voice – in all health and safety decision-making, including the setting of policies, programmes and procedures, conducting inspections, audits and accident investigations, and performing hazard and risk assessments.

Occupational death is by definition needless. No worker should be asked to trade her or his health for a job. That is the principle that has guided the trade union movement from its earliest days, and it is the same principle that guides it today.



## HOW TO TURN GOOD INTENTIONS INTO SUCCESSFUL ACTION: DEVELOPING AND IMPLEMENTING INITIATIVES TO ADDRESS SAFETY AND HEALTH AT WORK

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Despite incentives to promote safe and healthy work, the ILO estimates that each year 2.78 million workers die from occupational accidents and work-related diseases (of which 2.4 million are disease-related) and an additional 374 million workers suffer from non-fatal occupational accidents.<sup>1</sup> This is in view of a gross underreporting of accidents and diseases at work, so the real numbers will be much higher. A lot of time, effort, and resources are invested into addressing safety and health issues in the workplace. Unfortunately, more often than not, such efforts are derailed or fail to achieve desirable outcomes<sup>2</sup>. For example, it has been argued that the probability of failure of any intervention is about 50%, which is not much better than chance. But what can we learn from effective interventions? And what are the factors that can block or support safety and health interventions?

The aim of this think piece is to reflect on how organizations can turn good but often mis-shot intentions to support safety and health at work into successful action with sustainable results. We outline the most important factors that describe the essence of good interventions, change efforts, and initiatives to support safety and health at work. This is based on four decades of research and intervention studies, and lessons from both failure and success.

### What does not work: factors that inhibit successful interventions

1. **Ad-hoc** actions that are not adequately planned or implemented and evaluated. Safety and health should be an ongoing forward-looking concern not a reactive focus to specific incidents. The process should also include an implementation plan, always followed up by evaluation and review.
2. Actions that are **not aligned** with the policies, practices, culture and values of the organization. Any actions that do not consider the specific context of the organization may compete for resources or conflict with existing practices.
3. Initiatives and activities that are **not followed up**. At the very least, not following up on surveys is a waste of effort at best and impacts on trust at work.
4. Initiatives that are created **top-down** and that **do not engage the employees** in both conceptualizing and delivering them. Any initiative that requires the participation of the employees should involve them from the start in a process of co-creating the solutions.
5. Actions that address issues that are **superficial and symptomatic** rather than foundational. Identifying and then focusing on the underlying issues has more chances of success as it addresses the causes rather than the symptoms.

1 ILO (2019). Safety and Health at Work. <https://www.ilo.org/global/topics/safety-and-health-at-work/lang--en/index.htm>

2 Karanika-Murray, M., & Biron, C. (2015). Derailed organizational interventions for stress and well-being: Confessions of failure, solutions for success. (Eds.) Dordrecht, Netherlands: Springer Science+Business Media.

## What works: factors that contribute to successful interventions

1. Engagement and **participation** of employees at all levels across all stages. A preparatory stage to boost participation in any initiative and engagement of all across all levels can also help to address resistance to change and lead to a sense of ownership which is essential for sustained efforts.
2. A strong leadership and **management** capacity of a team with the necessary resources, knowledge, and skills.

**Along with a participatory approach, visible top management commitment to an initiative is one of the most important ingredients for successful interventions.**

It shows commitment to employee safety and health and ensures that the necessary resources are allocated to successful completion.

3. A **good plan** that draws on the strengths of the organization and a team of people who can drive change. Good planning is at the heart of any successful initiative. A plan that makes the most of resources already in place and mobilizes a team who are committed to driving change.
4. **Evidence-based** initiatives that are based on a thorough assessment of causes. Decisions on the most appropriate remedy have to be based on a good diagnosis. A good diagnosis that focuses on the needs of the employees can help to avoid tendencies to start with the preferred solutions.
5. Changes that focus on the **root causes**. Understanding the root causes of the identified safety and health problems is a more efficient way forward as often one cause has more than one symptom. Initiatives that focus on the root causes are also more preventative and sustainable in the longer term.

6. Initiatives that address the **organization of work** as well as the individual's resources. Initiatives to prevent accidents and diseases tend to focus on improving individuals' skills and coping strategies and delivering individual interventions (mindfulness, physical exercise, etc.), as they are cheaper and can yield immediate effects. Organizational level interventions that focus on the organization and the work itself are more difficult to implement but have more sustainable outcomes in the long term. There is good evidence that a combination of both individual and organizational level initiatives offer a more comprehensive and effective approach.

7. A combination of actions that are **preventative** and actions that are reactive. Addressing the symptoms as well as the causes makes good sense and is an approach that has shown to be more efficient than either-or.

8. A focus on positive **organizational culture** of values and beliefs that are supportive of good safety and health. Our values and beliefs on what is important shape how we behave. The importance of positive collective values and beliefs which are reinforced by policies and procedures that support safety and good health has been demonstrated consistently.

## A mind-frame to help make things happen:

There are four underlying principles that can help get the basics of effective interventions right:

1. ***Safety and health and performance go hand-in-hand.***

**The fact that performance and productivity, the reason for an organization to exist, go hand in hand with health, safety, and well-being concerns goes without saying.**

Recognizing that this applies to all aspects of safety and health, from accidents to mental health and well-being is gaining more and more prominence.

2. **A shared responsibility.** The prevention of accidents and disease should be a shared responsibility across all levels of an organization, from the individual employees and line managers when planning daily work, to the top leadership team and human resource/safety and health teams and strategic planning of work. Safety and health affect the whole organization and its functioning.
3. **A focus on organizational maturity.** For any safety and health initiative to have sustainable outcomes, there has to be learning. That learning has to be upstream to the management and organization of work. It also forms part of the process of developing organizational maturity for safety and health, and there is strong evidence that a focus on organizational maturity can bring substantial productivity improvements and cost savings.
4. **A situational approach to change.** There is a multitude of guidance available, both generic and for specific types of jobs or sectors, on a range of safety and health topics. However, such guidance often leaves organizations more confused than informed because it focuses on 'what' organizations should do rather than 'how' and supporting organizations to develop a process that works for them. An approach that is more situational, that builds on the strengths of the specific organization, its people, or its culture, and that focuses on growth is more likely to succeed in the long term.





## RISING TO GREATER HEIGHTS - INDUSTRIAL HYGIENE IN ASIA

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Over the last two decades, there has been rapid growth of Health, Safety and Environment (HSE) governance driven by regulators and supported by multinationals and voluntary HSE organizations in Asia. Though the focus has been primarily on safety, for the obvious reasons of immediate or acute effects, the importance of industrial hygiene (IH) is becoming more critical. The stringent regulatory requirements, coupled with greater understanding on the health impacts, and the growth of the professional industrial hygienists facilitated the positive changes. How can we accelerate the future growth of industrial hygiene in Asia? What are the challenges and opportunities that lie ahead? This Think piece highlights 3 key focused interventions that will steer the growth of IH to greater heights:

- 1) leadership commitment;
- 2) culture of compliance; and
- 3) competency development.

### General Description of Issues & Scope

Based on 2018 data (Wikipedia.org), Asia represents 59.7% or 4.4 billion of global population, and according to the International Monetary Fund (IMF) Report of 2018, the Gross Domestic Product (GDP) of Asian countries ranges between 3-10%, among the highest growth of all the continents, besides Africa. This translates into rapid business growth and global dependencies on Asia for reliable, quality and affordable products. In the business environment, low production cost is often likely to be compensated with a poorer state of health & safety.

According to the International Labor Organization (ILO), more than 1.1 million people die every year from occupational accidents or work-related diseases in Asia and the Pacific. ILO also notes that the poorest, least protected, least informed and least trained as the most affected. Diseases caused by chemicals, physical agents, biological agents, musculo-skeletal disorders and mental and behavioral disorders have been showing increasing trends, though, they are likely to be under reported.

Closer to home, in Malaysia, the Department of Occupational Safety and Health (DOSH), recorded a 31% increase of occupational disease cases reported in 2016 (7820 cases) compared to 2015 (5960 cases). The top three cases were related to Noise Induced Hearing Loss (NIHL), musculo-skeletal disorders (MSD) and occupational lung diseases. Review of the industries' commitment, showed that, whilst the big players or multinationals are putting in effort to reduce the risks of injuries or illnesses through effective HSE Management Systems, many of the smaller scale enterprises are reluctant to focus on health & safety, mainly because of their bottom line. Inability to associate good HSE is good business, lack of care for their workers and ineffective enforcement activities are among the root causes for this situation. How can we address this issue in a more effective manner, at a faster pace?

Like I mentioned earlier, the future growth of IH must be intensified by strengthening the following 3 areas.

- 1) Leadership commitment  
We cannot deny the significant influence a leader has in shaping the right HSE culture, and hence producing the right HSE results. Strong leadership commitment must begin with the

highest authority in a country, where the government values workers' lives, whenever they make strategic decisions. Government commitment and accountability to safeguard its people (including foreign workers) whilst promoting economic growth is crucial in support of the United Nation (UN) Sustainable Development Goals (SDG), where access to safe workplaces is a basic human right.

Leadership commitment to drive IH must also be instilled in the hearts and minds of business leaders, so that sufficient health & safety costs are allocated in business planning. Leaders actively develop their skills and must be role models in hazard and risk prevention. Commitment and perseverance of leaders from the voluntary IH organizations and research institutes is paramount in creating this drive. Clearly defined and joint accountability of these leaders, as seen in many developed countries, is a mandatory expectation in Asia.

## 2) Culture of compliance

Compliance to rules and regulations correlates with the level of societal maturity and household income. In Asian culture, there has been positive growth in the aspect of compliance, particularly with the stringent and transparent enforcement activities. While rules, systems and procedures are critical in setting standards practices, users or workers understanding of the purpose and meaning of those rules are crucial in shaping sustainable HSE culture. A Culture of compliance must be supported with a robust feedback loop, effective risk assessment and audit programs. Culture of compliance built upon enforcement activities coupled with continuous education programs proves to be more sustainable. Balanced rewards and consequence management, adopting the principles of Just Culture is an important element in strengthening Compliance culture.

## 3) Competency development

**Robust safety and health competency development must begin in homes and schools way before individuals starts their working life.**

Education reform to include safety & health in the syllabus in schools in shaping the right HSE culture in a country is a must. Young children, who are taught good values such as respecting the law and care for others will develop good habits.

The growth of IH professional development and certification, on par with other professional accreditation such as engineers and medical officers, recognizes IH as a noble profession, in the business of saving lives. This will further raise the profile and interest in the profession, will promulgate research and development opportunities and will help explore new knowledge and the best available technology to manage risks in a timely and cost-effectives manner.

Competency of general workers on the basic risks and controls required to protect their health and safety must be intensified. Easy access to safety and health information on the internet makes learning faster and exciting, compared to the primitive ways of learning. In addition, numerous reliable information is readily available on websites hosted by governmental or safety & health organizations and e-learning providers.

One of the catalysts that drives competency is access to safety & health coaches, individuals that are trusted to guide and mentor workers. Considering the Asian population of 4.4 billion, it has the greatest number of employed persons, where continuous coaching and mentoring are necessary. Voluntary organizations, education partners and multinationals, in collaboration with government agencies, should focus to develop more volunteers accessible to workers and small medium enterprises.

## Challenges & Opportunities

Heraclitus, a Greek philosopher, is quoted as saying "change is the only constant in life." Mind-set change and resources, which includes human capital and funding, are the main challenges to steer the growth of IH to greater heights. Nevertheless, the opportunities outweigh the challenges that drive industrial hygienists to persevere, consistently carry the message that we care for our lives of human being, because it is the right thing to do.

## Concluding Remarks

I am a true believer of Mahatma Gandhi's "Be the change that you wish to see in the world." Being an advocate of IH, I am committed to be part of the change. To summarise my learnings being in a career path of IH, I can proudly say:

IH = **I Help** others value the importance of life

IH = **I Honor** the importance of safety

In short... **IH = I'm HUMANE**. Shouldn't we all be?



## TOWARDS A HEALTHIER FUTURE OF WORK

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The ILO Global Commission on the Future of Work called for fundamental changes in the way we work in the new wave of globalization, rapid technological development, demographic transition and climate change. Such changes may bring about new opportunities for improving the health of 3.5 billion working people and their families. A healthier workforce is an essential prerequisite for a brighter future of work and for a more sustainable development.

Everybody has the right to health, which is defined by WHO as a state of complete physical and mental wellbeing and not only the absence of disease and infirmity. Working people also have the right to health and to healthcare as close as possible to where they live and work.

Healthier and safer workplaces can prevent at least 1.2 million deaths every year, according to a 2018 WHO study. Many deaths and disabilities can be prevented through addressing major health threats at the workplace, such as stress, long working hours and shift work, prolonged sitting at work, work-related climate sensitive diseases, such as heat and cold stress, as well as workplace air pollution. The workplace is a key setting for action in many WHO global health initiatives on environment and climate change, non-communicable diseases, mental health, tuberculosis, HIV and other communicable diseases.

