

## Summary Report

### Reducing Prevalence of Occupational Lung Disease in Great Britain

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## 1. Context

### 1.1 Background

The UK's health and safety standards have improved greatly since the 1970s.<sup>1</sup> However, each year workers are still exposed to health and safety risks as a result of their work with an estimated 1.3 million people suffering from an illness that was caused or made worse by their work in 2015/16.<sup>2</sup> The Health and Safety Executive (HSE) is committed to further improving standards and outcomes for UK workers.

HSE has identified occupational lung disease (OLD) as one of its three priority health areas in its 2017 Strategic Plan. OLD is estimated to result in approximately 12,000 deaths each year and 18,000 estimated annual new cases of self-reported breathing or lung problems caused or made worse by work. Estimates from the 2013/14 to 2015/16 Labour Force Survey indicate that around 36,000 people who worked in the previous year (and 141,000 who had ever had a job) reported lung or breathing problems that were caused or made worse by work. This is estimated to result in 400,000 lost working days annually.<sup>3</sup> OLD is generally caused by exposure to a wide range of workplace agents, including dusts, fumes and vapours, with asbestos and respirable crystalline silica (RCS) being particularly substantial contributors to the burden of lung disease. The delayed nature of some disease states further complicates recognition of the problem.

In 2017, HSE commissioned Kantar Public to carry out research to better understand workplace contexts in relation to OLD, and interventions that will increase the use of mitigations. HSE wanted to:

- Understand current practice and behaviours of workers and employers who are at risk of OLD
- Explore why they are behaving in this way
- Understand how practices, behaviours and drivers vary across varied six sectors
- Understand which types of employers, workers or businesses may be most open to changing practices for the better
- Understand the most effective and efficient model for interventions

HSE asked Kantar Public to focus on six sectors where the incidence of OLD and the potential risk of exposure are particularly high. These were construction, wood working, stone working, steel welding, bakeries and quarrying.

## 2. Approach

### 2.1. Method

HSE opted for an exploratory qualitative approach to this research to uncover the underlying influences on behaviour, not all of which are consciously understood by participants. Research took place over four phases:

**Phase 1:** Literature review (July '17): Kantar Public reviewed a range of existing literature and research about OLD, and spoke to HSE expert stakeholders. This informed the design of research tools and ensured researchers were aware of the context in which workers and employers operated.

**Phase 2:** Hour-long depth interviews with employers and triads with workers (Aug '17-Jan '18): Kantar Public conducted a total of 16 employer depth interviews and 19 worker triads.<sup>4</sup> Interviews were designed to gain insight into worker and employer understanding and awareness of health and safety

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<sup>1</sup> <http://www.hse.gov.uk/statistics/history/historical-picture.pdf>

<sup>2</sup> <http://www.hse.gov.uk/aboutus/strategiesandplans/health-and-work-strategy/health-and-work-strategy.pdf>

<sup>3</sup> <http://www.hse.gov.uk/aboutus/strategiesandplans/health-and-work-strategy/occupational-lung-disease.pdf>

procedures in general; their awareness and understanding of lung health and mitigations; and use of mitigations and what drives good or bad practice.

**Phase 3:** Video case studies (Sept '17-Dec '17): Kantar Public conducted 13 ethnographic observations across each sector, providing additional insight and evidence of non-conscious behaviour and contexts which influenced behaviours. This allowed us to triangulate between participants' stated behaviours and observed behaviours.

**Phase 4:** Co-design (Feb '18-Mar'18): Kantar Public conducted two creative co-design sessions with HSE stakeholders, and workers and employers from four of the six sectors: bakeries (session one) and steel welders, stone and wood workers (group two). The aim was to develop interventions to increase the use of mitigations and to develop products or solutions which take into account the needs and priorities of different audiences through collaboration.

## 2.1. Sample

In total, 56 workers and 16 employers took part in the insight phases of this research (Phases 2 and 3). Participants came from across the six sectors (quarrying, construction, stone work, wood work, steel welding and bakeries) and from businesses in England, Scotland and Wales.

In total, 8 HSE stakeholder and 16 manufacturing sector workers participated in co-design (Phase 4).

