Foundation

Global Safety Evidence Centre

The role of leadership and governance in occupational safety and health

Safe Work

Evidence Review

Briefing

1. The quick read

We conducted a rapid evidence assessment of the role of leadership and governance in improving occupational safety and health outcomes. The research was conducted in collaboration with the International Organization for Standardization (ISO) Technical Committee 283, to support the development of an international standard focused on leadership and governance. ISO standards define senior management/leadership by organisational hierarchy and authority, encompassing roles such as Chief Executive Officer (CEO), Chief Operating Officer (COO) and other C-suite positions.

The evidence shows that:

- Senior managers can positively impact occupational safety and health outcomes in organisations by providing strategic direction, demonstrating visible leadership and engagement, maintaining systematic oversight, and fostering a positive safety culture.
- These leadership practices directly and indirectly improve safety by reinforcing safe behaviours, building trust, and encouraging organisational learning.
- Positive leadership styles, such as care for employee wellbeing and ethical commitment, were consistently associated with reduced incidents and improved occupational safety and health outcomes. In contrast, traits such as overconfidence and a focus on short-term results were associated with increased workplace injuries and poorer occupational safety and health outcomes.
- Longer CEO tenure can foster organisational stability and accumulated experience, thereby contributing to improved occupational safety and health outcomes.
- There is inconsistency in how 'senior management' is defined across ISO standards and the research evidence. While ISO standards define senior management by organisational hierarchy and authority, the research evidence defines it by the functions and responsibilities they exercise, such as setting occupational safety and health policies, allocating resources, and overseeing safety performance. References to 'CEO,' 'top leader,' and 'C-suite' were common in the literature, but definitions tend to be functional rather than tied to job titles.

The findings highlight the need for embedding clear leadership roles, responsibilities, and competencies within occupational safety and health standards. Occupational safety and health policymakers and practitioners need to be encouraged to prioritise leadership development and integrate these insights into organisational policies and practices, with the aim of improving safety outcomes among workers.

Future research should aim to address the gaps identified in the definitions and scope of senior management within both the ISO standards and the research evidence. There is a need for comparative studies across different cultural and organisational contexts to better understand how leadership and governance influence occupational safety and health outcomes globally. Further investigations should also explore the development and evaluation of targeted leadership competencies and training programmes, assessing their long-term impact on safety culture and incident rates.

2. Why this is important

The International Organization for Standardization (ISO) is an independent, non-governmental body that develops standards to ensure quality, safety and efficiency across a wide range of products, processes and practices. One such standards is ISO 45001, a globally recognised standard for occupational safety and health management, that guides organisations to identify and control workplace hazards, minimise risk and improve overall safety outcomes. These standards are developed through a consensus-based process involving a technical committee made up of experts from relevant industries, consumer associations, government, academia, and non-governmental organisations.

While ISO standards are informed by considerable expert knowledge and practice experience, there are currently no systematic processes for incorporating research evidence – that is, information generated and analysed using standardised methods to increase reliability and reduce bias – into standards development.

We wanted to understand how research evidence could inform the development of a proposed ISO occupational safety and health standard focused on leadership and governance. The research addresses an identified knowledge gap regarding the roles, responsibilities and impact of leadership and governance on occupational safety and health outcomes.

The research also contributes to addressing Lloyd's Register Foundation's charitable objective of securing, for the benefit of the community **high technical standards** – of design, manufacturing, construction, maintenance, operation and performance – **for the purpose of enhancing safety** of life and property across sea, land and air, and advancing public education, particularly in transportation and engineering.

