

A photograph of a construction site under a cloudy sky. Several tall tower cranes are visible, with one prominently in the center. In the background, several modern high-rise buildings are under construction, some with glass facades and others with exposed steel frames. The foreground shows a concrete wall and a wet, reflective surface.

OCCUPATIONAL HEALTH, SAFETY AND WELLBEING IN CONSTRUCTION CULTURE, SYSTEMS AND PROCEDURES IN A CHANGING ENVIRONMENT

March 2019

Occupational Health, Safety and Wellbeing in Construction

Culture, Systems and Procedures in a Changing Environment

A research report on the UK findings

March 2019

© Hedley Smyth, Aeli Roberts, Meri Duryan, Fred Sherratt, Xu Jing, Angeliki Maria Toli, 2019.

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EXECUTIVE SUMMARY

The research is a cooperation between UCL and Hong Kong University, comparing occupational health, safety and wellbeing (OHSW) in the UK and Hong Kong SAR. This Report focuses upon the UK findings.

Safety statistics have plateaued in many developed countries, including the UK. There is a belief that improving wellbeing will have a positive effect upon performance.

Wellbeing is rising up the construction agenda. It is ill-defined, which poses a problem for implementation, including measurement. Practitioners would be wise not to prematurely establish measurements for wellbeing. There are institutional matters to address: government, regulatory and advisory institutions encourage firms to move towards identifying facilities and tools, hence prescriptive procedures in support with less management emphasis on any strategic approach towards OHSW and 'soft' issues. A more balanced approach is needed.

Strategies help establish competitive service design, of which OHSW may be a distinctive component. Clients can offer guiding principles from their own templates, for example in procurement. Supplier rates of improvement are more important than prescriptive ways that disrupt consistent good practice and increase supplier costs.

International contractors and subcontractors lack OHSW templates for their international operations to improve consistency, enhance learning and spread good practices, especially in developing countries.

Commercial and financial criteria remain the top priority despite the espoused values that health and safety (H&S) is a top priority. Commercial criteria shape projects and OHSW is tactically nested below this level of thinking and action.

Senior management are largely driven by legal compliance. OHSW measurement was found to be driven by compliance. It is a moot point as to how much the duty is towards legal compliance and how much is towards people. Measurement encourages isolated initiatives and many initiatives were reported to be short-lived.

The transactional contractor business model is broken. The business model provides little room for OHSW manoeuvre. A holistic and strategic view of the firm is necessary to develop transformational business models for commercial survival. Along these lines, incremental transition is needed to remove barriers to OHSW improvement.

Part of changing the business model is to re-engineer operational practices to address staff working long hours, undertaking long commutes and working away from home during the week. This is commonplace for office and site staff. Mental health and fatigue affect performance and safety on site, on the roads, and affect occupational health and wellbeing. Workplace factors both exacerbate and can cause mental health problems.

OHSW practices are predominantly procedural and prescriptive, developed top-down, and implemented inconsistently. Management do not necessarily understand how operations are or can be conducted safely on site. Some prescriptions and routine procedures can actually make certain activities riskier and more dangerous. Capturing bottom-up learning and experience from operatives and supervisors to incorporate their knowledge into nuanced and context specific prescriptive procedures is needed, thus moving away from the "one size fits all" solution.

Systems are weak: poor cross-functional communication and coordination, the so-called problem of “silo working”, weak systems at the firm to project level; contractor programme management is poorly developed in contrast to some clients. Too much is left to individual responsibility.

Safety management systems (SMS) were primarily about awareness creation and information communication. Knowledge management systems (KMS) were rudimentary, having almost solely a technical focus and low engagement levels from staff. Main contractors and subcontractors had good SMS for information processing and as basis for knowledge transfer through KMS, yet the two are not linked. This provides a place to build transformative organisational and project capabilities to overcome the shortcomings of the two individual systems and so benefit OHSW and address the residual “bolt on extra” aspect of OHSW.

Clients currently have largely static procurement practices for qualification and tendering. Yet, clients can occupy a proactive role in driving improvements during prequalification and tender stages by adopting dynamic procurement models, as seen in many industries. Suppliers have to demonstrate rates of improvement, rather than meeting minimum threshold requirements.

Imposing H&S policies down the supply chain by client organisations without considering the disruption to embedding H&S policies leads to increased costs and failure to embed practices. Main contractors do the same to their subcontractors.

There are different views of OHSW in construction. There are multiple voices: senior management, mid-management and site management, operatives, and supply chain members. Management have failed to adequately align the different views and ensure that project and construction managers, who currently act relatively autonomously, engage with OHSW in consistent ways as part of the service design.

Operatives stated that site conditions are variable regardless of size of contract and contractor; some sites failing to be legally compliant. The provision and maintenance of clean, warm and dry toilets, locker rooms, canteens, and showers cannot be guaranteed some ten years after they became a requirement.

Drug use has wellbeing and safety implications on site. Cannabis use has long-term detection issues, hence testing is perversely driving operatives towards using harder drugs, such as cocaine which does not last in the body as long.

Site management scope their responsibilities differently towards subcontractors. Some are concerned with direct employees, while others included employees in the supply chain. This difference was most evident between main and subcontractors, where subcontractor staff were of ethnic origin and there were language barriers.

A cultural approach to OHSW has considerable advantages, yet takes time to take effect. It also has drawbacks. Managers and practitioners can fail to challenge practices and “taken-for-granted” thinking. The procedural approach is currently dominant and requires:

- i) a strategy and business model using a consistent template, which accommodates a degree of nuanced flexibility for the project context and different types of tasks for employees, subcontract and contract staff; ii) training and induction for management, and induction and toolbox training for operatives that is currently more comprehensive, including ways to manage cultural barriers posed by ethnicity and language; and iii) taking care when intervening not to be too invasive into matters beyond immediate working practices.

The permitted use of digital technologies on site needs clarification. Video production and use on sites similarly requires precise but not necessarily standard protocols.

1. BACKGROUND

This Report forms part of a joint research project conducted by UCL and Hong Kong University:

*A Comparison of the Health and Safety Environment in Construction issues of culture, systems and procedures in changing environments.*¹

The market is changing in both locations. Clients are more sophisticated in their demands, projects are more complex and the size at the megaprojects end of the market is growing². Contractors, in trying to respond to these changes, are challenged with looking after their employees and those in their supply chains, that is part of their wellbeing, and keeping them healthy and as safe on site as can reasonably be expected.