## 3. Main findings

This report summarises workers' and employers' views and attitudes on health and safety (3.1), factors which drive their behaviour in relation to OLD (3.2), variations by sector (3.3), and the implications of these findings for HSE when considering how to increase the uptake and impact of mitigations (3.4). It draws on insights from all four phases of research.

### 3.1. Perceptions of health and safety

With the exception of some stone and quarry participants, participants in our research did not typically have a detailed knowledge of health and safety requirements in general or in relation to OLD.

**Employers across sectors** described how they struggled to understand the most appropriate health and safety measures and mitigations for their businesses. This was both in relation to health and safety in general, and lung health. Employers found health and safety information (including that accessible through HSE) difficult to understand.

**Workers** typically followed the rules set down by employers when there were consequences for not doing so (e.g. being officially sanctioned) or when they saw and felt the necessity of compliance.

Workers and employers understood health and safety as having two key connected dimensions:

- **Health and safety was 'common sense' practices that keep you safe at work** - tied to immediate safety risks that were tangible to workers. Health rarely was considered or at the forefront of peoples' minds.
- **Health and safety was the rules and regulations that you have to learn to meet official standards** - elements of health and safety that were frustrating.

Generally, if health and safety practice was not seen as 'common sense' it was about compliance. Workers and employers deprioritised it or saw it as a 'nice to have', rather than something which was essential for their safety. Health in general, and OLD, was often seen to sit in this space. It was deprioritised as a low immediate risk, and, in many instances, was not seen as the responsibility of the employer. This was generally because of the delayed consequences of work related risks to health, and the perceived lack of a direct causal link.



### 3.2. Factors that drive behaviour in relation to OLD

This research found that workers' engagement with mitigations that were designed to reduce the risk of OLD was influenced by three interlocking, interdependent factors:

**Sector context:** This research found that sectors had some common attitudes, behaviours and beliefs related to OLD and health and safety in general. These factors were typically informed by the unique history of a particular sector, how strongly working in a particular sector is synonymous with having a professional identity, and sector driven attitudes to risk.

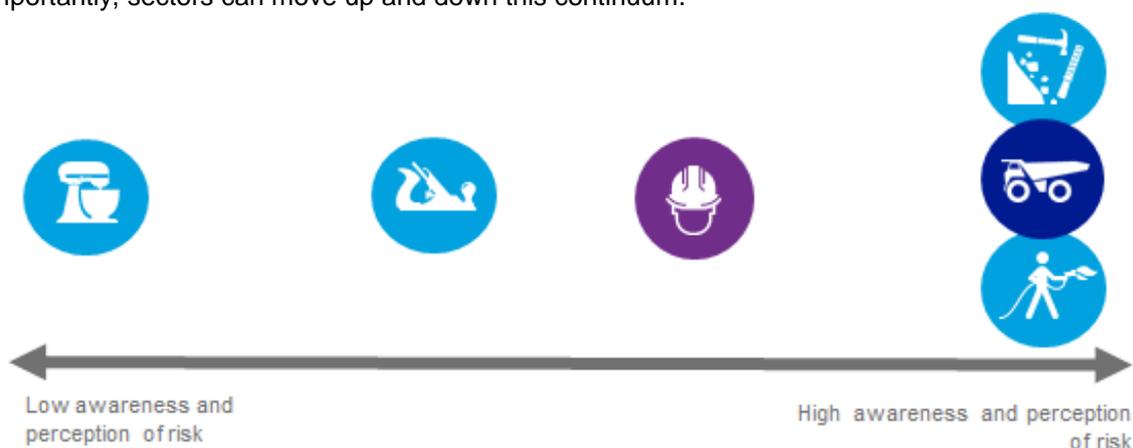
**Workplace context:** employers' and workers' specific workplace environments impacted the degree to which lung health and safety, and health and safety in general, was

front of mind and compliance was seen as a part of everyday practice. Workplace context was in turn formed by social drivers and social relationships, features of the workspace, activities undertaken (exposure levels) and the stability of day-to-day activities and job role.

**Individual context:** Individuals' characteristics, their professional identity, habit, knowledge, awareness and some physiological factors e.g. having a beard, influences the degree that they view OLD and, as a result, whether they can or want to use mitigations.