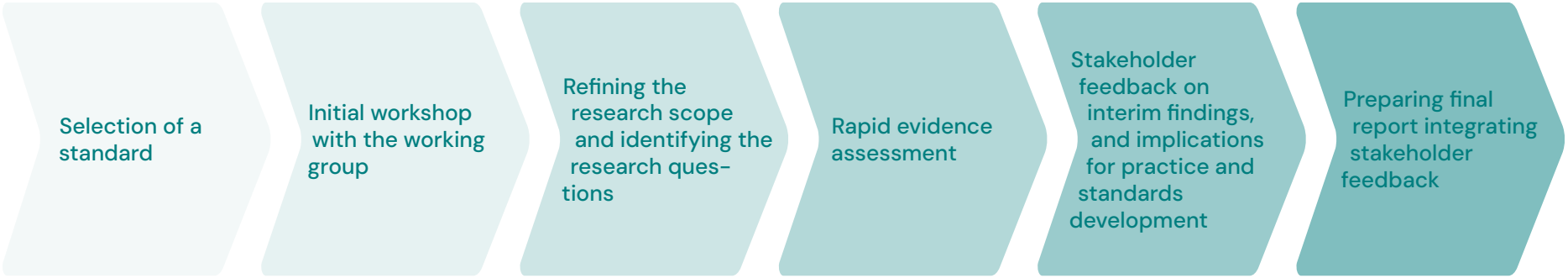
Note: this evidence briefing uses the terms 'senior manager', 'top managers' and 'senior leader' interchangeably.

3. The research

We conducted a rapid evidence assessment on the role of leadership and governance in promoting occupational safety and health outcomes. A rapid evidence assessment is a quick, structured and rigorous method for finding and appraising existing research evidence on a given topic to provide timely, high-quality evidence to inform decision making. This assessment was complemented by the integration of expert feedback gathered through online workshops with a working group made up of experts from ISO Technical Committee 283.

3.1. The research approach

The research involved the following process:



The research approach

Selection of a standard: the researchers consulted with ISO technical committee 283 to discuss the standard to use as the focus for this research. Following discussions, it was agreed to use the proposed standard on occupational health and safety leadership and governance. This standard was selected because it had been recently approved for development and a working group had been established to initiate the work.

Initial workshop with the working group: an online workshop was conducted with nine members of the working group to identify potential evidence gaps that needed additional research. The working group agreed on the need for research to clarify the roles and responsibilities of 'top managers' in comparison to 'middle managers' and 'supervisors' in an occupational health and safety context.

Refining the research scope and identifying the research questions: following the workshop, the scope of the rapid evidence assessment was refined to focus specifically on the roles, responsibilities and impact of senior managers on occupational health and safety. **The following research questions were explored:**

- How is 'senior management' defined in research literature?
- How does senior management contribute to or influence occupational health and safety outcomes?
- Which occupational health and safety outcomes do senior management influence?
- Which skills or competencies shown by senior management affect occupational health and safety outcomes?
- How does the influence of senior management on safety change in different contexts (for example, in different countries, organisation types or sectors)?

Rapid evidence assessment: involved conducting literature searches, screening, data extraction and analysis.

Stakeholder feedback on interim findings, and implications for practice and standards development: an online workshop was held with the working group and staff from Lloyd's Register Foundation, to present interim findings from the research and to seek feedback and input. Specifically, the group reflected on the findings and provided feedback on the implications for practice, policy and standards development.

Preparing final report integrating stakeholder feedback: feedback from the workshop was used to refine the findings, as well as recommendations for practice, policy and standards development.

3.2. The rapid evidence assessment methodology

Literature searches for the review were broad, with no restrictions on geographical location of studies. Literature searches initially focused on English language articles published between 2015 and 2025 across five major academic databases: Web of Science Core Collection, Scopus, Business Source Complete, EconLit and PubMed. To ensure global relevance, the search was then expanded to include articles published in Arabic, Chinese, French, Russian and Spanish, covering the official United Nations languages. Only studies relevant to occupational safety and health and senior management were included, with clear inclusion and exclusion criteria applied during literature screening.

Data were extracted in a consistent and structured manner, allowing for thematic analysis and comparison across different organisational sizes, sectors and global regions.

The six-level evidence hierarchy approach was used to assess the level of evidence included in the rapid evidence assessment, specifically using the classification framework by Reay et al. (2009)[1].

