INAIL

IN COLLABORATION WITH

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

THE EFFECTIVENESS OF ACCREDITED CERTIFICATIONS FOR OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEMS

Technical standards, regulations, support and assessment of results: from current status to prospects

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Edited by:
Statistical and actuarial department
Technical consultancy department for health and safety
Accredia

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CONTENT

FOREWORD by Prof. F. D'Ascenzo

President of Inail

Investing in accident prevention is certainly the main course of action to reduce the frequency and severity of occupational accidents and diseases.
The overall governmental and institutional work, especially the activities undertaken by Inail, is dedicated to this action strategy, intending to further strengthen its commitment to, both through the dissemination of the culture of safety and through economic support to companies.
To achieve this objective, it is essential to implement knowledge-building and monitoring actions aimed at defining the effectiveness of the initiatives undertaken and the investments made.
For this reason, the analysis covered by this work - resulting from the close collaboration between Inail and Accredia to compare the accident data of companies with certified Occupational Health and Safety Management Systems (OH&SMS) with those of other companies - appears not only appropriate but useful and necessary.
Furthermore, it is of absolute importance that this is periodically repeated so that results of such comparison can be monitored as the surrounding conditions change, for instance the revision of the reference technical standards, the certification and accreditation regulations, the production systems as well as the pool of certified companies.
This study, replicating the previous one published in 2018, reaffirms the evidence of a significant reduction in the frequency and severity of accidents in companies with a certified OHS&MS.
This prompts a renewal of the commitment that Inail continues to keep in order to support the drafting of management standards, create application tools and sectoral guidelines, collaborate in the preparation of accreditation and certification rules, and financially support companies that decide to adopt these tools for managing occupational health and safety.
Indeed, I would like to emphasize how OH&SMS and the Organizational, Management and Control Model (OMM) are voluntary adoption tools by companies and, therefore, represent an awareness of the need to make preventive action effective through the adoption of a managerial approach to workplace health and safety. The results of this study can only provide an extremely powerful element to promote such awareness. In this sense, the importance of managing accreditation and certification rules is highlighted, as well as Inail's commitment to technical standardization to support the development of prevention methods based on requirements shared by stakeholders and capable of defining the state of the art as well as rules applicable at an international level.

The presented work well represents the regulatory and legislative evolution that has occurred over the years, leading to these remarkable results today. However, it should be considered not as a final destination, but rather as the outcome of an ongoing journey.
Indeed, further improvements are expected which will contribute on the one hand to increasing the dissemination of certified OH&SMSs and/or asseverated OMMs and on the other hand to further improving accident rates also among certified companies.
Lastly, I want to highlight out the Institute's awareness of the general need for a greater growth in the "safety culture", to ensure that occupational health and safety at work are not considered as merely abstract principles that are difficult to implement or, worse, imposed burdens that one is forced to bear. Instead, they can be an integral part of the corporate culture and take on concreteness in the development of organizational processes, in professional practices and even in ways Inail behaving and thinking. They correctly involve perceiving and addressing the risks associated to work activities to prevent them and, if possible, eliminate or, at least, minimize the occurrence of negative consequences.

FOREWORD by Prof. M. De Felice

President of Accredia

Accredia sees encouraging confirmations in the results of this research; along with promising prospects for the (potential) development of the activities.
The results - work-related accidents continue to be a tragic topic in the news.
The legislation on occupational health and safety management systems (OH&SMS) and on the organizational models (OMMs) must be judged - objectively - to be of high quality. Interventions to mitigate occupational risk levels are therefore unlikely to derive much effect a revision of regulations. Different operational levers must be implemented.
The results of the research - carried out using a set of approximately 26,000 certified companies, a "corresponding" set of non-certified ones, and the historical series of accidents that occurred in the period 2017-2021 (adequately purged of outliers) - indicate strategic guidelines that are useful to consider and generalize.
The role of certification under OH&SMS accreditation and of OMMs stands out as a significant factor in mitigating risk.
The accident “frequency rate” decreases for certified companies compared to non-certified ones, ranging from a minimum of 14% to a maximum of 41% (differentiating by “type of economic activity”). Also, the “severity rate” of accidents is consistently decreasing from a minimum of 13% to a maximum of 39%.
In addition to the undeniable ethical significance, the result also carries economic weight, regarding what is defined in the research as "indirect costs arising from the occurrence of the harmful event".
And it suggests an important indication of method: certification - if well implemented - can play a valuable supporting role in giving tangible effectiveness to compliance with regulations.
It would be appropriate to enrich the method by inventing - implementing - "gentle nudge" tools to promote certification.
Connecting the data - in the preface to the previous research (2018, carried out by Accredia, Inail and the Italian Association for Quality Culture, on “Safety in the workplace and certification”) a passage from Numa Droz's report was referenced (it was presented at the International Congress of Accidents at Work, Paris 1889): at that Congress it was stated that statistics can be considered "true measures of prevention".
Enhancing statistics - and thus providing better support for prevention - is now easier due to the availability of new technologies (analysis schemes could be enhanced with the use of machine learning techniques). The crucial issue obviously lies in the availability of the data. Without linking "information bases" potential is lost.

