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Improving occupational health risk management in SMEs: the role of major projects - Research report

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Improving occupational health risk management in SMEs: the role of major projects

Research Report

October 2018

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The report conclusions and any opinions expressed reflect the personal views of the researchers, based on the information gathered.

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Executive summary

Project background

Although the management of occupational safety and health (OSH) in construction has been problematic historically, there have been improvements in recent years. Health, however, is typically more difficult to manage than safety, and is often the poor relation, despite the evidence that the human costs of work-related ill-health far exceed those of accidents in construction.

Improving practices in small and medium enterprises (SMEs) can be particularly difficult but there is evidence that, for safety at least, good practices 'trickle' from major projects and companies to smaller organisations and to those who work in them. This research assessed the impact that large projects can have specifically on the way SMEs manage occupational health (OH) risks: it used in-depth interviews with workers, managers and OSH professionals. The research was conducted on the Defence and National Rehabilitation Centre (DNRC), a major construction project which sought to drive good practice in its supply chain. By focussing in detail on eleven of these 'mid-level' companies – which sit between the well-resourced main contractors and very small, typically family-run, micro-organisations – it was possible to explore the specific barriers to good practice becoming embedded and consider the interventions necessary to overcome these.

Key findings

Many of those working on the project considered that the general arrangements for health risk management were similar to the way they usually worked, and particularly were in line with the way that they would work on other high-profile projects. This reduced the likelihood of those companies learning new practices specifically from this project. Nevertheless, there were some cases where subcontractors had purchased new equipment or adopted new habits to meet the requirements in relation to the management of dust or manual handling. This had given them an insight into the usefulness and benefits of such tools or measures and increased their commitment to use them elsewhere.

The main area where interviewees reported requirements on this project to be substantially different to their usual practices was for health assessments. This was an area where the client/main contractor had set out to achieve high standards, by bringing an OH provider onto site and requiring that all contractors arranged health checks for their workers. It was also an area where many of the subcontractors were currently falling below recognised good practice. Some companies which had not done health assessments previously said they would now continue with them; and those who were already doing them to a limited degree had used the project to drive the process forward internally. Some had also learnt about risk assessing and supporting individuals with health conditions, largely as a result of discussions with the occupational health adviser (OHA) on site.

Many operational workers interviewed were well informed about risk; they were also highly motivated to take care of their health. There was substantial evidence of 'trickle-down', that these workers learnt from large projects such as this and carried this knowledge with them. Those in more senior or professional roles also learnt and transferred good practice between jobs.

The subcontractors which adopted good practices most willingly were those which were already working hard to improve their OSH. This typically reflected a growing recognition of their responsibility and duty of care towards their workforce and also an organisational desire to do more work on prestigious projects (which were likely to pay the subcontractors enough to be able to work to these higher standards).

One of the biggest barriers to good practice in relation to occupational health risks was a lack of knowledge – individuals at all levels made decisions based on an incorrect understanding of either the risks involved or the legal requirements. For example, the legal requirements relating to health surveillance were widely misunderstood; also, many workers believed masks to be the best solution to dust exposure but underestimated the importance of being clean shaven.

Many interviewees commented that their main exposure to health hazards, particularly noise and dust, arose from the activities of others. Typically, they relied on PPE to protect them in these situations.

A third barrier to good practice was the relatively high proportion of subcontract, self-employed or agency workers. This reflects common working practice in the industry, and the high turnover of workers on site was reported to influence training, safety culture and the costs and provision of health assessments. However, there were examples of contractors working hard to overcome this, by using the same subcontractors or self-employed workers regularly, or actively increasing the number of workers employed directly.

Cost was also identified as a potential barrier to good practice: not necessarily for those working on this project, but, in their opinion, for others on less prestigious projects and those running smaller businesses.

Conclusions and Recommendations

This research has confirmed the impact that major projects can have on driving good practice along the supply chain and that this applies to health as much as it does to safety. It is therefore important that the clients on such projects:

- Set and enforce consistently high standards, to expose the supply chain and its workforce to good practices and encourage them to rise to these expectations
- Set expectations for the provision of health assessments, so that companies are motivated and supported to put mechanisms in place
- Make such expectations very clear at the tender stage to ensure that work is priced and planned appropriately
- Employ suitable occupational health specialists such as OH advisers and occupational hygienists to raise standards and support and educate managers and OSH practitioners
- Actively develop knowledge in the supply chain by sharing the expertise of in-house specialists
- Manage the interactions between contractors to minimise worker exposures from trades other than their own

Additionally, industry wide commitment is required relating to:

- Consistency within the industry, and ensuring that prequalification and accreditation schemes set high standards for health alongside those for safety
- Training for managers, supervisors and OSH professionals to ensure they are as knowledgeable about health as they are about safety
- Improved materials for workforce training so that they fully understand the impact of work related ill-health and know how to avoid it
- Increased education regarding OH/medical obligations so that senior managers and others in small companies understand what sensitive data they should and should not collect
- Processes for managing OH data at an industry level to ensure that records can follow a worker from one project or employer to another, and that all are working to the same minimum standard; such a process could then operate alongside the current requirement for each worker to have a CSCS card.

- Increasing the availability of specialist resource such as OH advisers, OH physicians and occupational hygienists, as there is a shortage of all disciplines across the UK

Ongoing efforts will be required to achieve widespread change. Clients on major projects need to focus on setting high standards and clear expectations; and ongoing engagement from major contractors and from bodies such as the Health in Construction Leadership Group, Build UK, and Working Well Together are important to propagate good practice through the supply chain. At the same time, wider industry interventions and continued technological advancements will be needed to enable and build on this; alongside legal intervention where necessary to support the minimum acceptable standard.

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1. Introduction

1.1. Occupational Health in construction

Construction is a problematic industry in terms of occupational safety and health (OSH). It has a fatal injury rate over three times higher in the UK than the average rate across all industries; and the level of self-reported workplace injury, at just below 3% each year, is second only to that for Agriculture, Forestry and Fishing. However, there have been improvements. Accident rates have fallen by about 40% over the last 12 years, with fatalities falling even further: by around 75% since 2001.

The management of health risks in construction typically lags behind that of safety. Over 100 times more people lose their lives each year as a result of ill-health than following a fatal accident. A high proportion of deaths reflect the legacy of asbestos, but deaths also occur from other respiratory disorders, and work-related cancers linked to diesel and UV exposures. Additionally, many suffer ill-health and disability as a consequence of their work. The highest reported incidence is from musculoskeletal disorders (MSDs) and work-related stress; but dust, noise and hand arm vibration also cause substantial harm. It has been estimated that work related ill-health in construction costs employers £848 million per annum (Gibb et al 2018). The costs to individuals and wider society are believed to be even higher than this, and this figure obviously does not account for the substantial unquantifiable impact of ill-health on individuals and their families.

Addressing these risks is challenging, due to their low visibility: work-related health conditions often take many years to develop and may not seem as significant as the more obvious impacts from accidents (HSE, 2018). Additional difficulties arise from the nature of the industry. Workers often live away from home and many move around between different employers, making it more difficult for them to manage their own health. Further challenges relating to health and safety culture, expectations and communication can arise with the engagement of migrant workers (Bust et al 2008).

