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What occupational safety and health practitioners need from an evidence centre

Safe
Work

Sector
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Technical
Report

Preface

This research has been funded by Lloyds Register Foundation, with the aim of supporting the Foundation's plans to establish a Global Safety Evidence Centre. For more information on the Centre, please visit: *lrfoundation.org.uk/news/research-support-for-the-establishment-of-a-global-safety-evidence-centre*

About Lloyd's Register Foundation Global Safety Evidence centre

The Lloyd's Register Foundation Global Safety Evidence Centre is a hub for anyone who needs to know 'what works' to make people safer. The Centre collates, creates and communicates the best available safety evidence from the Foundation, our partners and other sources on both the nature and scale of global safety challenges, and what works to address them. It works with partners to identify and fill gaps in the evidence, and to use the evidence for action.

To find out more about the Global Safety Evidence Centre, visit *gsec.lrfoundation.org.uk*

About Lloyd's Register Foundation

Lloyd's Register Foundation is an independent global safety charity that supports research, innovation, and education to make the world a safer place. Its mission is to use the best evidence and insight to help the global community focus on tackling the world's most pressing safety and risk challenges.

To find out more about Lloyd's Register Foundation, visit *lrfoundation.org.uk*

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Executive summary

Context, aims and methods

Supporting the Lloyd's Register Foundation's (referred to as The Foundation) establishment of a Global Safety Evidence Centre (referred to as The Centre), this study aimed to identify the evidence needs of Occupational Safety and Health (OSH) practitioners in high-risk sectors and occupations. We defined our research question as: 'What are the perspectives of OSH practitioners on the current evidence landscape?' Our definition of evidence includes research and academic evidence, data, analysis and expert advice. We defined high-risk sectors and occupations as those with the highest incidence of workplace-related accidents, injuries, high risk of exposure to hazards, and fatalities amongst workers. We define a 'practitioner' as someone who ensures that employees are safe and healthy in the workplace and that employers adhere to safety requirements and standards (Stockwell et al. 2022).

Methods

This qualitative interview study used semi-structured interviews conducted with OSH practitioners. We conducted interviews online using an interview guide developed based on a review of the relevant literature.

Sampling identified contacts through known networks, augmented with targeted internet searches of global OSH associations and individuals. These included respondents who could offer views from different global, regional and local perspectives, including low-and-middle-income countries (LMICs).

Based on the same literature review, we coded the results to a coding framework and analysed the content to establish emergent themes, refined through an internal workshop.

Findings

We conducted a total of 26 semi-structured interviews with 29 individuals. The respondents represented views from their experience in energy, mining, agriculture, transport, technology, research and academia, construction, medicine, waste management and hazardous chemical sectors. Most practitioners worked for organisations operating within specific sectors or industries and government and training organisations. A small number of respondents worked as independent consultants. We summarise the main findings below.

The types, access to and intended use of evidence varied between practitioner types:

- The types of evidence practitioners used depended on how they wanted to use it.

- Access to evidence sources varied depending on whether the practitioner was in industry, research, regulation or academia.

- OSH practitioners often preferred localised data because they considered it more compelling and relevant, using their professional networks to access further evidence and expertise when necessary.

Evidence sources do not support a reliable knowledge base or universal access across the OSH practitioner base:

- Practitioners point to three main challenges to a consistent knowledge base: 1) limited and sometimes outdated primary data, 2) the unreliability of some evidence sources, and 3) obsolete approaches in using/analysing evidence.

Evidence needs differ depending on whether the focus is on protecting health or safety:

- While respondents often viewed longitudinal data as supporting the exploration of longer–term causes of occupational ill health, they often saw evidence used to protect workplace safety as more related to explicitly identifiable workplace events and hazards.

- Practitioners expressed views about the broad types of evidence missing or required for occupational health and safety and the need to communicate better about both.

- While some practitioners identified evidence gaps, others suggested that the volume and coverage of available OSH evidence are already saturated, arguing that the ability to translate and communicate evidence for practice is the most salient skill–set gap.

Building a safety culture is paramount for practitioners:

- Although safety and health were a high priority for the practitioners interviewed, there is not always adequate evidence to implement or embed a safety culture. Practitioners also described how the influence on safety cultures is multifaceted.

- Practitioners identified how regulatory, economic and regional cultural perspectives could positively influence a safety culture.

- Additionally, practitioners indicated that leadership, including management, can embrace a more open culture of learning, or the idea that people both make mistakes and have successes, to support a health–and–safety culture.

- Practitioners suggested that changes in OSH norms were most effective through a systemic approach.

- Practitioners identified further areas for evidence development:

- These included occupational health, evidence and emergent areas.

- Practitioners noted the difficulty in quantifying the use of tacit knowledge in OSH evidence use and application.

- They flagged a need for further research into emergent areas, such as artificial intelligence (AI) and climate change.

Acknowledgements

Contents

Abbreviations

AI	Artificial Intelligence
EU-OSHA	European Agency for Safety and Health at Work
HIC	High-Income Country
HR	Human Resources
HSE	Health and Safety Executive
ILO	International Labour Organization
IP	Intellectual Property
LMIC	Low-and-Middle-Income Country
NGO	Non-Governmental Organisation
OSH	Occupational Safety and Health
UK	United Kingdom
US	United States

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1. Introduction and methods

1.1. Background

RAND Europe has been supporting Lloyd's Register Foundation (hereafter referred to as 'the Foundation') in their plans to establish a Global Safety Evidence Centre (hereafter referred to as 'the Centre') by conducting research to inform the Centre's research priorities. The Centre aims to address a critical issue: the available evidence on safety is often limited and of variable quality. Moreover, even when robust evidence exists, significant gaps exist in translating this knowledge into practice. This work package aims to elicit practitioner views on their evidence needs.

Occupational Safety and Health (OSH) practitioners are pivotal in using and developing evidence and its practical application. They require reliable, high-quality data to make informed decisions that enhance safety in their fields. However, they often consider that such evidence is lacking and that what is available can be questionable. OSH practitioners often face challenges in accessing and utilising this evidence effectively.

The term OSH practitioner is often synonymous with 'Occupational Professional' (Hale 2019). However, we used the term 'OSH practitioner' rather than OSH professional to conduct our research, ensuring our sampling focused on actively practising OSH professionals needing OSH evidence in their current daily duties, e.g. safety managers, directors or officers. We defined OSH practitioners as those who ensure that employees are safe and healthy in the workplace and that employers adhere to safety requirements and standards (Stockwell et al. 2022). We sampled practitioners worldwide to match the Centre's expected reach.

Based on our definition, practitioners may work in various roles, including (but not limited to) employment within organisations or sector-representative bodies, government and inspectorate agencies, third-sector and Non-Governmental Organisations (NGOs), advocacy groups, applied research and trade unions. Other practitioners include independent consultants or those within larger consultancies, training providers, or funding/financial bodies such as banks dealing with risk and governance issues, including worker risk and OSH.

Table 1 below shows the types of roles we recruited to participate in this study, including titles such as 'head of safety and safety strategy,' 'OSH consultant' and 'senior specialist of OSH.' The small number of additional researchers we interviewed had practical experience in the field or provided specialist points of view.

1.2. Research aims

This study aimed to identify the 'evidence needs' of OSH practitioners in high-risk sectors and occupations, defined as sectors with the highest incidence of workplace-related accidents, injuries and high risk of exposure to hazards and fatalities amongst workers. Annex A provides further details on how we scoped this. By 'evidence needs,' we mean the specific types of outputs of formal research, data, analysis, expert advice and lessons practitioners need the most, including understanding which evidence is most critical for decision-making, policy development and implementing safety interventions, and whether this is available and accessible to practitioners.

The research question is: what are OSH practitioners' perspectives on the current evidence landscape, and what are their evidence needs?

1.3. Overview of methods

We conducted a review to develop our interview topic guide, semi-structured interviews and thematic analysis of the interview data.

Rapid review and topic guide development

To develop the interview guide, we first conducted a rapid review of academic and grey literature to summarise the latest evidence on the current evidence landscape for OSH practitioners and identify the gaps in knowledge (see Annex A for the detailed methods we employed for the rapid review, and Annex B for its detailed findings). We used the findings to develop the interview topic guide (see Annex C for the topic guide). For instance, we found that safety culture often lacks salient measurement methods despite playing a significant role in OSH practice. The interview guide asked practitioners about their roles in OSH, their experience, definition and use of evidence in their practice, and the role of OSH culture. We also refined the topic guide through internal workshops to discuss the data collection material's clarity, usability and relevance in light of the themes derived from the rapid review.

Sampling and recruitment

We first identified practitioners in high-risk sectors and occupations with responsibilities across one or more countries or regions, initially relying on known networks and then conducting targeted searches using Google. We contacted potential practitioners via email through our existing network's intermediaries. We used the International Labour Organization's (ILO's) definition of high-risk sectors and occupations as those with the highest workplace-related accidents, illnesses and fatalities among workers (International Labour Organization 2024). These include:

- Agriculture
- Forestry and fishing
- Construction
- Mining and quarrying
- Transportation and storage
- Electricity, gas, steam, and air conditioning supply (energy sector)
- Water supply, sewage, waste management and remediation services
- Manufacturing

We purposively sampled for these sectors.

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Interviews

Five RAND Europe staff conducted semi-structured interviews over Teams, each lasting between 45 minutes and 1.5 hours. They obtained the participants' consent beforehand to record the interviews and transcribed them using the built-in Teams transcription feature. Interviewers were responsible for validating their interviews (using video recording) for accuracy and anonymising the transcriptions. Interviews took place between 16 October 2024 and 6 March 2025.

Analysis

We used a coding framework developed from the topic guide to code each interview. After collating the codes, two RAND team members conducted a content analysis to identify emergent themes within and across codes and interviews, subsequently refined through a workshop.