The 24/7 digital economy, long working hours, high demand and rapid change with low personal control can be devastating for physical and mental health and wellbeing. However, new frontier technologies and new ways of working provide solutions for classic occupational health problems, for example, by using robots for hazardous work, or artificial intelligence for monotonous, annoying tasks.

Most workers in informal and precarious employment, gig economy, care economy, migrant and

domestic workers don't have regulatory protection of their health and safety at work, occupational health services, and social security.

**We want the future of work to close, and not to widen, the gaps between those who have full labour rights, health and safety services, regulatory and social protection and those who do not.**

WHO and ILO are working together to develop a joint methodology and estimates of the health impacts of occupational risks based on the WHO burden of disease studies and ILO labour statistics. Such a methodology will allow us to assess and forecast the health impacts of changes in the labour force composition in the future of work.

WHO is working with countries to extend universal health coverage to 1 billion more people. The most basic interventions and services for safer and healthier workplaces need to be accessible for workers in all forms of employment, including in the informal economy, precarious employment, migrant workers and digital platforms. It is at the workplace where the Universal Health Coverage, the global goal of the WHO, and the Universal Labour Guarantee, proposed by the ILO Global Commission, can make a visible difference in the daily life of working people and their families, by connecting access to preventive, curative and rehabilitative health services to the right of all workers to health and safety at work. Health and labour policy makers need to join efforts to make this happen.

The current system of regulations, services and practice of occupational health and safety is a product of 20th century forms of work and organization of the economy – standard employment in big enterprises with social protection and regulatory control. This system is not anymore suitable for the new forms of work and work organization - it needs to evolve to ensure no one is left

behind. We need a reform of occupational safety and health (OSH) governance and services. The lack of collaboration between health and labour sectors in countries is a major obstacle for addressing the health and safety challenges from a changing world of work.

Globally, the proportion of people suffering from non-communicable diseases, such as cancer, respiratory, cardiovascular diseases, diabetes and mental ill-health, is increasing. In the future, working people will work with several chronic diseases. Therefore, as part of the measures to stop this epidemic, the Third High Level Meeting on Non-Communicable Diseases, held in September 2018 at the UN General Assembly called for providing healthy and safe working conditions, tobacco free workplaces, wellness initiatives and improving health coverage of workers. How can we make this possible? How can we make sure that frontier technologies are healthier, and working with artificial intelligence and robots is a source of pleasure and not a source of stress for working people?

We hope that the future of work will also be a good future for the health of all people. The jobs in the care economy will be increasing, no doubt. Some traditional jobs in the health sector may be replaced by robots and artificial intelligence, but no machine can replace human care and compassion. How will we prepare our future health workers with new skills to work with frontier technology and to do what technology cannot do, i.e. to be human? What will be the division of labour between humans and machines in the care economy? We have an ongoing collaboration with ILO and OECD on the future of health employment and inclusive economic growth and would like to see working conditions in the health sector to become more decent and more attractive for young people. The new jobs in the health sector need to be decent. This requires healthy and safe workplaces for everyone, everywhere – from hospitals to primary care, in cities, villages and fragile settings, and anytime – in daily work, and in public health emergencies.

We also need to be mindful of the environmental challenges arising from climate change, environmental pollution, for example air pollution. Many gig economy workers work outdoors and have no protection from air pollution and heat stress, this work is outside the scope of existing OSH regulations. The green jobs of the future also need to be decent, healthy and safe jobs. By combining health and safety at work with environmental protection, by linking human and environmental capital, we can contribute to a brighter future of work, a sustainable economy and a healthier planet.





## MINIMIZING THE ADVERSE EFFECTS OF RESTRUCTURING ON EMPLOYEE HEALTH AND WELLBEING

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### “The Only Thing That Is Constant Is Change” – Heraclitus

Change is commonplace in today’s workplace. With internationalization and globalization come increased competition and organizations strive to adjust to the demands of their markets or in case of the public sector to shrinking funds and increased demands of documentation. Recent figures from the European Working Conditions Survey (EWCS-2015) found that 30% of workers had experienced restructuring in the past three years.

Restructuring can be defined as an organizational change that is greater than commonplace changes. To be considered restructuring, the changes should affect an organizational sector or an entire company and can include closure, outsourcing, offshoring, sub-contracting, merging, and/or delocalization.

Despite the prevalence of restructuring, it is widely acknowledged that often restructuring fails to achieve its intended outcomes in terms of increased effectiveness and performance.

### ”How can you hide from what never goes away?” – Heraclitus

It has been argued that this failure can be, at least partly, attributed to the fact that organizations rarely consider the impact on workers remaining in the organization. Recent figures from the EWCS-2015 show that workers who had experienced restructuring in the past three years more often reported they needed to learn new things as part of their job, they had higher work intensity, they experienced more bullying and other adverse social behaviours. However, on a positive note, workers reported higher

levels of autonomy and better access to training compared to workers who had not experienced restructuring. The links between restructuring and poor health and well-being were clear: Workers exposed to restructuring were more likely to turn up for work when ill, had higher levels of sickness absenteeism and were more stressed. They were also less satisfied with their jobs, reported poorer mental well-being and reported higher levels of job insecurity.

In the EU, the challenges of ensuring healthy restructuring is well recognized. The Collective Redundancies Directive (98/59/EC) states that employers should inform and consult the workforce on plans for collective redundancies. Despite this Directive, few organizations make any serious attempts to prepare their employees for restructuring and ensure a healthy change process.

### “It is in changing that we find purpose.” – Heraclitus

There may, however, be light at the end of the tunnel. A review by de Jong and colleagues identified a range of factors which may be related to a healthy change process that may protect against the adverse effects of restructuring on workers’ health and well-being. First, communication is important. Second, if management actively manage change and involve workers; this may prevent poor well-being. Third, good quality training is also important. Finally, fair and transparent processes also have a positive impact. It is reassuring that the research supports the EU Directive that emphasizes communication and involvement! Despite the alignment between research and policy, there still seems to be a missing link as policy is not well implemented.

Findings from the European Survey of New and Emerging Risks (ESENER-2) suggest that the two major obstacles to managing risks to worker health and well-being are lack of expertise and lack of awareness among management. Together these findings suggest that we need to develop our understanding of how to intervene to address the threats of restructuring to workers' health and well-being.

**One way to address the threats to worker health and well-being may be through participatory organizational interventions that aim to improve working conditions and worker health and well-being through making changes to the way work is organized, designed and managed - that is, making changes to work practices and procedures.**

The key principle is participation. Workers and managers engage in a collaborative process to design the process and the content of the intervention. These types of interventions often go through the five phases of preparation, risk identification, action planning to reduce risks, implementation of action plans and evaluation of the success of the intervention to improve working conditions and worker health and well-being.

**Key elements of the participatory process are communication, consultation, management taking responsibility for managing change, and fair and transparent procedures as managers and employees work together to make changes.**

Through engaging with all phases of the intervention, workers and managers learn how to deal with the risks to health and well-being. These factors are what de Jong and colleagues found to be important for a healthy change process. Participatory organizational intervention may thus be the missing link enabling us to ensure a healthy change process.

To test whether participatory organizational interventions can indeed reduce one of the major risks of restructuring: job insecurity, we conducted a study in the Danish postal service. The postal service is an organization facing major restructuring due to privatization and reduced demands for their services.

Restructuring was identified as a major problem and four action plans were developed to address the risks associated with restructuring. First, an action plan focused on improving communication about planned changes. Second, an action addressed the problems associated with postal workers being temporarily transferred to other teams where they were unfamiliar with work practices and procedures. Third, an action plan was developed aimed at giving workers a voice when planning changes to the postal routes. Finally, an action plan was developed that involved including discussions of the role of postal workers in the future as the postal service faced major layoffs and demands to develop new services.

The evaluation showed that workers in the intervention group did not report increased job insecurity as was the case in the control group. Our results suggest that although we may not be able to reduce job insecurity participatory interventions may be kept stable in an everchanging organization.

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## NEW AND EMERGING RISKS OF CHEMICALS (NERCS) AND THE FUTURE OF WORK

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**There is an urgent need for a proactive approach to identify future risks of chemicals to workers' health and safety in a continuously changing world of work.**

There may be unknown and unexpected risks, and early warnings may prevent later high consequences in terms of adverse health effects and socio-economic impacts (see also "[Late lessons from early warnings](#)"). This argues for a complementary approach based on the occurrence of disease and inductive reasoning towards new risk factors in work. We call it the 'disease first' approach; an approach based on secondary prevention.

### Issue and scope of the problem

New and Emerging Risks of Chemicals (NERCs) continue to emerge despite all regulations. Currently, Occupational Safety and Health (OSH) regulations are based on risk assessments of chemicals by the identification of hazardous substances used, assessing inhalation and dermal exposure, comparing exposure with occupational exposure standards, and subsequently reducing exposure when applicable. This is the preferable approach since it is based on primary prevention; we call it the 'exposure first' method. It is based on the premise that all necessary toxicological information of substances is available. However, chemical classification is often based on oral exposure data, which is the least important exposure route for workers. This was, for instance, a problem regarding inhalation exposure of workers to the flavouring agent diacetyl used in the food industry (popcorn industry, bakeries, dairy products, and coffee). Oral exposure is perfectly safe but inhalation exposure may cause a potentially lethal lung disease. Besides exposure to substances with unknown toxicological health effects, workers may also be exposed to

substances with known toxicological effects in a branch of work with poor access to this toxicological information. For example, in mining and ceramics, it is well known that exposure to crystalline silica may lead to silicosis. However, after applying sand blasting techniques in the clothing industry, many workers were diagnosed with silicosis. At this moment, cases of silicosis are reported in dentists and dental technicians caused by alginate, which contains amorphous silica that is transformed into crystalline silica at high temperatures.

### Challenges and opportunities faced

**Since the approach of risk assessment and management is not sufficient in preventing employees from work-related ill health, we need complementary information from 'the field'.**

The 'disease first' method is an inductive way of reasoning, starting with observations of health effects in workers and trying to identify causal factors. In this way a disease can act as an early warning. This warning can be collected in 'Early Warning Systems' (EWS) comparable with the ones used in pharmacovigilance to detect and evaluate adverse health effects of drugs after introduction to the market. In the author's opinion the application of EWS in the occupational setting can ultimately reduce the number of work-related diseases. Generally, EWS are based on two approaches (1) spontaneous reporting of cases by vigilant physicians, other health care workers and/or workers using a clinical watch system, and (2) research in existing databases.

**The success of the disease first method depends on the vigilance of health professionals and workers.**

In a successful ‘disease-first’ approach, the cases of potential work-related health effects are collected in a clinical watch system. Next, these cases should be evaluated for potential causal relationships, preferably in expert groups, comprising occupational physicians, medical specialists, industrial hygienists, toxicologists, epidemiologists and statisticians. After the identification of a potential NERC, the signal is strengthened and verified by finding additional cases, e.g. in existing databases or using networks. International cooperation in the identification and strengthening of NERCs is essential to let the system work, since information both on health effect(s) and occupational exposure is needed to determine a causal, or at least plausible, relationship. Workers are often exposed to many substances and incidences of emerging health effects are often low which makes it difficult to establish a causal relationship. Furthermore, existing national databases on both exposure and health effects cannot easily be shared because of privacy and technical reasons. Collaboration between the owners of these databases will bring the identification of potential NERCs further. The MODERNET<sup>1</sup> network is an international network of mainly European professionals who evaluate and discuss NERCs for workers and share knowledge with each other with the aim of rapidly exchanging information on potential new work-related diseases between European countries and introducing measures to reduce the risk.

Several actions are possible if there is sufficient evidence for a potential NERC to become a verified NERC:

- (1) When health effects are reported below an occupational exposure limit (OEL), which was the case for diacetyl, a request for re-evaluation of the OEL is needed;
- (2) Professionals in occupational health and safety should be informed, e.g. via an alert;
- (3) If a substance is already under evaluation, e.g., under REACH in Europe, this should be communicated;
- (4) If a substance is not yet regulated, options to further regulate the concern should be investigated. In the past years, several NERCs were evaluated e.g. tricobalt tetraoxide and indium tin oxide. For tricobalt tetraoxide the initiative led to an adaptation of the composition of the substance. For indium-tin oxide it was concluded that users of the substance should be informed about the concern.

## Concluding recommendations

The ‘disease first’ method is an additional method to the generally accepted ‘exposure first’ method. It fills knowledge gaps and prevents new cases of work-related diseases. To let the ‘disease first’ method work we need well-functioning EWS, international collaboration between experts on the identification and evaluation of NERCs, responsible managers, branch organizations and trade unions.

1 MODERNET: Monitoring trends in Occupational Diseases and tracing new and Emerging Risks in a NETWORK





## DIFFICULTIES OF RECORDING AND NOTIFICATION OF ACCIDENTS AND DISEASES IN DEVELOPING COUNTRIES

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The world of developing countries is very vast, and spreads across multiple continents. Among these countries we can see wide variety of political systems, governance, economic situations, demography, culture, labor laws and its enforcement, numbers of workers in formal and informal sectors and difficulties in recording and reporting of accidents and occupational diseases. This leaves a narrow range for comparison.

Among developing countries, some are better in collecting data on occupational accidents and diseases while some are very poor.