Early on in the research, it became clear that the emphasis in Hong Kong remains on site safety, which is linked to an aging workforce, while wellbeing was rising up the agenda in the UK in the wake of a prior focus on occupational health. Yet safety statistics have plateaued and this presents a challenge. In the light of the changes in construction and the different national emphases, this Report focuses upon the UK findings.

There have been three phases to the research:

1. Agenda setting
 - a) Pilot interviews
 - b) University-Industry Workshop
2. Main data collection, using semi-structured interviews
3. Workshop to report the findings, launch this Report and disseminate the pdf version on the website for the Bartlett School of Construction and Project Management:
www.ucl.ac.uk/bartlett/construction/occupational-health-report

A number of themes were identified from the first workshop: worker engagement, wellbeing, statistics on occupational health and safety, operational issues, recruitment and churn, and priorities for investment. Not all these issues were reflected in findings from the main data collection, for example recruitment and churn, however, new angles and issues emerged on the themes from a range of sources.

Interviews were conducted with five types of organisation: institutional, client bodies, main contractors, subcontractors and self-employed operatives. They were conducted with senior management, head office and site management, and operatives. They included those responsible for occupational health, safety and wellbeing (OHSW), but also those in other roles and functions who would be expected to engage with OHSW directly or indirectly. A total of 43 interviews were conducted. As 14 of those interviewed were site based, 17 represented tier 3 and below in the supply chain. This made this study unusual as it reached beyond the first and second supply chain tiers. Table 1 shows the schedule of interviews.

¹ The work is funded by UCL-HKU Grand Challenges. We are grateful for the opportunity and support provided by the funding.

² Megaprojects are defined as >US\$1bn.

Table 1. Schedule of Organisations and Interviews

Type of Organisation	Organisation	Interviewee Role	Subtotals	Total	
Institutional	Industry Standards	Health and Safety Principal Inspector	1	3	
		Health and Safety Inspector	1		
	Government & Former Professional Body	Industry Expert and Chair of Professional Body	1		
Clients	Infrastructure	Head of Commercial	1	8	
		Infrastructure	Senior Procurement Manager		1
			Occupational Health & Wellbeing		1
			H&S Manager		1
	Developer	Change Programme Manager	1		
		Developer	Head of H&S		1
			H&S Manager		1
Main Contractors	International Contractor	Divisional Managing	1	15	
		International Contractor	Construction Director		1
			Associate Director Health and Wellbeing		1
	Health, Safety and Wellbeing Manager		1		
	International Contractor	SHEQ	1		
		H&S Director	2		
	International Contractor	Chief Executive Officer	1		
		Quality Improvement Manager	1		
		H&S, Quality and Environment Manager	1		
		HR Manager	1		
		Pre-Construction Director	1		
	Operatives	3			
	Subcontractors	M&E	HSEQ/Improvement Manager		1
HSEQ Advisor			1		
Electrical Project Engineer			1		
Technical Services			1		
Site Engineer			1		
Apprentice			1		
Structural Steel		Group HSE	1		
		H&S/Environment Director	1		
		Commercial Director	1		
		Assoc. Commercial Director	1		
		Operations Director	1		
		H&S Advisor	1		
Sub-subcontractors		Control Systems	Operative	1	2
	Plumbing	Supervisor	1		
Other Contractors	-	Site Manager	3	2	
		Project Manager	1		
Self-employed	Ventilation	Supervisor	1	1	
Interviewee Total				43	

2. INTRODUCTION

For many decades the construction industry focused upon safety. The UK was no exception, and in many ways was and continues to be at the forefront of improved safety performance. However, improvement has not been proactively driven by clients or providers. It has been driven by regulation and in particular the corporate manslaughter legislation³. This has led to health and safety (H&S) rising up as a priority to become the or a top priority, alongside profit for many providers in the construction sector that have site operations⁴. This raises the question as to the extent clients, contractors and subcontractors are more concerned with demonstrating compliance than inducing transformational change to improve occupational health, safety and wellbeing (OHSW).

Occupational health has also risen up the agenda over recent years, and now there is a growing interest in and concern for worker wellbeing. This is based upon an underlying assumption that focusing upon occupational factors and wellbeing will improve H&S, and so overall productivity and performance. Further, and perhaps because safety statistics have plateaued in many developed countries including the UK, other factors, such as wellbeing need to be addressed to explore the possibility of breakthroughs in performance, including in H&S. While such assumptions founded upon good strategic thinking and anecdotal evidence may provide some support, consistent and reliable evidence is currently unavailable.

This report is not going to resolve these issues, but aims to make a contribution towards a more robust understanding and ways in which current barriers can be broken through. It presents both confirmatory and challenging findings, which suggests there is much more that needs to be done. The report does so by looking at a number of dimensions through the research design that goes beyond operational matters. It considers and addresses:

1. The role of the firm as the vehicle for making transformations that not only potentially make a difference to occupational health, safety and wellbeing or OHSW, but also have wider performance implications.
2. Firm strategy for OHSW from the international to the local scale.
3. Integration of existing capabilities to enhance OHSW and positively benefit performance.
4. OHSW, and particularly H&S, along the supply chain from the institutional level to the self-employed operative.
5. OHSW, and particularly H&S, from the viewpoint of integrating top down initiatives with bottom up practice and experience.

³ Corporate Manslaughter and Corporate Homicide Act 2007; see also <http://www.hse.gov.uk/corpmanslaughter/about.htm> and 'Leading health and safety at work: leadership actions for directors and board members' (INDG417).

⁴ Roberts, A, Kelsey, J, Smyth, H J, Wilson, A (2012) Health and safety maturity in project business cultures, *International Journal of Managing Projects in Business*, 5(4), 776-803.

3. FINDINGS

For many years the construction industry has focused mainly upon safety. Occupational health in the industry has risen up the agenda over the last 5-7 years. Today, there is a growing emphasis upon wellbeing in the UK. There are two primary reasons for this:

1. Safety statistics have plateaued in many developed countries, including the UK.
2. There is a belief that improving wellbeing will have a positive effect upon performance, including health and safety, which is beginning to be supported by some research⁵.