Caveats

First, as most practitioners in the study were upper management and worked for large organisations, any attempt to apply the findings to workers must consider this. Although we endeavoured to sample a variety of practitioners from different sectors in our recruitment efforts, more consultants and voices come from industry, limiting the representation of practitioner perspectives from the government, third sector or academia. Second, since our literature review approach was rapid and targeted, we only included papers or sources in English – issues or evidence gaps reported in non-English publications were, therefore, not considered in the topic guide and thus not part of interview discussions with study participants.

Dissemination

To keep the practitioners who participated in this work package updated and informed on the work they contributed to, we plan to share high-level findings with them as a goodwill gesture and with the consideration that most have expressed enthusiasm in the prospect of engaging further with the work.

Ethics considerations and review

This study was reviewed and granted a favourable opinion by the RAND Europe Research Ethics Committee on 2 October 2024 (ref: 022627.004). We provided all participants with an information sheet outlining the purpose of the study and what it would involve in advance of the interview, and all gave informed consent to participate. We recorded all interviews with the participants' permission.

2. Findings

This report presents findings from practitioner interviews that help understand how practitioners define, use and access evidence in their practice. The interviews provided rich insights into the experiences of OSH practitioners working with evidence, often via specific examples and first-hand anecdotes.

First, we report on how practitioners from different sectors, roles or practices had access to and used different sources of evidence (see Section 2.1). We report how evidence sources and their accessibility are often unconducive to a solid evidence base (see Section 2.2) and how practitioners define, treat and utilise evidence in safety vs. health differently (see Section 2.3). We then report on the challenge practitioners face in sustaining strong OSH cultures (see Section 2.4) before outlining which areas would benefit from further development (Section 2.5).

Participant characteristics

The interview respondents greeted our researchers with evident enthusiasm, showing a striking motivation to be part of this area of research. Their responses highlight that fulfilling the evidence needs of OSH practitioners across the globe is worthy of further support.

We undertook 26 interviews with 29 individuals, representing practitioners from energy, mining, agriculture, transport, technology, research and academia, construction, medicine, waste management and hazardous chemicals. The practitioners hold roles in industry, government, training organisations or as independent consultants. Table 1 below summarises the practitioners' characteristics by sector.

Table 1. Practitioners' characteristics

Practitioner	Sector	Practice	Geography	Role
PO1	Mining and quarrying	Industry	United States (US), Australia, Canada, the Atlantic region and the southern hemisphere	Head of safety and safety strategy
PO2	Agriculture	Industry	United Kingdom (UK)	Group health and safety manager
PO3	Mining and quarrying Forestry and fishing	Industry	Democratic Republic of the Congo, Namibia, South Africa and Zambia	Project manager
PO4	All high-risk sectors and occupations	Research and academia Government	US	Director in a government agency
PO5	Energy	Industry	South America, North America and the Asia Pacific region	Global occupational health manager
PO6	Agriculture	Consultant	UK	Trainer and consultant

Practitioner	Sector	Practice	Geography	Role
P07	Manufacturing	Third Sector	UK	Head of policy and public affairs
P08	All high-risk sectors and occupations	Regulator	UK	Regulator for private industries and consultancies
P09_P10 (joint interview)	Manufacturing (technology)	Industry	Europe	Head of governance at a big corporation and lead of the environmental, health, and safety division of a consultancy
P11	Construction	Consultant	UK	Independent consultant and trainer
P12	Transportation & storage	Consultant	UK	OSH advisor
P13	Manufacturing (medicine)	Consultant	UK	Consultant in occupational medicine
P14	Forestry and fishing Manufacturing (heavy machinery) Mining & quarrying	Government	Australia	OSH researcher
P15	All high-risk sectors and occupations	Research and academia Industry	EU	Executive
P16	All high-risk sectors and occupations	Research and academia Industry	EU	OSH researcher
P17_P18 (joint interview)	Manufacturing (medicine)	Industry	US	Director of an independent consultancy
P19_P20 (joint interview)	Construction	Consultant	UK, Europe, Middle East, Africa, North and South America and Australia.	Group director of a construction and consultancy company
P21	All high-risk sectors and occupations	Industry	Africa	CEO of an independent consultancy
P22	Agriculture Manufacturing Construction	Industry	UK Central Asia	CEO of an independent consultancy
P23	All high-risk sectors and occupations	Consultant	Southeast Asia Pacific Region	Senior specialist of OSH for an international organisation
P24	All high-risk sectors and occupations	Third Sector	UK	OSH management and project manager
P25	Construction Water supply, sewage, waste management and remediation services Energy Transportation and storage	Consultant	Africa	OSH management
P26	Agriculture Manufacturing Construction Water supply, sewage, waste management and remediation services	Consultant	UK	OSH consultant
P27	Manufacturing (hazardous chemicals)	Consultant	EU	Project manager in a consultancy
P28	All high-risk sectors and occupations	Industry	Central Asia Eastern Europe North Africa Middle East	OSH consultant
P29	All high-risk industries	Consultant	UK	Manager

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2.1. Evidence types, access and intended uses vary across practitioner types

The types of evidence practitioners use depend on how they want to use it.

The types of evidence practitioners used ranged from primary research (interview data and survey results) to secondary research (literature reviews). Practitioners also conducted inspections to gather information. They consumed regulatory information, standards and best practice guidelines, and databases with pre-existing data on health figures. Practitioners use such data to inform government and organisational policy development and its application, conduct inspections, escalate risks, design OSH interventions, investigate accidents, develop guidelines and measure well-being. Although practitioners overlap in their objective of using data to inform decision-making, there are clear differences between the type of data they use to inform decisions and what they want to address. Our interviews revealed that each practitioner follows a different pathway from sourcing to using evidence.

One practitioner from a regulatory agency relied on self-reported accidents and incidences to determine where to conduct inspections (P06), whilst another used a systems-thinking approach and analysis of grey literature in accident investigations (P12). Reliance on secondary data was often linked to two views: 1) many practitioners in industry (P09_P10, P15, P16, P17_P18, P21, P22) reported that 'good' data already exists, at least in the High-Income Country (HIC) context, and 2) several independent consultants (P06, P11, P12, P13) suggested that grey literature (e.g. industry-related blogs and news) was publicly available (and thus accessible by independent consultants like themselves) but often synthesises difficult-to-fathom academic research in a way that does not require highly technical knowledge.

However, various industry and independent consulting practitioners also pointed to the diversity of evidence they use depending on the purpose. They described collating different evidence types, spanning guidelines to inform organisational policy (P08), data analytics systems that pull from human resources (HR) to identify trends in accidents, or quality assurance, finance, and productivity datasets to point to risks before incidents occur (P09_P10). A few industry practitioners mentioned relying on tacit, experiential knowledge accumulated over the years in their respective industries alongside using government guidelines to inform institutional best practices and employee OSH training (P11, P12, P28).

Two practitioners representing government agencies – a research agency and a regulatory agency – use specially commissioned primary research to inform their policy positions and intervention design (P04, P07) and provide definitive evidence of the robustness of their intervention design. Furthermore, such practitioners' academic backgrounds and the resources available to their government-funded teams afford them the necessary skills to assess and review commissioned research. Other practitioners in the construction sector highlighted capturing data through witness accounts and focusing on behavioural impacts, not just through

accident and incident frequency data (P19_P20, P28). Many other stakeholders across sectors mentioned a combined focus on quantitative and qualitative data (e.g., P01, P04, P12, P19, P20, P29) in their inquiries into accidents and incidents. Specifically, their self-explained aim as practitioners was to understand how and why accidents happen, not just how many, which requires qualitative inquiries such as on-site observations and employee interviews. In contrast, those with academic backgrounds tended to use literature reviews and evidence synthesis to inform their practice (P14, P15, P16), largely because their backgrounds have equipped them with the appropriate skills, their networks enable collaboration to consolidate skillsets further, and they tend to operate within institutions that promote such practices (e.g. universities and research institutes).

Practitioners from Low-and-Middle-Income Countries (LMICs) indicated they rely primarily on administrative data, labour force/household surveys, organisational statistics and sometimes health records to gather evidence to create suitable interventions (P21, P23, P28). LMIC practitioners tended to use administrative data because other types of OSH-related data are limited in the countries and regions in which they operate, usually because of resource limitations and the lack of institutional support from essential organisations to collect, assess or disseminate such data.

> 'So if you go into the grey literature of what does the oil and gas industry talk about when it comes to a certain, you know topic, they've done a lot of the processing for you already' (P12).

Practitioners' access to evidence varies depending on their sector.

The most challenging evidence to access included peer-reviewed articles only accessible through an institutional paywall, occupational health-related data (restricted due to the need to maintain employee privacy), employers/employees' self-reported data on incidents/accidents (only available in HR records or large administrative datasets) and proprietary data.

Many practitioners suggested that they and other practitioners have varying data access based on whether it is data is publicly available or whether they have the institutional support and resources to access certain data types (P02, P06, P07, P08, P09_P10, P11, P12, P15). According to several practitioners, those in academia, industry and government have varying access to different data/evidence types that require particular institutional support, e.g. access to peer-reviewed articles, which are often only accessible through institutional subscriptions (P02, P08, P09_P10, P15).

One practitioner with UK construction experience mentioned that while practitioners in mining and construction can ask employees for access to medical records in investigations to gather health evidence, practitioners in construction cannot because of the quick staff turnover, which limits access to their medical records (P11). This example highlights that employee-health-related evidence may be onerous to collect due to privacy issues and high staff turnover. For practitioners like those from regulatory agencies, who may rely on self-reported incidents (in HR records, for instance) as evidence

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to inform their inspections, resources can be limited, and the data may be inconsistently collected (PO2, PO6). According to two practitioners from the regulation sector, defunding has become an issue in recent decades because it passes the costs of inspection and other safety activities to employers. Therefore, funding such activities is left to the employers' discretion, which incentivises hiding accidents, thus compromising the data (PO2, PO6).

Moreover, there are other institutional limitations to accessing data based on sector. One industry and construction practitioner pointed out that while companies would like data from other companies for benchmarking (PO9_P1O, P19_P2O), this is impossible given market competition issues (PO9_P1O). This suggests a key gap where an independent, neutral organisation could collate the data in a way that does not infringe on Intellectual Property (IP) or threaten competition.