This research by Accredia and Inail shows the importance of linkages between databases; it encourages the enrichment of information bases (perhaps involving other data providers); it fosters the hope for ongoing collaboration.
The prospects - technological innovation is progressing rapidly, impacting the ways of working, often resulting in new configurations and risk situations for workers.
The applications of AI in operational contexts are -among innovations - a subject of urgent attention for regulatory policies.
In research - emblematically - there is reference to the new “European Regulation on the machinery safety and the “AI ACT”. The role of conformity assessment of AI systems is becoming increasingly important.
On AI, Accredia has started a research project (in collaboration with the National Interuniversity Consortium for Informatics, CINI), to provide concrete operational procedures for accreditation process.
The need for concreteness is prompted by the diverse forms that AI takes in the different fields of application, involving not only the judgment on the "machinery" itself, but also on the process that involves data (information carriers to the machinery) and requires assessment of data selection and data quality.
Regarding future activities (especially regarding AI), the commitment to a certification that also serves as a "support" for the company regains renewed relevance, thus supported by effective training plans.
It is no longer time, due to the complexity of systems, for purely “informative” training. There is a need to move on to training on specific problems (areas), taking up the ancient pragmatist slogan of "doing and training", of "training by doing".
An “active and technical” training approach would be added to the statistics as one of the "measures of prevention".
Research on AI will also be able to provide topics and teaching frameworks that the Accredia Academy can exploit and apply. For this as well, commitment, collaboration and networking are desirable, in the interests of businesses.
When expressing the hope for an ongoing collaboration between Accredia and Inail the perspective on training was another useful hypothesis to be evaluated and hopefully pursued.

EVOLUTION OF ACCREDITED CERTIFICATIONS

Irene Uccello, Alessandro Nisi - Accredia

Safety and the enhancement of the individual at the heart of innovation

Today we deal with a globalized world in which the economies of industrialized countries are strongly interconnected. Just think that complex productions like those of our companies, before being placed on the market, circulate around the world two or three times in the form of intermediate goods.
This image effectively captures the complexity of production cycles, the length of value chains and the level of global interdependence among businesses and countries.
The current crisis, which began in 2020 with the Covid emergency and the subsequent wars in Europe and the Middle East, is causing an atmosphere of mistrust that is spreading throughout markets worldwide.
If we consider that today approximately 80-90% of goods are transported by sea, the crisis in the Suez Canal and the resulting risks on that trade route are causing a sharp slowdown in trade and, consequently, an increase in operating costs for companies.
The exposure to growing global risks is leading companies to shorten global value chains and to their “regionalization” to shield them both from potential future pandemics and from new geopolitical imbalances, which can influence and impact economic growth in some countries at the expense of others. The claim to "regional" autonomy finds its limit within the international system, which is based on rules that risk becoming non-homogeneous. It would therefore be more appropriate to promote a mechanism of convergence among economic areas and, at the same time, to encourage a process of innovation capable of achieving sustainable economies resulting in fairer wages and the enhancement of work and individuals.
The digitalization process is certainly the one that most effectively meets the demand for sustainable and safe production, while also enabling the enhancement of individuals through a fairer access to knowledge and new technologies.
Not surprisingly, the new European Regulation on machine safety, which aims to harmonize safety requirements across Member states, eliminating barriers to trade within the EU, establishes the need to use new digital technologies to “regulate” risks in the workplace environment.
The new EU Machinery Regulation 2023/1230, published on 29 June 2023 in the Official Journal of the European Union, will fully enter into force starting from 14 January 2027, replacing the previous Machinery Directive 2006/42/EC.
The new version of the regulation introduces aspects related to artificial intelligence and IT systems applied to machinery, necessitating the adaptation of both the risk assessment process (including hazards that may occur during the lifecycle of the machine or related product, and not just those foreseeable at the time of placing machine on the market) and the essential safety and health protection requirements.