3.1 DEFINITIONS OF WELLBEING

While health and safety (H&S) is well-defined, wellbeing is not. There is still a lack of any commonly accepted and shared definition in general⁶. Table 2 shows a short selection of definitions. This lack of an agreed definition was confirmed during the first UK Workshop for the construction sector. The varying assumptions and views as to what wellbeing is were reinforced through the interviews.

While it is accepted that wellbeing embraces psychological, physical and social wellbeing in life⁷, the lack of an agreed or specific definition is a major problem for practice, including measurement within organisations, implementation processes and hence benchmarking in construction. Table 3 sets out some comments that were made around defining wellbeing. Some respondents talk of wellbeing as synonymous with site welfare. There is more uncertainty as to how far wellbeing intervened into other areas of life, such as diet and lifestyle. Some interventions are seen as invasive and socially intrusive by certain respondents, especially where inconsistencies exist within firms; a point looked at in detail later.

A site manager suggests that construction needs its own specific definition, given the work environment and tasks undertaken, echoing a point from the first UK Workshop for this research⁸. Therefore, sector specific standards may be needed with associated benchmarks if ones can be established for construction activities. This begs the question as to whether any definition would have to be based upon some lowest common denominators, which could perversely lower standards for site work; indeed, is this ethical? There are also dimensions that receive little or no consideration, notably gender, faith-related issues and to an extent language and social communication. Wellbeing is therefore fraught with difficulties at present. Practitioners will be wise not to prematurely establish qualitative and measurable assessments or benchmarks for wellbeing.

⁵ Poulsen, S, Ipsen, C (2017) In times of change: How distance managers can ensure employees' wellbeing and organizational performance, *Safety Science*, 100, 37-45.

⁶ OECD (2011) *How's Life? Measuring well-being*, OECD Publishing, <http://dx.doi.org/10.1.787/9789264121164-en>.

⁷ Grant, AM, Christianson, MK, Price, RH (2007) Happiness, health or relationships? Managerial practices, and employee well-being tradeoffs, *Academy of Management Perspectives*, 21(3), 51-63.

⁸ Smyth, H, Roberts, A, Duryan, M, Sherratt, F, Xu, J, Toli, M, Rowlinson, S (2018) Report of the UK Workshop: a comparison of the health, safety and wellbeing environment in construction between HK and UK, The Bartlett School of Construction and Project Management, UCL, London.

Table 2. A selection of wellbeing definitions: general and for other sectors

Wellbeing is understood, in the broad sense, to mean a time when a person is feeling good and functioning positively, meaning that a person would be engaged in learning, feel socially connected, and have positive perspectives and autonomy. Wellbeing is expressed in feelings and in dimensions such as persistence, grit, sense of belonging, mindfulness, identity formation and flourishing. It is possible to have high levels of wellbeing, yet to live with a diagnosed mental health condition⁹.

Employee wellbeing is an inclusive concept which has both cognitive and affective components. At a general level, EW refers to the quality of work as experienced by the employee..., and an overall feeling of happiness and health.... For wellbeing to exist work must be evaluated as satisfying, and positive emotions must be experienced more frequently than negative emotions¹⁰.

...ordinary people around the world would agree that it requires meeting various human needs, some of which are essential (e.g. being in good health), as well as the ability to pursue one's goals, to thrive and feel satisfied with their life.¹¹

Table 3. A selection of wellbeing comments from respondents

Treat people how you want them to treat yourself.

We just want people to feel that when they come to the office, we are there to make them well, to feel loved and to feel being looked after.

I think wellbeing is about getting these basics right...I think it's that caring and listening, all these soft skills that we don't talk about within this industry very much.

Wellbeing is being at your best. You might be fine but the environment you are in may make it impossible to be well. The environment, your physical health and mental health are the three components of wellbeing.

My understanding of wellbeing is ensuring that our people work in an environment, which aids their happiness, productivity, motivation...For me it's the soft, the people's side. It is not the hard-line health and safety. It is to make them sure that somebody is there to help them to do their job.

3.2 LACK OF A HOLISTIC VIEW ON OHSW

Occupational health has risen up the agenda and wellbeing is currently rising up the agenda in construction, yet priority is still given to safety, rather than health and wellbeing. Indeed, there were some comments made, especially by operatives that financial criteria, hence costs, revenue and profit remain the top priority despite the espoused values and rhetoric about safety being a top priority, a point that echoes prior research¹².

There was a lack of alignment between H&S and wellbeing initiatives and practices. For example, respondents tended to talk about site operations when discussing H&S, yet were more comfortable talking about office work when talking about wellbeing (including some of the operatives albeit with a more derogatory tone about office working). As another example, H&S policies and practices were considered appropriate for cascading down the supply chain from clients and main

⁹ Clarke, N, Mikulenaite, G, de Pury, J (2018) Suicide-Safer Students, Universities UK and Papyrus <https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2018/guidance-for-sector-practitioners-on-preventing-student-suicides.PDF>.

¹⁰ Vakkayil, J, Torre, E, Giangreco, A (2017) "It's not how it looks!" Exploring managerial perspectives on employee wellbeing, *European Management Journal*, 35, 548-562.

¹¹ OECD, op. cit..

¹² Roberts et al., op. cit..

contractors, whereas, wellbeing policies and practices were not. This misalignment is partly due to: a) poor definition of wellbeing, b) a lack of wellbeing measures, and that c) it has only recently received attention. Yet it is also due to the underlying focus on: i) legal compliance for safety rather than care for people among clients and main contractors, especially at senior management levels (whereas there are no rules and regulations of wellbeing to comply with), ii) commercial and wellbeing practices that operate in contradictory directions (wellbeing measures that encourage people to work long hours and in some cases away from home), and iii) the broken business model among main contractors in particular¹³.

Lately, some large infrastructure clients focus on the impact of wellbeing on occupational health and safety. There is a move from thinking about “do we have the right tools?” towards thinking “is there an environment that will help them behave in certain ways?”. This is to be welcomed, although implementation is critical. There is evidence of imposing H&S policies down the supply chain by some large client organisations without considering the disruption to the H&S policies and efforts of the providers. Main contractors do the same to the next tier of subcontractors. One client representative said:

As a public organisation, we need to make sure that our supply chain is acting and behaving in the right way.