1.2. Small and medium sized enterprises

The majority of workers in construction are employed within Small and Medium Enterprises (SMEs, generally defined as organisations which have fewer than 250 employees and a turnover of less than £25 million (Gov.uk, 2018)). There are particular challenges with managing health and safety here: practices in these companies typically lag behind those within larger organisations. Reasons given for this have included a lack of knowledge (Lancaster 2003; Masi and Cagno 2014), a lack of resources (Vickers et al 2003) and the influence that the company owner has over the culture of the organisation. (Hasle 2012, Brace 2009).

Despite these challenges there is evidence that small organisations can manage their safety effectively. For example, Pinder et al (2016) found that many of those in small companies took a high level of responsibility for the wellbeing of their workforce and that this was an intrinsic part of how they organised work, even if the processes were not always formally documented. The same research reported that many workers brought knowledge with them from experience on larger projects or with other companies. This supports the view that knowledge and good practices 'trickle' down and through the industry. It also highlights the importance of good practices on major projects, if they are setting standards which others will follow.

1.3. Research purpose

It is important that we understand whether this trickle works as well for occupational health (OH) practices as it does for safety. We also need to understand any limitations of this as a mechanism for driving improvement in the industry.

1.4. Research objectives

This research focuses on the management of health risks within SMEs. Specifically, it set out to assess whether working on a major project can change the long-term behaviours of SMEs and their workforce in relation to health risks, and what actions are necessary to facilitate this. A second objective was to identify the barriers to this positive influence and why SME companies as well as workers in SMEs might not take such behaviours with them on to future projects.

2. Method

2.1. Research setting

The research was conducted at the Defence and National Rehabilitation Centre (DNRC) in Leicestershire, a flagship construction project by Interserve Construction Limited (ICL), funded and overseen by the client, Black Stork Stanford Limited (BSSL). The DNRC is a replacement for Headley Court, the military's current rehabilitation facility: it is around four times the size and incorporates state of the art medical and rehabilitation facilities.

Construction commenced in August 2015 and the facility accepted its first residents/patients in the latter part of 2018.

2.2. Client, main contractor and OSH professionals

Initial meetings and interviews were conducted with site managers, and OSH and OH professionals working on the project (n=9, some were interviewed on 2 or 3 occasions). This provided background data on the policies and arrangements and enabled introductions to contractors on the site.

One of the researchers was a member of a client-led OH steering group, which was established to drive OH strategy on the project. Attendance at meetings of this group provided additional background data regarding the project and its context. A review of the impact of this group, which considered mental health interventions and healthy eating as well as OH arrangements is published separately (Jones and Gibb, 2018).

Six researcher visits were made to observe construction on site (including three with the OH steering group), accompanied by an OSH manager.

2.3. Participating companies

Eleven companies took part in the research, out of fourteen who were invited to participate on the recommendation of the site manager. (A total of 28 companies were on site at the beginning of the research). The participating companies were contracted to provide a range of services including groundworks, scaffolding, joinery, masonry and internal fit out.

These companies varied from those which were very small, with less than 10 employees; up to others which had up to two hundred workers on site at peak. Some companies employed almost all of their workers directly, whilst others used subcontractors or agency labour to a much greater extent. For all of the participating companies this project was bigger than they had done before, and this generally increased (sometimes quite substantially) the proportion of agency workers or subcontractors they used.

The companies working on this project were not thought to be representative of the whole construction industry spectrum: the project set stringent measures at prequalification so that companies with low standards or expectations would automatically have been excluded from the project. Therefore, these companies are likely to be at the higher end of SMEs in terms of their OSH profile and expectations. Thus they lie between the main contractors and the much smaller companies with lower expectations; and have potentially developed from that lower state themselves and are well placed to illustrate the mechanisms through which OSH develops.

2.4. Interviewees

Within each company, the aim was to interview the site supervisor/manager, a small group of workers, an OSH professional and a company director/senior manager. Some groups (e.g. directors) were

harder to reach than others and there was variation in access depending on where contractors were in their work phase and how the organisations were structured. In total the following interviews were conducted:

- 11 site managers (1 was interviewed twice)
- 41 workers (from 8 companies; 8 of these, from one company, were interviewed after they had moved to another site)
- 7 OSH professionals (1 was interviewed twice)
- 4 Company directors/senior managers

2.5. Interviews

Interviews were semi-structured. They focussed predominantly on interventions relating to occupational health (the management of health risks and the provision of OH services) although safety interventions or wellbeing activities were also discussed on occasions.

The exact content varied depending on the job role of the interviewee. Also, interview questions evolved through the project as new issues arose which were considered worth exploring. Overall, the main themes addressed were how the project compared to others they had worked on; how they knew about OH and how this affected what they did; and whether there were particular aspects or requirements on the DNRC which they would take to future jobs.

2.6. Development of research method

The original research plan had been to approach only 3 -6 companies and to conduct interviews on multiple occasions with each person to assess how their views and behaviours developed during their time on the project. However, it quickly became apparent that this would be difficult to arrange, would be onerous for companies, and that repeat interviews would be likely to yield little additional information. A decision was taken to broaden the project scope instead and talk to workers from a wider range of companies.

3. Findings

3.1. What was different on this project?

The requirements on the DNRC in respect of the management of health risks were generally in line with legal requirements and associated good practice. This is, anecdotally, a standard which many construction projects fail to achieve: HSE campaigns focusing on health risks found material breaches on one third of the sites they visited in 2014 (Whinder, 2014). A similar picture emerged from campaigns in 2016, when they identified ' "significant" health risks in the form of exposure to asbestos and dusts, in particular wood dust and silica' (Durrell, 2016); and again in 2017.

3.1.1. "DNRC is like other large projects"

Many of those working on the project considered that the general arrangements for health risk management were similar to the way they usually worked, and particularly were in line with the way that they would work on other high-profile projects. It was suggested that larger projects generally set high standards; and several companies reported having changed the way they worked in recent years to enable them to bid for such work.

Yeah, to be honest it's not really any different, everything they do is, their control measures for what they do are very much the same as ours.

Health and safety professional

Yeah, the health and safety obviously like anything, we work for companies such as Interserve and people like used to be Carillion and Willmott Dixon and people like that…….. So we kind of see the health and safety of all of them. And typically we have to raise to their game. So we've been doing this for a long time so we've risen our game up to their game anyway.

Company director

3.1.2. "Health management in construction has changed"

There was a widely held view that the management of health risks in construction had improved substantially in recent years, with examples being given of new practices having been introduced that now felt like the norm.

I never used to use gloves, I used to wear my fingers out laying bricks, blood used to come out of the end, all things like that. Dust in your face. It's not big and clever, we just didn't know.

Company Director (ex frontline worker)

Obviously dust, so we have to use full extraction kits…..you will find that that's compulsory on all sites at the minute and has been for a few year, probably the last seven or eight year.

Supervisor

I mean I remember in, say, '99, walking into a room where we'd been working and you could see all the MDF particles just floating through the sky…[we] didn't think about it back then because it wasn't really put forward to you. Like bricklayers would have the Stihl saws going without a dust extraction so the dust could be going everywhere…..[now] I have to have a face-fitted dust mask anyway. And like I said, back in the late nineties, I would never have dreamed of doing that.

Frontline worker



Figure 1 Portable dust extraction is increasingly used in construction to manage dust exposures

However, these improvements were not considered to be universal. There was recognition that not all companies worked to such a level, generally because of the perceived cost issues of improving standards and a low commitment by some to their (generally itinerant) workforce.