As regards the essential safety and health protection requirements, the most significant changes involve not only the ergonomic aspects and more reliable protections, also the use of cobots (robots designed to physically interact with humans), collaborating to make processes effective and safe and even replacing human presence, thus avoiding exposure to risk in highly dangerous work environments, such as working in confined spaces.
However, the extensive integration of artificial intelligence in work environments prompts a profound reflection on the ethical and regulatory implications and requires addressing some issues, including operational ones, that, if overlooked, could potentially evolve into problems. Such considerations encompass safeguarding of personal data, ensuring compatibility between AI and existing systems (to maximize technological benefits) as well as the acceptance by workers of the adoption of AI-based technologies.
In this regard, last December, the European Parliament and Council, following complex negotiations, reached an agreement on the proposal for the AI ACT Regulation. The objective is to ensure that artificial intelligence systems used within the EU are fully aligned with the Union's rights and values, ensuring human oversight, safety, privacy, transparency, as well as non-discrimination and social and environmental well-being.
Upon approval, the AI ACT regulation text will be published in the Official Journal and will become fully enforceable two years after its publication date.

Accreditation and its role in the public interest

The current draft of the AI ACT is centered around a risk-based approach, highlighting the significance of conformity assessment by notified bodies. These conformity assessment bodies, whose independence, impartiality, and competence are primarily and preferably ensured through accreditation, are tasked with verifying the conformity of artificial intelligence systems before their entry into the European market.
In this context, Accredia - the Italian National Sole Accreditation Body - is already exploring how conformity assessment activities can play a prominent role concerning the requirements stipulated by the AI ACT for specific types of high-risk AI systems. Conformity assessment, carried out by entities accredited in accordance to Reg. (EC) 765/2008, can serve as a crucial support mechanism in fulfilling the objectives of the Regulation. Through technical regulation promoted by the European Commission, manufacturers will have reference standards to develop systems that comply compliant with the requirements of the new regulatory framework. Furthermore, through accredited third-party assessment, as outlined in the regulation, compliance with the provisions of the AI ACT ca be attested.
The contribution of accreditation, indeed, lies in enhancing trust by providing a higher degree of reliability of conformity assessments and ensuring their

international recognition. This is accomplished through coordination with global infrastructures (EA, IAF and ILAC), enabling the free circulation of goods and services subject to verification.
At the beginning of the 2000s, due to the evolution of conformity assessment activities, the need to establish the Italian accreditation system became increasingly urgent.
In 2008, the entry into force of Reg. (EC) 765/2008 regarding accreditation, market surveillance and product control, regulated conformity assessments, CE marking and the responsibility of those placing products on the market. It identified the appropriate tools for strengthening the mutual recognition of national technical standards, stipulating that each Member State appoint a single body to carry out accreditation activities, acknowledged as a matter of public interest.
In Italy, the Ministry of Economic Development, by decree dated 22 December 2009, designated Accredia as the sole national body to assess the competence, impartiality and independence of certification and inspection bodies, testing laboratories and calibration laboratories.
In the field of health and safety, the publication and dissemination of the BS OHSAS 18001:2007 standard as a technical specification for the certification of occupational health and safety management system, prompted the need for a systematic and consistent framework to govern the conformity assessments carried out by the certification bodies. The work of a group established in 2001, involving Accredia (formerly Sincert), Inail and the social stakeholders of the country, culminated in the publication of Technical Regulation RT-12 *"Requirements for the accreditation of Certification Bodies operating the certification of management systems for the health and safety of workers."*
With the publication of the Technical Regulation RT 12, Italy was among the first countries in Europe to accredit the certifications issued in compliance with the BS OHSAS 18001 standard.
The objective of establishing internationally shared evaluation rules and methodologies to ensure a harmonized approach to the issuance of certifications for Safety Management Systems by accredited certification bodies was achieved, at European level, with the publication of the document EA 3/13 M:2016 *"Document on the Application of ISO/IEC 17021-1 for the Certification of Occupational Health and Safety Management Systems (OH&SMS)"* which later evolved into an international document *IAF MD 22:2018 "Application on ISO/IEC 17021-1 for the Certification of Occupational Health and Safety Management Systems (OH&SMS)".*
The adoption of an international regulatory document has brought multiple benefits. The harmonized approach to certification has resulted in a more consistent and congruent audit methods and duration times, thereby mitigating unfair competition in conformity assessment processes and bolstering the credibility of accreditation and certifications themselves.

In general, harmonized rules present an advantage for certified organizations, in terms of assurance, competence, awareness and international recognition.
Simultaneously, ISO had set up a working group to publish an international standard outlining the competence requirements for personnel involved in the certification process of Health and Safety Management Systems. The work concluded in January 2018, with the approval of the ISO 17021-10:2018 standard.