**From the data available, a wide gap is observed in the ratio of illnesses to injuries recorded between developed and developing countries.**

### Reporting of fatal and non-fatal injuries at work

Laws for safety and health at work in India have provisions to report the accidents and occupational diseases, but enforcement is so weak that there is a huge gap between the estimated fatal and non-fatal accidents reported by ILO for India, and the figures reported to ILO by the Indian Government. The average rate of reported fatal accidents in Indian-registered factories per 1,000,000 workers employed in the years 2010-2013 was 20.85, while it was 1.53 for the European Union in the same period. Based on occupational injury rates estimated by the World Bank, the risk of fatal and non-fatal occupational injury in China and India is about two and a half times higher than in the Economic Established Market region (basically Europe and North America). This difference is five times higher in the Sub-Saharan Africa economic region. Countries with developed economies have the lowest rates.

Fatal rates in Sweden and the United Kingdom are 1.9 and 0.8 per 100,000 workers, respectively, while in Mozambique or Kenya the fatality rates are 21.6 per 100,000 workers, similar to that in Bolivia, where the fatality rate is 21.9. (2007 report)

### Reporting of occupational diseases

Some data on accidents are available but there is paucity of data on occupational diseases. Diagnosis of occupational disease is still such a rare event that in many developing countries even the first case is not reported. Medical professionals in public and private sectors are not reporting cases of occupational diseases for several reasons. The Ministry of Labor of the Government of India published data for occupational diseases in India for years 2014, 2015 and 2016. In these three years, 132 cases of occupational diseases were notified by only 5 states of India. The rest either did not diagnose or failed to report.

### Why cases are not being reported

Private medical practitioners are sometimes hesitant to notify occupational diseases because they are concerned that the victim may lose his/her job, or that no one will take care for his/her rehabilitation or compensation. Thus notification may push the victim to the corner. Also, notification may not help reduce recurrence as the law enforcement agency may not take any action to improve the work environment. Each elected Government has their pressing issues, priorities and political compulsions. Elected Governments drive the policy and influence law enforcement and administration. In different countries, local issues are different, but the common thread is, generating resources will always have the top-

most priority. Industry is sometimes given leeway, which impacts notifications against employment generation. In public life and execution, persona gains in mutual interest impact enforcement in general, and for notifications in particular.

## **Social environment and government policies:**

In India, there are still thousands of people who do not know where they were born and when. The literacy rate in India stands at 74% (2011) which may be an indicator, though it does not assure that people know their legal rights. Unionization is very weak and existing trade unions have further weakened in the last two decades. Society is riddled with divisions on the lines of religion, caste, color, region and language. Social and economic inequality, poor governance, rule of the mighty, legacy of feudal thought, and huge economical gaps are hindrances in achieving labor rights. And now under the “ease of doing business,” labor laws are further liberalized to push more workers out of the purview of the law. Vacancy in state and central labor ministries is mounting. State and central governments are curbing powers of enforcement agencies by amending policies for inspection of workplaces. Overall, it does not provide a conducive social environment for reporting of accidents and occupational diseases.

## **Health care services:**

Diagnosis and reporting of occupational diseases is benighted. In India, 80% of health care is provided by the private sector, which is not monitored under any law. In rural parts, health care is provided by unqualified medical practitioners who do not have knowledge of occupational health. Incomprehension of legal provisions and occupational health among rural and private medical professionals is egregious. The state is not investing in making the legal provision known.

## **Whose responsibility:**

Dissonance prevails between the labor department and the health department about their duties. Setting up a separate cell on occupational health within the health department and making them responsible to monitor the health of workers in all economic sectors may be a solution.

## **The situation is changing slowly:**

**In the last two decades, we have observed change, though slowly.**

Despite all odds there are some positive stories of change. Setting up a clinic for screening or organizing diagnosis camps at irregular time periods have been used successfully by grass root groups to generate scientific data on occupational diseases like silicosis and asbestosis. Data so generated have been presented before the National Human Rights Commission to get directions from the commission for the State on prevention, rehabilitation and compensation. In South Africa, the State Compensation Board organized diagnosis camps for past gold mine workers not only in South Africa but also neighboring countries from where workers used to migrate. Activists have successfully helped victims of occupational diseases by bridging the information gap between the doctor and the victim by collating information on exposures and locating probable materials causing the disease. In some cases, state policy was positively influenced by grass root organizations to set up a system to confirm occupational disease and pay compensation. In the days to come, technology may help ease notifications, which may encourage experts to report the cases they come across. Public hospitals may set up a system for diagnosis of occupational diseases following public pressure. Though at low speed, positive changes have also been witnessed in countries like Vietnam, Indonesia, Pakistan, Tanzania, Thailand and Malaysia.

## **What can be done:**

1. The state has a major role to play. Let it invest in propagating legal provisions. Associations of medical practitioners can also be encouraged. Workers, trade unions and non-profits may be educated on notifiable occupational diseases.
2. The government can provide assistance to industry to improve the work environment.
3. The central government should name one single competent authority for all cases notified from mines, manufacturing, services and other sectors. Amend the law to empower any citizen to notify a case.

4. The notifications should be online and should be accessible to the public so that possibility of changing the record by the authority can be minimized or diminished.
5. Anonymity of the notifier should be allowed. Confidentiality should be respected at all levels.
6. Multiple approaches are needed – surveillance, data collated from research, data from social security and compensation claims.
7. Out-patient departments may be opened in all public hospitals for diagnosis of occupational diseases. Private hospitals also may be encouraged.
8. Encourage medical colleges to diagnose and report occupational diseases. Medical boards should confirm reported cases, and should be set up in all medical colleges. A system for appeal should also be set up for review and appeal.
9. Demonstration projects may be taken up in hospitals to set up systems to diagnose and report occupational diseases. Under the project, para-medical staff may be trained to record occupational history, and experts should be encouraged to use them.
10. Training programs may be developed to train personnel in recording occupational history.
11. There should be legal provisions for qualified occupational health professionals to submit annual updates of the cases they may have seen.
12. Society, in general, should invest more in occupational safety and health rights including diagnosis and notifications of occupational diseases and accidents.

## **Future of work:**

In India and some other developing countries, one can see the change happening and that the process of change continues to progress and strengthen further. As developing countries get economically stronger, governance may improve, reflected by better data on occupational injuries and diseases. People with more political power may lead to develop technology and a social atmosphere where reporting of occupational diseases will be easier. With technological advancement, working conditions may improve which would reduce occupational diseases. On the other hand, global warming, use of modern technology like robots, driverless vehicles, 3D printing, artificial intelligence may generate joblessness or an increase in unemployment in developing countries. The population in democratic countries votes to choose the Government they want in power. They have to choose between conservative and progressive political parties. The choice impacts overall life including labor rights and notifications.

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## INNOVATIVE LEGISLATION AND OSH

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This think piece addresses three contemporary issues that arise in the design of appropriate work health and safety laws:

- 1 Whether the contractual employment relationship remains relevant;
- 2 The impact of declining levels of trade union membership; and
- 3 The need to respond to particularly egregious cases.

**In most countries, the protection of workers from sickness, disease and injury arising out of their employment has historically been achieved through legislation. Laws and regulations are recognised by ILO Convention 187 (*Promotional Framework for Occupational Safety and Health Convention 2006*) as one component of a “national system for occupational safety and health”.<sup>1</sup>**

The first such law enacted in Australia<sup>2</sup> was modelled closely on the landmark *British Factories Act 1876*.<sup>3</sup> The law of Great Britain has continued to exert a powerful influence over Australian legislative developments. Present day Australian laws<sup>4</sup> owe much to the British *Health and Safety at Work etc Act 1974*, which in turn reflects the recommendations of the highly influential Robens Report of 1972.<sup>5</sup>

## The Continuing Relevance of the Employment Relationship

The principal focus of laws regulating work health and safety was the employment relationship: duties were imposed on “employers” for the benefit of their “employees”.<sup>6</sup> The existence of a contractual employment relationship underpinned the scope of the statutory duties. However, the last 20 years have seen dramatic changes in the Australian labour market – changes that are reflected throughout the world. These changes include the rise of the ‘gig’ economy, the widespread use of labour hire, ‘off-shoring’, franchising, telework and home work. Simultaneously, and probably not coincidentally, there has been a dramatic decrease in the proportion of Australian workers who are members of trade unions, especially in the private (non-government) sector of the economy.

Successive official reports which have evaluated Australia’s work safety laws have recognised these changes and have reflected on the need for law and policy makers to adapt work safety laws to ensure that the laws remain relevant to the changing labour market and society generally.<sup>7</sup> A highly influential national review of Australian work safety law concluded in 2008 that changes in the labour market meant that “using the employment relationship as the determinant of the application of the primary duties under OHS legislation is no longer valid”.<sup>8</sup> It recommended that “to ensure that the primary duty of care continues to be responsive to changes in the nature of

1 Article 4. See also Convention No 155 (Convention concerning Occupational Safety and Health and the Working Environment), Art. 8.

2 Factories and Shops Act 1885 (Vic.)

3 For a discussion of these historical developments, see Gunningham 1984: chapter 4.

4 See, for example, the Occupational Health and Safety Act 2004 (Vic.) and the Work Health and Safety Act 2011 (NSW).

5 Robens 1972. For an overview of the Report’s findings and recommendations, see Creighton & Rozen 2017: [1.10]-[1.18]

6 See, for example, s 21 of the Occupational Health and Safety Act 2004 (Vic.)

7 See for example, Maxwell 2004: chapters 3 and 20 and National Review 2008: chapter 2.

8 National Review 2008: 6.46.

work and work relationships and arrangements, the duty should not be limited to employment relationships”. Instead the duty should be owed by “any person conducting [a] business or undertaking”.<sup>9</sup> The Review also recommended that the class of persons protected be correspondingly enlarged beyond “employees” so that it extends to “any person who works, in any capacity, in or as part of the business or undertaking”.<sup>10</sup>

The Review’s recommendations were implemented in 2010 by most of Australia’s governments as a new model work health and safety statute.<sup>11</sup> As envisaged by the Review, in the jurisdictions that have implemented the model Act,<sup>12</sup> the primary duty of care is now imposed on a person who conducts a business or undertaking in favour of all workers who perform work in that business or undertaking.<sup>13</sup> A more recent Review of the operation of those laws concluded that these concepts in the model law remain “sufficiently flexible to encompass changing work arrangements, emerging industries and new business models”.<sup>14</sup>

## The impact of declining levels of trade union membership

Another issue which has challenged Australian policy makers is the need to ensure high levels of worker involvement in work safety in an era of declining trade union membership.<sup>15</sup>

**The ILO OSH Conventions emphasize the importance of consultation by employers with their workers as well as worker involvement more generally in the design and implementation of work safety laws and regulations.<sup>16</sup>**

In recognition of the decline in trade union membership, Australian law makers have broadened the obligation to consult beyond elected employee representatives as was the case prior to 2004.<sup>17</sup> Under current laws, employers and persons conducting businesses or undertakings must consult directly with their workforce in the implementation of changes to work processes that may have health and safety implications.<sup>18</sup>

## Response to work deaths caused by gross negligence

A third issue which has provoked much debate in Australia concerns the appropriate legal response to the most egregious cases of neglect that result in worker or third party deaths. High profile cases have included the deaths of three passers-by in Melbourne in 2013 when a wall at a building site collapsed onto a footpath<sup>19</sup> and the deaths of four patrons at an amusement park in Queensland in 2016. The response of the Queensland government to the latter tragedy was to introduce ‘industrial manslaughter’ laws into the parliament. These were duly enacted and came into operation in 2018 and enable officers of corporations to be imprisoned where a death

9 National Review 2008: Recommendation 11.

10 National Review 2008: Recommendations 10 and 16.

11 See generally Johnstone & Tooma 2012: chapter 1.

12 All Australian jurisdictions except Victoria and Western Australia have implemented the model Act: see Creighton and Rozen 2017: [2.32]-[2.40].

13 See for example, *Work Health and Safety Act 2011* (Cth), ss 5 and 7 and 19.

14 Boland 2018: p 7.

15 Maxwell 2004: chapter 3; National Review 2008: [2.52]-[2.54].

16 See ILO Convention No 155, Article 19 and ILO Convention No 187, Article 4(2)(d)

17 For example, in the 1985 law in Victoria, an employer was only required to comply with an employee elected health and safety representative. As the Maxwell Review of 2004 observed, there were many workplaces where no representative had been elected which meant the duty to consult was unenforceable - Maxwell 2004: chapter 20.

18 For a discussion of current Victorian law, see Creighton & Rozen 2017: chapter 12; for a discussion of the law elsewhere in Australia, see Johnstone et al 2012: chapter 7.