> *You go onto any of the big sites and you've got to play it by the rules. But the smaller jobs you don't….. I don't think it's welcomed by a lot of the smaller companies because of the financial impact…… And, people who are tendering jobs, the smaller companies that tender jobs, do not allow enough money for safety.*
>
> *Supervisor*

> *Sometimes the health and safety on smaller jobs will go out the window because they can just replace you in a heartbeat.*
>
> *Frontline worker*

> *That last company I worked for didn't even have an extractor. Didn't even know what one was…..I'd be on a Stihl saw cutting doors up with a chuffing roll-up in my mouth.*
>
> *Frontline worker*

3.1.3. Occupational health assessments

The main area where interviewees reported requirements to be substantially different to their usual practices was for OH medicals or health assessments. Some had undergone such checks on other large projects but for many this was their first experience of being seen by a health professional at work. This was an area where the client/main contractor had set out to achieve high standards, by bringing an OH provider onto site and requiring that all contractors arranged health checks for their workers. It was also an area where many of the companies that took part in the research were falling below

recognised good practice. For example, there were only three companies with internal processes in place for health surveillance; although some carried out health checks which were a requirement of other large projects or had processes in place for exposure to high risk substances such as asbestos or lead.

Some companies commonly used questionnaires, reviewed by a manager or someone from HR, or OSH, to assess worker health. This is potentially in conflict with the requirements of the Data Protection Act and its replacement, the General Data Protection Regulation (GDPR). These require that such 'sensitive' data is only handled under specific circumstances such as "processing necessary to enable the employer to meet its legal obligations" or "undertaken by a health professional or someone working under an equivalent duty of confidentiality" (ICO, 2011). Health information collected by a responsible person in connection with a health surveillance programme might fall under the 'legal obligation', provided it is properly managed. However, collection of health data other than this (such as detailed pre-employment health assessments) may not: it requires explicit consent which must be given freely and it could be argued that consent is not 'free' if a worker cannot decline to give it for fear of losing their job. In addition, the information commissioner's guidance states that 'the interpretation of medical information should be left to a suitably qualified health professional'.

Generally, the provision of worker health assessments on the DNRC was considered to be a positive intervention, as workers valued being alerted to their unknown health issues so that they could take action.

> *It's highlighted my hearing problem, which I didn't realise was a problem. Looking back on it, it has caused problems, and now it's manageable. I'm starting to be aware that I can't hear stuff at certain pitches and frequencies and, yeah, it's actually knowing that's made my life a little easier.*
>
> *Frontline worker*

> *So we have most guys that are quite appreciative, they go on the medical, they appreciate the fact that they have been checked on and sometimes it can identify underlying issues.*
>
> *Supervisor*

Where there were more negative opinions about health checks, these related to the impact on workers of having to take time off to sort out issues. There were also some who were uncomfortable with their employer potentially having information about them. From the employers' perspective there were also difficulties with the management of health assessments, in terms of arranging appointments on site; and the variability of the workforce

> *After their medicals they had to go off to their doctors and have further check-ups, which meant they missed time off work and stuff like that.*
>
> *Supervisor*

> *First time you have a HAVS assessment, got to go back in three months or six months and you end up then having individuals with seven different elements requiring about four different recall dates which is difficult to manage outside of a factory environment.*
>
> *Health and Safety professional*

A specific requirement on the project was for OH records to be uploaded to the database managed by CBH (Constructing Better Health). This would allow worker data to be accessible in future should those workers move to different companies or have health checks through different providers. Unfortunately, this requirement caused substantial practical difficulties, discussed further in section 3.4.5.

3.1.4. Detailed comparison between this project and 'usual practice'

Table 1 maps in more detail the requirements on the DNRC against usual practice for occupational health, as reported by those working on the project.

Interviewees also gave examples of practices relating to safety (rather than health) which they considered to exceed regular standards, some of which they found particularly helpful. This included the requirements for all supervisors and managers to have attended appropriate CITB courses, either SSSTS (Site Supervisors' Safety Training Scheme) or SMSTS (Site Management Safety Training Scheme); and the use of 'safe start' meetings at the beginning of the day. Both were considered by several interviewees to be helpful. These may have some impact on the management of health risks through raised awareness but are not considered here in further detail.

There were also interventions on the project which related to general health and its promotion, including interventions to catering arrangements and health promotion events. Again, as they are out of scope, these are not discussed further in this report.

Table 1 DNRC requirements compared to 'usual practice' in construction

	Key requirements on DNRC	**Legal requirements and good practice**	**Range of 'usual practice' reported**	**Reasons why best practice is not always the norm**
Dust - control	Those working on the project were required to: • risk assess and ensure hierarchy of control; • carry out health surveillance if required; • use water suppression for dusty activities; and • use on-tool extraction for dusty activities.	HSE guidance is to use water suppression or on-tool extraction. Additionally, PPE may be required if this does not control dust adequately or if the risk is high.	Most subcontractors reported that they used either water suppression (particularly for work with concrete) or on-tool extraction as standard practice on all their projects. However, there were some who said that they would use a dust bag in preference to on-tool extraction for wood dust. There were also reports that extraction was less likely to be used on smaller sites or by smaller contracting companies.	Some carpentry workers disliked using extraction due to the need to carry extra kit around, and up ladders etc, making it more awkward and less safe. Others felt that vacuums were too small for large amounts of concrete dust and preferred to dampen down and then use a broom for cleaning.
Dust – PPE	Face fit testing was required to have been completed in the previous 12 months. Training and supervision were required for those who would need to use respiratory protective equipment. During the project, a requirement was introduced that all face fitting had to be done by a Fit2Fit approved tester.	Face fit testing is required under COSHH if a close-fitting mask is necessary for worker protection. It is recommended that such masks are used only for close shaven workers i.e. those who have shaved in the last 8 hours (some workers and some masks may achieve good protection with face stubble, some may not)	Most (but not all) subcontractors on the project reported that they face fit tested their workforce and had done for several years. Workers were generally aware of the importance of being clean shaven when wearing a face fitted mask: it was standard practice to share dusty work around so that it could be done by those who were able to wear a mask at a particular time. However, several interviewees considered that the masks fitted fine even with stubble and one had been face fitted with a full beard and reported it to have fitted well.	Masks were not generally popular as they are uncomfortable and hot; there were complaints that they made glasses steam up, although one company had switched to full face masks with built in goggles and this resolved the problem. For companies that hadn't previously face fitted, there was no particular reason given; although one did comment that when they ordered FFP3 masks from their supplier they couldn't predict which brand would be supplied, which made face fit testing problematic.

	Key requirements on DNRC	Legal requirements and good practice	Range of 'usual practice' reported	Reasons why best practice is not always the norm
Noise	There was a requirement to reduce noise at source and to comply with the law	Assess the risks to your employees from noise at work; take action to reduce the noise exposure that produces those risks; provide your employees with hearing protection if you cannot reduce the noise exposure enough by using other methods; make sure the legal limits on noise exposure are not exceeded; provide your employees with information, instruction and training; carry out health surveillance where there is a risk to health.[1]	Hearing protection was reported to be widely available for use on this project as well as being standard practice on other sites served by subcontractors. There was variation, generally individual, in whether workers favoured disposable ear plugs or 'proper' defenders. For noise generated by a particular task, hearing protection would reportedly always be worn, with certain tools labelled with the noise output, or with certain tasks (such as 'metal on metal') being known as problematic. Other noise exposures related to work done by colleagues, typically those working in other trades –workers reported that they would 'just know' when the level was loud enough to need protection. For some noisy tasks, subcontractors talked about setting up noise exclusion zones, but these did not appear to be widespread on site. Noise monitoring was reportedly undertaken by a small number of contractors but did not appear to be widespread.	Much noise exposure was reported as relating to work done by others, which made it difficult for workers to judge noise levels accurately and what protection might be necessary. Such exposures might be variable, short term, or recurrent. In these cases, workers often considered it unrealistic to wear protection.