The evolution of health and safety management systems: technical and organisational aspects

At the beginning of 2020, the health crisis upheaved the world, directly affecting accreditation rules as well. Continuous lockdowns led to objective difficulties in finalizing conformity assessment processes. These challenges impacted the health and safety certification sector precisely during the transition to the UNI ISO 45001:18 standard, published in 2018.
However, a far-sighted decision was made by European Accreditation and the International Accreditation Forum[1] to authorize companies and Certification bodies to carry out assessments remotely.
Accredia, along with all European countries, embraced this provision as early as April 2020, enabling the use of new digital technologies to ensure continuity to the conformity assessment activities of management systems, without compromising effectiveness.
In line with the earlier discussion, the historical analysis of the number of sites certified by accredited Bodies shows an upward trend, especially in recent years (Figure 1). Overall, as of October 2023 (the latest data available) the count stood at approximately 32,000 certified sites. In general, over the entire analyzed time frame, from 2012 to 2023, the number has steadily risen, with the sole exception of 2018, when the first certificates for UNI ISO 45001:18 were issued.

[1] The two associations represent, respectively, the European and global networks of national accreditation bodies. Both can issue mandatory documents to which the accreditation bodies must conform. EA also organizes the peer evaluations that the accreditation bodies must undergo. If the outcome is positive, the accreditation body acquires the right to sign international mutual recognition agreements, also valid for IAF, according to which an Italian certification of a health and safety management system, must be mutually recognized worldwide.

International recognition of an ISO standard and its integration with other management systems have undoubtedly contributed to a broader adoption of the health and safety management system among companies. The operational decisions made by accredited Certification Bodies, supported by tools and technologies, have enabled companies to implement certified management systems, thus mitigating the effects of economic activities constraints stemming from Covid-19.

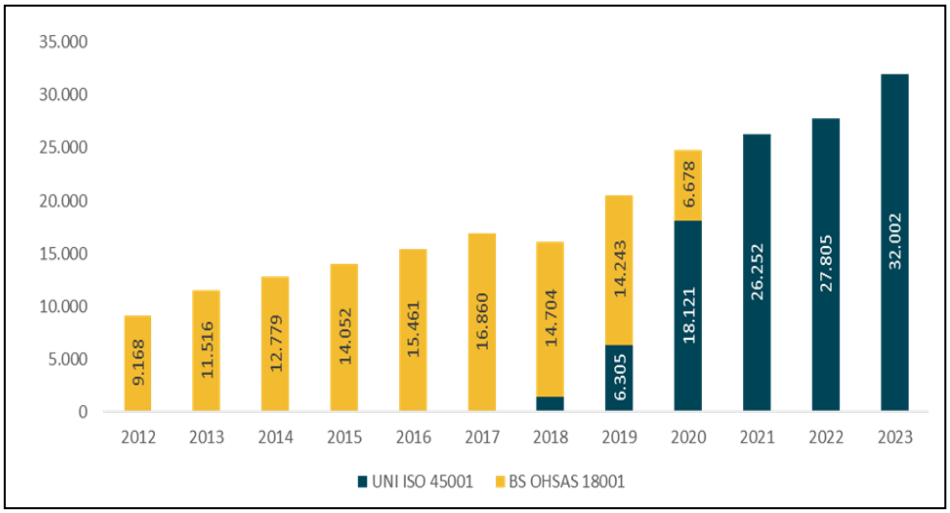


Figure 1. Number of company sites with a health and safety management system certified by accredited bodies. Years 2012 - 2023 - Source: Accredia databases.

There is a noticeable variability in the adoption of management systems across different sectors of economic activity (Figure 2).
In October 2023, the construction sector stood out as the leading industry in terms of the number of sites with a health and safety management system certified under accreditation, totaling 4,701 units. This accounted for an 18% share of the total number of management systems certified under accreditation (quality, environment, safety, etc.).
We observe distribution shares, relative to the total number of management systems, that are notably high, approximately 50%, in the electricity supply and water supply sectors. In the transportation, logistics and communications sector, one out of three certified corporate sites had a certified health and safety management system.