> 'When I was working in the academic setting, it was easier for me to get access to evidence-based articles. However, if you work in industry, that is only limited. When I am working in an industry, I am more reliant on publicly available information. On the contrary, I am working as a regulator now and can access more information.' (PO8)

OSH practitioners often prefer localised data because it is more compelling and relevant to their practice, using their professional networks to access further evidence and expertise when necessary.

According to many practitioners (e.g. PO2, PO3, PO5, PO6), the highly specific nature of a workplace context renders aggregate, cross-regional or cross-organisational data less applicable and useful for practitioners. Many practitioners viewed more localised data and information as more relevant, trustworthy and usable, especially when collected transparently within the same sector and geography (PO2, PO3, PO5, PO6, P24, P28). Most practitioners linked the data's usefulness to how directly they could use it for their geographical- and sector-specific contexts and considered geographically granular data most relevant. According to practitioners, although other same-sector data from different regions may help to make inferences, it will be severely limiting in many respects, as non-localised data will be too generic and unable to inform country-specific policy (PO3, PO6, P22, P23), aid with designing sector-specific guidelines for companies that operate across regions (e.g. P19_P2O), or help with identifying risks to pre-empt and mitigate potential incidents (PO5, PO6, P24).

Due to language and local OSH culture issues, LMIC-based practitioners strongly preferred localised data. As evidence is often scarce in LMICs, practitioners must resort to educated guesses or input from other local OSH practitioners to inform their institutional OSH policies and design with a localised perspective (P22, P23, P24, P25, P28). The LMIC-based practitioners we interviewed often focused on the lack of available evidence in these contexts and the consequent need to bolster data-collection efforts in these regions and domains more than the HIC-based practitioners we interviewed (P22, P23, P24, P25, P28).

Relatedly, other practitioners elaborated that they would draw on their personal and professional social networks to access specific expertise (PO2, PO5, P23), especially for health and methodological expertise (PO3). This support helped them access and analyse evidence when they lacked the necessary expertise.

> 'For skills, I would say you need different people to understand and assimilate, you know, analyse the data.' (PO3)

2.2. Evidence sources do not support a reliable knowledge base or universal access across the OSH practitioner base

Practitioners point to three main challenges to a consistent knowledge base: 1) limited and sometimes outdated primary data, 2) the unreliability of some evidence sources, and 3) obsolete approaches in using/analysing evidence.

Many practitioners noted a marked inconsistency in the knowledge base (PO1, PO3, PO4, PO6, PO7, PO9_P1O, P12, P24), with many reporting that OSH-related information, such as self-reported data on accidents, is regularly incomplete (PO1, PO3, PO9_P1O). This is particularly true in sectors like construction and energy, where data is less centralised than in the oil and gas industry, which benefits from structured data collection and peer-to-peer learning opportunities (P25). Practitioners suggested that primary data is often too outdated to be relevant to current OSH practice (PO1, PO3, P24), especially in sectors affected by emerging developments like artificial intelligence (AI) and climate change (PO7) or in fast-changing environments that regularly experience conflict or natural disasters (P24).

Several practitioners highlighted that linking the cost of OSH investment (e.g. in training, material, implementing interventions) directly to costs saved (e.g. from decreased sick leave, absenteeism and litigation) is a major challenge in their field (P13, P14, P22, P25, P28), pointing out the significant need for financial evidence to support the case for investing in OSH. Without clear financial incentives or benchmarks, it is challenging for practitioners to persuade institutions to prioritise OSH. These same practitioners suggested that a helpful first step in addressing this challenge could be to utilise economic expertise to help identify clear cost outcomes linked to OSH outcomes and to help in using methodology such as cost-benefit analysis.

A second issue practitioners mentioned was their trust in and usability of data across geographies. Several interviewees mentioned that data sources play a significant role in practitioners' assessment of evidential quality and trustworthiness (PO7, PO9_P1O, P13, P24), citing data collected from regions or countries without the research infrastructure to support consistent and reliable data-collection activities (as in many LMICs), where there are less mature systems for recording incidents (PO7, PO9_P1O, P24). Additionally, they mentioned

that HIC-derived data and tools may lack applicability in the LMIC context. LMIC practitioners in industry (especially those working in utility and infrastructure sectors) highlighted the importance of integrating local primary evidence into the OSH knowledge base (P22, P23, P24, P25, P28), emphasising that reliance on academic literature from Europe or North America may not adequately address cultural differences. LMICs face challenges in retrofitting and adapting tools and practices that were developed using data from HICs as regions like Sub-Saharan Africa and Southeast Asia have comparatively limited resources and greater financial constraints (P21, P22, P24, P25, P27, P28), underscoring the need for culturally relevant and locally sourced evidence (P21, P22, P24, P27, P28).

Finally, a small number of practitioners highlighted that commonly used approaches to analysing or utilising data to provide evidence in OSH practice are sometimes obsolete (PO9_P10, P12). One practitioner noted that current approaches to safety often focus on isolated quantifiable, discrete data, neglecting important contextual or cultural data and considerations on environmental design, tacit knowledge, safety work culture, occupational processes and machine ergonomics (PO9_P10). Another practitioner pointed out that the 'traditional', 'linear' science typically used in OSH practice, such as testing a hypothesis to see whether 'A' causes 'B', tends to ignore approaches that potentially offer more comprehensive ways of analysing and collecting evidence (e.g. might other 'A's affect 'B'?). They highlighted the potential of complexity science, for example, which is rarely used in OSH but draws on various methods (e.g. qualitative interviews) to paint a broader (albeit less definitive) picture of the causes and contexts of accidents and incidents (P12).

Practitioners also pointed out that data collection is more comprehensive and systematic in some sectors than others (P24, P25). One example mentioned is the oil and gas sector, which has established guidelines for combining regular, transparent and consistent data collection with peer review systems and embedded expertise to conduct these activities (P25). In contrast, the construction and energy sectors face major challenges in data availability and peer-to-peer learning because there are far more locality-based variables to consider. Thus, guidelines must vary significantly compared to those for the oil and gas sector (P25).

> 'A lot of safety is driven from especially the UK and the US. But it doesn't meet the cultural requirements of different countries.' (P25)

2.3. Evidence needs differ depending on whether the focus is on protecting safety or health

Practitioners often view longitudinal data as essential for understanding the long-term causes of occupational ill health. In contrast, they regard more clearly identifiable workplace events and hazards as crucial for ensuring workplace safety.

Practitioners reported that they often rely on longitudinal data when using evidence to protect the workforce's health (PO2, PO3, PO5,

PO7, PO8, P11, P12, P13, P15, P19_P2O, P21, P25, P28, P29). Organisations may focus on occupational safety due to its perceived immediacy, proximity to the workplace and clearer liability. Some practitioners felt organisations may be less convinced about protecting health in the workplace because negative impacts on health outcomes might be less likely to present in the short term and less easily attributed to occupational activities exclusively. This suggests that liability might be easier to establish for safety than health, increasing the incentive for focusing on the former. Many practitioners suggested that evidence relating to workers' health is less immediate and obvious than safety evidence (PO2, PO3, PO5, PO7, PO8, P11, P12, P13, P15, P19_P2O, P21, P25, P28, P29). While they defined safety in terms of accidents and fatalities in the workplace (e.g. P21), they defined health as more of a 'slow accident', as one practitioner described it (P11).

Data for health outcomes is often more difficult to link directly to the workplace because the cause-and-effect relationship is not chronologically immediate; health outcomes take time to manifest. For example, symptoms or outcomes may occur post-retirement, and the organisation where the exposure took place may no longer exist, making legal recourse difficult and unpromising to pursue (PO2, PO3, PO5, PO7, PO8, P11, P12, P15).

A few practitioners mentioned the limited evidence linking workplaces with well-being, mental health outcomes (PO8, P19_P2O) and chronic health issues (PO2, PO7, P23). One practitioner highlighted the current trend of workforce transience, where many individuals have multiple employers throughout their working lives (P11). Additionally, some respondents noted that factors outside the workplace (PO8) significantly impact health outcomes, which may extend beyond the traditional scope of occupational health (P16).

Consequently, many practitioners argued that employers often do not consider or address occupational health as thoroughly as occupational safety because they perceive the former to lack a clear return on investment (PO2, PO3, PO5, PO7, PO8, P11, P12, P16). However, prioritising safety over health may be misguided; according to one practitioner, health issues can lead to significantly more deaths than accidents (PO8). Additionally, two interviewees emphasised that despite the focus on safety, occupational health is crucial for achieving sound business outcomes, e.g. reducing costs related to absenteeism and presenteeism (PO9_P10). Traditional safety evidence, which relies on incident rates, fatalities, and occupational diseases, is inadequate for addressing these challenges (PO9_P10). Therefore, there is a strong call for improved data sharing and learning from incidents, similar to practices in the oil and gas industry (P25).

> 'While there is a lot of data on safety incidents, there is less comprehensive data on health-related issues, which can take years to manifest and are harder to attribute directly to workplace conditions.' (PO7)

Practitioners shared their views on the types of evidence needed for both occupational health and safety, highlighting the necessity for improved communication in both areas.

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Distinguishing between the evidence needs for health versus safety can be challenging for most practitioners because worker health can influence safety outcomes, and incidents and accidents can influence health and well-being. Moreover, each area requires different expertise, reinforcing this challenge (P02, P03, P05, P08, P09_P10, P11, P12, P15, P17_P18, P19_P20, P21, P23, P26, P27). For example, immediate indicators like accident rates could also yield longer-term health outcomes (P02, P03, P05, P09_P10, P13, P16, P17_P18). According to many practitioners, this interconnectedness between health and safety means that they can be treated under the same umbrella (P05, P09_P10, P17_P18), combining a holistic approach with different 'competencies, training, and interventions' for simultaneous management (P05). Some practitioners suggested that occupational health and safety typically focus on lagging indicators at the sector level, lacking key indicators for comparisons across industries and geographies (P03, P09_P10, P17_P18). In short, evidence directly correlating leading indicators (surrogate outcomes) with long-term outcomes (e.g. death) for occupational illnesses is minimal, highlighting a key gap in health and safety evidence.