The included studies were classified into the following levels of evidence:

Level 1: Randomised controlled trials (RCTs) or meta-analyses

Level 2: Systematic or high-quality literature reviews that are comprehensive and replicable

Level 3: Large-sample, multi-site quantitative studies or comparative case studies

Level 4: Small-sample, single-site studies conducted objectively by trained researchers

Level 5: Descriptive or self-report studies with limited methodological rigour

Level 6: Expert opinion or anecdotal commentary without original data

1. Reay, T., Berta, W., & Kohn, M. K. 2009. 'What's the evidence on evidence-based management?' The Academy of Management Perspectives: 23(4), 5–18. As of 17 November 2025: *https://www.jstor.org/stable/27747539*

3.3. Strengths of the research

- The research employed a rigorous and structured approach to review the evidence, with the use of a clear hierarchy of evidence to classify included studies.
- The search strategy was comprehensive, covering literature published in the six UN languages – Arabic, Chinese, English, French, Russian, and Spanish – and across different countries, sectors, and organisational sizes. The methodology allowed us to distinguish between generalisable findings and those drawn from more localised or exploratory studies.
- Stakeholder feedback was actively sought through workshops, ensuring the findings were relevant and informed by practitioner perspectives.

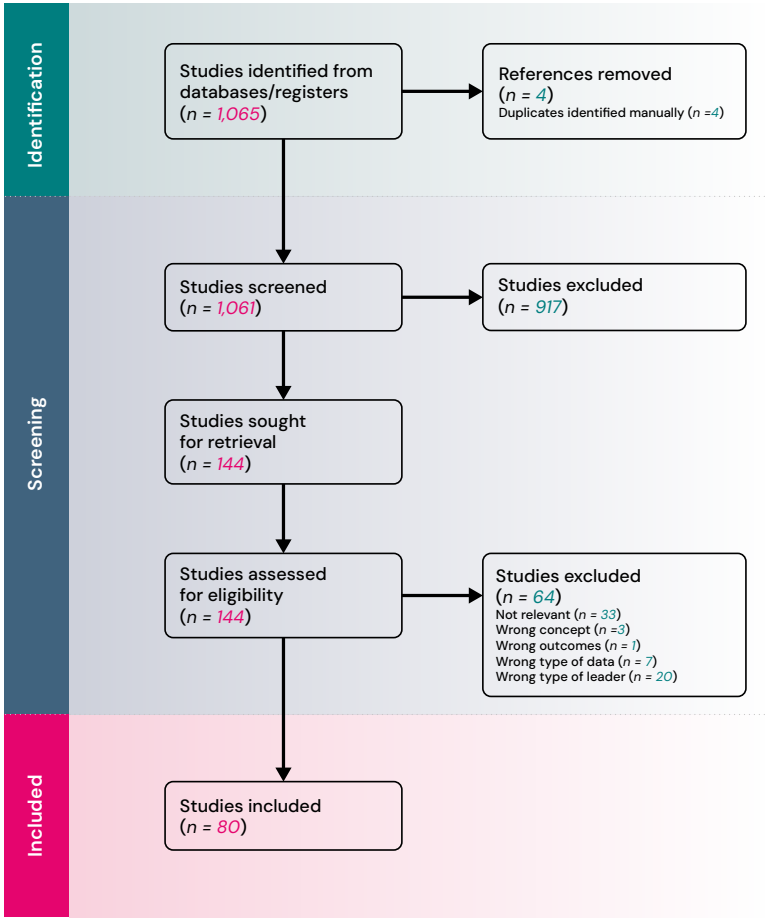
3.4. Limitations of the research

- Evidence on small and medium-sized enterprises (SMEs) may have been under-represented due to the search criteria (for example terms such as "founder" were not included in the search strings).
- Restricting the publication window of eligible studies to 2015-2025 may have excluded relevant studies published before 2015.
- The research did not include quality appraisal of the included studies, limiting conclusions on methodological rigour and certainty.
- By focusing exclusively on academic articles, the research may have missed important studies from grey literature or non-academic sources.

4. The findings

4.1. Selection of studies

The literature searches retrieved 1,061 unique studies for title and abstract screening, following which 917 studies were excluded, and 144 studies were reviewed at the full text screening stage. Of these, a total of 64 studies were excluded for reasons such as being outside the scope of the research, addressing ineligible leader types, using unsuitable data types, focusing on irrelevant concepts, or measuring outcomes not aligned with the study's aims. Ultimately, 80 studies met the inclusion criteria and were selected for data extraction and analysis. The searches in other languages identified 34 potentially relevant articles, but none qualified for full-text review. The study selection process is presented in the PRISMA Flow diagram below.