19 See Creighton & Rozen 2017: [10.139]-[10.142].



results from the gross negligence of the corporation.<sup>20</sup> A 2018 Review recommended that the Queensland laws be implemented throughout Australia “to address increasing community concerns that there should be a separate industrial manslaughter offence where there is a gross deviation from a reasonable standard of care that leads to a workplace death”.<sup>21</sup>

## Conclusion

Australian work safety laws continue to develop and evolve in response to changing labour market conditions and community expectations. As part of this development,

**Australia will continue to seek ideas and inspiration from the ILO and the broader international community in its quest to safeguard working people and others from illness, disease and injury arising from work.**

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20 *Work Health and Safety Act 2011* (Qld), Part 2A. These laws were based in part on the ‘corporate homicide’ laws which was introduced into the United Kingdom in 2007: Corporate Manslaughter and Corporate Homicide Act 2007 – for discussion see Roper 2018.

21 Boland 2018: pp 123-124.



## THE PROMISES AND PERILS OF THE PLATFORM ECONOMY: OCCUPATIONAL HEALTH AND SAFETY CHALLENGES, AND THE OPPORTUNITIES FOR LABOUR INSPECTIONS

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Platform economy (PE) is a digital innovation undergoing gradual, but certain global expansion. The PE is an internet-based technology that utilizes smart-phone applications or websites for administering, requesting, providing, remunerating and evaluating work that delivers a range of offline and online consumer services. Offline services in a PE typically include professional driving, cleaning services and food delivery. While, online services include desk-jobs like translation, web-designing and proofreading. Individuals who render these services are often called service providers. Sharing economy, gig-economy and on-demand economy are also nomenclatures designated to the PE.

This think piece is a modest overview of the occupational safety and health (OSH) implications of the PE. It further delves into potential measures that labour inspections (LIs) could consider to better protect the workers in the PE. Today, most workers globally still acquire employment in the traditional or the informal economy. Likely, over the next decade, a critical mass of workers will gradually shift from the traditional economy to the PE. This shift may include a wide spectrum of occupations such as nurses, cleaners, painters, and programmers. At this time a small proportion of occupations are directly impacted by the PE. The OSH concern is principally for workers who are dependent on the PE as a primary source of income. Globally, labour inspections will benefit from being mindful of this gradual, but imminent shift of workers from the traditional economy to the PE, and its implications for occupational safety and health (OSH).

The service providers in the PE are essentially participating in the same tasks and exposed to similar OSH risks as the workers in the traditional economy. For example a cleaner employed

with a cleaning service business and a cleaner hired from a digital platform are both performing cleaning tasks. They are likely exposed to the same workplace hazards. The difference, however, is the apparent absence of a traditional employer in the PE, and the job is restricted to a specific time-bound task demanded by a customer. Instead of the traditional employer, the service provider is dealing with a vague digital entity on a daily basis. Thus, the service provider has much in common with a worker in terms of tasks, risks, and remuneration. For this think piece the service provider has been designated the term – platform worker.

A classic example of offline services in PE is the taxi ride. A request for a ride is sent by a customer using a smart-phone through an internet-based digital platform. A registered driver with the platform is notified by the app on her/his smart-phone of a potential customer seeking a ride. The notification to a driver is a function of algorithms that accounts for among other things, driver's availability, geographical proximity to the departure point, number of drivers in the area, and demand rides at the time. After the completion of the ride, the driver is notified on the costs incurred on the smart-phone app, and the customer makes an electronic app-based payment. The customer then receives a receipt, and can also provide feedback (ratings) to the platform for the services rendered using the app. In the case of a ride service, the transaction loop is tripartite arrangement and involves a platform worker who is typically the vehicle owner, a digital platform, and the customer seeking a ride. Nevertheless, there are complex variations where the vehicle owner and the person driving the vehicle may be different people. In some instances, one person may own many vehicles and solicit several drivers to operate these vehicles. In this case,

the owner of several vehicles is a subcontractor between the digital platform and platform workers.

In the traditional economy, a large transport company may outsource part of its business to the subcontractor who owns several vehicles and then hires several professional drivers. In most instances, the drivers are considered employees, and the transport company along with subcontractor, would harbor the role of the employer depending on the national regulations at play. In contrast, neither the platform, nor the individual owning several vehicles are necessarily considered an employer in the PE. Furthermore, contract drivers are frequently designated as individual service providers. Regardless of the type of work (e.g., food delivery, cleaning services) workers may follow a tri-partite arrangement similar that of the platform-based taxi service. As with ride-based services, other forms of work may be subject to complex working arrangements where a single subcontractor acts as an intermediary between the platform and assigning a specific job to the platform worker who provides labour to at the customers site of preference.

**The online services in the PE may be performed anytime and anywhere in the world untethered by OSH regulations of a nation state.**

For example, an urgent website designing job for a customer in Sweden could be expedited by a platform at low-wages by a home-based website designer in India. It is impossible to enforce either the Swedish or Indian wages and working time regulations to a platform worker in the privacy of his household. The difference in contrast to offline services is that the online platform worker and customer may encounter each other only in the digital world.

The salient features of both online or offline services is the singular use of the digital platforms along with the non-standard nature of employment, and the apparent absence of the traditional employer. Organization of work-tasks in the PE is undoubtedly efficient for the platforms as the supply of labour is hired, only subject to demand, thus cutting costs and liability. PE also provides consumers a high level of efficiency, range of choices, and convenience at a reasonable cost. The platform worker benefits from the PE as it provides both additional and/or a main source of income. The

technological innovation apparently could be a win-win for everyone involved, but perhaps someone, somewhere and somehow must pay the cost of convenience, choice, and efficiency. Plausibly these costs are partially offset by compromising the OSH of the platform worker as well as failure to provide workers' compensation.

## Occupational Safety and Health Challenges

Professional drivers in the traditional economy risk long working-hours, violence, threats, working alone, demanding night-shifts, poorly maintained vehicles and poor wages. Platform drivers are exposed to identical risks. Moreover, platform drivers are subjected to ongoing digital surveillance. The platforms keep track of drivers using global positioning systems (GPS) 24/7 to maintain accessibility and determine transportation costs depending on the number of vehicles available in the area, traffic situation, and demand for the service. Also, drivers endure the pressure of customer ratings. Such surveillance data obtained from the driver are fed into algorithms that the platform utilizes to assign the next job to the driver. Job security for the driver in the PE is thus intricately linked to surveillance data collected by the platform. Constant surveillance and burden of being persistently evaluated is detrimental to the psychosocial working environment. Together these physical and psychosocial risks may compromise the health and safety of PE drivers.

Online office-based services in the PE are comparable to the desk-jobs in traditional economy which are prone to among other things poor ergonomic designs, high work-intensity, indoor air quality, long work hours, cyber-bulling, sedentary tasks, and solitary work. Desk-jobs, in general, are therefore predisposed to musculoskeletal and psychosocial disorders. Akin to the professional drivers in the PE, workers rendering online-services are subject to constant evaluations and surveillance that may compound levels of psychosocial stress.

In the traditional economy, some pioneering employers are advocating workplace wellness or health promotion programs to encourage a healthy lifestyle, work-life balance, and social well-being for both manual and sedentary jobs. Such em-

ployer initiatives acknowledge that a healthy worker is a productive worker and that the health of the worker mandates a holistic approach at, and beyond the workplace. Emerging research suggests that sedentary work is a major risk attributing to the global burden of non-communicable diseases. The seeming absence of the employer, and subsequently an employer-initiated health promotion programs may predispose the sedentary online platform worker to chronic diseases. Research suggests that non-standard employment such as temporary work harbors a higher risk of injuries compared to those with permanent work. Moreover, temporary work, coupled with poor wages and ceaseless fear of job loss is collectively a cause of enduring psychological stress. Chronic stress leads to a biological response resulting in excessive levels of the hormone cortisol; a hormone implicated in a range of debilitating conditions like cardiovascular diseases, hypertension, and diabetes.

PE will facilitate inclusion and offer flexibility to workers who typically have been excluded from the intractable labour market. For example, the PE will enable disabled workers to gain rewarding online-jobs in web-designing or programming. PE will provide more autonomy to workers who by choice would like a fixed amount of work and only at specific times. However, a large majority of workers in the future would still seek job security, and a stable income to plan a foreseeable future for themselves and their families. These developments may concurrently hazard the exclusion of workers employed in certain low skill occupations. Educated, tech-savvy young people could gain easy access to platform work because of their comparative advantage at maneuvering, and probably manipulating technology to their advantage. Elderly and low skill workers, however, stand to lose income opportunities because of their lack of familiarity with and ability to navigate the new technological terrain. The PE also provides tech-savvy students with temporary work that yields supplementary income. In that sense, PE would potentially reward workers based on their digital aptitude to maneuver technology rather than the physical capability to offer diligent manual labour. Thus, the PE could instigate income and occupational health disparities in the traditional labour market by excluding low skill, less educated and technologically unsavvy workers from acquiring gainful work. Traditional workers unable to adapt to the platform technology will

be thrust in to precarious jobs with low income and tenuous OSH protections. Such a development will potentiate a race to the bottom between the platform worker and those workers in the traditional economy perpetuating the base of undeclared work (grey economy) in the labour market.

Emerging technologies such as Artificial Intelligence, 3D printing and Robotization are certain to improve safety and health of workers. However, there is little evidence indicating that PE as a technological innovation will mitigate the inherent OSH risks for the online or offline platform worker. PE will likely impact the health of platform workers through hazardous physical conditions; adverse psychosocial conditions; poor wages; temporary, insecure work, including the risk of job loss and exclusion from work-life. Moreover, the technological disruption in some cases will catalyze the inadvertent expansion of undeclared work, and occupational health inequalities.

## Opportunities for Labour Inspections

Historically, labour inspections evolved as part of a state response to temper the hazardous health effects of work. For example, both asbestos and white phosphorus were technological marvels that were with time abated with regulatory interventions to prevent the insidious impact of these substances on the health of workers. Our past experiences with new technologies should inform our effort to shape the future. It must be underscored that technological change today as compared to the last century is exponential, while regulatory interventions initiated by LIs tend to be logarithmical. This model for developing regulatory interventions is far from sustainable given the pace of technological change. PE is a novel technology of our times, but as with all other new technologies a precautionary approach is mandated with regards to understanding potential OSH risks posed to the platform workers.

**Definitions of a worker and employer in the PE remain a contentious issue for regulators.**

In 2017, a Hague judgement concluded that a digital platform providing transportation services is not a web-based information service, but a transportation business, and therefore an employer. Efforts are being made in some countries to redefine the traditional concepts of workers and

employers, such that platform workers are brought under the auspices of OSH regulations. Judicial definitions will continue to evolve and refine with time, hopefully to provide improved health and social protections to the platform worker. Nevertheless, labour inspectors should deliberate practical approaches for better protecting the health and safety of platform workers.

First, the traditional tripartite framework could consider accommodating global platform businesses and representation of platform workers in their tripartite boards to a greater degree. A collaboration between labour inspectorates and the platform businesses will facilitate data sharing between platforms and regulators. Perhaps it might be wise to include multinational tech-business representation given the worldwide nature of the PE. The tripartite process assumes that the platform-worker has representation. The platform-worker, however, is a solitary worker competing with another platform-worker for the same job. Platform-workers lack an arena for either interacting or socializing given the veiled nature of their work where they are unlikely to encounter each other in a workplace setting. Hence, they are less likely to organize and collectively bargain for safe and healthy working conditions. State regulators could conceivably provide arenas, incentives and encouragement for the platform workers to organize. These measures together will enable an inclusive and consensus-based tripartite approach to future OSH regulations where LIs work in tandem with the flow of technological innovation rather than against it.

Second, there are prospects for integrating requirements of OSH regulation into the algorithms of the digital platform. For example, aligning the limitation of working-time regulations or integration of mandatory safety management programs into the platform software for the drivers including vehicle-based driver fatigue assessing technology. Such interventions draw inspiration from the principle of prevention through design, albeit not the physical design of the technology, rather the digital design of technology.

Third, regulations facilitating data sharing between several platforms that offer competing platform-based services deserves consideration. For example, a driver could be working for two or more taxi platforms concurrently which might mean working 24/7. This constitutes a health

hazard for both the driver and the passengers. Data sharing between platforms will facilitate limiting the work-time for the platform workers which in turn will improve worker and consumer safety, product quality, and concurrently achieve regulatory compliance. Similar mechanisms may also be feasible for online-work that limits total work time in a week across several platforms. Data-sharing based regulation of online workplaces could potentially curtail the hazardous effects of long working hours, simultaneously ensuring a healthy platform worker that will yield superior customer service and quality product. LIs should explore data sharing agreements between regulatory agencies that deal with the environment, public health, road safety, food safety, social security, private insurance etc. For example, third-party food delivery platforms facilitate the delivery of food from a restaurant to a customer using freelance motor-cyclists (platform workers). Platforms involved in food delivery have at a minimum elements that concern food safety, traffic safety, and worker safety including workers' compensation if the driver is injured on the job. Therefore, a collaborative approach to data-sharing based regulation of PE could ensure a smart regulatory regime.