> '…A decision might lead to a safety incident, a quality issue, or even stress-related occupational diseases. It is all interconnected.' (P09_P10)

While some practitioners noted gaps in the evidence available, others suggested that the OSH field is already oversaturated with the volume and coverage of available evidence, emphasising a greater need for the skills to translate evidence into practice and communicate its implications effectively.

Some practitioners argued that there is already sufficient evidence available in both occupational safety and occupational health, suggesting the key gaps are in how the evidence practitioners utilise, communicate and translate the evidence rather than in the evidence itself (P08, P11, P12, P14, P19_P20, P26). A few practitioners pointed to using evidence synthesis and systematic reviews via resources like Cochrane to find and use existing evidence (P15, P16, P17_P18), while others highlighted the need for better communication (P08, P17_P18). The latter suggested that using health evidence to effect (healthy) behaviour change at work is challenging because traditional methods for presenting 'facts' (e.g. highly technical, academic reports) may not work, such that other avenues for convincing people to be more 'healthy' may need exploring, e.g. les text-heavy posters that use clear infographics and image-laden communication (P08). According to this practitioner, the issue is less about needing additional health evidence and more about better access, translation and presentation of that knowledge (P08, P17_P18). A few practitioners reinforced this view, arguing that much of the available scientific research has yet to be used by practitioners despite its highly relevant implications and potential for their practice (P08, P11, P12, P14).

> 'Traditional methods of presenting facts and evidence have limited effectiveness in changing behaviours related to health risks…Asbestos exposure illustrates this challenge: some individuals knowingly expose themselves or others to risks for immediate benefits, such as a paycheck, despite understanding the long-term health consequences.' (P08)

2.4. Building a safety culture is paramount for practitioners

While safety and health are top priorities for the practitioners we interviewed, adequate evidence is not always available to implement or embed a safety culture; its influence on safety cultures is complex and multifaceted.

Among the main factors practitioners mentioned as impacting safety culture were overarching regulation (P01, P05, P06, P14), reporting requirements (P09_P10, P20), economic factors (P01, P09_P10, P12, P15), leadership (P06, P13, P21, P28) and communication between industries, organisations and individuals (P01, P12, P24, P28). LMIC practitioners, in particular, stressed leadership's crucial foundational role in defining and instilling a safety culture, which must start from the top and percolate throughout the organisation (P21, P24, P25). Some practitioners recognised that global OSH research and evidence could help instil improved health and safety cultures alongside future external reporting requirements and expectations (e.g. P24). They also noted that practitioners could use research evidence on the importance of safety culture for safety outcomes, cost savings and productivity and supporting such a culture within workplace organisations in developing local culture (P01, P05, P06, P09_P10, P12, P23, P24).

According to many practitioners, regulation could influence safety culture through traditional methods, such as enforcing standards (P06) and additional measures (P01, P06, P12, P14, P24). One practitioner suggested establishing and allocating more resources for safety awareness days modelled on industry conventions, featuring multiple engaging demonstrations (P06). Enforcing dedicated time for activities like safety awareness days could instil a safety culture from the top down, especially if not already incentivised at the individual employer level. Another practitioner suggested introducing a 'global Key Performance Indicator (KPI)' of institutional culture issues impacting workers at the organisation level to support and sustain safety culture (P09_10). Practitioners indicated that safety culture trickles down from all organisational leadership levels and can be incentivised (P01, P03, P09_10, P12, P17_P18, P24, P25).

> 'Leaders cannot make decisions in isolation that affect only one area, like safety or quality, as every decision impacts multiple areas. For example, a decision might lead to a safety incident, a quality issue, or even stress-related occupational diseases. It is all interconnected.' (PO9_10)

Practitioners identified how regulatory, economic, and regional culture perspectives could positively influence a safety culture.

Several practitioners indicated that an organisation's primary focus is its financial performance and productivity, which may affect its safety policy and practice decisions (PO8, P11, P12, P16). In some cases, there is a desire to follow the UK's robust health and safety practices, but the ability or willingness to invest in these practices may be lacking (PO8). As a counterpoint, shareholders can positively impact culture by insisting employers capture and measure health and safety culture (e.g. through regular and systematic questionnaires about tacit knowledge) and incentivise employee adherence through performance-based bonus schemes linked to health and safety measurements (PO1, PO9_10).

However, an employer's ability to offer bonus schemes or measure culture also relies on their economic outlook. For example, a company's size may determine whether it can afford to allocate resources to safety adherence (PO6, P11, P16, P24). All industries face resource constraints and must make decisions that impact safety. While an outside enforcer (e.g. the ILO) can encourage a safety culture, the cost of promoting it may be too high if an employer lacks the financial or human capital (PO6, P11, P16, P17_P18, P25). Another practitioner indicated that the costs could be prohibitive, leading companies to default to meeting only the local minimum safety requirements (PO8) and treating compliance with those requirements as a tick-box exercise rather than a genuine endeavour to promote an OSH culture (P16). Nonetheless, planning for the safety and health of the workforce may not be as cost-prohibitive as expected (P17_P18). One practitioner noted that those who plan meticulously for factors that contribute to ensuring safety and health tend to 'plan for everything else' as well (PO3). This planning ethic contributes to their success in maintaining a strong health and safety record and achieving production targets (PO3). Explicitly measuring the impact of culture on safety and health could help keep health and safety at the forefront of leaders' minds (PO3).

According to some practitioners, understanding the cultural paradigms around health safety and responsibility is key to understanding where evidence is needed in the LMIC context. For instance, there is often a cultural sense of duty to worker's families, particularly in Sub-Saharan Africa, where returning workers to their families in good health after a day's work or (in the case of retirement) a lifetime's work is seen as the employer's responsibility (P21, P24). However, data spanning this extensive timeline and post-

retirement health outcomes is virtually non-existent or ignored (P21, P24, P25), and this approach to OSH culture is far more time-and-space intensive than typical in the HIC context. To adequately consider this cultural paradigm in Sub-Saharan Africa and other LMIC contexts, practitioners highlight the need to collect health data beyond temporal and spatial proximity to the workplace that extends to, for example, physical and psychological symptoms that manifest during non-work hours (P21, P24, P25).

> 'So, where you have a culture, let us say, for example, one manager would push production because that is important for him, and he would push the employees to do something. Take shortcuts. Whatever it may be, that affects your health and safety performance because somebody might get seriously injured or not take the necessary precautions. And then you go to another manager within the same operation where health and safety are at the top of their mind. But, usually, that manager's production targets are already met because he's focused on health and safety, so it's because of the culture installed within his team, even though health and safety is top of mind and production is probably second to mind. But it's got a lot better performance, and usually, production is also on target. Everything runs a lot more smoothly because planning is a lot better. Because you don't just plan for health and safety; you plan for everything else.' (PO3)

Practitioners also suggested that leadership and management could foster a more open culture of learning, emphasising everyone experiences mistakes as well as successes and supporting a stronger health and safety culture.

Some practitioners suggested that an open culture where people at all levels can be challenged indicates a strong safety and health culture (PO1, PO2, PO5, P15). Practitioners could draw from evidence in other industries to understand best practices regarding an open culture (PO3). Key to this idea of openness is embedding a learning culture that consistently seeks key lessons from accidents and incidents (PO1, PO2, PO3, PO5, P15, P22). Practitioners outline three main institutional indicators of an open learning culture: 1) transparency, i.e. there is no effort or incentive for the institution to hide incidents or accidents, and there are safeguards in place to prevent such activities; 2) psychological safety and safeguarding, e.g. established guidelines to safeguard whistleblowers and marginalised voices, and 3) clear, effective and consistent reporting systems, e.g. a constantly updated protocol for recording incidents. Organisational leaders can thus promote learning and openness by ensuring transparency, safeguarding psychological safety and ensuring a consistent reporting system (PO1, PO2, PO3, PO5, P15, P22).

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'Culture is the most important element for getting good safety and health results. Workers used to be blamed for accidents when it might take more than two weeks to read manuals for simple tasks, so it wasn't really their fault. Also, they were under so much scrutiny for major accidents that it caused under-reporting. Workers should be supported in sharing their concerns and anxieties. A strong culture focused on the wrong things will create poor outcomes. As an organisation, we now recognise human factors and have statements such as "Humans make mistakes". A caring culture better supports outcomes.' (PO5)

Changes in OSH norms are most effective through a systemic approach.

Participants felt that, in general, an organisation's safety culture is only effective when strongly embedded in its wider workplace culture and not siloed or considered separate (PO1, PO2, PO7, PO8, PO9_PO10, P12). Participants also considered cross-geography developments as part of this systemic approach (PO3). For example, cultures vary between countries, partly due to regulatory regimes or regional cultural differences; risks must not be merely shifted from one geography to another, permitting poor practices in a country with less regulatory oversight (PO3, P21, P24, P25). One practitioner explained that cultural differences also must be considered openly, focusing on safety as a uniting force (PO8).

'Organisations operating internationally must consider the impact of diverse national cultures on their organizational culture. It is important to recognise and integrate these cultural differences to foster a collaborative environment focused on achieving safety, rather than labelling cultures as "right" or "wrong".' (PO8)

However, addressing differences in cultural approaches to safety across different sectors and geographies is complex; several practitioners noted that some data cannot always be compared due to differences in data collection, infrastructure and indicators in use (PO9_PO10, P21, P23, P24, P25). It could be helpful to have a 'one-stop-shop' offering regularly updated evidence to embed culture from a systemic perspective (PO8). This is important because whilst some evidence is available from a macro perspective, this evidence is not always specific enough to be useful (PO2). Ultimately, there may not be enough usable evidence supporting practitioners to effectively bolster the health and safety culture in a meaningful, scalable way, which may be due to a lack of indicators to help inform safety and health guidance (PO9_PO10). Participants also suggested a need for more research into the influence of organisational culture on health and safety (PO7, P15), as well as evidence that is in an acceptable format for practitioners (e.g. trusted sources such as peer-reviewed journals) (P15, P21, P23, P24, P25).