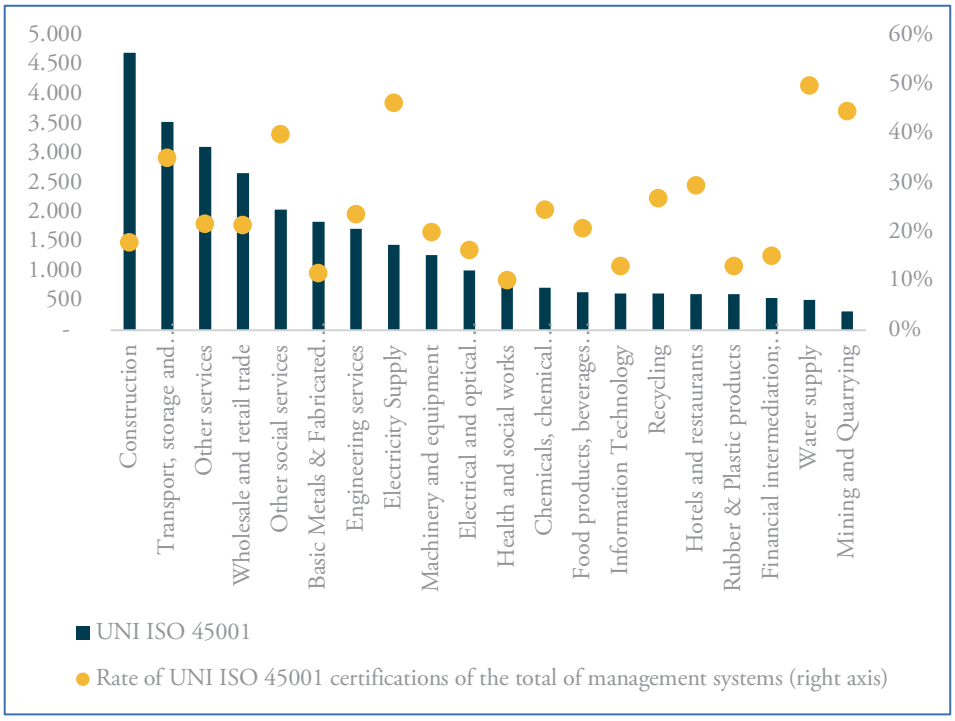


Figure 2. Top twenty sectors of economic activity by number of corporate sites with a certified health and safety management system and percentage share compared to the total number of sites with a certified management system per region. Year 2023 - Source: Accredia databases

The use of digital technologies to conduct assessments remotely during the Covid emergency proved to be a valid and effective choice to supplement in-person audits and overcome the challenges of having to postpone or even cancel assessments during lockdown periods.

Furthermore, after the emergency, the use of digital devices such as "smart" software and sensors has also increased in the safety sector. These devices enhance the reliability of risk assessment processes and operational procedures aimed at safeguarding workers, thereby improving the efficiency of management systems compliant with ISO 45001:18, whose objective is to protect workers and improve company performance in terms of health and safety.

Today there are several applications of smart devices that contribute to more effective worker protection measures.

Artificial intelligence-based software, for instance, can analyze extensive datasets with speed and accuracy far beyond human capabilities. When adopted correctly, they not only optimize estimations of accident data and near misses, but also simulate

hazardous situations, assisting employers in assessing risks for company safety, thus enhancing the efficiency of the process.
Moreover, new digital technologies can play a crucial role in workers' emergency education and training. By using virtual reality simulators, they offer workers the opportunity to gain hands-on experience in a simulated and safe environment.
In this way training becomes more realistic and helps in identifying risks and making rapid decisions in appropriately crafted emergency situations.
To safeguard the health and safety of workers, artificial intelligence offers significant potential to enhance the effectiveness of personal protective equipment (PPE) and its use by workers. For instance, by analyzing historical data and employing machine learning algorithms, it is possible to accurately predict potential injuries and determine the context in which a specific type of PPE would be most effective.
Additionally, artificial intelligence technologies, in conjunction with the Internet of Things - IoT, can also provide real-time monitoring of the use of personal protective equipment and determine whether PPE is being used correctly and under what circumstances. This information is particularly valuable as it enables the correction of improper behaviour in real time, also allowing supervisors to intervene immediately.
The application of artificial intelligence is also becoming increasingly popular in the fire risk prevention sector. Smart sensors in fire prevention systems, including thermal cameras, smoke and heat detectors, and toxic gas sensors, gather real-time data on the surrounding environment. This data is then sent to a centralized data analysis system capable of processing the information and swiftly calling for operator intervention.
Thus, there are numerous smart devices that enable operators to make quick and effective decisions helping reduce accidents at work. Nevertheless, organizational and human factors still play the most crucial role concerning in the enforcement of safety policies and the propagation of safety culture.
When we talk about the "Human factor", we are referring to work, organization and the individual. All three of these factors affect behavior, which in turn impacts health and safety in the workplace. To reduce the risks associated with the human factor it is first necessary to address work management methods and then individual behaviour.
The technical regulation on occupational health and safety acknowledges the significance of the Human Factor and highlights the need to develop organizational models that take it into account, including worker training and information as well as planning activities that engage all workers.
For this reason, as well, from 2018 to the present, thanks to the recognition received from Article 30 of Legislative Decree 81, the dissemination of voluntary health and safety management systems, adopted as a means to effectively implement worker protection measures outlined in the same decree, has become increasingly consolidated.