Yet it was reported by both main and subcontractors that this can lead to increased costs and failure to embed practices suitable for the operational context of each provider, especially at subcontractor level.

Wellbeing policies could prove more disruptive than imposing H&S policies along supply chains due to the divergence of explicit and implicit wellbeing definitions used in and across firms in the supply chain.

3.3 DRIVERS

There are institutional processes and agencies driving improvements in construction, through health and safety legislation, regulations and good practice guidance. Whereas formal institutions in the construction industry play a major role in promoting safety practices, wellbeing practices are driven more by people’s increasing awareness of personal health and commercial concern with productivity and safety performance. Firms generally relate wellbeing to human needs, although respondents were unaware of any organisational or sector definitions.

There is a concern for organisational culture, behavioural programmes and procedures at the level of the firm. Institutions, such as the Health and Safety Executive (HSE), tend to place less emphasis upon the ‘soft’ issues and more emphasis upon facilities and tools. There is little concerted emphasis among institutions to drive wellbeing agendas forward in construction. At operational level, there is greater alignment with the institutional emphasis. Site safety is driven by procedures within a transactional cost-driven industry. This encourages managers to focus upon safety as a micro-level consideration of operations, while cost is more strategic in operational terms. The two meet where there is disruption to work due to near misses and accidents. Accidents can rapidly escalate to impact reputational and compliance issues at the firm level.

¹³ Smyth, H J (2018) Castles in the Air? The Evolution of British Main Contractors, www.ucl.ac.uk/bartlett/construction/castles-in-the-air.

Escalation that affects safety statistics, leads management to drive prescription down to site operations. OHSW is currently driven from the top management in most organisations. Specifically for H&S, it was reported by a managing director:

If it is valued at management level and endorsed and pushed, then the supervisors and engineers will then push it onwards.

This is seen as “a fundamental duty”, yet it is a moot point among senior management as to how much the duty is towards legal compliance and how much is towards people.

Overall, it is found that drivers in the firms tend to focus upon operational initiatives and procedures, in reaction to institutional and legal pressures, rather than the strategic implications of OHSW for their company and the people under their responsibility. Putting aside any moral implications, firms could take a more strategic and proactive approach to the commercial benefit of OHSW to the firm by adopting more transformational business models for the benefit of the firm in its markets but also for more direct benefit of those working for them and their subcontractors.

3.4 MEASUREMENT

3.4.1 MEASUREMENT AS A STRATEGIC TOOL

Measurement was found to be driven by compliance. Safety practices and outcomes are easier to quantify, whereas occupational health and wellbeing measurement is more challenging. OHSW practices were observed to predominantly be prescriptive in terms of inputs and descriptive for outputs. This serves the firm in efforts to demonstrate legal compliance; it provides benchmark evidence for those cases that might end up in a court of law.

Firms are concerned about measurement, in particular the plateauing of H&S statistics and the absence of wellbeing measures. There is less strategic attention given to breaking through the barriers of current firm business models among contractors. OHSW is part of the service provided and hence part of the service experience. While some main contractors have looked at the bigger picture, particularly around culture¹⁴, most have quickly drilled down to procedures and prescriptions at the operational level.

Measurement encourages isolated initiatives. Many initiatives were reported to be short-lived, such as fruit days to improve diets or videos created for induction, training and site guidance. Organisational change, such as shortening working hours, could dramatically impact worker wellbeing, reduce fatigue, and time away from home of operative and office staff¹⁵. There is a debate in the sector between leading and lagging indicators. Leading indicators have opportunity to identify changes from inputs, whether they are given or prescriptive factors. While lagging indicators are valuable, it is the inputs in transformational practices that are more likely to remove barriers to improving performance, including OHSW.

Measurement is linked with executive decision-making about investment in capabilities and

¹⁴ See for example Roberts et al., op. cit..

¹⁵ See Sherratt, F (2017) Shaping the discourse of worker health in the UK construction industry, *Construction Management and Economics*, 36(3), 141-152.

practices, not only for general management functions, for example in marketing¹⁶, but also for OHSW. Strategic investment is a key driver to incrementally transforming practices, especially among main contractors, to one that better serves both its markets and the firm.

3.4.2 MEASUREMENT AND PROCUREMENT IN THE SUPPLY CHAIN

Clients currently have largely static procurement practices for qualification and tendering. While qualification practices differ, for example one client requires contractors to have a mental health and a behavioural programme, once the contractor has internalised the requirements, the qualification threshold remains the same. Clients occupy a proactive role in driving improvements during prequalification and tender stages by adopting dynamic procurement models, as seen in many other industries. Suppliers have to demonstrate rates of improvement, rather than meeting minimum thresholds. However, in construction, the static picture is present among leading infrastructure clients, who see main contractors simply ‘cut and paste’ the same ‘improvements’ across successive bid documents; they are not called to account to demonstrate ongoing improvement in practice. Main contractors follow similar patterns in procurement. It is in the interests of clients and contractors to transform these practices, although it was found there was a reluctance to intervene at this more detailed level in the supply chains, despite a willingness to impose policies on members and more general supply chain management practices. Yet, measuring improvement rates could help transform OHSW performance.

3.4.3 MEASUREMENT AND WELLBEING

Wellbeing measures can be inaccurate, having unintended consequences. The use of hours of sick leave provides an inaccurate picture on employee health. One organisation measures the number of mental health first aiders and the number of medicals for their employees; it does not measure engagement levels, yet a drop in engagement could show poor implementation or be the result of improved health and wellbeing. Measuring drug use on site induces problems. Measuring cannabis use is relatively easy because it remains in the system whether it is currently an impairment or not. This research confirmed it is driving operatives towards using harder drugs, such as cocaine which is out of the system quickly. Cocaine or amphetamines can help operatives work very long hours, increasing safety, health and wellbeing risks¹⁷.