2.5. Practitioners identified further areas for evidence development

In addition to the main findings above, practitioners noted several areas for future research related to occupational health, evidence and emergent areas.

The perception that occupational health has a more significant evidence gap than safety (PO3, PO5, PO7, PO9_PO10, P11, P13, P16, P21, P24, P25, P28) relates to the difficulty in attributing or recording causes or exacerbations and may require a holistic approach. As one practitioner described:

'I approach Occupational Health and Safety holistically, considering both health and safety aspects as integral to worker well-being. Managing OH and OS requires different competencies, training, and interventions tailored to specific organizational contexts and roles. For instance, safety might focus more on preventing accidents and physical harm, whereas health might address broader issues such as mental well-being and chronic health conditions.' (PO5)

Health becomes a more significant issue when considering chronic conditions and keeping people well in a changing health and well-being landscape (PO2, PO5, P16, P21, P24). Additionally, several practitioners suggested that 'big ticket' (P11) items – such as physical issues – receive greater attention than psychological or well-being-related issues (P11, P14, P16, P21, P24). This often leads to smaller-scale concerns being overlooked (P11, P14, P16, P21, P24). For example, some practitioners asked about the long-term health and/or psychological effects of mundane practices in each occupation (P21, P24).

Quantifying tacit knowledge in OSH evidence use and application is challenging.

Measuring hidden tacit knowledge (experiential knowledge that is part of everyday work culture) is challenging (P12, P28), particularly when accident, incident and near-miss data rely on employers' self-reports (PO6, P11, P14, P16).

Further research is needed in emergent areas such as AI and climate change.

Many practitioners across industries like disaster preparedness and academia in both HIC and LMIC contexts pointed to the challenge of emergent issues with no historical precedence to rely on for data (e.g. PO7, P15, P24). Issues such as climate change and the associated new industries generated, such as renewable energy, offer minimal data because they are new, meaning some risks may still be unidentified (PO7, P15, P24, P25). The burden of the energy transition is disproportionately impacting LMICs as they face the increased demand for new equipment and technologies required to support this shift (P25). Introducing renewable energy solutions brings new risks, especially in rural and frontier areas where emergency services

are often limited (P21, P25, P29). High-risk sectors in Africa and Asia include those involving extensive land travel, such as telecom and construction, due to road safety concerns and the challenges of managing high-rise developments (P21, P22, P24, P27, P28). Additionally, the push for renewable energy introduces community health and safety risks, as regions unaccustomed to electricity must adapt to new technologies without assured quality standards (P25). Many practitioners reinforced that to address the emergent OSH issues in an ever-changing work environment across various sectors, OSH practitioners must be agile and open to new ways of approaching OSH-related issues (P15, P16, P19_P2O, P23, P24).

3. Discussion

We synthesise eight salient cross-cutting points from our findings. The points pivot around three core themes: 1) OSH evidence is multi-faceted and should be understood relative to the practitioner and context of use; 2) the differences between OSH evidence and the reasons for their distinctive uses may warrant further investigation; and 3) variables beyond the OSH practitioner that may help or hinder strong safety cultures would benefit from further evidence. We identify and consider the points here before moving to our conclusions.

3.1. OSH evidence is multi-faceted and should be understood relative to the practitioner and context of use

Applying the evidence in practice depends on the localised use of data and local regulations, culture and infrastructure.

Workplace- and country-specific dynamics tend to drive practitioner expectations and local variation in the types of evidence available (see Section 2.1), particularly regarding the extent to which evidence systems and sources are mature enough to provide sufficient quality for OSH practice use. Indeed, a major theme that emerged during our rapid review (Annex B) was the significant role that data quality plays in whether practitioners use it. Using local languages within regions and countries also exerts some barriers to recording and interpreting evidence sources (see Sections 2.1 and 2.4). Such barriers mean that, despite a consensus that localised approaches could offer global learning, what works in one region, country or setting may not readily apply to another without the localised understanding of regulation or organisational operations. This principle was particularly evident in the LMIC findings, illustrating how the infrastructure, language and reason for using evidence may differ globally (Sections 2.1-2.3). The accessibility of the evidence varies based on the compatibility and maturity of the systems in place to capture it, and a concentration of discrete languages and cultures within localities and regions challenged the ability to establish quality OSH evidence practices in LMIC regions. Such responses from those working in LMIC countries help outline how OSH practice has to match the best evidence available locally, possibly explaining why considering global OSH evidence as a homogenous universal concept may not

be helpful. Furthermore, the LMIC perspective this work package has captured was rarely represented in the literature (see Annex B), providing valuable insights into LMIC practitioners' experiences and evidence use.

There is variation in the types of evidence used, access to sources, and intended use of evidence between practitioner types.

Practitioners use different evidence sources depending on their work, educational background and experience (see Section 2.1). While some might consult two or three preferred academic journals, others might source evidence from regulatory and grey literature sources. Participants also mentioned the benefits of grey literature as providing a ready-made synthesis and analysis of different primary evidence sources. In this way, OSH practitioners considered evidence from grey literature ready for OSH application, minimising the need to search for and make sense of multiple evidence points. While our rapid reviews reinforced that practitioners' expertise in data collection and analysis activities is important in understanding when they might rely on academic sources or conduct primary data collection to support their practice, grey literature was rarely mentioned. Thus, our interviews shed light on an important evidence source for practitioners, showing that they often view grey literature as a desirable source of evidence because it is already consolidated and easy to use.

Another key driver of the variation in evidence use was how evidence needs differ and are defined by a practitioner's role and working context, including the region or area they work in (see Sections 2.1 and 2.4). Different sectors' and industries' activities and characteristics influence how practitioners seek and use evidence. There is no universal requirement for one evidence type; instead, different types of evidence are required depending on practitioner roles and their activities and responsibilities. The literature suggests that such roles can vary depending on a company's work culture, e.g. one that promotes open and transparent incident recording versus one that does not.

Practitioners use evidence for a variety of decision-making purposes.

The practitioner's intended use of the evidence is important in establishing practitioner needs (see Section 2.3), reinforced by the literature (see Annex B) and what OSH scholars call the different types of sector or industry-specific 'recorded knowledge'. For instance, the data that regulatory bodies require for an inspection regime will likely focus on accident type and prevalence. Therefore, some practitioners will be required to report and manage OSH outcomes based on these data types. Other practitioners may seek different evidence, such as guidelines to inform organisational policy, data analytics from HR systems and quality assurance, finance and productivity datasets that may support the prediction of OSH risks. Some respondents discussed using evidence in terms of statistical data to monitor OSH risk, while others discussed using grey literature because it distils the evidence base for more practical and time-efficient application (see Sections 2.1–2.3).

Practitioners reported significant reliance on tacit knowledge.

Practitioners often mentioned relying on on-the-job learning rather than access to supporting materials for using evidence (see Section 2.4). This reliance on experience and learning was also a salient theme in the literature review (see Annex B), reinforcing what OSH scholars call the practitioner's 'agency' or 'ability to act' based on such experience. Practitioners also relied on guidance from their professional networks to understand and apply certain evidence types, suggesting a possible need for more supporting materials on using evidence effectively (see Sections 2.4 and 2.5). For instance, an over-reliance on on-the-job experience and learning could result in variation and bias in two ways: practitioners may be more inclined to take action based on familiar data and sources, and there might be a tendency to seek out data to confirm a single preconceived hypothesis without considering others that may be more relevant to the situation (see Section 2.1).

The practitioners' responses highlighted that their knowledge and experience are key in effectively using evidence (see Section 2.2). Such experience includes how practitioners know which evidence types are fit for purpose, where to find them, and how to interpret and apply the evidence. The results show that while focusing on evidence types is important, the experience and knowledge practitioners need to identify and use that evidence is also integral (see Sections 2.1–2.4). For instance, this distinction can be seen in how the trust practitioners place in data sources depends on the context and how they apply their own experience to it. Practitioners often used such experiential learning to help source and apply OSH evidence, suggesting that understandings of which evidence sources to use and access and how to apply them in practice vary between practitioners. Practitioners often expressed that a more central evidence platform would be useful so that they did not have to rely on their personal knowledge of what evidence to access, how and where. This aligns with another common view that access to a clear and trusted platform of evidence sources would be helpful (see Section 2.5). There was no consensus that current evidence sources were fit for purpose, with many respondents believing they were not (see Sections 2.1 and 2.5).

3.2. The differences between occupational health and safety evidence and their respective uses may warrant further research

Although some evidence types overlap, efforts to improve occupational health rely more on longitudinal data than those for occupational safety, suggesting that the evidence base required for occupational safety differed from that required for occupational health.

Our research also explored whether respondents considered it possible to separate OSH evidence explicitly needs into exclusively safety or health-related elements (see Section 2.3). Although many respondents considered this possible, they argued that reliance on safety-specific data and evidence overlooks the potential magnitude of occupational health issues, partly due to the longitudinal nature of the data required. Evidence on safety and accidents may be easier to generate because these incidents' outcomes are immediate. In contrast, impacts on health can take longer to manifest and record, making it a more complex evidence base to capture. This disparity between occupational health needs versus occupational safety needs reinforces one of the key gaps in the field the literature identified (see Annex B).

Many respondents believed the interplay between occupational health and occupational safety evidence might be being overlooked to the detriment of workers' health outcomes (see Section 2.3). One respondent summarised that a health outcome is like a 'slow accident'. These views were emphasised by some who felt that employers might not vigorously pursue health and well-being outcomes because they carry less financial imperative or potential returns on investment.