[1] The Control of Noise at Work Regulations 2005

	Key requirements on DNRC	Legal requirements and good practice	Range of 'usual practice' reported	Reasons why best practice is not always the norm
HAVS	There was a requirement to reduce vibration exposures at source and to comply with the law	Assess the vibration risk to your employees; take action to reduce vibration exposure that produces those risks; decide if employees are likely to be exposed above the: daily exposure action value (EAV) and if they are, introduce a programme of controls to eliminate risk, or reduce exposure to as low a level as is reasonably practicable; daily exposure limit value (ELV) and if they are, take immediate action to reduce their exposure below the limit value; make sure the legal limits on vibration exposure are not exceeded; provide information and training to employees on health risks and the actions you are taking to control those risks; Carry out health surveillance (regular health checks) where there is a risk to health[2].	Vibration management based on manufacturers' exposure data was reported as standard practice by almost all of the interviewed subcontractors, on this project and on others they worked on. They advised that workers knew how long they could use particular tools for (typically before they reached the HSE EAV, which equates to 2.5 m/s^2), and the workers interviewed confirmed this. Where a job took longer than the 'permitted' time, work would be shared between different team members. Several contractors said that vibration levels would influence the tools they purchased – they would consider the vibration levels to ensure that the job could be done safely (or that the worker could continue on the job for long enough to complete it) and would buy good tools specifically for this reason.	All companies seemed confident that they were managing HAVS to a good standard. Almost all appeared confident that they had good knowledge. However only one interviewee mentioned the importance of good maintenance etc of tools to reduce risk.

	Key requirements on DNRC	Legal requirements and good practice	Range of 'usual practice' reported	Reasons why best practice is not always the norm
Manual handling	There was a requirement to eliminate manual handling at source where possible; to handle kerb stones mechanically; and to avoid specifying blocks >20kg.	Avoid hazardous manual handling operations so far as is reasonably practicable; assess any hazardous manual handling operations that cannot be avoided; reduce the risk of injury so far as is reasonably practicable.[3]	Manual handling was identified as a substantial risk and a potential or actual source of harm for many of the workers. Joiners, scaffolders and ground workers all commented on the physical demands of the job. They took the risks seriously and there were lots of comments on having had manual handling training repeatedly over the years. There was also reference to the use of shared lifting for heavy loads (such as 65 - 75kg doors). Lifting aids such as cranes, forklifts etc. were also widely used. Many said they routinely used such aids on other projects although some commented that the current site was particularly good in respect of their availability. A small number of interviewees talked about how they planned or designed work to reduce risk from manual handling – using lighter weight scaffolding poles or shorter lengths of plaster boards for example.	Examples were given of site design features (here or on other projects) which increased manual handling risks: sites which had failed to include lifts, so that doors etc had to be carried up the stairs; rubbish down the stairs; tools carried long distances from the car park. Also, there was reference made to tools designed to help which actually made the job take a lot longer so that workers would be unlikely to use these.

[2] The Control of Vibration at Work Regulations 2005
[3] Manual Handling Operations Regulations 1992

	Key requirements on DNRC	Legal requirements and good practice	Range of 'usual practice' reported	Reasons why best practice is not always the norm
Mental health	The project had an Employee Assistance Programme in place, provided free of charge to all working there. Mental health first aid training was provided to ten individuals, most of these were employed by subcontracting companies.	There is a legal obligation to carry out and act on a risk assessment (required under the Management of Health and Safety at work regulations). The Stress management standards are an HSE tool which can assist those carrying out this risk assessment.	Some workers interviewed knew about the EAP, some did not. Those who know of it considered it a good thing; however, utilisation of the EAP was extremely low. There was no evidence of impact relating to MHFA training.	There was commentary that "*Obviously not a lot of males do like talking about their feelings"* (Frontline worker) – and EAP was seen as being a good way forward, but there was also acknowledgement that it might not be well used. The low utilisation of the EAP was likely to be in part related to the high turnover of worker on the project and the difficulties of promoting the service to companies which joined after its initial launch. There was also some evidence of lack of trust in the confidentiality of such a service. Many MHFAs left the project relatively soon after training, which will have limited their potential for impact on this project although they may ha been able to use their skills on future jobs.

	Key requirements on DNRC	Legal requirements and good practice	Range of 'usual practice' reported	Reasons why best practice is not always the norm
OH provision – health assessments and medicals	Health assessment was available to subcontractors at a favourable rate through a specified OH provider. Health assessment was to be provided free of charge to self – employed workers. Drug and alcohol testing was carried out at pre-employment for all high-risk workers and for a random selection of other workers.	Health surveillance is a requirement where risk assessment shows it to be necessary e.g. due to exposure to dust, noise or hand arm vibration. Fitness for work checks are required or recommended for specific types of work such as driving an LGV (mandatory) or operating a crane or forklift (recommended). Under the Data Protection Act and its replacement, the General Data Protection Regulations, health data is considered 'sensitive' and should only be collected and processed under specific circumstances or for particular reasons.	A number of interviewees reported that medicals had been a requirement on other larger projects they had worked on, but these were clearly not standard practice. For many workers this was their first workplace health assessment. Where companies did carry out medicals or health checks, these were typically for 'safety critical' work e.g. plant, cranes, and did not appear to include any ongoing health surveillance. Some companies carried out other health checks in their organisations. This provision was more advanced where workers were exposed to high risk materials such as lead or asbestos. However, where companies had provision for high risks they did not necessarily extend this to health checks for other workers. Several companies reported doing health checks in house i.e. workers questionnaires which were assessed (e.g. by HR) to ensure fitness for work. In some cases, this included some health surveillance (e.g. , review by a responsible person as recommended for HAVS) but fell short of full surveillance (as it did not include audiometry or lung function testing); seeking detailed medical information which might be assessed by someone other than a health professional is very poor practice.	Reasons given for not fully engaging with health assessment included logistical issues such as booking a mobile unit to come to site, and concerns around CBH (section 3.4.5). For other projects, the need to arrange appointments for a geographically spread workforce was also a challenge. Cost was a reason given for not doing health assessments more widely, particularly in the absence of consistent standards across projects. Lack of knowledge was a significant contributor to companies not doing health checks adequately, with poor understanding of the legal requirement for health surveillance. Some worker reluctance was reported anecdotally but most workers valued health assessments. A few interviewees considered that it was inappropriate to do health checks beyond those very specifically linked to work (e.g. related to particular toxic substances) as it was not the employer's business.