#### 3.2.1 Sector context

Kantar Public identified common views and attitudes within sectors in relation to OLD. Some sectors were more aware of OLD and viewed it as more of a risk than others. Workers and employers in quarries, steel welding and stone working sectors were highly aware of OLD and viewed it as a risk. In comparison, most of the employers and workers in bakeries we spoke to were unaware of OLD or the risk flour could present to their health. The use of mitigations was closely aligned with sector level awareness and perception of risk. Awareness of OLD and perceptions of risks existed along a continuum. This continuum does not necessarily reflect standards; instead, it represents whether or not individual workers and employers understood why certain procedures or processes were in place. Importantly, sectors can move up and down this continuum.



Sector level attitudes appear to be driven by three key factors:

**Sector level professional identity:** the degree to which workers and employers have a professional sector level identity. Workers and employers in all of the sectors in this project regarded themselves as skilled and professional. However, the degree to which sectors were 'professionalised' varied with some sectors having very low barriers to entry. For instance, many of our bakers entered the sector having cooked as a hobby; in contrast the steel welding workers had engaged in specific training before entering the sector.

**Cultural history of lung health:** whether or not there is a common awareness of sector linked lung health issues. In some sectors there appears to be a stronger awareness of the risk to lung health than in other sectors. This cultural memory of 'risk' is passed on by older team members and ensures greater focus on lung health. However, HSE should not be complacent about sectors where awareness is currently high (e.g. stonework). Similarly, it is challenging to 'replicate' this cultural awareness in other sectors where there is no existing 'common' knowledge.

**Perception of absolute risks associated with that sector:** whether or not a certain sector or behaviour is considered 'risky'. Some sectors were perceived to be more 'risky' than others. Materials appear to be key factor in understanding risk. In relation to day-to-day materials, workers using stone or welding with stainless steel were aware that chemicals, fumes and dust may be released. In contrast, flour and most natural woods were perceived to be harmless.

### 3.2.2 Workplace context

People's workplaces influence the mitigations they have available and their ability to use mitigations. Workplace context shapes practice in relation to OLD and lung health risks. Four key dimensions of workplace context frame workers' experiences. These are:

**Social relationships:** The behaviours of others help people to interpret social situations and decide what is appropriate or necessary. The attitudes and awareness of clients, colleagues, and employers influences whether or not workers and employers engage with lung health and safety measures.

**Working environments:** The type of physical space a worker is in can impact their behaviour. In some working environments 'dust' can have a greater impact and be more 'present' than in others. If workers are aware and can see fumes or dust particles, or 'taste' fumes in the air, they are more likely to use mitigations.

**Tasks and time:** Whether or not workers are regularly exposed to dust or fumes, and the extent of that exposure, impacts engagement with mitigations. Workers who were regularly exposed to dust were also more likely to say they used mitigations than workers that were infrequently exposed. For many, wearing a mask was a habit and part-and-parcel of doing their job. Workers who were less frequently exposed, particularly if they worked on-site, were sometimes also less likely to have quick, easy and convenient access to mitigations. They were more likely to view the time taken to access mitigations as an irritant and were therefore sometimes less likely to take up appropriate mitigations.

**Access to mitigations:** In almost all instances, employers provided some form of mitigations (PPE, RPE, LEV) and had policies and processes in place to encourage their workers to take up these provisions. However, employers did not always understand why they provided them or enforce their use. Similarly, they were not always convenient or practical for workers to use.

### 3.2.3 Individual context

Individual attributes and characteristics shape workers' abilities and willingness to comply with health and safety regulations, and with what employers' understand they are obliged to provide their workers:

**Knowledge and awareness of OLD:** Driven by the extent to which participants have had formal training which covers OLD and lung health. Across sectors there is a lack of understanding about the level of risk of specific tasks or exposure, and the seriousness of some conditions. This is also the case in sectors where awareness is high.

**Professional identity:** Being health and safety aware appears to be more part-and-parcel of particular work roles or professions than others. For some, being a professional includes being health and safety compliant, as well as being proficient in a particular skill or trade. Professional identity can also confer a degree of status on the individual. 'Higher status' people on sites or in workplaces often have more specialised or senior roles. Others perceive them as more credible and as role models. In workplaces, higher status professionals' actions can strongly shape practices (see 3.2.2).