Respondents felt that better capturing and using health data could help identify which industries generate the most significant life risk. For instance, occupational disease prevalence may only become apparent many years after exposure to a hazard or have cumulative health implications over many years. In contrast, data around accidents and fatal injuries are more immediate and time-bound, requiring a shorter-term evidence base. Some practitioners suggested that evidence to better understand and support these differences would be useful (see Sections 2.3 and 2.5).

Our findings suggest that OSH culture in sub-Saharan Africa may focus more on returning workers to their communities in good health at the end of their working lives (see Section 2.4). If so, the interplay between the longitudinal impact of occupational health and how it informs our thinking about what constitutes a high-risk sector or occupation will require shifts in categorisation.

3.3. Further exploration of variables beyond the OSH practitioners themselves that may help or hinder strong safety cultures would be beneficial

Some practitioners mentioned that they must constantly balance implementing evidence-based safety with wider organisational decision-making on issues such as operating costs, regulation and culture.

The interviews gave respondents a platform to highlight how they cannot apply safety evidence without considering other subjective organisational decisions (see Section 2.4), such as those around organisational finance, regulation and culture. Practitioners supported improved guidance and evidence in establishing stronger safety cultures within the wider organisational and market factors and forces at play.

There is minimal evidence on recognising organisational cultures and wider contexts when establishing effective safety cultures.

Practitioners described how diverse organisational, regulatory and economic influences can affect a safety culture (see Section 2.4). They highlighted the organisational culture set out by the senior leadership team as having a particularly powerful influence on OSH culture, suggesting an evidence gap in developing and maintaining a safety culture that considers the organisational and external forces at play. To illustrate this, they described how it is easier to build a strong safety culture within an organisational ethos that understands that mistakes are made and supports workers in recognising and learning from them rather than failing to report them out of fear of reprisal. Respondents highlighted how leadership impacts the safety, regulation and organisational cultures, which rely on external and internal forces beyond OSH and across the value chain (see Sections 2.3 and 2.4).

Respondents discussed these complex interplays in different ways. For example, some focused on the effect of organisational culture on safety, describing how an open and supportive culture permitted challenges in ways that could improve safety cultures (see Sections 2.3–2.5). Others highlighted the financial resources organisations had to invest or whether external agencies actively enforced regulation (see Section 2.4). What was clear from the responses is that this area is important but poorly developed in existing evidence access.

Despite the importance of these dynamics, participants considered the evidence supporting practical ways of building an effective safety culture of safety varied in quality and applicability, as was also noted in the literature (see Annex B). Although some interviewees considered it useful in establishing OSH norms, setting a systemic approach to capturing and using evidence was not straightforward and required evidence and incentives.

3.4. Reflections on the implications of our findings

Based on our reflections on the findings described in this report, there are several important factors to consider when developing an evidence centre. We have compiled a list of ways the Centre could provide value to OSH practitioners:

- **Organising** 'evidence' by what function(s) it can support: For example, evidence to inform policy, conduct inspections, escalate risks, design OSH interventions, investigate accidents, develop guidelines, measure well-being, and/or communicate the weight and strength of evidence.

- **Providing accessible pathways to the sources practitioners require:** For instance, encouraging organisations to subscribe to peer-reviewed journals, collating publicly available sources of data, compiling 'cheat sheets' on how to deal with health-related information when it comes to the privacy of employees, and best practice on how to collect self-reported data.

- **Brokering collaboration:** For instance, acting as a broker/supporter of methods for breaking down barriers and encouraging research partnerships between regulators, industry, worker advocates and academia to increase the availability of compelling and relevant evidence for practitioners.

- **Signposting expertise beyond OSH** when needed for OSH-related decision-making: For example, expertise in health and specific data analyses is vital in supporting OSH decision-making, and signposting the methodological expertise each evidence type requires would also help.

- **Encouraging collaborations that address capacity/capability gaps:** This includes sharing learning between and within local and regional OSH approaches and cultures, supporting a global and universally accessible OSH evidence community.

- **Promoting and supporting OSH practitioners in methods for generating evidence where needed:** This would involve actively promoting and supporting evidence-collection efforts in LMIC contexts, as practitioners in these regions are typically underrepresented. This effort could also include sharing and promoting best practices and methods for overcoming challenges in LMIC countries with other parts of the world while signposting evidence sources that might further support OSH practice.

- **Addressing access, applicability and lack of time and resources to use evidence:** Developing direct access or routes to evidence via a central global centre could significantly help meet practitioners' evidence needs.

4. Conclusions

Our research results suggest three overarching conclusions. First, it is clear from our respondents' views that we cannot objectively assess the need for specific evidence types without understanding the context in which a practitioner uses it. The interplay between the practitioner's needs and experience, the context in which they operate and the evidence required for their practice determine how useful evidence is; economic and financial drivers, leadership, industry type, country, region, cultures and regulations are all important contributing factors. Localised differences within the global context mean that much can be shared between practitioners worldwide if provided in relevant formats.

Second, practitioners' experience and knowledge in applying evidence is paramount and should not be overlooked. There is significant knowledge and multiple OSH practitioner networks across the practitioner base, indicating the potential for supporting and understanding practitioner knowledge regarding what evidence to seek, where to find it and how to use it.

Finally, there is considerable variability in the type, quality and access to evidence. Standards could be improved to ensure access to high-quality localised data for all practitioners who need it.

Our research suggests key examples, including matching localised data sources to meet OSH practitioners' needs, better identifying and accepting occupational health data and evidence supporting improved safety and when and how to improve safety cultures.

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Annex A. Methods for interview guide development

This Annex details the methods used in developing the interview guide for conducting semi-structured interviews with OSH practitioners.

The interview guide development process involved two key stages: 1) a rapid review of the literature and 2) an internal workshop to develop questions based on identified gaps in the literature. The following sections describe each stage in detail.

A.1. Rapid review

We conducted a rapid review involving the following steps: searching the literature, screening, extraction and narrative synthesis, each detailed below.

A.1.1. Searches

We conducted a rapid literature review, i.e. a focused approach to reviewing the literature on our topic of interest. The approach draws on the principles of rapid evidence assessment by employing a systematic approach involving 1) searching the literature, 2) screening potentially relevant articles against pre-established eligibility criteria, and 3) extracting data from the included sources.

We undertook initial scoping work to identify the key concepts and terms to incorporate within the searches academic and grey literature English-language searches and to identify the most appropriate databases and platforms to conduct them.

We first sought to define the rapid review's focus based on the work programme on high-risk sectors and occupations. Based on initial desk research, we identified several relevant definitions:

- **High-risk sectors:** Defined as sectors with the highest number of fatal occupational injuries per 100,000 workers by economic activity in 2022. We identified these using International Labour Organization (ILO) statistical data, including from agriculture, forestry and fishing; construction; mining and quarrying; transportation and storage; electricity, gas, steam and air conditioning supply; water supply, sewage, waste management and remediation services.

- **High-risk industries:** Based on the seminal review by Derdowski & Mathisen (2023), these are characterised by their proximity to hazards.

- **High-hazard industries:** Those encompassing practices, technology, and/or material that can have a higher chance and instances of adverse physical or psychosocial impacts on the worker and negative potential impacts in the broader public and environment (International Labour Organization 2024). Hazards in high-risk industries stem from complex

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systems and constantly changing practices, which make learning from experience and operating safely (i.e. avoiding injuries, accidents, illness and mortality) more challenging (Liu et al. 2023). This echoes the definition given by the European Agency for Safety and Health at Work (EU-OSHA), the Occupational Safety and Health Administration of the US Department of Labor and the UK's HSE define hazards to safety and health (European Commission Joint Research Centre 2020).

In developing the search strategy, we incorporated a wide range of terms related to risk, danger and hazard (to reflect the range used to conceptualise high-risk sectors and occupations) and the specific industries covered by these definitions.

Other key concepts included evidence (and the use, need for or lack thereof) and safety (or lack thereof) and its associated outcomes (e.g. injury or death). We drew on the strategy used for RAND Europe's previous rapid evidence assessment in their 2022 study on using evidence in OSH (Stockwell et al. 2022). We searched the Web of Science (WoS) on 21 August 2024 and combined terms using Boolean logic as outlined in the search strategy in Table 1 below.

While developing the search strategy, we piloted search terms using WoS and PubMed to select the platform with the most extensive coverage of the relevant literature, selecting WoS on this basis.

We drew the terms used in the grey literature searches from those used in the academic searches.

Search of academic literature

We conducted the academic literature search in WoS on 28 August 2024. The search only sought to identify articles containing the terms in Table 1 in the title. Search hits were stored and managed using Endnote 21.5 reference management software.

Table A1. Search strategy

#	Web of Science Search string (Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI), Emerging Sources Citation Index (ESCI))	Hits
1	TI=(evidence* OR knowledge OR information OR innovation* OR benchmark* OR policy OR policies OR legislation OR regulation* OR metric* OR indicator* OR analytics OR "return on investment*")	1,881,086
2	TI=((research OR study OR studies OR trial* OR RCT OR review* OR synthesis OR syntheses OR evaluation* OR audit* OR report OR survey*) NEAR/3 (finding* OR output* OR result* OR data))	149,713
3	TI=(guidance OR guideline* OR checklist* OR "check list*" OR standard OR standards)	304,397
4	OR/1-3	2,312,806
5	TI=(utilis* OR utiliz* OR use OR using OR employ* OR implement* OR embed* OR engage* OR apply OR application OR adopt* OR access* OR inform* OR practice* OR change* OR adapt*)	6,930,657
6	TI=(decisionmak*) OR TI=(decision* NEAR/3 (make* OR making OR inform*))	90,932
7	TI=(gap OR gaps OR lack* OR minimal OR limited OR need* OR require*)	826,663
8	OR/5-7	7,733,469
9	4 AND 8 (evidence use / needs)	601,599
10	TI=("high risk" OR "high-risk" OR "major risk" OR risky OR "high hazard" OR "high-hazard" OR "major hazard" OR hazardous OR "high danger" OR "high-danger" OR "major danger" OR dangerous OR unsafe)	107,261
11	TI=(industr* OR work OR workplace* OR "work-place*" OR "work environment" OR sector* OR occupation*)	726,445
12	10 AND 11	1,826
13	TI=(agricultur* OR construction OR manufacturing OR "transport* industr*" OR "energy industr*" OR "mining industr*" OR "waste management" OR "water management" OR "disaster management" OR fishery OR fisheries)	400,232
14	12 OR 13 (high risk industries)	401,983
15	TI=(safe* OR risk* OR accident* OR hazard* OR injur* OR incident* OR protective OR "PPE" OR "near miss*" OR death* OR fatal* OR mortalit* OR wound* OR nois*)	2,526,399
16	9 AND 14 AND 15	366
17	Limit 16 to English	353
18	Limit 17 to publication date in last ten years	268

Searches of grey literature

We conducted searches of the grey literature in two stages. Targeted searches were conducted systematically within the websites of various organisations identified as potential sources of relevant reports. The approach to these targeted searches involved using Google to search for PDF documents within the specified site. See Table 2 below for a list of the websites screened. In addition to these targeted searches, we also conducted broader searches in Google and Google Scholar on 23 August 2024 (using combinations of the following terms: safety, evidence, knowledge, benchmark, hazardous, dangerous, industries and high risk). We took the first 20 results from each search forward for screening (or all results if we identified fewer than 20).