Some organisations use questionnaires on wellbeing and happiness in the workspace. Qualitative assessments are useful, as well as providing data for long term analysis. We do not know whether current wellbeing measures employed by contractors are useful. It was commented by a director in this context, “The only answer is we finished on time”. Another director stated: “It is a hypothesis that if you are at your best you perform better”. This might indicate that senior management will not pursue wellbeing without measures being developed quickly. This is again symptomatic of the tactical and operational focus rather than a strategic approach to both the business and OHSW.

¹⁶ Smyth, H J and Lecoeuvre, L (2015) Differences in decision making criteria towards the return on marketing investment: a project business perspective, *International Journal of Project Management*, 33, 1, 29-40.

¹⁷ See also Sherratt, F, Turner, M (2018) Exploring the hidden social consequences of working in construction with Q methodology: developing a study for Australia and the UK, *Proceedings of the Joint CIB W099 and TG59 Conference Coping with the Complexity of Safety, Health, and Wellbeing in Construction*, 1-3 August, Salvador, Brazil.

3.4.4 MANAGEMENT AND MEASUREMENT

Is management being measured and held to account in the firm? There are anomalies and contradictions between what senior management allow, even encourage for commercial reasons, and OHSW. Staff working long hours, doing long commutes and working away from home during the week are still commonplace for office and especially site staff. It was reported that these ingrained practices are not being challenged or re-engineered by management. Mental health and fatigue affect performance and safety on site, on the roads, and generally affect occupational health and wellbeing. These practices arguably are without commercial support given the failing transactional business model among contractors.

3.4.5 MEASURES FOR SITE CONDITIONS

Many more tactical issues are inconsistently measured. The historic Construction (Health, Safety and Welfare) Regulations 1996 were superseded by the Construction (Design and Management) Regulations of 2007 (now in its 2015 iteration), and requirements for site welfare provisions are set out within Schedule 2. The operatives interviewed stated that site conditions are variable, some being less than compliant. The provision and maintenance of clean, warm and dry toilets, locker rooms, canteens, and showers cannot be guaranteed some ten years later. The evidence did not correlate with the size of the contract nor the firms involved¹⁸. It highlights weak management systems between the firm and site levels¹⁹, which would suggest that project and construction managers having too much autonomy. It further highlights commercial directors strategically place cost as top priority and H&S is tactically fitted to the cost-shaped project; H&S is not a top priority in their thinking and where work is secured at minimal or zero margins due to intense competitive bidding.

In sum, a holistic and strategic view of the firm, its business models, and how these enhance or compromise practices, is needed to remove the barriers to improvement for OHSW.

3.5 WHOSE SAFETY AND WELLBEING?

There are several organisational levels at which OHSW is considered and treated differently:

1. Senior management of the firm
2. Mid-management and site management
3. Operatives
4. Supply chain members

Senior management are largely driven by legal compliance, especially due to corporate manslaughter legislation. Demonstrating compliance includes having systems and procedures, which are put in place top-down, and statistics and other evidence is used to show reasonable

¹⁸ There needs to be further investigation as to whether site and contract size are material, yet the findings here may be indicative of the prevailing picture.

¹⁹ Dov, Z (2008) Safety climate and beyond: A multi-level multi-climate framework, *Safety Science*, 46(3) 376-387; Roberts et al., op. cit.; Sherratt, F, Farrell, P and Noble, R (2013) Construction site safety: discourses of enforcement and engagement, *Construction Management and Economics*, 31(6), 623-635.

decisions and actions have been taken. Senior management are incentivised to ensure firm survival by declaring adequate profits and protecting the reputation of the firm²⁰. This is not to claim they lack a concern for people, but that management are charged with balancing responsibilities. The consequences can be unpredictable and can compromise OHSW. The existing predominant transactional business models exacerbate the consequences for OHSW; they provide little room for manoeuvre.

There was indicative evidence confirming that senior management see commercial matters as a firm issue and hence strategic to survival, whereas OHSW was perceived as an operational issue, hence more tactical, as echoed by some of the respondents among site supervisors and operatives. Despite many firms espousing H&S as top priority alongside profit, the strategic-tactical divide places OHSW at a lower level of consideration where commercial considerations shape the project under and within which OHSW is then addressed; it holds less importance and remains something of a “bolt on extra”. The consequence can be a lack of leadership commitment that negatively influence OHSW practices as detailed later.

Mid-management and site management are charged with supporting execution of construction projects. Within the commercial context, interviewees stressed the positive OHSW changes that have and are still taking place. A number of respondents stressed that they have never been constrained in expenditure on H&S, to a large extent concerning occupational health, and to some extent concerning wellbeing. Respondents discussed these matters in terms of reaction to events. A H&S inspector commented on firms:

They are reactive more than proactive.

However, not one respondent was able to identify strategic investment in OHSW as part of the business model. Some limited investment was identified around certain initiatives, many of which were isolated rather than part of a coherent strategy. This was particularly the case among subcontractors. When they were not asked an OHSW question or made general comments, most site managers gave greater weight to commercial factors.

Operatives had rather different views on OHSW. Several matters were reported repeatedly:

- There is considerable variability between sites where the same main contractor had been appointed. Some firms are considered better to work for, despite the site variability, especially among contract labour. As size of the contracts does not seem to account for the variability, it appears to be a management issue, especially the selection of project and construction managers, who act relatively autonomously from the guidance of the firm. The result is that H&S processes and site conditions for welfare, which many operatives interviewed saw as synonymous with wellbeing, were inconsistently managed across sites.
- There is confusion on sites as what is required regarding aspects of H&S, despite induction sessions, toolbox talks and safety management systems:
 - a) Initiatives are developed top-down, are implemented inconsistently, and some become fads that soon fade or disappear, for example health food initiatives.
 - b) Initiatives can conflict with other procedures, for example videos of guidance for use on site, yet smart phones and tablets are banned from sites except in designated areas away from operations.

²⁰ Profits are typically managed and measured in the form of return of capital employed rather than profit margins per se, which is part of the current broken business model, especially among main contractors.

c) Many prescriptions, initiatives, and procedures are developed by ‘university’ educated office staff, who have little or no understanding of how operations are or can be conducted safely on site. Some prescriptions and procedures can actually make certain activities more risky and dangerous. Goggles were given as an example, restricting vision for important cutting tasks and inducing headaches. Experience and knowledge of operatives as well as context, it was said, could or should be taken into account.