**Habit:** Built up over time, often taking place on an unconscious level. What people default to is often the result of training and routine. Habits can be both good and bad. In relation to lung health, habit can influence whether or not a person wears a mask for a particular task. Although individuals display habits, they are often set (or disrupted) by the behaviour of others and features of a workplace.

**Character:** People enter workplaces and professions with individual mental and emotional traits. This informs their attitudes towards health and safety regulations and risks more broadly, which impacts their response to mitigations. Participants in our research typically fell on a spectrum of cautious around potential risks to being more cavalier. This played into whether or not they perceived their health to be at risk as a result of certain activities and what they felt was an acceptable “risk”.

**Cognitive or physical barriers:** Some people have individual aspects which make it more difficult for them to engage with information about OLD or use mitigations. For instance, language barriers sometimes made it difficult for participants to explain the risks of OLD, while beards reduce the effectiveness of masks.

### 3.3 Sector overview

This research suggests that there are clear differences in attitude and awareness of OLD across the different sectors.

#### 3.3.1 Stone work

The participants we spoke to appeared to be highly aware of the risks posed to their health from inhaling dust. The nature of working with stone also increased the use and updating of mitigations. Workers described the dust in their workplaces as tangible and visceral. Many saw that the prevalence of dust made using protective equipment a pre-requisite to working with stone.

Similarly, there was a strong cultural narrative that ‘*You never meet an old stonemason*’. Many participants had stories about people in their profession who had died from lung-related illnesses. The visibility of these illnesses gave stone workers an awareness of the immediacy of risk to their health and shaped their behaviours and attitudes towards lung health and associated health and safety practices.

Workers and employers placed value in protecting their health and were prepared to follow correct protocol. Given their working conditions and training, using appropriate mitigations had become a habit for most workers. They saw using mitigations as necessary rather than irritating, this was reinforced by the degree of training and specialism that goes into becoming a stonemason. This training gave workers and employers a high degree of pride in doing things well, which included following correct protocols.

The workers we spoke to had generally been employed by a single company for long periods of time. Workers and employers thought this was due, in part, to the scarcity of their skills. This meant that employers displayed care towards the long term health of employees, rather than seeing them as itinerant or easily replaceable.

#### 3.3.2 Quarries

Among our participants there was a strong awareness of OLD and its causes though some found it more difficult than others to operationalise this guidance and felt they needed a deeper understanding of the disease and related risks. OLD appeared to be having something of a watershed moment among the workers and employers we spoke to. Participants were aware that older workers were increasingly being diagnosed with OLD; some of the older participants we spoke to had themselves been diagnosed with OLD.

In part, in response to increasing incidents of OLD, workers and employers said that they provided and had access to a range of mitigations. Although dust played a significant part in quarry workers’ roles and was highly visible, working practices were highly mechanised and designed to ensure that workers are as segregated from the dust as possible. Many practices appeared to have been designed to eliminate dust from the environment, where feasible.

Across all three quarries, workers had access to an array of mitigation measures including water lorries going around wetting down the quarry floor; a personal Hoover for workers to take dust off them before they go into the shower; everyone has FFP3 face-fit tested half masks with Hepa Filters (filters are changed every 2-4 weeks); and all work overalls are put in soluble bags in order to avoid cleaning staff coming into contact with silica. However, there were inconsistencies in approaches to mitigations e.g. boots being allowed in vehicle cabs on two of the three sites we visited, and the frequency of cleaning cabs varied. There was also evidence of opportunities to enhance understanding of OLD, triggers and risks relative to different situations and environments. This included workers

operationalising information and processes. Some workers had proactively sought further information on OLD. For the most part, workers described their day-to-day tasks on site as highly repetitive and stable across the working week, enabling them to engage with mitigations. The quarries sector requires further exploration into the drivers of inconsistent risk control given their levels of awareness, resource and sector culture. Further research has been commissioned.

In addition to access to mitigations, the social relationships between workers and employers based in the same quarries appear to support peer enforcement of engagement with mitigations. Participants reported a high level of work-site loyalty, with people working at the same site for most of their career. This appears to create an environment where there is a focus on mitigating long term impacts to health.