Table A2. Grey literature search

Website	Organisation	Hits screened	Included sources
unglobalcompact.org	United Nations Compact	16	0
safetyculture.com	Safety Culture	20	0
osha.europa.eu	European Agency for Safety and Health at Work	20	1
iso.org	International Organization for Standardization	20	0
ilo.org	International Labour Organization	20	0
osh-med.pro	Occupational Safety and Health and Emergency and Medical Care	0 (no PDF hits)	0
ioe-emp.org	International Organisation of Employers	20	1
itcilo.org	International Training Centre of the International Labour Organization	20	0
tomorrowshs.com	Tomorrowshs	0 (no PDF hits)	no PDF hits
oshinternational.us	Occupational Safety and Health international	0 (no PDF hits)	no PDF hits
aposho.org	Asia Pacific Occupational Safety and Health Organization	20 [unable to access]	0
enwhp.org	European Network for Workplace Health Promotion	20	0
iali-aiit.org	International Association of Labour Inspection	20	0
historyofosh.org.uk	History of Occupational Safety and Health	4	0

A.1.2. Screening and article selection

Screening and selecting academic articles

We selected academic articles for inclusion in the rapid review based on screening the article titles and abstracts captured by the WoS search against the eligibility criteria in Table 3.

Two reviewers (MS and MC) conducted the screening, each screening a portion of the results. Where either reviewer was unsure whether an article met the inclusion criteria, the reviewers decided together through joint discussion.

Screening and selection of grey literature sources

We screened grey literature sources against the same eligibility criteria as the academic literature, using the first 20 sources identified by each search.

A.1.3. Data extraction

We extracted relevant information from the articles selected for inclusion within the rapid review using a structured Excel template. This was designed to capture information about the source's nature, insights related to OSH practitioners' use or need for evidence in high-risk sectors and occupations, and reviewer reflections on translating the results into interview questions for the practitioners. A single reviewer (MS) conducted the extraction.

A.1.4. Narrative synthesis

Two reviewers (MS and MC) identified key themes from the data extraction (See Annex B) and then discussed them with the wider team during a workshop.

Table A3. Eligibility criteria

Include	Exclude
Articles focused on high-risk sectors and occupations (e.g. agriculture, construction, manufacturing, transport, mining, waste and water management)	Articles focused on industries not considered high-risk sectors and occupations
Articles focused on the use of evidence by OSH practitioners	Articles focused on evidence used by policymakers and/or academics
Topics focused on OSH practitioners' requirements/ evidence needs (in safety management in high-risk sectors and occupations)	Conceptualisations of evidence (rather than active use, needs or gaps in usable evidence)
Articles published in English	Articles not published in English
Articles published in the last 10 years (2014–2024)	Articles published before 2014

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A.2. Internal workshops to finalise the interview guide

The research team held an interview guide development workshop after the rapid review that involved two key activities. The first was to map out the research questions to address through stakeholder interviews (including those identified at the study's outset and those related to further evidence gaps and areas of interest identified through the review). The second was formulating and prioritising questions to ask OSH practitioners in the interviews to address the key research questions.

A.2.1. Question mapping

To ensure our questions to OSH practitioners aimed to address identified gaps in the literature, we distilled a set of topic areas that linked directly to those gaps. We established a core set of questions mapped to the findings and prioritised questions to manage the time constraints of the interviews. To do this, we first created a main set of questions, some of which had a series of probing sub-questions. We gave time-duration estimations to each question and followed an iterative grouping and prioritisation process until we established the core interview guide presented in Annex C.

Annex B. Rapid review findings

B.1. Overview of the literature included in the review

The Web of Science search identified 268 potentially relevant articles, of which 24 met eligibility criteria, and 18 had full texts accessible by the review team and included in the review.

All articles reported on empirical research (involving surveys and interview-based studies, modelling and data mining). Two referred to a literature review conducted as part of the study methodology – alongside empirical research, but none were standalone review articles conducted using a systematic approach. Searches of grey literature identified six other relevant sources (including reports and case studies). We included a total of 24 sources.

B.2. Review findings

Based on our review of the literature and an internal workshop to discuss emerging findings, we identified several key themes relevant to practitioner engagement.

B.2.1. Accessibility of knowledge

This section discusses the broad findings related to the accessibility of knowledge, which we refer to as the ability to access and act on knowledge. Accessibility comprises standard accessibility but also includes data availability, acceptability and practitioners' ability to

act. Findings related to knowledge accessibility covered a wide range of topics, including organisational memory, recorded knowledge, data quality and continuous learning. We detail each of these topics below.

Organisational memory

Knowledge availability can rely on organisational memory (Udayanga et al. 2023; European Commission 2020). Organisational memory is a contested topic that can focus on either information or knowledge in its definition (Udayanga et al. 2023). Ultimately, organisational memory references remembering and applying knowledge to new contexts, which includes improvisation to suit this context. However, a key aspect is maintaining organisational memory, which includes 'general good safety culture and safety management' (p. 247) and becomes embedded in individual memories, technology and documentation (European Commission, 2020).

Recorded knowledge

Not all knowledge is recorded using technology or other documentation. For example, tacit knowledge may be an aspect of organisational memory that is more difficult to sustain. Tacit knowledge is 'known by an individual' (Zhou et al. 2019; p. 8). Explicit knowledge must be reported and recorded for later use to secure tacit knowledge (Zhou et al. 2019). Tacit knowledge can include near-miss data that needs discovery and preparation at an organisational level. Finding this data can involve analysing accident databases, considering near misses regarding regulations and standards and observing work or simulations (Zhou et al. 2019). However, merely recording and quantifying knowledge is not the end objective (Zhou et al. 2019). This knowledge should be able to be shared and utilised. It should also be fit-for-purpose, capturing easily quantifiable quantitative data alongside more qualitative data, such as case studies (Zhou et al. 2019).

Data quality and acceptability

The variation in data quality is another key issue affecting the accessibility of high-quality, reliable data, whether qualitative, quantitative, recent or historical (Bahamid et al. 2022). In this rapid review, we identified that practitioners often focus on more easily quantified elements, partly for convenience (Oswald et al. 2018; Xu et al. 2023b), which helps explain why qualitative case studies that require rich and time-intensive data collection may be less valued (Oswald et al. 2018). knowledge recorded robustly can aid practitioners in promoting safety but is not a cause for complacency. Ensuring high-quality data raises questions about practitioners' methods of interpreting and constructing knowledge (Xu et al. 2023a). One way to contribute to data quality is to employ a standardised approach to investigating incidents, such as serious and near-miss incidents (European Commission 2020). However, the acceptability of data or types of knowledge must be considered. Although quantitative data is often appealing to practitioners due to its perceived quality, it is not always as high-quality as expected (Callen & Wilson 2015). For example, in prioritising measures, the scores of larger vs. smaller employers should be weighted rather than directly compared. Additionally, the nuance of data should be considered. For example, when analysing company-level aggregate

data, it is important to question any variation across sites or locations (Callen & Wilson 2015).

Continuous learning, skills and usability

Practitioners also need continuous learning and measurement. For example, healthcare waste workers in Sri Lanka had sufficient safety knowledge but room for improvement in their knowledge of local regulations (Udayanga et al. 2023). Practitioners must also have sufficient skills to apply safety knowledge or conduct analyses. Agricultural extension workers in Ethiopia had low educational levels and could not adequately advise farmers on safety (Mormeta 2019). Whilst the ability to interpret and advise are key skills, so too is the ability to utilise data systematically, e.g. by drawing on particular methodologies or practices, such as accident trees (Liu et al. 2023). However, there are two additional issues regarding accessibility of knowledge: how practitioners learn safety information and their ability to interpret it at the most basic level. Practitioners' ability to act relates to how they gather information and build their knowledge repository. For example, farmers in rural areas of the US preferred to get their safety information through print media despite many having adequate access to digital media (Chiu et al. 2015). Finally, usability relies on an individual's ability to interpret safety information, making the language of the distribution of safety information important. Many construction site workers are transient workers who struggle with English language fluency, raising questions about how health and safety information is transmitted and translated (Burns & Conchie 2014).

B.2.2. A culture of safety

Organisations promote safety by supporting OSH practitioners and actively considering safety in their budgets and planning. A good safety culture is when an OSH practitioner has the knowledge to promote safety effectively and workers are familiar with safety personnel, policies and practices. Several articles included in our review suggest that this is important because safety is often promoted most effectively at a collective organisational level (Oswald et al. 2018; European Commission 2020; Simpeh et al. 2022; Xu et al. 2022; Liu et al. 2023; Xu et al. 2023a; Xu et al. 2023b).