	Key requirements on DNRC	Legal requirements and good practice	Range of 'usual practice' reported	Reasons why best practice is not always the norm
OH – wider provision	Workers were asked to disclose health conditions to the OSH team at induction to enable any necessary risk control measures to be put in place An OH adviser was in post for around 10 months during 2017. She engaged with contractors' supervisors and project managers and assisted them in arranging health assessments. She provided support to enable them to do risk assessments for those with health conditions and worked to enhance their understanding of the cost effectiveness of OH interventions; and that the OH role extended beyond health checks such as blood pressures and cholesterol. She also supported a small number of workers who failed drug and alcohol testing but were subsequently able to return to site following referral and treatment.	Adjustments for workers with health conditions are a requirement of the Equality Act. There is no specific requirement for OH provision beyond statutory medicals but it is recognised as contributing to good practice.	The process of carrying out formal risk assessment for workers with health conditions was new to many on the project and generally valued. However, there were many examples of informal arrangements made by supervisors and managers to accommodate workers with health issues. Where guidance was needed on a worker's fitness to work, most subcontractors would send them to their GP although a small number engaged an OH provider to advise in such cases. Where health conditions were identified which could impact on work ability, common practice was to refer a worker to their GP.	Many GPs do not have specific expertise in Occupational health; they may not recognise conditions as being work related or may not have the skills to advise on appropriate work adjustments. Those interviewed for this research appeared to be relatively enlightened and sought to treat their workforce compassionately even where they were not direct employees. However, it was reported that 'other' companies might be less supportive of workers with health problems.

3.2. Has this influenced behaviours?

A number of interviewees said that they would take elements from the project to future work. Some of these were practical, safety-based interventions such as Safe Starts, weekly meetings, and training more supervisors and senior managers to a recognised standard: these have potential to influence health risk management as well as safety. Additionally, there were some specific health measures which were identified as having legacy impact.

3.2.1. Occupational health assessments

This was the most visible legacy from the project. Several companies which had not done these previously said they would now continue with them; or, where they were doing this to a limited degree had used the project to drive the process forward internally.

> *Yes, so we always had an ambition to carry out health surveillance, it kind of fell by the way side a little bit and this job helps us push that, it prompted our thoughts a little bit more.*
>
> *Supervisor*

> *It's something that we were already in the process of doing before we went on DNRC. We did push it to get it done faster. We do a basic health screen when we start a new employee, which is a question and answer scenario for a new employee. But about twelve months ago, before we started on there, we knew that it needed to go to the next level, which is actually to get a proper official health company in. And we have done that with all of our guys.*
>
> *Health and safety professional*

3.2.2. Wider OH interventions

Some had also learnt about risk assessing and supporting individuals with health conditions, largely as a result of discussions with the OHA on site.

> *She helped me do a risk assessment for a diabetic guy that we took on. Which I thought was pretty good actually. Because she went through all the requirements that we should be putting in place. Like where he should have his Insulin and clean environments and all of this sort of stuff and let him have his breaks.*
>
> *Supervisor*

Companies which didn't have access to specialist OH advice were generally still familiar with the concept of making adjustments for workers with health conditions, and often did it as a matter of course, with guidance from the GP where necessary. Such adjustments were generally reported as being usual practice regardless of whether workers were directly employed, self-employed or subcontracted (although there was also acknowledgement that for agency workers on smaller projects, this might not be the case).

> *If someone has an incident or if somebody has done something at work or outside of work, we would generally bring them back in and let them do a different task and ease him back into it.*
>
> *Supervisor*

They're always conscious that the guys have got families etc. I think one of the guys…. had to have a procedure done on his ankle, so he was in an air cast afterwards…..they then took him into the office. He couldn't do anything, so he worked in the office for six weeks.

Supervisor

3.2.3. Health risk management

Most companies reported that the standards required by the project in terms of managing health risks were similar to their usual practices. However, there were some cases where they had purchased new equipment or adopted new habits to meet the requirements. This had given them an insight into the usefulness and benefits of such tools or measures and increased their commitment to use them elsewhere. The fact that they had now made a financial commitment increased their motivation to do so. This was reported in the context of manual handling, and also in relation to dust management.

One thing that we have used here a lot is things like trolleys, more tele-handlers, so more use of mechanical aids than we have ever done before to try and reduce or eliminate…..so we have adopted that elsewhere.

Supervisor

First time, it's a full extraction site…….Moving on the next job we think is full extraction as well, so that is happening in the industry now ……..we had to offer like a pre-quote, and we said, we are now fully extracting, yes.

Supervisor

3.3. What influences the adoption of good practice?

Interviews illustrated that there is scope for good practices to be adopted by individual workers; by companies; and by the industry as a whole. There are overlaps between these, but also particular factors that influence the likelihood of adoption in each case.

3.3.1. Individuals

Improved practices for individual workers were generally a consequence of increased knowledge and understanding of risk. Seeing good practice helped them understand what was possible and this, in some cases, was likely to influence their future behaviours – even if they were working on projects where such practices were not mandatory. At the same time, there was an element of 'habit forming' – working in new ways become the norm, so that they did it automatically. Many frontline workers interviewed were well informed about risk; they were also highly motivated to take care of their own health.

To start with there was quite a lot of resistance to it. ……. But the guys are pretty much institutionalised now…..it was changing the way that the guys think and their mentality and the way they approach things.

Supervisor

Even when I'm doing something at home, if I'm doing something…. I will still get my dust extraction out.

Frontline worker

So… you learn from these big contracts…when you go on another job, you're like, oh, well that was there for a reason, maybe I'll take it on to another job.

Frontline worker



Figure 2 Once workers become used to working with on tool dust extraction, they are more likely to use it by choice on future jobs

Those in more senior or professional roles also learnt and transferred good practice to other jobs.

I think the Olympics was the one that really, really brought it home because they had a massive culture on occupational health as well as health and safety. And it really did bring it home….Then if you are doing it, it becomes a habit, if you get a habit then, like I have taken the habit from the last job to this one.

Health and safety professional

Some interviewees could see the benefits of good practice but would accept poor quality jobs out of financial necessity or would just go along with whatever was the norm on a project.

DNRC they made us have the hoover, on the side of the saw where here, they've only got a dust bag, so it collects into the dust bag and the dust bag will get full. Then we empty the dust bag and then it blows all over the place again.

Frontline worker, now working on another project

Obviously with this company, you wouldn't have an issue, but if we worked for another company, say, you would more than likely just knuckle down and get on with it because they'd just replace you with someone waiting behind you. ……. You would like to turn round and say to them, "Oh, that isn't right," and everything like that, but, nine times out of ten, they'd turn round and say to you, "Well, there's the door."

Frontline worker

We come here to earn money. Basically, at the end of the day, I'm coming to earn money to feed the family, so if they're saying that you can't do that, reduce the time on using that machine, then obviously it's reducing your earning potential, isn't it?

Frontline worker

There is, therefore, evidence that improved knowledge is likely to increase the likelihood of adopting good practice – described as 'trickle' in the literature. However, this by itself does not guarantee good practice for workers in companies which do not value or embed such principles or where there is a potential impact on their ability to maximise their pay.

3.3.2. Companies

Where companies adopted good practices, there were a number of factors which contributed to this.

Company readiness

Companies which had already started making changes were likely to adopt further good practices which they saw as an additional small step in the direction they were already travelling. Often this tied in with a specific goal of improving OSH because the company was getting larger.

Responsibility to the workforce

Companies also reported that they were improving their health and safety arrangements to fulfil their responsibility and duty of care to their workforce.

Business benefit

Some companies reported that they developed their health and safety for business reasons. For some this was a recognition that higher standards could save money.