### **3.3.3 Metal work**

At a sector level, workers and employers recognised that welding with steel carried a number of risks due to the materials involved and the equipment being used. Generally, the day-to-day materials being used were seen as less “natural” and believed to be more dangerous as a result.

Welding was seen as a specialist skill and as a professionalised sector. Workers needed to receive specialist training in order to use the equipment. This training gave workers a strong awareness of OLD and the risks to their lung health that their work could present.

Workers’ training and regular exposure to risk meant that the risks to lung health were therefore seen and accepted as immediate, rather than abstract. As a result, they were more likely to see being health and safety compliant as a pre-requisite to doing their job.

Although workers were generally compliant and used available mitigations, this was particularly the case when workers were welding for long periods of time. Non-compliance most commonly occurred when workers were ‘tacking’ materials together, doing short welds or the time-taken to put on mitigations was greater than the time it would take to complete the weld. There was also evidence of value judgements and trade-offs; some masks were viewed as causing safety risks including steaming up of goggles. In this instance, it was judged that removing the mask and protecting their eyes was more important.

### **3.3.4 Wood work**

Among the wood workers we spoke to, there was generally a low level of sector-wide awareness of the risks working with wood could present to lung health. Participants who were aware and concerned about the risks typically had cross-sector experience (for instance in engineering) or adopted particular lifestyles which made lung health a personal priority e.g. health lifestyles.

Risks were attached to the different materials used within the sector, rather than on dust as a whole. For example, MDF was frequently cited as being dangerous because its use has been banned in a number of countries. However, other types of wood were seen to be less dangerous than this. Dust was largely seen to be innocuous rather than out-rightly dangerous to health.

With a disparate knowledge of lung health, social relationships appeared to play a big part in creating a workplace culture around mitigating lung health risks. Employers’ attitudes helped set the tone for workers. Most employers recognised dust as a health risk as well as a productivity risk and, as a result, provided mitigations. The extent to which workers used mitigations was influenced by the extent they agreed with the perceived need, with some taking guidance from ‘credible’ experienced co-workers rather than their direct employer. Workers who placed their craft ahead of health and safety were seen to resist mitigations and influence other workers with their disdain for health and safety.

While dust was ‘ever-present’ within woodworking workshops, the perception of the low risk posed by the material meant that workers only adopted practices they deemed beneficial. For some, LEV was too noisy; while others saw it as ‘enough’ to reduce the dust in the atmosphere and felt that they didn’t need to wear a mask as well. In some instances ‘risk’ was determined by working context. When in open-spaces, on time-sensitive jobs, or outside of their workshops they tended to display lower default behaviours to mitigate risks, e.g. dry-sweeping.

### 3.3.5 Construction

The workers and employers in the construction sector we spoke to had mixed awareness of OLD, which contributed to variable use of mitigations. Although some workers were very aware and compliant, others did not know enough about risks to prioritise using mitigations.

Workers' awareness and use of mitigations was influenced by a range of factors. Views and attitudes towards OLD in construction were framed by construction workers' general attitudes towards health and safety. Within the sector there was a strong narrative about the negative impact that health and safety requirements have had on workers' day-to-day roles. There was a strong belief that the sector was overregulated; that regulations stop people doing their job or slow jobs down; and that requirements were more about protecting the employer from litigation than about health and safety. As such, participants displayed a tendency to resist or complain about changes, often failing to see the value in many health and safety practices. This was even if they agreed overall there was 'some benefit' to health and safety and that some issues were 'common sense'.

Construction workers' and employers' general views on health and safety were applied to OLD and the risks of construction work to lung health. Even when workers deduced that dust may have a negative impact on lung health, there was very little understanding about the particular conditions or impact that this might have upon them. Therefore, practices which are designed to mitigate risks to lung health were at best, intermittently followed. This was largely because workers did not understand the correlation between their practices in the present with negative health consequences later on and did not view compliance as 'common sense'. Some workers we spoke to referenced a 'silica flu' which appeared to be viewed as a short term effect.