Fourth, a central regulatory challenge in the PE is the fact that the platform, and the platform worker are separated by space, and time. Thus, identifying the proprietor of the platforms remains a complex issue, and even more compelling is the difficulty of enforcing OSH regulations given the transnational nature of the working arrangements. Global franchises work in different countries, and OSH regulations of local countries apply to these establishments. Drivers, painters or food delivery services can be inspected at a physical workplace, and the remotely placed platform could be held accountable for OSH. Enforcing OSH regulations for online platform workers is problematic given the working environment could be a household, café, or private vehicle. Such standards could include self-regulatory regimes vis-à-vis risk assessments for ergonomic design, lighting, air quality and work-hours for online platform work. Regulators might contemplate mandatory training programs integrated in to the platforms for workers with the aim of conducting, and documenting risk-assessments at their respective workplaces. Initiatives such as these could foster development of industry guidelines on physical activity and work-life balance in order to address risks related



to sedentary work. In addition, tele-inspections based on real-time video feed is not a farfetched idea given its applications in fields like telemedicine. Platforms could be required to provide real-time video access their online-service workers and workspaces. Real-time video inspections could facilitate inspection of the workplace and consultation with online-platform workers to better secure their safety and health.

Initiatives such as data-sharing and video surveillance are bound to raise concerns on ethics and confidentiality. However, these measures are proposed to nurture common good, solidarity, accountability and trust between the stakeholders. Subsequently, the need for individual privacy and confidentiality will be balanced by the collective interests of the labour market ensuring fair competition and protecting the platform worker.

As a minimum, relevant state authorities might consider training low skilled workers to be tech-savvy and better prepared for platform-based work. This will foster inclusion and create more opportunities to acquire high demand platform-based jobs such as cleaning services. Failing to provide equal access to jobs in the PE to low skilled working populations that may lack tech-savviness will encourage the expansion of the undeclared economy perpetuating income, health, and occupational health disparities.

Finally, technological innovations such as PE have OSH implications beyond the realm of nation-states, and therefore demand both local and global solutions. Therefore, investing in digitalization of the local and national LIs is imperative such that they are equipped to embrace the challenges of the future. Big data, machine learning, artificial intelligence and video-based inspection technologies could be integral to guiding risk-based inspections and consultation operations. Critically, a global coalition constituting labour inspectorates and international agencies ought to consider synthesizing practical minimum international OSH standards for platform workers. Models for cross-border cooperation and enforcement are part of ongoing efforts in the European Union for tackling the challenges of undeclared work. These models may provide valuable insights for transnational enforcement of OSH regulations to protect the platform worker.

**Over the last 100 years, the International Labour Organization (ILO) has assisted nation states and regions to secure a safe, healthy and productive workforce. ILO will remain pivotal in laying the groundwork for global coalitions, international conventions and tools to ensure a safe and healthy “Future of Work” for all workers, including the platform worker.**



## THE IMPACT OF TECHNOLOGY ON WORK AND THE WORKFORCE

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**Disclaimer:** The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention.

The global economic and health impact of technology, such as automation, artificial intelligence (AI), and robotics on work and the workforce is increasingly being considered by commentators, but in widely divergent ways. One view is that technology will bring less work, make workers redundant or end work by replacing workers. The other major view is that technology will create abundant opportunities for workers and boost economies. Historically, as technology has changed the way work is done, the number of jobs created has outstripped the number of jobs eliminated.

There is concern that although history may be correct, the future may reverse history, and worker displacement and unemployment due to automation, AI, and robotics will be widespread (Ford 2015). However, future forecasting is difficult and complicated. If analysts in 1870 in the United States had been informed that agriculture sector employment would go from almost 50% of the workforce to less than 2% in 2018, they also would be hard-pressed to foretell a burgeoning health care sector, software, and services as major sources of employment (Autor 2018; Daly 1981; Segal 2018).

Still, with current evidence of technological displacement, there is a growing preponderance of analysis and commentary supporting the occurrence of technologically induced unemployment (Brynjolfsson and McAfee 2014; Frey and Osborne 2013). In many cases this displacement

is the result of increased productivity which is responsible for reduction in labor demand and wages in some sectors (Acemoglu and Restrepo 2018). International trade, such as trade with China, has been mentioned as a contributing cause of job displacement, but competition from China may explain only a fourth of the decline in manufacturing during the 2000s (Autor et al, 2015). The view that technology is a prime cause of job displacement is bolstered by the concern that some technologies such as AI have the ability to replace something previously exclusive to humans: intelligence (EOP 2016). Cognitive capacity, including machine learning and decision making, will rapidly scale across all sectors and be as pervasive as electricity (Ford 2015).

**The impact of technology on employment is real and pervasive and likely to relentlessly affect developed and developing countries.**

Estimates of impact vary. One high estimate is that globally approximately 400 million jobs will be displaced (MGI 2017). However, the historic lesson that the introduction of new technology ultimately creates new jobs should not be ignored; the dichotomous “jobs or no jobs” assessment is too simplistic and, in short, a “false dichotomy” (Acemoglu and Restrepo 2018).

Rather than thinking about entire occupations being eliminated (that is, technology as a substitute for human labor), there is value in addressing the issue in terms of specific tasks within occupations being automated (that is, technology as a complement to human labor). Tasks should be considered in terms of the range and the extent to which they can be automated. Technology then is conceptualized as replacing human labor in tasks used to perform it even in jobs with higher educated people (Acemoglu and Restrepo 2018).

Task-based analyses provide a more detailed level of information than occupational analyses do. Technology can eliminate jobs, but it does not eliminate work (Autor 2015); it aims at automating specific tasks rather than whole occupations (Autor 2015, Arntz et al. 2016). Consequently, certain tasks rather than occupations may be displaced. However, there are various countervailing effects of technology that boost employment, in terms of increased capital accumulation, and the creation of new tasks in which labor has a comparative advantage relative to machines (Acemoglu and Restrepo 2018; Besson 2017).

Another way that the impact of technology on work is misconstrued is the impression that all workers in a specific occupation or sector will suffer unemployment in the same way and at the same time. This projection uses a low-power focus to view a time-dependent complex process. Some work will be highly resistant to the technological induced changes in jobs or tasks. Non-routine physical and cognitive work fits in this category. The issue of comparative advantage of labor for various tasks also plays out when the cost of producing a subset of tasks is reduced; automation generally increases the demand for labor in non-automated tasks (Acemoglu and Restrepo 2018).

Nonetheless, there is the strong possibility of a mismatch between technology and skills (capabilities)—between the requirements of new technologies and tasks and the skills of the available workforce. Already in many countries there is evidence that such a mismatch has resulted in millions of jobs going unfilled because there are not enough skilled workers. However, the issue of a “skills gap” is controversial and still requires analysis to clarify exactly what the true state of skills of the labor force and job opportunities will be (Cappelli 2015). A strong, proactive worker training and re-training effort is immediately necessary to address the issue, as are considerations of policy issues attendant to nonstandard present and future work arrangements (ILO, 2019; Karacay 2018). Work, now and even more in the future, will be a mosaic of standard and nonstandard work arrangements (Howard 2017). The social protection of workers with inadequate skills or inadequate nonstandard work arrangements and the maintenance of ‘decent work’ will be important and difficult problems to address.

**The impact of technology on work and workers is multifaceted and complex. Technology is not homogenous and at least should be thought of in terms of enabling and replacement technologies: the former complementing the productivity of workers and the latter taking away the need for workers**

(Acemoglu and Restrepo 2017). In addition to technology’s impact, workers and the workforce also will be affected by the policies and governance of societies regarding the needs of impacted workers. Clearly, inequalities and wage polarization will arise and need societal response (ILO 2019).

The impact of technology on work and workers also should be considered as a process that occurs over time. Hence, it appears important to understand the extent of the process according to specific times. The speed at which technology is modifying work is believed to be increasing, although it will not happen everywhere all at the same time. There will be differential transitions by country, region, sector, occupation, task, and type of technology. While yielding positive benefits to some parts of the workforce each transition process is likely to create negative physical and psychosocial impacts in the workforce due to the precariousness of work and the perception of a potential lack of opportunity for workers to evolve with a job or be positioned for a new one (Leso et al. 2018; Stacey et al. 2018).

**Currently, the anxieties resulting from the skills gap and anticipation of a future lack of opportunity may be contributing to a public health crisis in some countries.**

In recent years, some regions and subpopulations in the United States have experienced an alarming increase in suicide rates; abuse of opioids, other drugs, and alcohol; and poorer physical and mental health. These can be traced in part to unemployment, underemployment, and the compromised quality of working lives (Case and Deaton 2017; McGee et al. 2015, Hollingsworth et al. 2017). The lack of skills and opportunities and an increase in hopelessness and despair may play a role in the drastic increase in mortality arising among middle-aged white Americans (Case and Deaton 2017), increased depression among young adults (McGee et al. 2015), and increased likelihood of unemployment and

health problems among African Americans (McGee et al. 2015). The absence of employment in good paying jobs contributes to these “deaths of despair” (Case and Deaton 2017; Sirviö et al. 2012, László et al. 2010, Hollingsworth et al. 2017). Future work also could be a source of adverse health effects due to work intensification, altered organization of work, impaired coping, sedentary postures, impaired work-life balance, physical trauma, and psychosocial stress (Leso et al. 2018; Murashov et al. 2016).

**The future of work and the workforce will need to be seen against the backdrop of technological change and working life, not just at the level of a single job or task.**

Technological change will continue to impact all work and nonwork periods over the working life. Hence, the occupational safety and health (OSH) field should extend its focus and needs to be longitudinal over time and working life (Schulte et al. 2017). OSH and other public policies should address not only hazards in a single job but also hazards along the whole working-life continuum. This means addressing the precarious nature of work and attendant stresses and anxieties, as well as the times between jobs,

where unemployment and underemployment can cause significant health problems. It also means immediately focusing on the lack of appropriate skills of present and future workers. These conditions are “occupational health hazards” as well (Schulte et al 2017).

**Clearly, a broader focus of OSH requires the consideration and application of new skill sets in the field. These include more emphasis on psychosocial factors, human capital, organizational dynamics, education and life-long learning theory, human development, and economic disciplines.**

Ultimately, not only will a new focus be necessary for OSH practice but also technology may drastically transform the OSH profession in terms of the role of human experts (Susskind and Susskind 2015). Still, there is the need for proactive risk assessment and management of new technologies (Murashov et al. 2016) and the promotion of worker participation in design of technological and organizational innovation (Oeij et al 2017). Protecting the workforce of today and the future, as new technologies are applied, requires taking a holistic view of the hazards they experience and the range of adverse effects that may result.

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## CONNECTING THE DOTS: OCCUPATIONAL SAFETY AND HEALTH AND BUSINESS PERFORMANCE

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### Value Creation: People, their Health and Safety at Work and Sustainable Business Performance

Today, forward thinking companies and their stakeholders recognize people create value when they are safe, healthy and fulfilled at work. Worldwide, the maturity curve in this thinking is still in its infancy. Many organizations have yet to connect the dots between the value of their workers' safety, health and well-being (OSH) and the associated risks and opportunities to their sustainable business performance.

#### People:

- Workers & their representatives
- An Organization's Human Capital.

This is beginning to change. Stakeholder expectations on transparency in identifying, measuring (i.e. OSH metrics), valuing and publicly reporting (disclosing) non-financial impacts of corporate activity is evolving and proving to be one of the greatest levers for change. According to [the KPMG Survey of Corporate Responsibility Reporting 2017](#), OSH performance is considered a non-financial impact (risk) to a business. OSH performance is becoming part of the change in non-financial impact (risk) measurement, valuation and public reporting on human capital. Human capital is the investment community's language for people who work in an organization or business. People in this context are workers and include their representatives. Organizations include companies and other entities where workers work such as in value chains (supply chain and contractor's workers). Workers are employees, contingent, part time, agency and migrant workers, interns and visitors and their work or work activities may or may not be under the control or shared control of the organization. Workers

and their safety and health at work contribute to an organization's ability to attract and retain workers. In this example, OHS performance creates value and can have a direct impact on an organization's sustainable business performance. See Fig 1. below.

#### Organizations:

- Business, Company
- Other entities where workers work.



**Fig 1. Optimal Business Environment for All**

### Stakeholders: The Influencers

The dots are also beginning to connect with OSH stakeholders on a global level. These OSH stakeholders specifically include corporate boards, C-suites, investors, safety and health professionals, governments, regulators, NGOs, communities and people working in organizations and their value chains. Key global influencers include the [International Labor Organization \(ILO\)](#), the [United Nations](#), [Global Reporting Initiative \(GRI\)](#), [International Integrated Reporting Council \(IIRC\)](#), [Sustainability Accounting Standards Board \(SASB\)](#), [Center for Safety and Health Sustaina-](#)

bility (CSHS), [Social and Human Capital Coalition](#) (SHCC) and the [World Business Council on Sustainable Development](#) (WBCSD). These stakeholders are aligning through partnerships, alliances and collaboration on the shared understanding that safe and healthy people working in organizations of any size is an indicator of sustainable business performance.

**Value Chain Workers include:**

- Supply chain workers
- Contractors' workers

The fact is, business needs engaged workers to thrive and workers need businesses that are thriving for good job opportunities. In some regions of the world there is a shortage of workers which is proving to be difficult for companies to manufacture products and deliver on service. This interdependency underpins a shift in thinking on the correlation between OSH and sustainable business performance. Business performance is interconnected with workers, their value and contribution. In the sustainability and human capital space, stakeholder expectation on value creation and good decision making is directly impacted by an organizations recognition that workers' safety and health risk (impact) are material to their business. This thinking is continuing to evolve in the investment community.