We found that definitely the mechanical aids, things like tele-handlers, hoist trolleys, one is the obvious health benefits to our guys, but again they have commercial benefits that they speed things up……. I think that was realised here that it would cost up front but long term we would save a lot more than we spent.

Supervisor

So there is a benefit, but from a selfish company point of view, there is a psychological benefit because they feel they are being looked after. And we want them to feel that way because there is commercial benefits, safety benefits and we do want to look after the people that work for us.

Supervisor of company who paid for physiotherapy for workers

For others, it was because they wanted to be seen as a leading company; or because they wanted to do further work on prestigious projects.

We want to be better or a leader …… we looked at the business and thought, where are we going, how do we grow? And we looked and thought, well we want to be working for the blue chip companies, mainly because we are more likely to get paid….. it's been a good move.

Company Director

3.3.3. Industry

There was evidence of changing industry norms with regard to the management of health risks as discussed previously (section 3.1.2). This was particularly mentioned in relation to the management of dust and musculoskeletal risk. This largely related to increased knowledge and awareness and changes in attitude but improved tool design had also had a substantial impact.

> *Obviously, these drills now are a lot more powerful, you have to put less effort for the job to go through and stuff. So that's less wear and tear on your body.*
>
> *Supervisor*

> *Obviously dust, so we have to use full extraction kits and all sort of saws….. most joiners have it now, it's been around and about for the last 10 years.*
>
> *Supervisor*

> *Yeah, it's got like some sort of suspension system in it or whatever it is……It's massive changes in technology. But you pay for it. And again, it comes down to what people can afford to pay for these things.*
>
> *Supervisor*

Such innovations were reported to be beyond the reach of many smaller organisations. However, their adoption on projects such as the DNRC and by companies which seek to work on them, is likely to influence their wider use through worker exposure and experience. In the longer term this is likely to influence the organisations further down the hierarchy as such new developments become the norm. This will leave only the worst companies underdeveloped, those which perhaps will respond only to punitive measures by enforcement agencies.

> *[on a previous project] you could walk round in your pants if you wanted to and no one was going to say anything. But to be honest, they did have a visit from the HSE while we were there and it was mainly the, the main thing was dust suppression, dust was a big thing.*
>
> *Supervisor*

3.4. What are the barriers and disincentives to good practice?

In the interviews, a number of factors were identified that made it difficult to implement good practice in managing worker health, even amongst individuals who appeared highly motivated. In some cases, this reduced the extent to which 'good practice' was implemented on the current project. In other cases, these factors influenced whether or not companies and individuals would take good practice with them to future projects.

3.4.1. Lack of knowledge

One of the biggest barriers to good practice in relation to OH risks was a lack of knowledge – individuals at all levels made decisions based on an incorrect understanding of either the risks involved or the legal requirements. For example, some interviewees had:

- a general lack of understanding about what health surveillance is, and the fact that it is a legal requirement in some circumstances;
- a lack of understanding about how sensitive health data should be managed;

- a belief that asking the workforce to complete health questionnaires was an adequate and effective way of assessing health in relation to dust;
- a belief that dust bags were as effective as on-tool extraction to reduce dust exposure;
- a belief that a mask was the best way of managing dust;
- poor understanding of the importance of face fitting.

And it's not that bad a contaminant is it, stone? Apart from silica, because it's just dust isn't it, it just blends into the soil, it's not like it's a chemical or anything like that, it's a natural contaminant, you know. Extraction doesn't really work. It cuts it down, but it doesn't eliminate it. That's where you're back to your masks, you know, you know you're hundred-percent there.

Frontline worker

You can get away with stubble I reckon.

Frontline worker

But my beard what I've got now, is what I passed with a face-fit mask, that were the effect of it. They act like a filter in effect.

Frontline worker

This lack of knowledge was acknowledged as being a wider industry issue, for example for OSH professionals.

My job title has been health and safety manager for the last twenty-seven years, but I would say the health side of it has been very limited in the past. It's always been safety related.

Health and safety professional

Particularly from a legal standpoint, the employers' responsibility, I wasn't aware of that side of things….I mean it's, it's a few years since I did my NEBOSH course, so I don't know if that's something that's included now, but it certainly wasn't.

Supervisor

3.4.2. Contractor interaction

The high number of contractors and trades working on a shared site increased the likelihood of conflict between them; and of health hazards from one group affecting others. Many interviewees commented that their main exposure to health hazards arose from the activities of others, particularly noise and dust. Such exposures were unpredictable and it was difficult for workers to quantify the risk. The only protection available to workers in such cases was PPE.

Then the other hazard they've got is other trades, particularly bricklayers. They leave an absolute mess on the boards. So the mortar…that they're using for the bricklaying spills all over the boards. It'll dry off and then it becomes all flaky and dusty.

Health and safety professional

It's like yesterday, they were knocking a wall down and the blokes working down the far end of the building, the wind was blowing through and the

people knocking the wall down were all kitted up but the blokes just down the corridor were just stood doing there their normal work and all the dust was blowing down towards them.

Frontline worker

There was willingness amongst a number of managers and professional to raise these issues and seek resolution but this was not always successful.

3.4.3. Nature of the workforce

Many companies on the project used a high proportion of subcontract, self-employed or agency workers. This reflects common working practice in the industry:

- some companies generally required their workforce to be self-employed/subcontractors to allow the organisation to work more flexibly;
- others reported that being self-employed was a preference of their chosen workers;
- some companies were using more subcontractor and agency labour than usual due to the size of the project, and also because the client was keen that they used as much local labour as possible;
- additionally, subcontracting companies were brought in for short periods of time to provide specialist services.

The consequent relatively high turnover of workers on site had an impact on training, safety culture and the costs and provision of health assessments.

The difficulty is if you have got a specialist gang coming in just for one week they're unlikely to commit to it [additional site based training] if nobody else in the industry requires it.

Health and safety professional

We don't know what the background is, where they've come from, what sort of upbringing they've had, or what sort of past safety training. It's very difficult……the development of a safety culture with a workforce that's transient is not easy.

Health and safety professional

The problem that we have with manual handling is we are supplying, or we are using agency labourers so, ideally, we should be giving them manual handling training. I suppose I'm just presuming that they have got it and we don't know if they have and that's something we would have to go back to agency with and say to them, if you supply us with labourers then they do need to come manual handling trained.

Supervisor

If something like the crane driver comes through an agency but then we will ask for a medical for them, but labourers and stuff like that, they don't, agencies tend to be a short-term thing, so we wouldn't typically in a – unless it was a case that they were going to be there long term, it's unlikely that they'll be picked up on the medicals.

Supervisor

However, there were also examples of this not being an issue - many companies used the same subcontractors or self-employed workers regularly or were actively increasing the number of workers they employed directly.

> *That's why we're trying to be a bit more streamlined with our supply chain now. We're trying to work and build up relationships with contractors that do know people, that have worked with people long-term.*
>
> *Health and safety professional*

> *A lot of [other companies] have subbies but we tend to find that if we maintain and retain we get a better, or we can provide a better service that people are more loyal to and for all the benefits that we talked about, you know, people hang around. And, you know we can put money into training and developing people if they are going to stay with us, the other route it doesn't really happen and they get left behind, they might not realise it but they do.*
>
> *Supervisor*

Such companies would consider extending their health arrangements to workers who were not directly employed or might accommodate any health restrictions they had when allocating work. It was also standard practice to provide appropriate PPE and sometimes tools to workers on the project, regardless of their employment status.