This conceptualisation was based on our interpretation of the literature in this review. Our data collection pointed to several factors that supported a culture of safety. These include individual and interpersonal factors, company culture and working environments.

Individual and interpersonal factors

In an industry with high turnover rates, age and experience were compelling factors impacting safety culture. In a study on the South African mining industry, older workers were comparatively safer than their younger peers, partly due to greater compliance with health and safety standards (Muthelo et al. 2022). Other relevant and interrelated individual-level factors include 'behavioural controls' such as personality traits, safety knowledge, attitudes to safety and job satisfaction (Ni et al. 2020). Furthermore, settings with high mental load could diminish situational awareness, in which case an individual needs to rely on others, such as practitioners, to help bolster their situational awareness (Ni et al. 2020; Muthelo et al. 2022).

Organisational factors

Organisational factors supporting health and safety practitioners include two main categories: funding and prioritising the health, safety and treatment of whistleblowers (Burns & Conchie 2014; Mormeta 2019; European Commission 2020; Simpeh et al. 2022; Edwin 2023; Xu et al. 2023b). Prioritising safety from an institutional perspective is paramount because it defines OSH practitioners' approaches and scope. Funding must also be available for safety protocols, management, systems and equipment (Simpeh et al. 2022), including investments such as using Big Data (European Commission 2020). Even if organisations prioritise health and safety, they must think beyond short-term fixes and plan for long-term safety for maximum impact (Xu et al. 2023b) – including prioritising data and information sharing, whether inter-organisationally or across the industry (Edwin 2023). Finally, cultural change is important within organisations and across sectors, starting with a solid leadership understanding of safety management systems and their practitioners (Schwatka et al. 2016). Ultimately, organisations should strive to reliably prioritise safety by investigating issues, acting on them and ensuring knowledge management and organisational learning occur (Simpeh et al. 2022). Those with safety concerns should be welcomed in this type of organisation, leading to our last finding: how organisations respond to whistleblowers is crucial (European Commission 2020). Those who punish whistleblowers or discourage identifying failings have a greater probability of experiencing systems-level accidents. Whistleblower information can significantly help identify key causes of accidents and prevent them further (European Commission 2020).

Physical environment

The physical environment or context in which people work, including equipment, is important in promoting and ensuring safety. The building site for a high-rise complex requires different safety knowledge from that for constructing a subway, although classified within the same industry. Practitioners' knowledge here must be broad and specialised. For example, practitioners required additional specialist knowledge of geological risks in constructing a subway in China (Xu et al. 2022). The equipment used can also affect safety and compliance, and organisations must invest in the equipment's quality (Muthelo et al. 2022).

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Annex C. Interview topic guide

C.1. Occupational Health & Safety Practitioner Interview Guide

Thank you again for agreeing to take part in an interview. I am ____ , and I am a ____ at RAND Europe. I will be facilitating this interview with you today.

Can I confirm that you have read the information sheet and signed and returned the consent form?

This research has been funded by the Lloyd's Register Foundation, with the aim of exploring how research and evidence can help to improve occupational health and safety. More specifically, we want to identify the evidence needs of occupational health and safety practitioners like yourself.

As researchers, we are looking for peoples' honest experiences, and so there are no right or wrong answers. The answers you provide will be used only for this research project and will not be attributed to individual practitioners, so please feel free to speak openly. However, please do nevertheless respect your own organisation's rules about confidential information and avoid disclosing information that would identify individuals regarding any current or potential breach of applicable rules. Please know that we cannot provide any legal advice or support, and we do not have the power to amend the way your organisation operates. If you have concerns about the safety of your colleagues, we may be able to help you identify appropriate channels to safely report your issues (such as HSE).

The interview will start with some broad questions about your role as an occupational health and safety practitioner and then move into the use or lack of evidence for practitioners before finally moving on to questions about the culture of health and safety. Please know that there are no right or wrong answers. We are not here to judge you, your organisation, or the way you conduct your practice; we are only interested in hearing your opinions and experiences. The interview will last around an hour, but if you need a break at any point, just let me know, and we can pause. [Only if the practitioner consented to be recorded] We will record the interview to ensure accuracy; these recordings will be kept confidential and will be destroyed once the project is complete. Only RAND Europe researchers involved in this project will have access to the recording.

Before we begin, I want to assure you that there are minimal risks associated with participating in this research. Some topics we discuss might be sensitive or emotionally challenging, particularly if they relate to past workplace incidents. Please feel free to share only with what you are comfortable. You can pause or stop the interview at any time.

If you wish to describe events involving malpractice, we ask that you avoid naming any individuals or organisations. This helps us

protect everyone's privacy and maintain confidentiality. Please also remember that we do not have the power to make any changes in your organisation.

Rest assured, all information you provide will be kept confidential, and no identifying details will be included in any reports. We will not disclose what you say to anyone, including your colleagues and line managers. If you feel any distress during our conversation, please let me know. We provided some information on support services in the practitioner information sheet we emailed you. Also, remember that you are free to leave the interview at any time.

We are particularly interested in perspectives relating to health and safety and to high-risk occupations and industries, such as construction, mining, transport, agriculture, manufacturing, and so on. If you have any experience relating to these areas, please use this to inform your answers. Any examples in practice that you can give to any of the answers will also be welcome.

Before I start the recording, do you have any questions?

[START RECORDING (If practitioner agreed)]

"For the recording, the date is _____ , and this is project number O22627, practitioner interview number _____".

To get us started…

[Only get to greyed-out questions if there is time]

Occupational health and safety practitioners

Please tell me briefly about your role in occupational health and safety. 1 MIN

PROBE: What countries or regions do you currently operate in or have had experience in?

PROBE: What sectors/industries do you have experience in? Which of these would you define as high-risk?

PROBE (if little admin data is known about the practitioner's sector): How large is your organisation?

PROBE: What are your occupational health and safety-related responsibilities, and whose OSH are you responsible for?

Are you responsible for the health and safety of people employed by one organisation, or people sub-contracting from other organisations or self-employed too?

Is there any difference in what you need from the evidence with respect to this?

In your practice, do you separate the management of occupational health and safety from the management of occupational health, or is it all part of the same thing?

PROBE: If they are different, what is the difference? If they overlap, what is the overlap?

PROBE: What are the similarities and differences in terms of separating or conflating safety and health between your industry and other high-risk industries?

In your opinion, do you have the skills and information you need to know how to effectively find and use sources of evidence when you need them? 3 MIN

PROBE: Tell me about any specific qualifications or certificates etc. that you received which help you in your job to know which types of health and safety information to use, access, and find (e.g. internally or externally via websites, government platforms, internal servers, etc.)?

PROBE: When thinking of the risks in your industry, is there a difference between risks to 'health' vs. risks to 'safety'? If so, can you tell me about this difference?

PROBE: Do you view your sector as high-risk, and why? Which occupations in your sector?

PROBE: Are you responsible for OSH on any designated Control of Major Accident Hazards (COMAH) sites?

PROBE: What specific knowledge needs are different for your high-risk industry (or COMAH site) than for the general knowledge needs of occupational health and safety practitioners?

PROBE: What factors make a sector considered high-risk to you?

Use (and lack) of evidence

Do you use evidence? If so, how often do you use it when you make recommendations? 5 MIN

PROBE: What do you consider 'evidence' in the field of occupational health and safety?

PROBE: Where do you get your 'evidence'?

PROBE: Are there any other aspects of your OSH practice that need support?

PROBE: HOW DO YOU EVALUATE THE QUALITY OF THE EVIDENCE?

Our understanding of 'evidence' is the outputs of formal research, data, analysis, expert advice, lessons, and views of practitioners. Does this fit with your understanding of what is meant by the term 'evidence', and are there any available in practice? 5 MIN

PROBE: What is each for, when are they used, and what methods are used to implement them?

Are there particular groups of practitioners who are the main users of occupational health and safety evidence?

How often do you need to make decisions but cannot find any evidence to support your decision-making process? Can you tell us of some examples? 3 MIN

PROBE: What evidence is lacking when it comes to showing that something works (effectiveness) or not?

PROBE: What evidence is lacking when it comes to showing that something is worth doing (cost-effective)?

On a scale of 1–5 (1 strongly disagree – V strongly agree), to what extent do you agree with the following statement? 'I have access to all the evidence sources that I need to do my job well'. 7 MIN

PROBE: What additional information do you need to make effective occupational health and safety decisions?

PROBE: Are there any 'difficult-to-measure' aspects of occupational health and safety that you think are worth pursuing to measure occupational health and safety? E.g. ways of doing things, anecdotal information that is not always written down, job satisfaction

What are the challenges that you have experienced when using evidence in decision-making in relation to occupational health and safety? 10 MIN

PROBE: Is there anything that would help you overcome any of the challenges that you have described? E.g. new data, information management systems?

PROBE: (If not covered) Are there aspects of your role or decision-making that you would like more evidence or information to support on? What?

PROBE: Do you trust the evidence sources you use or is there a need for something different or new?

Health and safety culture

Health and safety culture is present when workers learn and implement both tacit and explicit knowledge to promote health and safety and where there is consistent application and role modelling of expected behaviours. Organisations choose to promote health and safety by supporting occupational health and safety practitioners and active consideration of safety in budget and planning. A good health and safety culture is when an occupational health and safety practitioner has the knowledge to promote health and safety effectively and when workers are familiar with health and safety personnel, policies and practices. The literature suggests this is important because health and safety are often most effectively promoted at the collective organisational level.

How important do you feel is the culture of health and safety in terms of achieving health and safety in a workplace? 5 MIN

Are there differences between evidence needs for managing occupational safety compared to those for occupational health? 5 MIN

Areas for development

Is there anything that you do in your practice that you think there should be more, or any, evidence to help you? 10 MIN

Is there anything else we have not discussed that you would like to share? Just to remind you, we are interested in the evidence needs of practitioners like yourself. 5 MIN

What additional contacts or networks can you suggest we contact for this project?

Thank you very much for your insights and your time today.

[STOP RECORDING]