**Material Risks:**

- are significant internal and external economic, environmental and social impacts;
- substantively influence the assessments and decisions of stakeholders

source: GRI 101 Foundation 2016

## Performance Measurement & Reporting (Disclosure)

How does a company measure how well they are managing OSH performance? Globally, there has been a lack of proactive, consistent, comparable, measurable, relevant and reportable OSH metrics/disclosures that demonstrate a business' value and insufficient information regarding how they manage risks to their workers (human capital.) Data matters. The new GRI 403 OHS (OSH)

standard will influence this significantly. One of the key OSH metrics advocated by the CSHS and GRI is implementation of a sustainable, risk based Occupational Health and Safety management system (OH&S MS.) It is a key leading performance indicator, proactively incorporating repeatable and reliable processes and standard operating procedures into business operations to effectively measure how well a company is reducing potential worker injuries and Ill health, most importantly serious injuries, disease and fatalities.

## Sustainable Business Performance: The Value of Workers

According to [the Center for Safety & Health Sustainability](#), "More companies are gathering OSH metrics, but few are reporting publicly on their findings. Even fewer companies are measuring and reporting on OSH performance in the supply chain (including their contractors). A shift in mindset needs to take place among both OSH professionals and occupants of corporate boardrooms. Both groups need to fully appreciate human capital as much as they do investment capital."

Business performance is connected to workers. The key drivers for the uptake in OSH measurement and public reporting (disclosure) are the investment community and customers. The [Human Capital Management Coalition](#) (HCMC) represents over 25 institutional investors with US\$ 2.8 trillion assets under management and is focused on disclosure of human capital impacts (risks and opportunities) in annual Corporate financial reports. Their focus is on the adoption of standards by the US Securities and Exchange Commission (SEC) requiring listed companies to disclose information on human capital management policies, practices, and performance. This includes public reporting of OSH performance. While US based, the HCMC invests globally, and is looking for investment opportunities in companies who value their people. While Human Capital encompasses a myriad of issues for workers, OSH is one of the issues beginning to be considered by investors in their investment decision making.

## The Influencers of Change

Investors and customers are proving to be the greatest influencers increasing the velocity of change in measurement and public reporting of non-financial impacts/risks. Financial incentives afforded by investors and customers are at the forefront of this change. Private companies can be influenced by customers who are publicly traded. Publicly traded multinational organizations and their value chain in Europe, North America and parts of Asia are the early adopters to public reporting on human capital and sustainability performance.

### 1. Environmental, Social and Governance (ESG) Investing

In addition to the HCMC, individual institutional investors and other ESG focused asset owners and managers, such as [Blackrock](#), [BNP Paribas](#) and the 1,800+ [UN Principles of Responsible Investment signatories](#), are growing in number and looking to make good investment decisions. Companies who are transparent, measure and publicly report their ESG impacts/risks tend to be better investments. Human capital investors want to understand and assess how well the companies they own are managing their people. This trend is beginning to accelerate, turning non-financial and integrated financial public reporting into a corporate imperative.

As the interest in ESG issues, specifically human capital, among investors continues to grow, OSH stakeholders are also asking for more transparency through public reporting (disclosure). The dots are beginning to connect in this space.

### 2. GRI, ILO and CSHS Collaboration

According to the latest [KPMG survey](#), 75% of the G250 and 63% of the N100 companies surveyed use the GRI framework for public reporting on a company's ESG impacts. The GRI has recently launched an updated version of their [GRI 403: Occupational Health and Safety reporting standard](#). This standard was developed by the GRI Project Working Group, a collaboration of OSH stakeholders including the GRI's Global Sustainability Standards Board (GSSB), ILO, CSHS, corporate reporters, rating agencies, investors and government. This standard setting process provides a rigorous methodology for measuring and publicly reporting OSH performance based on consistent,

comparable, measurable and relevant leading and lagging indicators of performance (metrics/disclosures/impacts). The GRI 403 standard places emphasis on reporting proactive measures for risk reduction such as identifying impacts (work) with high consequence injury and ill health potential (includes fatalities) rather than just reporting on incidents that have already occurred. Use of the [ILO Occupational Safety and Health Management Standard- 2001](#) as a recognized national or international OH&S management system measure is referenced as a metric (disclosure) in the GRI 403 standard.

The GRI OHS (OSH) standard requires disclosure of material impacts (risks and opportunities), identifying hazards and risks, promoting healthy and safe working conditions, and developing processes and programs that reduce risk to workers, including workers in a reporter's value chain.

Influencers on the Corporate side include the [World Business Council on Sustainable Development \(WBCSD\)](#) and [Social and Human Capital Coalition \(SHCC\)](#). WBCSD is a CEO lead organization representing [200 companies](#) with \$8.5 Trillion in combined revenues and a collective 19M employees around the world. Their mission is to "accelerate the transition to a sustainable world by making more sustainable businesses more successful." They are helping companies connect the dots between social, human capital and business performance, including alignment with the [UN Sustainable Development Goals \(SDGs\)](#). In April 2018, the WBCSD launched the [Social and Human Capital Coalition \(SHCC\)](#) with a separate board of directors to focus on the belief that "Companies that truly value people and relationships will be more successful." The SHCC envisions harmonized, credible and comparable techniques for social and human capital measurement and valuation being consistently incorporated into corporate, investor and government decision making.

In February 2019, the SHCC launched the [SHCC Protocol](#) to advance current social and human capital measurement and reporting practices. It supports the financial community and capital markets in recognizing and rewarding social and human value creation in the companies in which they invest. The work of the SHCC is evolving, they are an influencer to watch.

### 3. The [UN SDGs](#), [UN Principles of Responsible Investment \(PRI\)](#), [UN Global Compact](#) and ILO

Another dot that is connecting globally is OSH alignment with the [UN SDGs](#). According to a recent KPMG survey of the G250 and N100\* companies, “within two years of the SDGs being launched in 2015, four in ten (40%) top companies acknowledged the UN SDGs in their corporate reporting. Of these, 84% identified the SDGs they consider most relevant to their business.” The SDGs most commonly prioritized by leading companies include SDG 13 Climate Action, SDG 8 Decent Work & Economic Growth and SDG 3 Good Health & Wellbeing. OSH performance lies within SDGs 8, 5 and 3. SDG 8 measures how an organization promotes sustained, inclusive economic growth, full and productive employment and decent work for all. It includes SDG 8.8 on how an organization will “Protect labor rights and promote safe and secure working environments of all workers, including migrant workers, particularly women migrants, and those in precarious employment”. This is the focus of the [ILO’s Decent Work Agenda](#).

From an OSH perspective, SDG 5 focuses on women and girls, their social protections for domestic workers, a workplace free of violence and harassment (includes sexual harassment) and effective engagement and involvement in leadership roles within the organizations in which they work. SDG 3 is to “ensure healthy lives and promote well-being for all at all ages.” Business, Investors, governments, standard setters and customers are beginning to recognize the relevance of the UN SDGs on sustainable business performance and the importance of disclosing (reporting) how an organization is meeting those goals.

The PRI and UN Global Compact are also lending weight, influencing the investment and corporate communities to think differently about longer-term responsible investments. PRI encourages investors to use responsible investment to enhance returns and better manage risks using six principles, “developed by investors for investors” to incorporate ESG issues into investment practice. PRI has attracted signatories representing many of the world’s professionally managed investments and is working with these signatories to align responsible investing to the broader sustainable objectives of society, defined in the UN SDGs.

The UN Global Compact includes over [12,000 + signatories](#) in 160 countries and is calling on companies and their CEOs to align strategies, operations and long-term success with the importance of their workers, communities and the planet. At the heart of the UN Global compact is actions to support companies achieving the UN SDGs by 2030.

## **The Value of Workers, a Business’ Human Capital**

Today, Top management does not always see the value of OSH in the overall performance of the business and its competitive advantage. This is part of the mindset change that needs to occur. According to a [CSHS report on the new sustainability](#), “effectively managing human capital results in an organization’s ability to recruit and retain employees.” The report goes on to say, “reputation is a key factor in attracting and recruiting talent and can have a significant financial impact. Reputation affects the strength and efficacy of supply chain relationships, too. Companies that recognize and report on metrics related to human capital create opportunities for recruitment and retention of high performing workers, engagement, innovation, improvement and performance in their business. New markets, products/services and disruptive thinking come from the people who know they are invaluable to an organization.” Additionally, the CSHS report says, there is “a spread of more than 5% in operating margin between companies with low versus high employee engagement.” Engagement by workers (includes employees), positively impacts a business’ ability to innovate, stay relevant, reduce risk, create efficiencies and improve sustainable business performance. Employee engagement impacts the ability of an organization to reduce OSH risk through feedback and participation in the assessment, measurement and management of OSH risk to the business. The benefits of measurement and public reporting that include OSH are evident. Whether one’s frame of reference is workers and their representatives or human capital, business, OSH professionals, supply chains, investors or an NGO, they all can align on the value of safe and healthy people working within a business and its value chain.



## CALL TO ACTION

The dots are connecting on OSH performance, the value of Human Capital and public reporting. However, a shift in mindset needs to occur among occupants of corporate boardrooms, C-Suites and with OSH professionals. Corporate boards, C-Suites and investors, in general, need to appreciate human capital as much as they do investment capital. OSH professionals need to see themselves as leaders and active partners in the human capital and sustainability arena as it relates to their job and ability to lead their organizations through this shift. Although OSH measurement and public reporting are at the beginning of this public reporting maturity curve, there are indications they are beginning to trend as environmental measurement and public reporting has evolved.

The most successful organizations are ahead of the curve. They recognize the impact a skilled, engaged and productive workforce can have on its operations, and ultimately, its perceived value and business performance. When organizations proactively identify hazards then assess, control and prioritize risks to people working in their organization through repeatable and reliable processes, procedures and a risk-based systems approach, OSH performance is positively impacted, reducing the potential for injuries and ill health, especially serious injuries and fatalities.

OSH professionals have a role to play in educating their leaders and other stakeholders and identifying and managing risks and opportunities. Many are just beginning to understand the power of sustainability to align their organization on the importance of reducing OSH risks and integration of an OH&S MS. Through performance measurement and public reporting, it's becoming clearer that workers aren't problems to be managed but are essential and create value for a sustainable business. Workers create opportunities for innovation, operational excellence, quality products and customer service excellence, delivering on an organization's promise. This is good for business and good for workers.

What is your OSH stakeholder group? What are your next steps to connect the dots between sustainable business and OSH performance? How will you influence the Human Capital and OSH agenda?





## WORK AND NANOTECHNOLOGY

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This paper will address two topics. It will start with a question ‘where do we stand now’, and ends with a reflection ‘what can we expect for the near future’.

## Where do we stand now?

It is estimated that a few tenths of million workers are already, or will be exposed in years to come to nanomaterials in their workplaces, mainly in research and in industry. The nanotechnology field has been increasing for the last decade, with huge amounts of money invested. This growth of activity has been followed by development in the field of nanotechnology safety, or as it is commonly named, the nanosafety field.

Despite the recent development of nanotechnology, it is being widely estimated that its impact will be somehow similar to what happened with the discovery and use of electricity at the end of the 19th century. This huge impact is related to the nature of this technology, as nanotechnology is a sort of link between the physical, digital and biological systems. The use of nanoscale allows these systems to communicate mutually, for example, establishing connections between cells, metal, ceramics, etc. Nanotechnology will allow, for instance, the development of nano-devices that will be able to act inside our body and search for, and eliminate undesired elements, such as virus, bacteria or cancer cells, but also to print 3D body tissues and organs, to develop ultra-resistant materials with augmented properties, to develop body-embedded sensors able to identify any body change, or create new materials able to store, transport and provide energy. The possibilities are huge and right now we still can't figure out most of the possibilities of this technology. Being so disruptive, it is expected that this technology will lead to a

change of the way we produce, consume, communicate and live. Nanotechnology will certainly have a major impact. Some authors are discussing how these developments will burden our current society.

**However, much of the advances of this technology can be overshadowed by the potential human health effects resulting from emission, and consequently exposure to nanomaterials.**

Even if the uncertainty is still a major issue in the current domain of nanotoxicology, it is also widely accepted that physical and chemical properties of nanomaterials, such as its size, shape, surface areas, and agglomeration are very different from the properties of the same materials at a macro scale. Those characteristics of nanomaterials can lead to a different interaction with human cells, resulting in inflammatory processes and, ultimately, in cell death. Most of the authors believe that those effects are mediated by oxidative stress. Other materials properties are also important, such as the solubility, which has an important influence in the persistence and durability of nanomaterials in living organisms and environment. Being so widely developed and applied, nanomaterials will be an important element of the future workplaces, both at an industry level and also at an user level.

Accordingly, it seems clear that one of the main future challenges for researchers, and occupational safety and health practitioners will be the reduction of the before mentioned uncertainty within the nanotoxicology domain. Some major advances have been achieved. New and emerging approaches including high-throughput screening and omics-based systems toxicology tools are being adopted in nanotoxicology. Unfortunately results of nanotoxicology research are not yet

fully reflected in health and safety practices in workplaces. The communication channels between nanotoxicologists and safety practitioners (to exposed workers in rigor) still need improvement.