3.4.4. Practical barriers to good practice in risk management

In some cases, workers and companies were aware what was considered to be good practice but found it difficult to put into place for practical reasons. This was particularly a challenge in relation to dust control - wearing dust masks was reported to make goggles steam up; and using on-tool extraction increased the manual handling demands due to the need to transport ventilation units, or to manipulate a tool with an extra nozzle attached.

> *It depends where you're working. If you're working in one place all the time, then you'd have one, you know, keep the place tidy. But if you're up and down ladders, it's a bit cumbersome to be carrying all that.*
>
> *Supervisor*

> *I mean it does get more of the dust up, but it's just awkward to use….. you've got a workbench and you've got that, when you lean, pulling against it, it [gets] caught on it, you know.*
>
> *Frontline worker*

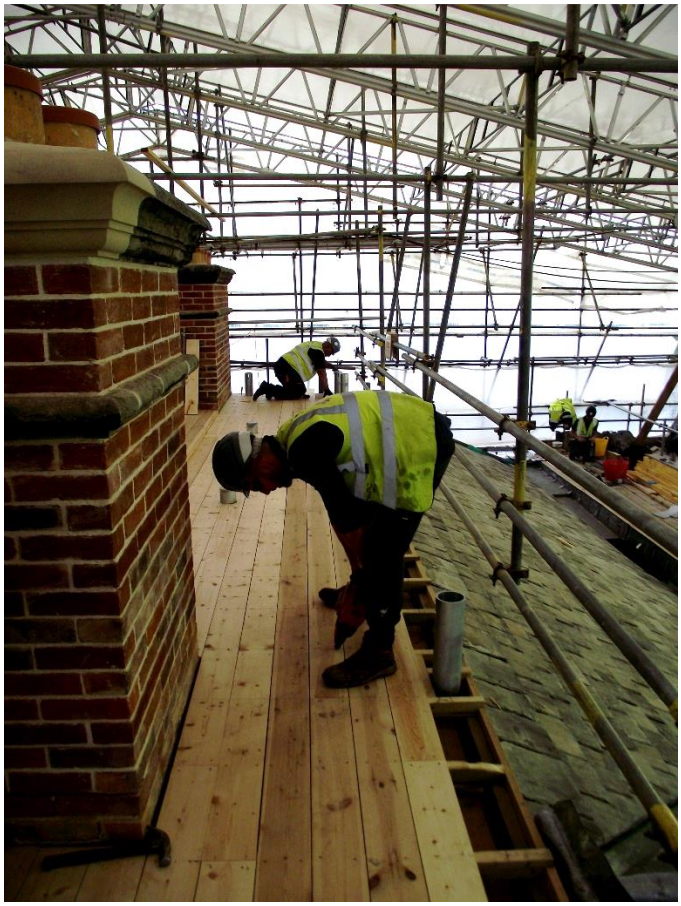


Figure 3 Manual handling and poor working postures are an ongoing challenge in construction

3.4.5. Practical barriers to good practice in OH management

Several factors made it difficult to provide good OH services even where companies were motivated.

The first was the geographical challenge of getting site-based workers seen by a health professional and the associated need, for example, for mobile facilities.

The second challenge related to the availability of suitable providers. For example, one company which had a good provider had difficulty getting enough clinical time to cover their needs. Another had trouble finding a provider that was affordable within their geographical area. The presence of a dedicated OH professional on site was recognised by the HSE during this project as a positive intervention and this contributed to skills development by the contractors and the effectiveness of the OH health assessment/ medical process. However, there was a delay in recruitment of this professional at the start of the project which may reflect the wider issue of limited availability of qualified OH professionals. (See section 4.2.6.)

A third challenge arises from the difficulties of managing health data for a transient workforce. To address this, it was a requirement for all companies on the project to register with CBH, so that data could be uploaded for access by workers through their future OH providers. This process caused upset due to the costs of membership to the employer , the administrative load of sharing data and the reported refusal of some workers to have their data managed in this way. Additionally, there were problems within CBH itself (which changed owners during the early stage of DNRC construction)

which prevented some worker data from being uploaded and also made it difficult to manage recalls and referrals.

3.4.6. Cost issues

Some companies, as discussed in section 3.3.2., were comfortable that increased costs were offset by business benefits. Others accepted the increased costs because of the health benefits for their workforce but recognised that it limited their ability to compete on price for smaller projects.

There was a widely held belief that cost was a significant barrier to smaller projects and companies adopting better practices.

> *In order for them to compete against each other they have to cut corners….*
> *we have lost a lot of work, because we price it right.*
>
> *Supervisor*

3.4.7. Disagreement in principle with some elements of 'good practice'

There was a lot of evidence from workers and organisations showing them to be highly motivated to embed good practices, and highly motivated to protect themselves. A much smaller number of comments were made about workers who were reluctant to adopt good practice because they were lazy, or were unwilling to change their behaviours. This included a small number of interviewees who held a view that health and safety arrangements in general went too far.

There were also some who had concerns about health assessments and whether it was appropriate for organisations to be taking too much interest in individuals' personal lives.

4. Conclusions - what is the way forward?

4.1. OH practices on major projects

The management of OH is developing in construction but continued effort and interventions are needed to ensure that improvements continue. Some of these can be driven by major projects: several companies on this project had made or were making changes to their practices as a direct response to their experience on the DNRC. Others had already made such changes as a consequence of work on other large projects. There was therefore strong evidence of a 'trickle-down' effect, that raising standards on major projects has an impact which spreads down the supply chain and establishes new norms. There are several steps that large projects should consider to support this development.

4.1.1. Set and enforce high standards

Companies with the scope and aspiration i.e. those for whom such standards are 'within reach' will rise to the expectations. Additionally, the workforce will be exposed to this level of practice, understand what is achievable and adopt good practices as habit. In some cases, this will enable them to encourage good practice elsewhere or at least, to decline to work in unhealthy situations. It is essential that these expectations are made clear at the tender stage to ensure that bids are priced to take this into account.

4.1.2. Set expectations for the provision of health assessments

Setting clear expectations that the supply chain will carry out worker health checks gives companies a motivation and an opportunity to address an issue that many find particularly challenging: taking these initial steps makes it more likely that they will adopt this as a longer-term practice. This could include expectations on labour agencies to arrange health checks for the workforce they supply. Again, clarity of expectations at the tender stage is crucial.

4.1.3. Employ suitable specialists

Occupational health clinicians such as nurses and physicians can educate site managers and supervisors to ensure that provision isn't limited to medicals and health checks but can include broader interventions to support the workforce and make adjustments for those with health issues. They can also provide specialist expertise regarding the management of hazards such as noise, dust and vibration.

The employment of an embedded OH adviser, who was a qualified nurse, on this project contributed to a number of positive outcomes and was identified as an example of good practice by the HSE.

Expertise on health risk management is also the province of occupational hygienists who, '…control risks to health, by designing out hazards and applying engineering controls to reduce exposures to a minimum' (BOHS, 2018). For example, increased use of noise and dust monitoring by such specialists would highlight those areas where better controls are needed. Involving them more strategically and also in the design phase of the project would allow early identification of risks which could be designed out or otherwise mitigated.