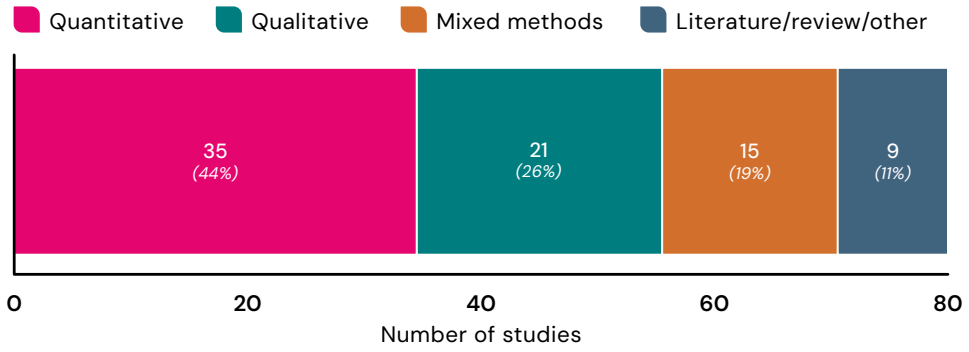


4.2. State of the evidence base

The included studies show considerable diversity in design, geographical location, organisational size, and sectoral focus.

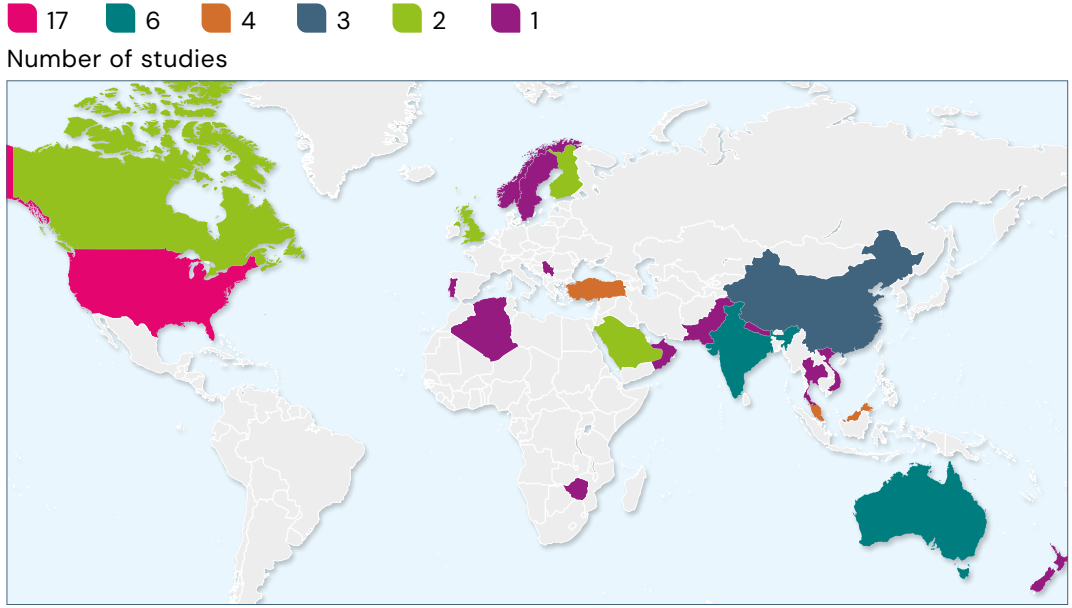
Nearly half of the studies used quantitative approaches, while about a quarter were qualitative. The remainder employed a mixed-methods design or a literature/review-based approach.

Type of included studies



Geographically, most of the research was conducted in developed countries, with the United States and Australia contributing the largest shares, followed by the United Kingdom, Canada, and Finland. Most of the studies from developing countries originated from India, Türkiye, Malaysia, China, and South Africa. There were also a substantial number of studies drawing on multi-country or cross-regional analyses.