As we have observed, this trend surged in the post-pandemic period and continues to expand. Presently, the adoption of a safety management system contributes to the reorganization of business processes, particularly when facing significant changes prompted by contextual conditions. It is no coincidence that ISO 45001:18 standard devotes an entire section to the topic of change.
The ability to manage change is a challenge for businesses, but it also serves as an indicator of their ability to maintain, or indeed increase, the performance of their processes over time in a constantly and rapidly evolving external environment.
Today, a winning company is one that can apply the requirements outlined in its ISO 45001:18 management system and continuously strive for improvement in response to changes in context, requirements and expectations.
Corporate choices must therefore stem from the ongoing analysis of the threats and opportunities that may arise.

The effectiveness of third-party assessments of certified health and safety management systems

In the current ever-evolving scenario, assessing the performance of a health and safety management system goes beyond mere compliance with the requirements of ISO 45001:18. Mere confirmation of adherence to legal and standard requirements (system requirements) is not sufficient to achieve the goal of enhancing safety management system performance, particularly in a constantly changing context. Moreover, the auditing process cannot consist solely in recording the evidence collected following predetermined checklists, as it may have in the past (or at least in the period preceding the pandemic), as the legislative framework also undergoes constant changes to adapt to the demands of domestic and international markets.
From this "leap in complexity" of management system assessments, doubts may arise regarding whether third-party conformity assessment of management systems, in an evolving context, provide a valid measure of the effectiveness of the system. This could increase uncertainty associated with the assessment outcome, resulting in the risk that the assessment is considered ineffective and does not generate value.
However, this perception (of uncertainty of the outcome) can be countered if the assessment techniques and methods adapt to the company's context.
This requires the assessor (or auditor) to be capable of understanding and critically examining the organizational behavior and to possess the skills to evaluate whether the choices made by the organization align with criteria of rationality and reasonableness, including the actions implemented to address technological or organizational changes.
The assessment must therefore involve investigating the reasons behind the company's decisions, in line with the principles of risk-based thinking and complying with the regulations for the protection of workers.

This investigation approach for seeking conformity can prove valuable both in providing reliable judgments on the performance of the health and safety management system over time and in ensuring that for the assessment generates value.

In addition to generating value, as a proactive contribution to improvement, the accredited certification of management systems, according to ISO 45001:18 standard, represents the tool to enhance business efficiency by reducing costs associated to non-safety.

Unfortunately, accidents and fatalities at work still result in significant social cost which translates into losses, including economic ones. Given these considerations, it becomes even more evident how obtaining an accredited certification for workplace safety can offer benefits for the company and the community.

Is this indeed the case? The study conducted by Accredia and Inail in 2018, as well as the current update, confirm that there is a virtuous relationship between possessing a certified management system under accreditation and a lower frequency and severity of injuries within companies.

An increase in the dissemination of accredited certifications, aimed at implementing safety policies, could significantly reduce workplace accidents in our country.

EVOLUTION OF OH&SMS STANDARDS

F. Benedetti, P. Fioretti, L. Mercadante, A. Terracina
Inail - General management - Health and Safety Technical Consulting
I. Uccello - Accredia

Introduction

Paraphrasing the guideline OH&SMS[2], published by UNI in 2001, "an Occupational Health and Safety Management System integrates health and safety objectives and policies into the design and management of systems of work and of production of goods or services. The OHS&MS defines the methods for identifying, within the company's organizational structure, the responsibilities, procedures, processes and resources for the implementation of the company's prevention policy, in compliance with the health and safety regulations in force."
An Occupational Safety Management System is thus a voluntary organizational system, aimed at achieving workplace health and safety objectives, where the management of safety and health in the workplace becomes an integral part of the overall management of an organization.
The history of OH&SMS standards can be traced back to BS 8800 in 1996, published by the BSI - British Standards Institute, followed by OHSAS 18001 of 1999, which became a legal requirement in England in 2007. In Italy, the previously mentioned Guidelines for Occupational Health and Safety Management System, also known as Uni Inail Guidelines of 2001. have had and still have significant relevance. Also important in this journey were the guidelines issued in 2001 by the ILO (International Labour Organization).
Today, all of these references converge in the UNI EN ISO 45001:23 Occupational health and safety management systems - Requirements with guidance for use" standard, published by ISO and simultaneously in Italy by UNI in 2018. More recently, in 2023, it was also implemented by CEN. Finally, after more than twenty years, safety management can now rely on an official standard that holds global validity.
The path that led to the current situation followed complex processes, influenced by the culture and goals of diverse and sometimes conflicting parties. A structural starting point has certainly been the logical application of the quality circle, or Deming cycle, and the concept of "continual improvement", which had already occurred long before with the management systems standards from the ISO 9000 series for quality management and by ISO 14000, for environmental management. This connection is today also enshrined in the text of UNI EN ISO 45001:23, by a

[2] https://www.inal.it/cs/internet/attivita/prevenzione-e-sicurezza/promozione-e-cultura-della-prevenzione/sgsl/uniinail.html

foundational structure, common to all other management systems, referred to as "high level structure", through which management integration becomes real and concrete.
This evolution will be discussed in more detail in the paragraphs below.