The supply chain members exhibit the issues above. In addition, they frequently have to comply with policies and requirements from the tier above. To the extent these are misaligned with their own policies and practices, not in rigour but in content, effectiveness may be comprised, and operating costs increase.

In summary, there is not a single viewpoint or voice about OHSW in construction. There are multiple ones, which management have failed to adequately address within and across organisations. It is likely that this currently poses a further barrier to improving H&S outcomes, hence the statistics on H&S, and wellbeing generally.

3.6 WEAK SYSTEMS

The paradox in construction is that the prescriptive procedures for H&S are strong in many organisations, yet the systems are weak.

It is well known that departments in contracting organisations have poor cross-functional communication and coordination, the so-called problem of “silo working”, although reporting procedures and hence safety management systems appear reasonably strong at communicating H&S information, in particular near misses and accidents. Information potentially becomes knowledge that is tacitly absorbed by individuals that may be transferred to improve H&S performance, but it is not systematically managed.

Of equal concern, but arguably less articulated both according to the interviewees and prior research, are the weak systems between the firm and their projects. This is part of the current problem with the business model, where programme management is poorly developed at firm level among contractors (in contrast to some clients) to coordinate capability development and activities across projects. The programme level covers functions, such as relationship management and key account management, knowledge management, service design implementation²¹, as well as the consistent integration and coordination of OHSW.

Despite the espoused high priority given to H&S, the lack of comprehensive firm-project systems compromises delivery. Too much is left to individual responsibility from project and construction managers to site supervisors. The consequence is that H&S remains something of a “bolt on extra” in thinking, decision-making and sometimes action on the ground. Although H&S managers at firm and site levels undoubtedly play decisive and important roles, they add to the functional silo working rather than promote integration. This issue is not ‘a call’ for more prescription. Many of the supervisors, junior site managers and operatives want less top-down prescription which is too often inappropriate to the tasks at hand; and many resented what they perceive to be ‘educated’

²¹ See Duryan, M and Smyth, H J (2018) Service design and knowledge management in the construction supply chain for an infrastructure programme, Built Environment Project and Asset Management, <https://doi.org/10.1108/BEPAM-04-2018-0060>, forthcoming; Smyth, H J (2015) Relationship Management and the Management of Projects, Routledge, Abingdon.

office staff who fail to understand the nature of operations and particular tasks. What is called for is a transformational approach from senior management, which is systematic, where coordinated systems flexibly support and facilitate bottom-up learning from operatives and supervisors in ways that more fundamentally incorporate knowledge into nuanced and context specific prescriptive procedures – the “one size fits all” solution is now insufficient.

It was apparent that some project and construction managers do not always follow prescribed project management methods. They act with relative autonomy²². Site supervisors, and particularly operatives deviate from prescribed practice. They claimed some deviance was necessary in order to complete certain tasks or conduct them safely. Indeed, deviance was probably both necessary and unnecessary, perhaps driven by payment conditions or convenience, which pose risks. Yet, without bottom-up learning and nuanced H&S procedures to fit context, it is impossible to tell.

3.6.1 SAFETY MANAGEMENT SYSTEMS AND KNOWLEDGE MANAGEMENT SYSTEMS

When asked about knowledge transfer and the knowledge management processes, most respondents talked about reporting procedures on site and the safety management system (SMS). Those with H&S responsibilities did not make links to any knowledge management system (KMS). Others discussed knowledge management in terms of technical lessons learned and knowledge transfer as distinct from OHSW. Upon further questioning, it became clear that SMS was primarily about awareness creation and information communication. There was an absence of formal knowledge capture and transfer within the SMS process apart from individuals internalising knowledge and transferring it on a happenstance basis. On the other hand, KMS is confirmed as rudimentary with low engagement levels, confirming prior research²³. Despite partial development, KMS was typically starved of information in timely ways.

In sum, main contractors and subcontractors had good SMS with information processing and as basis for knowledge transfer through KMS, but had not integrated the two. Here is an obvious place to build transformative organisational and project capabilities, in ways that would also potentially help overcome the shortcomings of the two individual systems. This would benefit OHSW, begin to overcome the “bolt on extra” characteristic, and have benefits for other learning and knowledge transfer to improve project performance.

KMS resides at programme management level to coordinate and integrate activities across and between projects in order to drive effectiveness from the front-end of construction projects to post-completion stages. Clients can encourage such practices from the procurement stage, as discussed, making knowledge transfer between supply chain members and across their programmes an area where rates of improvement need to be demonstrated. While the main objection among contractors is that sharing knowledge gives away competitive advantage, this is a symptom of a static transactional organisation, for dynamic transformational ones share knowledge because they are already developing new frontiers by the time competitors embed existing knowledge²⁴. Further, such sharing is of potentially enormous benefit for OHSW, indeed information frequently is within SMS among contractors and suppliers, which needs enhancing

²² This is in line with prior research that many project managers espouse following prescribed methods from their employer and divergence is claimed be change in response to “client drivers”, although on questioning, neither is the case – project managers tailor their practices to their own “comfort zones”: Wells, H and Smyth, H J (2011) A service-dominant logic – what service? An evaluation of project management methodologies and project management attitudes in IT/IS project business, Paper presented at EURAM 2011, 1st-4th June, Tallinn.

²³ For example, Anumba, C Egbu, C and Carrillo, P (2005) Knowledge Management in Construction, Blackwell Publishing, Oxford.

²⁴ For example, Smyth, H J and Duryan, M (2016) Knowledge application in the supply network of infrastructure programme management, Proceedings of the RICS COBRA Conference, 22nd-24th September, Toronto.

and embedding as knowledge.

An overreliance on individuals exists: OHSW managers for systematic knowledge transfer, and operational managers for tacit knowledge transfer; it occurs happenstance. Tacit knowledge transfer is good among subcontractors and formal transfer is a little more developed than for main contractors. Overall, firms fail to systematically manage OHSW learning and knowledge.

3.6.2 MANAGING OHSW IN THE INTERNATIONAL MARKET

International contractors and subcontractors lack OHSW templates to cover international operations according to the UK evidence. In other sectors many international firms have strategies and overarching business models that are fixed, leaving room at national and operational levels to flexibly generate more specific policies and procedures according to culture, legality and context. The reverse appears to be the case in construction; there is no international template, and inflexible OHSW prescriptions are applied locally.