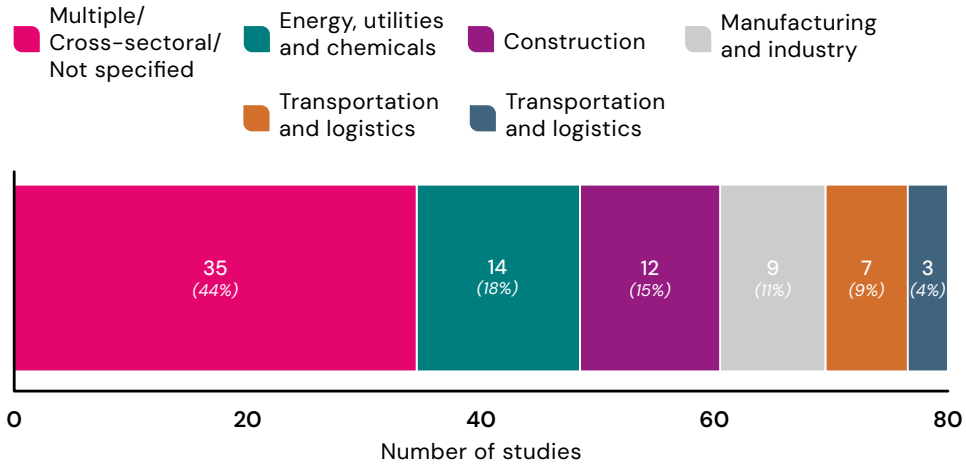
Geographical distribution of included studies



Note: 10 studies reported findings from multiple countries; these are not illustrated on this map.

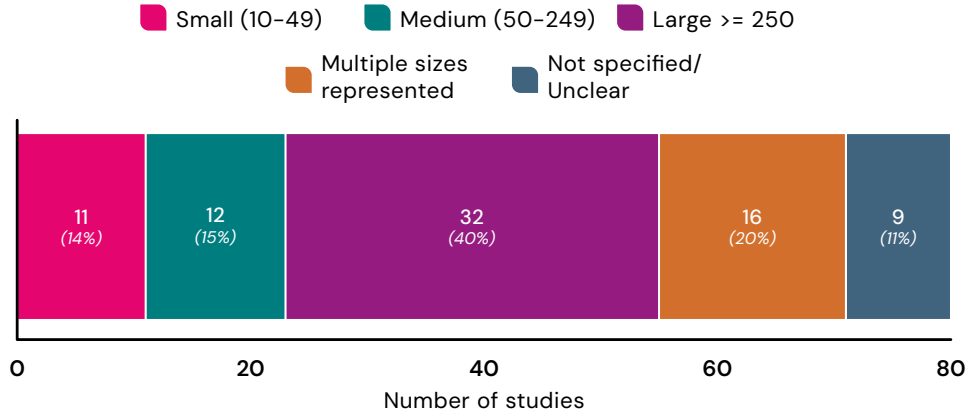
Sectoral coverage was broad, with a significant proportion of studies spanning multiple sectors. Among those focused on specific industries, energy, utilities, chemicals, construction, manufacturing, and transportation and logistics were most frequently represented, while mining received comparatively limited attention.

Sectoral coverage of included studies



Regarding organisational size, most studies concentrated on large enterprises, with a smaller number addressing medium-sized and small firms. Some studies encompassed organisations of mixed sizes, and a few of the studies did not specify organisational scale in their analysis.

Organisational size



4.3. Level of the evidence

The included studies had variable levels of evidence, with a predominance of observational and non-randomised designs. Most of the studies used a multi-site, large sample quantitative or comparative study design, classified as Level 3 evidence. This was followed by Level 4 (small-sample, single-site, theoretically motivated objective studies) and Level 5 (descriptive studies/self-report, non-systematic, limited analysis) evidence. Systematic or high-quality literature reviews contributed to Level 2 evidence, though these were fewer in number. Only a single study used a randomised controlled trial (RCT) design, classified as Level 1 evidence.

This distribution shows that while there is a substantial body of research on occupational safety and health leadership, the overall strength of evidence is moderate, with limited representation from the highest evidence tiers such as RCTs and meta-analyses.