From OHSAS 18001 and UNI Inail guidelines to UNI EN ISO 45001:23

Voluntary standards for the protection of workers' health and safety emerged, as mentioned earlier, in the 1990s, with the diffusion of BS 8800:1996[3], a non-certifiable national standard issued by BSI, the British standards body, and subsequently of the technical specification OHSAS 18001:07 of 1999 (Occupational Health and Safety Assessment Specification). In Italy, in 2001, it was the publication of the UNI-INAIL Guidelines for Occupational Health and Safety Management Systems - OH&SMS.
The UNI and INAIL Guidelines are the result of a working group that included both the national employer and trade union associations. That created favorable conditions for launching a series of initiatives that, within a few years, led to the widespread adoption of OH&SMS in companies and the establishment of OHSAS 18001:99 certification.
Alongside this, various supranational and national bodies have launched efforts to enhance the culture of health and safety at work and its management aspects, leading to an extensive publication of informative materials and guidelines. Among the latter it is worth mentioning the ILO-OHS Guideline of 2001[4].
In 2007, OHSAS 18001 became a BSI (British Standard Institute) technical standard, effectively establishing itself as an internationally recognized reference. This acknowledgement was reinforced by its updated structure, which aligns more closely with ISO 9001 standards for quality management, and, above all, with ISO 14001 for environmental management. The 2007 edition of the British standard strengthened its focus on management aspects, mentioning worker participation and shifting the emphasis from process safety to process management, aiming for the progressive reduction of risks[5].
Similarly in Italy, the BS OHSAS 18001:2007 standards have become a recognized reference for certification purposes and had a gradual increase, being embraced by tens of thousands of companies. As will be discussed later, they were integrated, along with the OH&S MS Guidelines, in Art. 30 of Legislative Decree 81/2008 and subsequent amendments.

[3] "Guide to occupational health and safety management systems"
[4] "Guidelines on Occupational safety and health management systems"
[5] AA.VV. "Occupational health and safety management systems. State of the art contents and prospects for the development of a culture of safety beyond obligations and towards results" - Inail - Journal of occupational injuries and diseases - Issue 1/2012

Finally, in March 2018, the ISO 45001 standard, also adopted in Italy by the national standardization body as UNI ISO 45001:18, opens up new scenarios for improving of prevention policies, which are essential for effectively reducing occupational injuries and diseases[6].
The ISO 45001 standard is an international standard, as it is published by the International Organization for Standardization (ISO) and represents the ongoing process of globalization and, most importantly, the recognized need to consolidate various workers protection management models into a single internationally acknowledged standard. These management models have been spreading across Europe and developing countries over time. The publication of the ISO standard has enabled the overcoming of the limitation of the OHSAS 18001 standard, which is, indeed, primarily a British standard and not an international one, therefore not globally shared and harmonized.
The structure of 45001 also reflects the ongoing harmonization process. In fact, the document structure is defined by the text of the so-called HLS - High Level Structure, which is common to all new ISO standards, including the updated versions of 9001 and 14001, and governed by Annex SL[7].
In other words, all ISO standards concerning management systems adhere to the same document structure, characterized by a uniform approach as regards terminology, text, definitions, titles and sequences.
From an operational perspective, ISO 45001 introduces new aspects regarding risk management and workers protection.
The most innovative aspect is undoubtedly the analysis of the context, directly linked to risk management (see next paragraph). Designing a management system compliant with ISO 45001 must indeed consider the organization's broader operational context, identifying and addressing the interests of workers, as well as the external context, such as social, cultural and political aspects.
Leadership, and worker consultation and participation, are also crucial aspects. Top management, in fact, is tasked with providing strong commitment: the policy and objectives for the safety management system established by top management must be implemented at all levels of the organisation. Worker partecipation, however, an aspect barely mentioned in BS OHSAS 18001 but better defined in the UNI INAIL Guidelines, assumes a central role, as it is essential for identifying hazards and defining measures for workers protection.
In May 2021, three years after the publication of the standard ISO 45001, the task force ISO/TMBG/JTCG TF 14 "*Revision of the High-Level Structure for MSS*",

6 F. Benedetti, L. Mercadante, A. Terracina, "Genesis and application of UNI ISO 45001" - AIFOS safety notebooks - No. 1 Year X, January March 2019: "Safety objective: ISO 45001 and Vision Zero"
7 Annex SL (workplace safety) is a section of the ISO/IEC Directives Part 1 that prescribes how ISO management system standards should be written. Its aim is to improve the consistency and alignment of management systems by providing a unifying and agreed high-level structure: an identical core text and common basic definitions to make them more compatible.

updated the Annex SL and introduced the HS (Harmonized Structure) model for harmonizing the structure of the voluntary technical standards.
The new HS structure, besides updating some editorial aspects, introduced the principle that field of application of a standard must encompass the expected outcomes of the management system.
This new aspect of voluntary standards provides a foundation from which organizations can begin to consider the relevant risks and opportunities they need to control or leverage to achieve or surpass management system objectives.
Indeed, the expected outcomes serve as a significant benchmark for determining the overall effectiveness of a health and safety management system.