Occupational hygienists were employed on the construction of the London 2012 Olympic Park between 2005 and 2012. Since then there has been growing recognition

of what they can bring to construction but they are not widely employed in the industry except on very large projects such as Tideway and HS2.

4.1.4. Actively develop knowledge in the supply chain

Projects which employ specialists such as OH advisers and occupational hygienists can share this expertise to increase the knowledge of others such as the operational workforce and the managers in smaller companies.

4.1.5. Manage the interactions between contractors

It was commonly reported in this project that workers were exposed to health risks by the activities of others. Active management of the interactions between contractors is essential. Options to enable this include careful work planning so that particularly noisy or dusty work is scheduled for times when other workers are elsewhere; and separation of work from workers, e.g. through the use of cutting stations, noise exclusion zones and noise barriers.



Figure 4 Cutting stations can reduce noise and dust exposures to colleagues working nearby

4.2. What else is needed

Embedding good practice on major projects is insufficient by itself: companies working on the DNRC are typically those which are already aspiring to good health and safety practice. To achieve higher standards elsewhere in the industry, particularly with very small companies, other interventions are needed. Some of this will come from good practice trickling along the supply chain, but a general increase in the expertise in the industry is also important.

4.2.1. Consistency within the industry

Many large clients require their subcontractors to demonstrate a minimum OSH standard through completion of prequalification documentation such as PAS 91 or accreditation with schemes such as CHAS and Achilles. It is important that such schemes consider health to the same level as they do safety, setting high standards for health risk management and the provision of health checks where required.

4.2.2. Ongoing training commitment

Being knowledgeable was a key contributor to the workforce making good decisions about the management of health risks; at the same time, incorrect or incomplete knowledge underpinned some poor decision making. It is therefore essential that the overall level of expertise and knowledge continues to be developed.

The typical qualification for OSH professionals in the industry is the NEBOSH Certificate in Construction Health and Safety, although those on larger projects and working independently might be qualified to a higher level e.g. NEBOSH National Diploma in Health and Safety. Within the construction certificate, health risks are addressed to a relatively low level. For example, the time allocated to radiation, stress, vibration and noise is only five hours in total (compared to seven hours for working at height and six hours for fire and explosion).

Increasing the time spent on the legal and practical issues around health management within such training would increase the likelihood of practitioners being confident and competent in tackling these. Attendance at specific OH courses for managers and OSH professionals is another way of increasing understanding and expertise,. A range of these are available including include the BOHS “Certificate in Controlling Health Risks in Construction” which focuses on management of health risks and is aimed at managers and supervisors; the IOSH “Managing Occupational Health and Wellbeing” course which targets those supporting workers with health issues; and the CITB “Occupational Health Stay Well At Work” course. Upskilling OSH professionals is particularly important where they do not have access to specialist OH resource. Education is also important for others in the construction process such as architects, designers, surveyors and those working in procurement, so that they understand the impact they have on the health of the workforce.

4.2.3. Improved training materials

Training is essential not just for managers and OSH professionals but also for the wider workforce, and again there are many resources available to facilitate this. It is important that companies and providers work together to develop participative and innovative training tools rather than relying entirely on Toolbox Talks. This might include presentations from construction workers who have suffered work-related ill-health, improved audio-visual resources, and tools for experiential learning such as the LUSKInS wearable simulations.



Figure 5 The LUSKInS simulate the impact of HAVS and dermatitis, and have been used to good effect with construction apprentice and workers

4.2.4. Increased education regarding OH/medical obligations

There is a need for education regarding the practicalities and legalities of health checks, including the correction of misinformation. Small employers need to understand clearly what they should do (carry out legally required health surveillance where risk assessment shows it to be necessary; make adjustments for workers with health problems, in line with the Equalities Act); and what they should not.

This could be addressed within the courses mentioned above: it is particularly important for decision makers such as company managers and health and safety professionals.

4.2.5. Processes for sharing OH data

The need for a structured way of managing worker health data in construction is widely recognised. Following research which was launched in 2001, and pilot work from 2004, a proposal was made for a centralised database, similar to the CSCS (Construction safety card scheme). Constructing Better Health (CBH) was formally established in 2007 to meet this need but faced ongoing challenges. It is now owned by B&CE (Building and Civil Engineering) who are seeking to launch an OH surveillance framework to support a consistent approach across the industry. They are also developing a process for workers' health data to follow them through the industry whilst still clearly belonging to the individual.

Establishment of a robust mechanism such as this is essential to underpin future improvement in OH in construction; to be successful, it will need support from all the key stakeholders including OH providers and major clients and contractors. Commitment from the major industry bodies such as the Health in Construction Leadership Group, Build UK and Working Well Together could be a key part of this. Such a process could then be adopted as a minimum standard, operating alongside the current requirement for each worker to have a CSCS card.

4.2.6. Availability of specialist resource

It was discussed in sections 4.1.3 and 4.1.4 that major projects should employ specialist resource, such as OH advisers, OH physicians and occupational hygienists to improve their own arrangements and that of their supply chain. However, this will be impossible if sufficient specialists are not available. There is a UK shortfall of specialist practitioners in OH (not specific to construction), estimated at over 1000 OH physicians, 1000 occupational hygienists and 10,000 OH Advisers/nurses (Harrison et al, 2016). There are similar (or greater) shortfalls for other specialists such as ergonomists, physiotherapists

and psychologists. This will need to be addressed if there is to be sufficient pool of practitioners for construction to recruit from.

4.3. Closing thoughts

Many of the small and medium sized companies which participated in this research were trying hard to manage their health risks. Their workers were motivated to take care of themselves and were often well-informed.

It was apparent that the 'trickle down' process that has been observed for safety practices applies to health also – worker and companies learn from being on large projects and take that expertise and those expectations with them. Additionally, the need to achieve certain standards in order to bid for such work is clearly a major driver for good practice in SMEs. It is therefore essential that major projects such as this continue to set and consistently enforce the highest standards of occupational health.

The biggest area of impact on this project was for OH health assessments. This is an area of practice which has not yet been widely embedded across the industry. Partly this is because it is challenging to do, can be expensive, and can be hampered by the limited availability of suitable specialist resource. Additionally, many of the megaprojects which led the way in this area such as London 2012 and Heathrow Terminal 5 focussed on providing services free at the point of use for all workers, regardless of employment status. Consequently, the subcontracting companies did not need to take any ownership for the provision of services. The DNRC, by comparison, established a process which was specifically designed to encourage SMEs to take the services forward for themselves. Although this met with its own challenges, it was a good model in principle which other projects of this size could follow.

The issue of cost was discussed frequently during this research. Good management of occupational health should reduce worker ill-health in the future with social and financial benefits for all parties. However, it would be naive to ignore the increased costs that come with good practices in the short to medium term. Carrying out health checks incurs direct costs (paying for the service) and indirect costs (e.g. releasing workers for time to attend appointments, modifying work to take account of newly diagnosed health conditions). Reducing worker exposures through the provision of high quality tools involves additional costs which may or may not be offset by improved efficiencies.

These changes will be particularly difficult to embed in smaller projects with lower margins and/or unenlightened or disinterested clients. They are also potentially problematic in the context of an industry model which seeks to minimise construction costs (HM Government, 2013). Continued drive and commitment on major projects is essential but will need to be supplemented by highly innovative technological solutions and a continued robust legal enforcement of good practice.

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