Number of studies by evidence level

Level 1: Randomised controlled trials (RCTs) or meta-analyses	1
Level 2: Systematic or high-quality literature reviews that are comprehensive and replicable	6
Level 3: Large-sample, multi-site quantitative studies or comparative case studies	36
Level 4: Small-sample, single-site studies conducted objectively by trained researchers	27
Level 5: Descriptive or self-report studies with limited methodological rigour	10
Level 6: Expert opinion or anecdotal commentary without original data	0

4.4. Key findings

4.4.1. Definitions of senior management

The ISO provides definitions of senior leadership roles.[1] Across multiple standards (ISO 9000:2015; ISO 45001:2018; ISO 41011:2024), 'top management' or 'executive management' is **defined as the person or group at the highest level of an organisation, with authority to direct, control, delegate and allocate resources**. ISO standard 81001-1:2021 places additional emphasis on overall accountability, while ISO/TS 5441:2024 notes that 'senior management' is often used interchangeably with executive, top or upper management. These definitions typically encompass C-suite positions such as Chief Executive Officer (CEO), Chief Operating Officer (COO), Chief Financial Officer (CFO) and Chief Technology Officer (CTO), underscoring their responsibility for strategic and governance functions.

The research found that:

- The research evidence uses dissimilar definitions. References to 'CEO,' 'top leader,' and 'C-suite' were common in the literature, but definitions tend to be functional rather than tied to job titles.
- Within the literature, senior management are characterised based on the responsibilities they exercise, many of which are directly linked to occupational safety and health outcomes. These included:
  - Setting occupational safety and health policies and objectives.
  - Reviewing safety performance.
  - Designing reward and recognition systems.
  - Allocating resources (e.g. occupational safety and health staff, personal protective equipment, and training).
  - Ensuring a visible presence on worksites.
  - Engaging in two-way communication with employees and supporting middle management and supervisors.

1. ISO definitions of top/executive/senior management were searched from ISO's Online Browsing Platform (OBP). (*https://www.iso.org/obp/ui#home*)

4.4.2. Senior managers' role in shaping occupational safety and health outcomes

The evidence shows that senior managers can positively shape occupational safety and health outcomes in organisations through several key actions, including providing:

- **Strategic direction:** includes setting clear safety policies, establishing measurable objectives and integrating safety into broader business strategies.
- **Visible leadership and engagement:** demonstrated through site visits, participation in safety meetings, and direct communication with employees, thereby reinforcing the importance of safety and building trust.
- **Systematic oversight:** involves implementing training programmes, monitoring safety indicators, conducting internal reviews and investigations, and establishing reward and recognition frameworks to incentivise safe behaviours.
- **Cultural leadership:** reflected in the creation of a 'just culture' where employees feel safe reporting incidents, and in the ability to adapt to new risks and support innovation.

Through these actions, senior managers influence safety both directly – by allocating resources and enforcing compliance – and indirectly – by shaping employee motivation, trust, and organisational learning, all of which contribute to a stronger safety culture and reduced incident rates.

4.4.3. What motivates senior leaders to support safety

A wide range of factors motivate senior leaders to support workplace safety. This includes financial incentives, reputational concerns, regulatory pressures and intrinsic factors.

The research found that:

- **Financial incentives,** such as linking CEO pay to safety metrics or offering long-term compensation, can encourage a stronger focus on safety. However, **the evidence is mixed**, and the findings show that such incentives may sometimes result in unintended behaviours like underreporting incidents.
- **Reputational drivers**, including the desire to enhance legitimacy and meet government contracting requirements, also play a significant role, as does the pursuit of formal safety benchmarks.
- **Individual characteristics**, such as risk aversion and a focus on prevention, are consistently linked to better safety outcomes, while **overconfidence and an emphasis on short-term results are associated with higher injury rates**.
- Evidence for **intrinsic motivations**, such as moral commitment or reputation-building, is limited and methodologically weaker, often based on qualitative or self-reported data rather than robust experimental designs.

4.4.4. The influence of contextual factors

The evidence shows that contextual factors – including geographic region, policy environment, and level of economic development – play a significant role in the level of impact a senior manager can have on improving occupational safety and health outcomes.

The research found that:

- Occupational safety and health outcomes vary considerably across countries and organisational environments.
- National factors such as legal systems, trade union presence, regulatory frameworks, and board practices can have implications for the role of senior management and how safety policies are implemented and governed.
- In developing economies, there are additional challenges, including resource limitations and difficulties in policy execution, which can hinder senior management effectiveness.
- Cultural differences, workforce composition, and sector-specific regulations can also affect how leadership actions translate into safety outcomes.