The lack of an international template is a weak systems symptom. It inhibits the transfer of OHSW practices between sites and programmes in one country, and knowledge transfer between countries. This affects firms, clients and stakeholders in each national location, and constrains developing countries learning from international experience and knowledge to improve OHSW. This reflects poorly on corporate social responsibility (CSR).

3.7 OPERATIONAL PRACTICES AND PRACTICALITIES

The range and diversity of site activities and tasks is a challenge. The “one size fits all” approach to H&S may have worked to bring about change and reduce incidents, especially near misses. Since the statistics have plateaued, this approach will no longer be adequate. A more nuanced management approach that embraces bottom-up learning is needed, as noted. It is impossible within a research scope to tackle the range and complexity of site operations and current OHSW practices on site. However, certain issues were raised on more than one occasion and pose some challenges to current approaches.

3.7.1 ANOMALOUS PRACTICES

Organisations have the responsibility to provide employees with training, tools and technology to ensure health, safety and wellbeing. Leadership, which is trusted at all levels, is important in order to engage all involved in OHSW. As a managing director of a major international contractor stated:

Everybody has a duty to make other people safe.

It was widely recognised by site management and operatives that the top-down initiatives and prescriptions were too often of little value, irrelevant or impractical for project execution. There was recognition that compliance was a driver although some albeit limited practical support in evidence:

There has to be accountability and responsibility for any policy to work.

What does not work is bombarding people with signs, overly complicated rules [that] don't work; good communication does, leading by example works.

Long working hours, stretched resources for meeting deadlines and payment by results raised concerns for OHSW, especially wellbeing. Some operatives willingly work with these conditions. Some contract operatives interviewed are less concerned about OHSW; they are motivated by working intensively and extensively so they could move to the next job and maximise their income. One operative admitted regularly working 14-hour shifts. Disposable income is one wellbeing measure outside of work, but only one. Firms frequently encourage this type of behaviour through their working practices²⁵. Other employees and contract staff see the harm, yet accept the conditions. There was evidence of the thinking changing, creating conditions to change the business model. A site construction director explains:

It's more about what you are doing during the day than how long you actually stay here.

There are differences among site management as to the scope of their responsibilities. For some responsibility ends with direct employees, for others it included employees in the supply chain. This difference became most evident between main and subcontractors, where particular subcontractor staff were predominantly of ethnic origin. Main contractor site staff tended to perceive H&S as the responsibility of others where there were language barriers. This difference could seem reasonable where signage is in one language and interpreters are thin on the ground, yet is contradictory where main contractors impose their H&S policies on subcontractors as well as having responsibility for all those on site.

Operatives do not always use occupational health to improve their own health and wellbeing. There are several motivations. First, construction has a predominantly male workforce. The “macho” culture was mentioned by respondents, although they mentioned ethnicity, gender was a blind spot. Second and to some extent related to this point, is pride. Pride is linked to being seen to take decisive action, for example dismissing people for taking drugs and offloading the problem to another site, rather than offering support. Third, it was said that taking up opportunities eats into productive, paid time among contract staff.

3.7.2 CULTURE AND BEHAVIOUR

Organisational culture is an important factor²⁶. Some construction companies have had success in improving their H&S performance by addressing the prevailing culture, introducing behavioural programmes and inculcating norms of occupational health as well as safety at site level²⁷.

However, a cultural approach has drawbacks. Managers and practitioners can fail to challenge prevailing practices once they become part of “taken-for-granted” thinking. An example is the failure to address the prevailing business model or unaligned practices on site that have evolved over time.

This research suggests that cultural approaches are on the wane. It echoes recent work²⁸, showing most firms are currently adopting and reinforcing procedural approaches, based around strong prescription.

²⁵ Sherratt, op. cit..

²⁶ See for example Schein, E H (1996) *Organizational Culture and Leadership*, Jossey-Bass, San Francisco.

²⁷ Roberts et al., op. cit..

Problems with a procedural approach are multi-dimensional. A procedural approach requires:

- A strategy and business model that provides a consistent template, which accommodates a degree of nuanced flexibility for the project context and different types of tasks for employees, subcontract and contract staff.
- Thorough training and induction procedures for management, and arguably more induction and toolbox training than is currently received on site.
- A comprehensive set of measures to manage cultural barriers posed by both ethnicity and language, which usually overlap though are not always exactly the same.
- An interventionist approach that many operatives perceive as being too invasive, because they have ‘something to hide’ and/or the intervention takes responsibility away from them over dietary and social matters beyond immediate working practices.

3.7.3 TRAINING

Training is a key component of both cultural or procedural approaches to OHSW. Induction is provided before allowing workers to go on the site. In two cases this is monitored through biometric ID equipment that scans the employees. In two of the organisations it was stated that if operatives arrive on site and do not understand English, they are not allowed to work on the site. Yet when there is a group of operatives that are specialists but do not speak the language, they are allowed to work on site. This is part of the anomalous variation in the scope of OHSW responsibilities. The justification was that interpreters are provided, though it was admitted they cannot cover all operations and may be unavailable when site management or the main contractor need to communicate some important H&S information.

Training is generally appreciated and H&S was recognised as an important part of training, in line with institutional guidance and firm requirements:

The company invested a lot in my training through the years, they've kept me employed all that time. I have got lots of experience now, met many interesting people. This is a good company to work for.

3.7.4 MENTAL HEALTH, SAFETY AND WELLBEING

Major attention has been increasingly paid to mental illness in construction over the last few years. There is a focus on running mental health and wellbeing campaigns, which become one overall measure commonly used, along with initiatives as leading indicators:

We need to get mental health and wellbeing to be as normal to talk about as physical health.

Mental health arises from sources outside of the workplace. However, workplace factors can exacerbate mental health conditions, indeed, can be the cause of mental health problems. Some of the issues raised by respondents include the following comments, which are not quotes, yet written in the type of language respondents used:

- Working to tight deadlines causes stress and the long working hours expected in the industry make matters worse – mentioned by office and site workers.
- Fatigue leads to poor decision-making yet people want to do a good job, so this induces worry and anxiety – mentioned by managers working in offices.