Secondly, the type of construction being undertaken influenced workers' sense of professionalisation and the degree to which being health and safety compliant was seen as part-and-parcel of doing the job. We found that some workers including as bricklayers and labourers, were less likely to be aware of the impact of dust on lung health and to adopt more cavalier attitudes towards taking risks. Though there was a sense of health and safety having some role to play on site, the narrative within the construction sector most prominently spoke to the idea that health and safety had 'gone mad'. In contrast, workers with specialist skills, for instance, stone workers working on construction site, were more likely to see health and safety and working safely as part of being a professional. Among these specialised construction workers there was a general belief that you could not do your job properly without being health and safety compliant.

These different views and attitudes towards health and safety came together when people were working on site. Unlike other sectors where they may have a workshop or set working environment, construction workers constantly have to adapt to changing work sites and ways of doing things. By virtue of being subjected to new work places, workers are constantly put in a position where they have to adapt their general practices to the spaces they find themselves in, the tools available and the differing priorities within their working context. This puts them in a reactionary position.

Although there will be 'risk assessments' and 'toolbox talks' at each commercial site they work on, because of the cyclical nature of these assessments and talks, workers become 'bored' or indifferent. As a result, they rely on 'common sense' when working or engaging with others on site. In the absence of active enforcement or standards set by the client, many workers become non-compliant.

In addition to having to adapt to the physical aspects of a site e.g. layout, tools and mitigations available etc., workers also have to adapt to different social environments. Each site has a different culture and status hierarchy. Professional status and skill, typically expressed through job role, helps define this hierarchy. Workers who were seen by participants to have 'high status' or specialist skills were generally more conscious of health and safety requirements, and more compliant as a result. They can set the tone for other workers. In contrast workers who did not work in certain 'specialised roles' were less likely to see being health and safety compliant as an integral part of their roles and as a result do not follow requirements when unmonitored.

### 3.3.6 Baker

The bakers who participated in this research had very little awareness of OLD and tended not to use mitigations. Most employers either saw mitigations as unnecessary, believing machinery minimised exposure to flour, or saw it as a way of promoting food hygiene rather than lung health.

Bakers' lack of awareness and use of mitigations were the result of a range of factors. Firstly, bakers' views of health and safety in general were dominated by the concept of food health and safety. They wanted to ensure the food they were producing was high quality and safe for their customers to consume. Employers wanted to ensure their workers did not get injured, they were primarily focused on physical accidents and immediate risk e.g. getting burnt or carrying heavy objects rather than longer term health concerns. Similarly, workers were typically very task orientated with only a peripheral interest in individual health and safety. Their views of health and safety were similar to their employers e.g. practical and focused on not cutting yourself with knives, hurting your back by standing in the same position for an extended amount of time, or lifting sacks that are too heavy.

The bakers we spoke to had very little awareness of the risk flour could represent to lung health. In part, this was because flour was seen as a natural substance that was not hazardous or risky to consume. The hot environment of the bakery meant that many of the bakers we spoke to found it very uncomfortable to use certain mitigations, particularly masks. They also found it difficult to communicate among one another when wearing masks and didn't see the value of wearing them due to low awareness and understanding of risks relating to OLD. Employers saw practical barriers to providing alternative mitigations, such as LEV, for example cost and size of workspace. They also did not perceive a clear need.

#### **4. Implications and conclusions**

Encouraging workers and employers to engage with mitigations around OLD requires a multi-faceted approach. Phases 2 and 3 of this project demonstrated that employers and workers have different roles to play in increasing compliance. Phase 4 uncovered the design principles which HSE should bear in mind when designing interventions to tackle OLD in future.

##### **4.1 Phase 2 and 3: implications**

###### **4.1.1 Employers**

Employers set what is appropriate behaviour for workers. They have the ability to provide tools and enforce processes to keep workers safe; for them to do this effectively they first need to be aware of OLD and the relevant risks. In many respects awareness is a hygiene factor and precursor to any action. Awareness and understanding frames whether or not being compliant is seen as common sense.

Outside of awareness, an employer needs to see OLD as a safety issue rather than a health issue. Safety is seen as an explicit responsibility of the employer. In contrast, health issues are more likely to be seen as a 'nice to have' rather than an essential.

Once an employer is aware of OLD and sees it as their responsibility, or something they are liable for, they then make choices about what the most appropriate actions are. The degree of consideration they give to mitigations, next steps and the actual appropriateness of these actions depends on their level of knowledge, combined with practical considerations. These are informed by sector context, workplace context and individual context (discussed in section 3.2).