Most of the evidence was drawn from larger organisations in developed economies, limiting the generalisability of findings to smaller organisations or less-represented countries.

4.4.5. Senior leader characteristics that impact occupational safety and health in the workplace

4.4.5.1. Demographic characteristics

Most of the included studies reported the characteristics of senior leaders such as age, gender and tenure. However, only a few of the studies explored the association between these characteristics and occupational safety and health outcomes.

There is preliminary evidence to suggest that:

- Board diversity, specifically increased representation of women and people from minoritised ethnic backgrounds in influential positions, is associated with improved workplace safety outcomes. The evidence shows a strong positive impact when boards are diverse across both gender and ethnicity, particularly under conditions of heightened accountability.

However, this evidence is from a single study and needs to be confirmed through further research to ensure its reliability and generalisability.

4.4.5.2. Organisational characteristics

The evidence shows that factors such as tenure, positional power, and the structure of senior management influence occupational safety and health outcomes:

- Evidence from a large-scale study involving almost 32,000 participants suggest that structurally powerful CEOs – that is, those appointed through formal organisational channels – are linked to lower injury and illness rates, while owner-CEOs tend to have higher rates of workplace safety incidents.

There is also preliminary evidence to suggest that:

- Longer CEO tenure can foster organisational stability and accumulated experience, thereby contributing to improved occupational safety and health outcomes.
- Senior management commitment, effective communication, and employee involvement are key to enabling safety systems to function effectively. However, this evidence is derived from a small-scale, context-specific study, focusing on perceptions rather than measurable outcomes.

There is a need for further research using robust methodologies to establish the impact of these factors on occupational safety and health outcomes.

4.4.5.3. Leadership profile

Leadership profiles are described as a range of individual characteristics that influence how senior leaders approach safety.

The research found that:

- A leader's career background, personality attributes and leadership style collectively shape safety culture and outcomes within organisations.
- Positive leadership styles, such as care for employee wellbeing and ethical commitment, were consistently associated with reduced incidents and improved occupational safety and health outcomes.
- Senior managers' familiarity with organisational policies can translate into tangible organisational actions to improve safety, and greater awareness of policy among frontline supervisors and employees.
- Managerial experience and specific behavioural tendencies – such as risk aversion, integrity, and chronic unease – can have positive effects on occupational safety and health outcomes.
- Traits such as overconfidence and a focus on short-term results are associated with increased workplace injuries and poorer occupational safety and health outcomes.

Overall, the evidence highlights the importance of nuanced leadership profiles, suggesting that a blend of managerial experience, attitude and leadership style is critical in fostering a safer organisational environment.

5. Recommendations

Implications for future research

- Future research should aim to strengthen the evidence base by employing designs that can better test causality, such as robust longitudinal studies, natural experiments, or randomised controlled trials, and by clear theories of change that specify how and why senior management actions are expected to influence occupational safety and health outcomes.
- Future research should expand its scope to include small businesses and developing economies, as the current evidence base is heavily skewed towards large companies in developed countries.
- Future research should use robust methods to evaluate the impact of senior managers' demographic characteristics, such as age, gender, and ethnicity, on occupational safety and health outcomes.
- The gap between research and practice needs to be bridged, particularly in terms of how ISO standards are defined and implemented. Future studies could explore how these standards are operationalised in real-world contexts and whether aligning research definitions with those in ISO standards improves practical relevance.

Implications for policy and practice

- Policymakers and practitioners need to be encouraged to prioritise leadership development and integrate these insights into organisational policies and practices, with the aim of improving safety outcomes among workers.

Implications for standards development

- Recommended standards and practices should be grounded in the best available evidence and implementation science, allowing for flexibility and adaptation to local contexts. It is important to acknowledge the limitations of the research evidence and avoid prescribing overly rigid requirements when causal pathways are not well established.
- Those involved in standards development need to embed clear leadership roles, responsibilities, and competencies within occupational safety and health standards.

About the 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*

Lloyd's Register Foundation, 71 Fenchurch Street, London, EC3M 4BS, United Kingdom

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RAND Europe was engaged to conduct the evidence review on which this summary briefing – authored by Lloyd's Register Foundation – is based. A full technical report of the evidence review – authored by RAND Europe – is also available on the Global Safety Evidence Centre website.