Nowadays, there is a wide consensus in the scientific and business communities concerning risk management and exposure assessment strategies. Concerning exposure assessment, the Tiered Approach was first proposed by a group of German institutions aiming to harmonize the occupational hygiene approach to nano-objects exposure in workplaces. More recently, and also considering other proposed strategies to assess nano-objects exposure, the Environmental Directorate from Organisation for Economic Co-operation and Development (OECD) adopted a similar approach. The model proposed is based on the increasing complexity from tier 1 to tier 3. In tier 1 – Information Gathering, the use of Control Banding risk assessment tools is considered, whilst in tier 2 – Basic Exposure Assessment, portable equipment, such as Condensation Particle Counter (CPC) is used to assess the workers' exposure and tier 3 – Expert Exposure Assessment, complies the use of state-of-art measurement equipment, including collection of nano-objects in filters followed by electronic microscopy and/or chemical analysis.

Risk management in nanotechnologies could be supported by control banding tools, developed during the last decade for specific use with nanomaterials. Control Banding is a general term referring to a qualitative risk assessment that stratifies nanomaterials hazards at a given workplace across two sets of levels or bands, the hazards bands and exposure potentials. Although these qualitative methods have limitations concerning risk assessment, they give helpful support to risk management. For risk control a recommended order of priority is: 1/substitution or elimination; 2/isolation; 3/engineering controls; 4/administrative controls; and 5/personal protective equipment (PPE). Several national and international bodies wrote recommendations regarding occupational risk management in nanomaterials laboratories and industrial settings. Although these recommendations are relevant, there are many uncertainties concerning the effectiveness of recommended measures controlling the risks, in particular, considering the wide range of existing nanomaterials.

## What can we expect for the near future?

Special focus should be pointed to safety assessment during research and development (R & D) phases. Several authors have called for attention to safe-by-design approaches introducing risk management in the products and processes design phase. "Safety-by-design" to reduce emission, "Safe innovation", and "Responsible development" should be concepts, if not mandatory, for nanotechnologies market self-regulation. Corporate social responsibility is essential as a driving force for risk prevention, as well as regulation, including both soft and hard law. Researchers and manufacturers need to integrate safety in R & D processes, and demonstrate the harmless character of the materials, products, and production process.

In a frequently cited article, published in 2006, a model for the evolution of nanotechnology is presented, including different generations of nanomaterials with an increasing complexity. At present, we are dealing with a first generation of passive nanostructures and to some extent with second generation nanotechnologies which include active nanostructures. Some authors divide the nanotechnologies progression in 3 ways: incremental, evolutionary and radical. Incremental nanotechnology corresponds to improvements of present day use of nanomaterials; evolutionary nanotechnology corresponds to a higher level of complexity in systems, including areas such as drug delivery systems, medical imaging, and energy conversion; and radical nanotechnology deals with even more complex systems or systems of systems, including nano robots, self-replication, or molecular manufacturing. But complexity leads to more uncertainties. Despite a current appropriate OSH approach on nanomaterials, there will be always new conditions imposing new challenges. Existing risk assessment management strategies, based on the existing knowledge, are able to deal with the most common nanomaterials like titanium dioxide, fumed silica or carbon nanotubes. These strategies are inadequate when workers are exposed to more complex nanomaterials. The main challenge in nanotechnologies is to harmonize the great technological advances with risk mitigation.

It is important to identify and validate the most appropriate risk management approaches for nanotechnologies. At the same time, occupational exposure limits must be established, at least for the more common nanomaterials in use nowadays, including carbon nanotubes, titanium dioxide, amorphous silica and silver, along with definition of the standard sampling and analysis methods. It is highly speculative but artificial intelligence could bring unpredictable developments to exposure and risk assessment methods. The improvements could appear in nanotoxicology, exposure assessment equipment, and also in risk management tools.

**Regulators should work with researchers in order to deliver legislation and regulations for nanotechnologies that could reflect the most reliable approaches to workplace safety.**

One general framework widely open to integrate new knowledge is advantageous, comparing with “hard” and strict rules that need more time for approval and get outdated fast. Risk assessment and management approaches will have to deal increasingly with uncertainty. Integrative and multidisciplinary approaches to risk assessment and management is necessary and this is obvious when looking at the development boom of materials with increasing complexity.



## INNOVATIVE, CREATIVE AND ADAPTABLE – HOW TO KEEP PACE WITH THE DIGITAL TRANSFORMATION

**Rebekah Smith**

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The digital transformation of the economy is changing the way we live, work and do business. Companies are at the forefront of this evolution, providing the technology that facilitates this transformation. But the wider business community can also face challenges in integrating technology in a cost-effective way which improves productivity along with workers' well-being. Unfortunately, however, debates tend to focus on the challenges for workers.

Society, the economy and the world of work have much to gain with this transformation and there is a broad consensus on the opportunities for improvement of occupational safety and health (OSH). We are seeing only the tip of the iceberg in terms of what is and will be possible.

**To reap the maximum benefits, this transformation must evolve in a human-centric and inclusive way.**

The question is whether our attitudes and approach to the future world of work will allow us to be innovative, creative and adaptable, or whether our albeit legitimate but often unfounded fears will get the better of us. The question is also whether policy responses to the changes will be flexible enough to leave space for tailored solutions by social partners as well as individual companies and workers.

### Digital transformation – benefits for all?

The number of workplace accidents in Europe has been consistently decreasing over the last 2 decades. The further development and successful integration at the workplace of automation, robotisation, artificial intelligence etc, has an enormous potential to cut this even further, with workers no longer doing the most dangerous or physically intense tasks. Take for example the

use of robots in the removal of asbestos and the potential this has for lowering workers' exposure.

But the potential of the digital transformation for OSH should not be reduced to physical work tasks – this is only part of the picture.

Where at least as many potential benefits are to be gained is through the successful integration of new digital technologies towards increased worker well-being, engagement and personal fulfilment. With workers doing less dull, repetitive or monotonous tasks, their time can be allocated to more complex and creative tasks. And the focus can be on those where a human aspect is essential, such as critical decision-making, emotional intelligence and value judgement. This is where the more traditional world of OSH - technical, scientific, and risk-based - meets the broader world of work organisation. However, this transformation has to take place in an inclusive way, to avoid creating divisions in the world of work and in society between those with the necessary talents and skills and those left behind. This makes skills forecasting and updating absolutely essential.

The use of digital tools and devices can also have benefits for workers' wellbeing, in terms of giving more autonomy, control and allowing for better work-life balance. Of course, there are two sides to this story. Justifiable questions arise about control, pressure, work intensity, the blurring of the boundaries between work and private life and the impact that this can have on workers' health. However, solutions will not be found by setting strict one-size-fits-all rules or procedures, which rigidly prescribe to companies and workers how they should deal with these challenges. The solutions lie in equipping workers and employers to manage the changes in a way which fits their situation.

## **Worker well-being – automatic productivity gains?**

The potential employer gains with the digital transformation of increased efficiency, productivity and competitiveness are certainly not negligible. Furthermore, there is clear evidence that as long as the costs are not disproportionate, OSH improvements also contribute to the profitability and competitiveness of companies. Therefore, based on the assumption that integration of digital technology can improve workers' occupational safety and health, this can have an added value for companies.

At the same time, new technology, even if available on the market, is unlikely to be adopted immediately by companies, due to the time it can take to recuperate the necessary investment costs. Whether and when new technology is adopted also depends on the general strategy of the company, including its desire and foresight to integrate new technologies, whether it does so straight away throughout company operations or step by step. It also depends on its ability to do so in terms of coping with the disruption of existing processes and depending on the level of acceptance by the workforce.

Whilst there is merit in the belief that improving workers' wellbeing, personal fulfillment and motivation will have a positive impact on their productivity, and conversely that stressed, overburdened and unfulfilled workers are not likely to be as productive, this is certainly not a given. It depends on many other factors, including whether the worker has the right skills, whether they work well in a team, whether they take initiative, whether they are adaptable and flexible and whether they are motivated to contribute to the company's success. Therefore, it is crucial to make sure that the integration of digital technology and use of digital tools helps to increase companies' overall productivity, competitiveness, and employment. This also means that while employers have a responsibility in supporting and informing workers in all aspects related to OSH, workers also need to be adaptable to these changes to remain employable in a rapidly changing world of work.

## **Robots - the new workforce?**

It would be difficult to speak about the digital transformation without touching on the debate about job destruction. Bearing in mind that one of the biggest threats to people's health, particularly mental health and well-being, is sustained unemployment, this is important from an OSH point of view. It is vital that those workers who are replaced by robots or other types of technology are able to find work again, not only for the individuals concerned but also for the economy and society at large.

However, the reality regarding replacement of humans with robots is much more nuanced than we are sometimes led to believe. The extent of the replacement effect depends on the scope for automation, i.e. whether machines can technically replace labour. The range of estimations of the share of jobs susceptible to automation (anything from 4% to 40%), highlights the difficulties and dangers of making predictions in this field, especially if they become the basis for policy. It is in fact very unlikely that entire occupations or jobs will be automated, because this is difficult for some specific tasks. Therefore, we should rather speak about replacement and adaptation of specific tasks rather than of jobs. The replacement effect is also very sector-specific. Automation and robotization at the workplace often conjure up images of a modern factory settings, but what about the opportunities for improving productivity and OSH in the services sector, administration, transport?

In any case, probably the largest potential lies in the partnership between humans and machines. So far, robots and other technologies have been used to work in parallel with people, with the aim of improving efficiency in processes. Now we need to support and accompany the development of human-machine interaction. This, however, raises questions on how to manage the OSH risks related to the physical interactions between humans and machines, but also the psychosocial interactions, including the acceptance of humans to co-work with machines.



## What should be our guiding principles to accompany the transition?

**The world of work is changing as we speak. We are not able to predict exactly what type of technology will exist in the future, how it will be integrated into the world of work and what impacts – positive or negative – this will have on OSH.**

Therefore, a modern policy framework is necessary, which is flexible enough to leave room for tailor-made solutions by social partners, and by individual companies and workers. Putting people at the centre of the digital transformation and enhancing productivity and competitiveness of companies must be at the heart of our actions.

Whilst the speed at which technology develops and the possibilities it gives us as employers and workers are impressive, not everyone is well prepared.

**If the digital transformation is to have a positive impact on OSH in an inclusive way, depending on their situation, employers and workers may need support in assessing the implications of the changes for OSH and in devising strategies to adapt to them.**

To maximise the potential of use of digital tools, automation, robotisation and other technologies for improving OSH, we need to be open to innovation, including in the way we work, to new ideas, to be creative, and to have a positive approach to change. Above all this requires a climate of trust and respect between workers and employers, which is the necessary foundation for a thriving social partnership.

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## CHANGING WORK AND WORKERS' HEALTH IN THE 21<sup>ST</sup> CENTURY – A VIEW FROM KUWAIT

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Kuwait, as well as the other Gulf Cooperation Countries (GCC), is challenged by the quick changes in the world of work and in the general conditions of life. The GCC region is one of the richest in the world, due to the significant oil and gas reserves. The economic growth until the last years has been spectacular, and has led to significant changes in everyday lifestyles. Consequently, there has been an epidemiologic transition from mostly communicable diseases to mostly non-communicable diseases as a cause of death. All the GCC countries are dependent on migrant labor to bolster economic growth. The non-nationals are largely outnumbering the national citizens. Migrant workers may engage in jobs that can be hazardous to health. This can lead to workplace fatalities and injuries. The construction workers in Qatar have received intense media attention due to inappropriate working circumstances and conditions. These reports led to involvement of ILO and to the development of a three-year “technical cooperation programme” in order to improve the situation. In the 21st century, all workers need work contracts, which secure work conditions and appropriate treatment, irrespective of worker’s country of origin, nationality and ethnic background.

**Maximizing health and safety for everyone requires contributions from various sectors of society.**

Health and safety at work deserves immediate action, since protection and prevention at the worksite is achievable and doable in practice with currently available tools.

**Keywords:** occupational safety and health, migrant labor, health inequities

### Changes in the world of work

In 2019, the ILO celebrates its first 100 years of existence. All of the Gulf Cooperation Countries (GCC) are members of the International Labor Organization (ILO), even though Bahrain, Qatar and Saudi Arabia are observer States. The other GCC countries include Kuwait, Oman and the United Arab Emirates (UAE). The GCC region is one of the richest in the world, due to the significant oil and gas reserves. The economic growth in the region has been spectacular since 1980s. It has led to significant changes in everyday life. Diets and levels of physical activity have radically altered. Reduction in physical activity due to the availability of cars, mechanic appliances, cheap (migrant) labor, and computers have all contributed to the rapid changes in lifestyles.