###### **4.1.2 Workers**

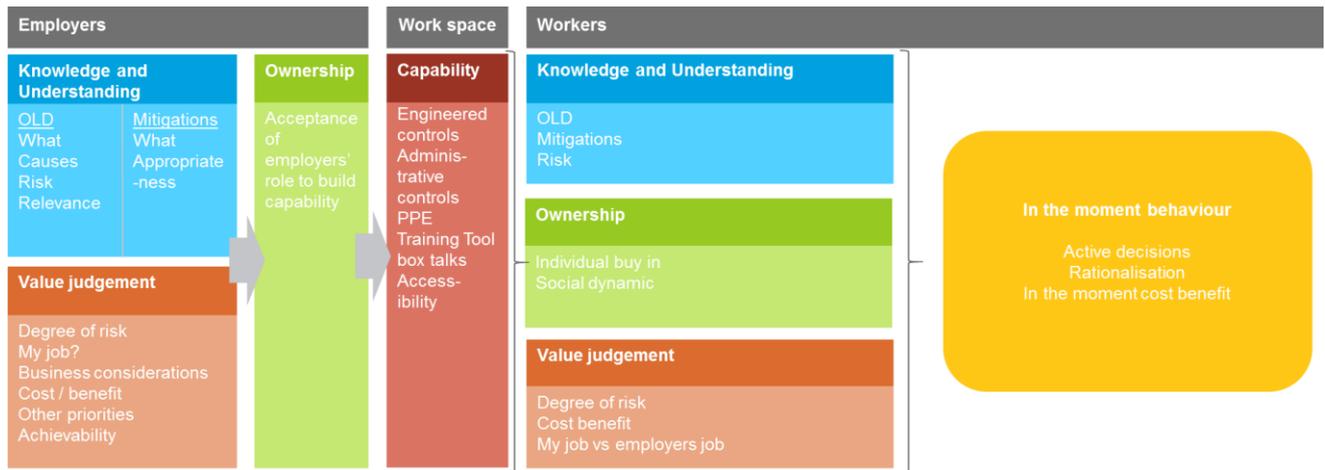
As with their employers, whether or not a worker is aware of OLD and related risks impacts whether or not they comply. If they are not aware, they are more likely to do nothing to mitigate a risk unless there are rules or enforcement mechanisms.

If they are aware of an issue, they then make a judgement about whether or not they are facing a safety risk (which is seen as more immediate) or about whether they are facing a health risk (which is seen as more long term). If they see it as a safety risk, they are more likely to take up provisions.

The consistency with which workers use mitigations or follow safety protocols is influenced by a number of sector, workplace and individual factors (discussed above).

###### **4.1.3 Cross role and sector drivers to engagement with OLD mitigations**

While sector, workplace and individual contexts reveal some sector based patterns, when looking across sectors, there are four key drivers to in the moment behaviour in relation to OLD.



**Awareness and understanding: does an individual know about OLD?**

Awareness and knowledge act as a foundation for value judgements, the degree of ownership they have over mitigations and their capability to act appropriately. Individuals' knowledge can be built from a variety of sources, including formal training and skill, on the job learning, and through social networks, e.g. knowing someone with OLD and sector history/stories. Knowing someone who has suffered from OLD is particularly powerful. For a person to change what they 'know' or incorporate new knowledge into their existing scheme they must believe the information to be true, and credible – it must also be relatable.

**Value judgments: do they consider OLD to be a risk?**

What people know about OLD and mitigations informs whether or not they 'buy into' it as a concept or something valid; this in turn influences their behaviours. Some may prioritise other issues above OLD. For instance, sole traders may prioritise getting a task done quickly instead of complying with health and safety regulations, particularly if the value of those regulations is not immediately evident.

The extent to which people actively engage in value judgement varies and does not always happen consciously. These judgements are influenced by an individual's personal attitude or appetite for risk. They can also be impacted by the extent to which individual workers feel or believe they can mitigate risks. This can be influenced by their knowledge, and the support of their employers.