²⁸ Smyth, H J, Roberts, A and Razmdoost, K (2019) Managing health and safety in a fast changing market and organisational culture: a case study, Paper accepted for presentation at the CIB World Building Congress, Constructing Smart Cities, 17-21 June, Hong Kong Polytechnic University, Hong Kong.

- Fatigue is caused by working away from home, long days or patterns of 3x8 hour shifts, long commutes, especially when working away from home – factors mentioned by management and site operatives.
- Working away from home during the week causes family stress and difficulties in sustaining relationships – mentioned by office and site workers.
- Terms of pay can incentivise you to work during weekends when the opportunity arises, which brings in needed income but considerably disrupts home life – site operatives.
- Long working hours incentivise drug use to stay awake – site operatives talking about others.

Poor mental health can impair judgements around safe practice on site. It is emotionally draining and induces stress, exacerbating fatigue. Fatigue is a major H&S risk on site and when traveling to and from work, daily or at weekends. According to previous research:

Construction workers are prone to fatigue as construction work typically involves heavy workloads, awkward working postures and prolonged working hours... we found that workers who felt tired or exhausted were more likely to report difficulty with physical and cognitive function than workers who did not feel tired.²⁹

This nexus of mental health, stress and fatigue is not managed among the contractors, subcontractors and most importantly the contract staff used³⁰. Flexible working is one way of reducing fatigue and improving wellbeing. It is more applicable to office workers. It could mean managers leave matters to individuals to be responsible, resulting in people working even longer under deadline pressures. Leadership commitment is again highlighted as important.

3.8 DIGITAL TECHNOLOGIES AND MEDIA

Developing digital technologies as a means to modernise construction and its image is underway. Digital technologies can facilitate OHSW auditing, communication, knowledge sharing and learning, enable agile working and promote a sense of responsibility. There are trends in opposite directions. On the one hand smart phones and tablets are seen as useful tools of communication. There is potential to link them to other smart devices, such as BIM, drones and other robotic equipment. It was found that BIM is not understood by some operatives, who require training to use it on site, which has a safety angle to its use on site.

Videos and filming on site have been cited as useful for training and guidance in conducting tasks safely. On the other hand, they have been used as means to disseminate bad practices that could be incriminating, and hence harmful.

The general use of phones for calls and social media purposes were also seen as both a distraction and a risk. Most sites have restricted their use in one form or another:

- Banning smart phones and tablets – rare.
- Usage confined to restricted areas – common.
- Site supervisors usage of tablets – variable.

²⁹ Zhang, M, Murphy, L A, Fang, D and Caban-Martinez, A J (2015) Influence of fatigue on construction workers' physical and cognitive function, *Occupational Medicine*; 65, 245-250.

³⁰ Haslama, R A, Hidea, S A, Gibbb, A G F, Gya, D E, Pavitt, T, Atkinsona, S and Duffc, A R (2005) Contributing factors in construction accidents, *Applied Ergonomics*, 36, 401-415.

Agreed practice has yet to emerge, although that does not necessarily imply standard practices in all contexts and all sites are necessary.

One subcontractor organisation had invested in training and guidance videos for its operatives. The operatives had not come across these videos in training, site induction or toolbox talks and were unaware of their online presence. Where investment is committed there needs to be a clear implementation plan in advance that is followed through.

In sum, the permitted use of digital technologies on site needs clarification. Video production and use on sites similarly requires precise but not necessarily standard protocols.

4. NEXT STEPS

There are matters to address at the institutional level. Government, regulatory and advisory institutions encourage firms to move towards identifying facilities and tools. They place less emphasis upon the 'soft' issues and any strategic approach towards OHSW for the firm level. A more balanced approach is needed.

Firms need to develop their own strategies as part of competitive service differentiation, of which OHSW may be a distinctive component. While their clients may have guiding principles from their own templates to guidance procurement, rates of improvement are arguably more important than being prescriptive in ways that can disrupt embedding good practice and increase costs.

It was found that there is a considerable amount to address at senior management level. The current business model based on minimal expenditure, minimal investment, cashflow management and the return on capital employed is no longer workable. Incrementally shifting to a model based upon differentiation, investment in order to yield a return, higher profit margins and higher contract costs for an improved service will increasingly become necessary to survive³¹. OHSW is part of that emerging picture and for some firms may become a core part of their competitive service provision. Actions needed include:

1. Address the firm strategy and business model to incorporate OHSW by building systems and capabilities to break through the barriers to take performance beyond the current plateau.
2. A strategic template is needed into which OHSW fits for international, national and site operations, being fixed at the general level with increasing flexibility as it cascades down to operational level.
3. Recognise OHSW as an intrinsic part of service provision and integrate it at all levels more coherently and consistently.
4. Address the anomalies at operational levels in the offices and on site. Some of the anomalies, for example long working hours, need re-engineering and feeding into the evolutions towards a more transformational business model.

³¹ Smyth, op. cit..

For those with OHSW responsibilities, only so much improvement can be made without the “buy in” of senior management and therefore strategic plans to address the main board. Functional and departmental heads are needed. The timing may be apposite because of the need to transition to new business models. There is also a considerable amount of action that can be taken by OHSW managers. This can be organised around several actions:

Induce a more integrated approach between functions, departments and OHSW.

1. Develop the programme management level to:
 - a) Improve firm-project integration.
 - b) Begin to work with those responsible for knowledge management to develop and integrate knowledge management systems with safety management systems in a process of mutual learning.
 - c) Then explore other synergies for integrating activities.
2. A flexible, hence nuanced and tailored approach at site level to:
 - a) Accommodate context.
 - b) Facilitate bottom-up learning around specific activities and particular tasks, drawing on the experience and knowledge of operatives.
3. Resolve the anomalies at operational levels in the offices and sites.

For site management and operatives, engage more with management at all levels:

1. To take advantage of the occupational and wellbeing opportunities presented.
2. To engage with reengineering working hours and payment practices that induce and encourage practices that are counter to occupational health and wellbeing, indeed can impair safe practices on site too.
3. To develop ways to inject experience and site knowledge into tailored safety practices.



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