The changed nutrition, including increased consumption of meat together with refined sugar intake, have led to increased occurrence of chronic non-communicable diseases (NCDs) such as diabetes, cancer and heart diseases. In Kuwait some 73% of all deaths are attributable to NCDs. The non-nationals living in Kuwait have a longer lifespan than the nationals. They are also less overweight, and physically more active. Of the NCDs, those which need particular attention are obesity, diabetes, circulatory system diseases and certain cancers (e.g., breast cancer and colorectal cancer).

### Migrant workers in the GCC countries

All of the GCC countries are dependent on migrant labor to bolster and stimulate economic growth and development, as the GCC countries possess an abundance of capital while the domestic labor capacity is low. Although migrant workers in the GCC region amount to no more

than 10% of all migrants worldwide, they constitute a significant part of the population of their host countries.

The GCC countries are situated among the top twenty countries worldwide where non-nationals outnumber national citizens. Both Saudi Arabia and the UAE are among the top ten countries accommodating the largest migrant populations in the world. Especially in the construction sector, over 90% of the workers are migrant workers. Over the last 10 years, the number of migrants residing in the GCC countries has increased considerably.

None of the six GCC countries have signed the most important conventions on the protection of the rights of migrant workers, namely the Migration for Employment Convention, 1949 (No. 097), the Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143), and the 1990 International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families.

Migrant laborers are vulnerable members of society. They are often engaged in what are known as 3-D jobs: dirty, dangerous and demanding (sometimes considered degrading and demeaning). These workers are often hidden from or invisible to the public eye and from public policy.

The non-national construction workers in Qatar, building infrastructure for the new city which will host 2022 World Cup matches, have received international attention due to the presumably high rates of safety violations at work. Qatar's kafala sponsorship system, which is used to recruit the majority of its workforce, has prompted international outcry because it limits workers from changing jobs or leaving the country without a permit. According to the ILO, the Qatari government has since made substantial progress on its three-year technical cooperation programme to ensure "compliance with ratified international labor conventions as well as achieving basic principles and rights related to work in Qatar".

Improvements are great in many fields of the world of work; however, work itself is under constant change and therefore, occupational health and safety issues are changing as well. As seen from the GCC countries point of view, many of

the old problems remain, at the same time when new winds are blowing from the "Future of Work" window.

## Situation in Kuwait

Similarly to other oil-rich Arab countries, Kuwait continues to rely heavily on foreign workforce. Of its current 4.5 million population, 1.35 million are Kuwaitis, the rest being non-Kuwaitis from the neighboring or even more remote, often poor, countries, such as India, Egypt, Bangladesh, Philippines and so on.

Most migrant workers in Kuwait are of Asian origin and the largest group consists of Indian nationals. Approximately 80% of the foreign residents are active laborers, and made up some 83% of the workforce. In the private sector, non-Kuwaitis constitute over 90% of the workforce. Foreign nationals from Arab countries tend to hold higher positions with more responsibility, such as manager positions. Asian migrant workers generally work in crafts and service sectors. Despite the commonness of foreign nationals to travel to Kuwait to work, the conditions of the migrant workers have been of concern for the ILO.

## Sponsorship system

An important concept which regulates migrant labor in the GCC countries is the kafala sponsorship system which provides the legal basis for both residency and employment of migrant workers in the GCC countries. It relies on a citizen or organization, the *kafeel* (sponsor) within one of the GCC countries employing migrant workers, which is the only manner in which the migrant worker can receive an entry visa, residence permit and work permit. Furthermore, under the kafala system, the sponsor takes on both legal and economic responsibility for the migrant worker. This system binds the migrant worker to the employer, as the migrant is allowed only to work for the *kafeel* and only for the duration of the contract.

Thus, the Kuwait foreign worker sponsorship system mandates that expatriates must be sponsored by a local employer to get a work permit. This system is being changed to a system to allow expatriate workers to transfer their residence permits to the Ministry of Social Affairs

and Labor. In this system, it is the government which is the only sponsor.

## Migrant laborers from Asian countries

Many of the migrant workers in Kuwait are low-paid manual workers. Cleaners and menial labor come mainly from India, Bangladesh and other Asian countries. Thousands of them work in the streets of Kuwait. Most take extra jobs on the side to supplement their income.

The newspaper Kuwait Times (retrieved 2018-12-07) interviewed Mr Ameen, a worker from Faridpur, suburb of Dhaka. He works as a street sweeper and shrub and tree cutter in Kuwait.

*In summer, Mr Ameen wakes up at 3 am and starts his job in Shuwaikh from 4 am, and is back in his accommodation by noon. Mr Ameen and his Bangladeshi colleagues are taken by bus at 3:45 am and reach their assigned area by 4 am. They all work speedily at their designated areas to finish as soon possible. "The instruction from our supervisor is to clean the area quickly so we can take rest when the sun is up."*

*Despite being only 30 years old, Mr Ameen has a 14-year old son and a 3-year old daughter. He got married when he was 15. Mr Ameen worked first as a carpenter, but the money he earned from making tables and chairs was not enough for the family. "So, I told my wife that I should go abroad". Mr Ameen identified an agent, paid about KD 500, and found himself in Kuwait. He was hired as a cleaner, and signed a contract to receive KD 40 monthly. This was later increased to KD 60. "In my spare time, I clean cars so I can earn extra cash", he added.*

Mr Ameen is a fairly typical guest worker in Kuwait. As a street cleaner, he works hard, lives a simple life, and sends much of the salary back to home to support his family. The work is unskilled manual work, not stimulating, sometimes done under the burning heat of the summer sun and cold in the winter. And yet, this is something these workers opt to accept to maintain their families left behind.

Occupational safety and health conditions have improved over the years for migrant workers in general, including street cleaners. Kuwait bans

outdoor work from 11 am to 4 pm from June 1 to August 31. Mr Ameen's day concludes and the transport bus returns to take them back to their accommodation. Timings during winter and autumn are from 5 am to 1 pm.

Exposure to heat is unavoidable in Kuwait, as is exposure to air pollutants: particle matter content exceeding 10-fold the WHO Air Quality Guidelines is common. Street cleaners use little or no protection while working. Using the sweeping techniques of the past, street cleaners are highly exposed to the airborne concentrations of the fine and ultrafine particles from street dust. The nature of the street cleaning work has not materially changed over the years. In the 21st century, the cleaning of streets could be done with machinery, which sucks in dust and other toxic materials. The situation will change, for sure, in the future. An important reason for the change will be the increasing demand for the control of the street dust and air pollution in general. Air pollution is a 'silent killer', the main component being the invisible fine dust. This particle matter cannot be cleaned by manual sweeping – it requires more technologically advanced tools.

## Domestic workers from the Philippines

There are more than 250,000 migrant workers in Kuwait from the Philippines, approximately 60% of them working in domestic labor. There have been reports on individual cases of mistreatment and harassment of domestic workers. The Kuwaiti authorities have responded quickly apprehending the people responsible for mistreatments. The Kuwaiti government passed legislation in May 2018 requiring employers to allow Filipino migrant workers the right to possess their passport, the right to a 12-hr work day with one-hour break and one day off per week, an end-of-the year bonus, and access to a working cell phone. (The National. Retrieved 2018-08-08)

## What can ILO do in the years to come?

**The change in the status of workers' health and safety is justified not only from the human right's point of view, but also from the productivity point of view.**

People in the 21st century demand appropriate work conditions, which do not endanger health. Appropriate work conditions lead to work which is less risky and more productive.

**Productive employment and adequate working conditions are key elements to achieving fair globalization and poverty reduction.**

While Kuwait is giving work to millions of people from poor countries, they are expected to follow the ILO's work principles in their employment. The ILO has developed an agenda for the community of work looking at rights at work, social protection and social dialogue, with gender equality as a crosscutting objective.

## Disclosure statement

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## WORKING FOR WORLD CLASS PERFORMANCE; APPROACHES TO ADMINISTRATION AND GOVERNANCE IN WORKSAFE NEW ZEALAND

### Ross Wilson

Chair of Worksafe New Zealand and  
former President New Zealand Council of Trade Unions

The Pike River Mine Disaster in 2010, which claimed 29 lives, shook all New Zealanders. Worksafe New Zealand, a stand-alone regulator, governed by a Board, was established in 2013 as one of several Government measures to achieve 'an urgent, sustainable step-change' in our workplace health and safety performance.

The 2011 Royal Commission into Pike River, and the subsequent Task Force, identified serious weaknesses in many aspects of the existing system. Recommendations included a new OSH law, the new regulatory agency and strong visible leadership from the Government, business and unions, a stronger focus on occupational health and major hazard facilities, and greater use of high-quality data to support more effective harm prevention and a more risk aware national culture.

As a start-up WorkSafe NZ spent much of its founding years building core capacity, visibility, and respect as an effective regulator. This included developing a base operating model, policies and procedures, assisting with the development of a new legislative and regulatory framework based on the Health and Safety at Work Act 2015 and leading its implementation, building capability for regulatory functions by training new and existing staff, and building relationships across the health and safety system with business, union and other partner organisations in the private and public sectors. A range of tripartite groups and senior leadership fora have been established across industry sectors and government to enable unions, industry and regulators to work collaboratively in developing solutions to sector health and safety issues.

**In our 5 years since inception, good progress has been made in reducing harm.**

We are on target to achieve the Government target of a 25% reduction in work-related fatalities and serious harm by 2020. These reductions have been driven largely by improvements in the performance of Worksafe's priority sectors; forestry, agriculture, construction and manufacturing.

There is no doubt that the new agency model, led by a Board from diverse backgrounds, has been a key aspect of this success, but there has been a very strong commitment from all levels of the organisation and from players across the national system. The relatively small organisation of 545 people has responded enthusiastically to the mission to transform New Zealand's health and safety performance to world class, and our vision of ensuring 'that everyone who goes to work comes home healthy and safe'. People feel proud of the work we do and as an organisation we remain committed to making the changes necessary to build performance and achieve our mission.

### The Challenges

But, while Worksafe has established itself as a credible regulator and system leader, there are major challenges ahead in working to achieve our mission of world class performance. There is evidence that the improvement in health and safety performance achieved over the past 5 years is levelling off and more systemic initiatives are required, capacity to address chronic exposures and health issues (including mental health, bullying and harassment) is immature compared with many other comparable countries, and further work needs to be done to ensure that the catastrophic harm potential of some high hazard organisations is adequately regulated.

And this needs to be done in the context of an ageing and growing population with increased numbers of vulnerable workers, growth in higher risk sectors, changing business models and employment relationships, the changing nature of work, and an increasing prevalence of work-induced psychological harm.

## The Step Change

To achieve the next 'step change' in sustainable performance, the Worksafe 2018-22 strategy is focused on harm prevention through improved regulatory effectiveness, increased harm prevention capacity and growing effective strategic relationships across the national system. Underpinning this will be a programme to drive our organisational excellence; strengthening capacity and culture by ensuring that we are a learning organisation, and making the investment in ICT capability and infrastructure to create a high performing organisation. An important aspect of our approach will be building our Te Ao Māori (Māori world view) capability to inform our work with our indigenous people who suffer higher fatality and injury rates.

## New Initiatives

Worksafe aspires to be a data and intelligence led regulator able to aggregate and analyse data to target injury prevention initiatives to the highest risk areas and to enable regulatory interventions including enforcement and prosecutions to be more effectively and efficiently directed, thus reducing the costs to society and the economy of workplaces that don't adequately protect against harm. Subject to Government funding, such a system will be progressively developed and implemented over the next few years alongside an organisational modernisation programme, and a modern regulatory practice model appropriate to the challenges of modern workplaces.

The Health and Safety at Work Act 2015 provides a framework of duties and regulatory tools, the potential of which have yet to be realised. The strong duties on Officers and Persons Conducting a Business or Enterprise (PCBUs), along with the rights supporting worker participation and the powers of health and safety representatives provide a core to this modern version of the Robens model.

The greatest emphasis to date has been on education and an impressive resource of guidance and information, in many formats, has been developed. A very popular innovation has been 'Safe+', an online self-assessment improvement tool. An independent onsite assessment and advisory service was launched last year, along with the free online self-assessment tool which is particularly targeted to small and medium-sized enterprises.

A joint Harm Reduction Plan with our Accident Compensation Corporation will aim to shift behaviours through researched and targeted interventions. This will be supported by enabling investment in projects such as building worker engagement, participation and representation, and a stronger focus on vulnerable workers and work-related health protection.

**Worker participation and representation is another major challenge in a country where union density in the private sector has fallen below 20% and is even lower in high risk sectors such as agriculture, forestry and construction.**

This has led Worksafe, working in tripartite planning workshops, to look at the development of alternative models of support and representation for workers, particularly vulnerable workers in high risk sectors. The first pilot will begin this year in the forestry sector and will work, under the auspices of the new tripartite Forest Industry Safety Council (FISC), with unions and Māori communities in the North Island of New Zealand to develop a community-based model of support and representation for forestry workers, many of whom are Māori. This project will build on the Te Ao Maruiti Project which brought employers, workers and their families (whanau) together in a workshop based on a Māori approach and values.

The final key part of the Worksafe strategy is to build more, and more effective, relationships across the national health and safety system. We already have close working relationships with our business and union social partners, and sector councils in forestry, agriculture and construction. We know that working with all players in the system is the key to sustained performance improvement.

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