**Ownership: do they see it as their responsibility or someone else's?**

People with a high degree of ownership view being compliant part of their professional identity. Being knowledgeable and using mitigations is part-and-parcel of being a professional and doing the job well. Organisations with a high degree of ownership could also influence the degree to which peers monitor and censure one another or the degree to which health and safety is enforced from the top down.

In contrast, individuals with a low degree of ownership can have an 'us and them' mentally or view health and safety as a 'tick box' activity which is more about protecting the employer, rather than the individual.

**Capability: are they able to mitigate that risk?**

'Capability' describes whether individuals have access to appropriate mitigations, know enough and are empowered enough to take them up effectively. Capability is not static. It can vary by task and across working days and sites. Having knowledge and awareness of appropriate mitigations is often a pre-requisite to capability. This is often driven by training and skill.

**4.2 Phase 4 Co-design**

**4.2.1 Co-design: design and preparation**

Following the insight phases, HSE commissioned two co-design where workers and employers were involved in developing ideas for interventions, based on the insight. Session one consisted of a session with bakers. Session two consisted of a session of pre-dominantly workshop based stone,

wood and stainless steel sector workers. HSE asked us to focus on bakers for one co-design session as the insight phase highlighted that they had particularly low awareness of OLD and low use of mitigations; and to focus the second group on stone, wood and stainless steel sector workers as the insight identified them as having similar working environments and relatively high awareness and engagement with mitigations. However, they became no-complaint at particular points in their working day when completing one off, ad hoc tasks. The remaining sectors were taken forward in other work.

HSE held an internal ideation session to prepare for the co-design. They developed a long-list of between 30 and 40 concepts which they felt could be taken forward to co-design. Kantar Public reviewed and refined these concepts to a sub group of 15 core concepts. Kantar Public then developed a selection of low fidelity stimulus to support the co-design of interventions to increase the use of mitigations. These fell into four areas: initiatives and support, design and technology, communications advertising campaigns, and schemes and danger messages

#### 4.2.2 Reactions to concepts

Bakers and workshop based manufacturers reacted to HSE's concepts in different ways.

The bakers were small/micro businesses owners who were previously unaware of the risks that flour dust posed to their health. They favoured interventions which would help raise their awareness and understanding of OLD, have limited cost implications and come from a trusted information source. Bakers typically said that they looked to flour mills and the Food Standards Agency (FSA) for advice and guidance over food safety. They did not like mitigations which they felt could potentially damage their business, impact the quality or safety of their product, or that made flour seem overly dangerous. There was also a general belief that bakers exposure to flour could not be fully removed and that there would therefore always be a degree of risk.

In contrast, workshop based manufactures favoured and prioritised interventions which would remove their exposure to risk and that would 'design out' their exposure, including technology, and those which included campaigns to raise awareness and put risk front of mind. Although aware of the risk their work posed to their health, like bakers, workshop based manufactures did not want their work to be presented as too dangerous. There was a concern that over emphasising the danger their work could represent to their health could lead people to not enter their sectors, or leave their sectors all together.

When co-designing potential interventions with HSE stakeholders both sets of participants designed interventions aligned with their preferences. They built on earlier discussions to develop the concept into something that they would respond to, which work in their 'real-world' situations.

#### 4.2.3 Underlying design principles

In light of participants' reactions to HSE's concepts and their co-development of potential mitigations, Kantar Public identified eight key principles that could inform HSE's thinking when approaching ways to support audiences going forward. These are:

- **Approach me through channels and bodies I already use and know:** consider where those at risk already go to for information or for the core materials of their work.
- **Hold my employer to account (or help me do this):** think about what a worker may need to access to in order to challenge their employer, or how to help workers which may not be able to challenge their employer's directly due to temporary employment rights.
- **Help me use mitigations when I need them (but not all the time):** consider ways to encourage appropriate use of mitigations, rather than taking a one size fits all approach.
- **Make the cost of doing nothing more than doing something / make it affordable:** consider ways of making mitigations affordable.
- **Make me worry enough to do something (but not so much I disengage):** focus on communications that make people worry, rather than afraid.
- **Help me keep the risk front of mind:** consider ways of making the risk of OLD present so that it is kept front of mind.
- **Make learning interactive and relevant:** avoid purely passive, text based ways of communicating risks, advice and guidance.
- **Use visuals not words and keep it simple:** consider ways of avoiding jargon.