Risk management and UNI EN ISO 45001:23

Strong economic, political and social changes, which began with the Covid emergency in 2020 and have lasted until today with the ongoing wars in Europe and the Middle East and the turmoil in global markets, especially European ones, have repercussions in everybody's life. The perception of uncertainty about the future is thus characterized by five main themes: geopolitical and macroeconomic uncertainty, data protection, climate change, sustainability policies and digitalization.
With this uncertainty driven by change, "organized" businesses manage to adapt and can find diversified solutions to effectively respond to new challenges, often even in advantageous ways, and regularly providing outputs that meet requirements.
We have witnessed how many companies, during the health emergency, found technical and organizational solutions to resist and subsequently emerge from the crisis even stronger. These solutions were heavily reliant on flexibility and the ability to find alternatives to adapt to change, providing services and products that comply and align with market expectations.
Naturally, to achieve these objectives, companies will need to possess with up-to-date knowledge of the requirements framework: legislative provisions, expectations and needs of the most critical and important stakeholders and monitor their evolution.
Yet, that alone is not sufficient without a clear reading and understanding of the risks and opportunities, whether associated with internal processes or with the external context.
It is therefore crucial for companies, especially considering uncertainty, to adopt appropriate tools for analyzing and evaluating risks and opportunities, ensuring that the rationality of decisions is maximized.
Today, business management relies on models, such as those derived from the voluntary technical standards of management systems. The voluntary standards, however, do not offer specific organizational management solutions; instead, they establish a structured system of requirements. By consistently adhering to these requirements, these models can help organizations to adopt adequate analysis tools

that foster the rationality of decisions, within the perspective of continuous improvement.
The systematic application of the organizational model, therefore, serves as a means for the organization to prove to itself and to third parties that the solutions devised, even within the new and broader margins of discretion linked to evolving scenarios, are the result of a logical and traceable process, in which each solution corresponds to risks and opportunities.
All this implies a transformation of the “corporate culture”, or rather, of the mindset that the definition of "risk-based thinking", adopted by the voluntary technical standards of management systems, hereinafter MS, synthetizes effectively.
The standards of modern MSs, including those for occupational health and safety management in standard 45001, define risk as "the effect of uncertainty". This pertains to the attainment of planned or expected business results and objectives. Consequently, risk encompasses both negative and positive risks, or opportunities.
The adoption of risk-based thinking thus involves embracing a new approach to risk (negative: crisis - positive: opportunity); it represents a strategic and systemic approach to thoroughly examining the objective rationale behind organizational decisions.
Regarding the application of risk-based thinking, the standards in question (in line with the new approach to performance) do not provide specific solutions. Generally, small-sized organizations with established technologies, operating within a stable/predictable external/internal context, will not require sophisticated tools to implement risk-based thinking. They can rely, for instance, on SWOT analysis to identify risks and opportunities and make rational decisions.
The UNI EN ISO 45001:23 standard for occupational health and safety management, extensively utilizes the term "risk". The emphasis on risk is linked to the fact that the organization, through its health and safety MS, is tasked with addressing risk assessment, not only for the management of emergencies and the selection of protection measures, but also for devising solutions to organizational changes, often linked to evolving contexts, which can affect both people's health and the safety performance of processes. It is as if the standard states: *“Whenever you engage in risk assessments within your health and safety MS, even just to address changes, make sure to look beyond the probability of something happening. Always ensure that whatever happens serves to protect the health and well-being of workers, the sustainability of your business and to benefit the community."*

UNI EN ISO 45001:2023 occupational health and safety management systems - requirements with guidance for use

The presence of the UNI EN ISO 45001:2023 standard today is the result of a long period of development and refinement, driven by the need for an international consensus on both principles and contents.
In the wake of experience gained over time, within a strongly changed regulatory, cultural and social context, the drafting of UNI EN ISO 45001:2023 has ensued. Its formulation required not only prolonged commitment, but notably intense negotiation efforts. In fact, it was a job that had to consider the different positions, sensitivities, cultures, priorities of the actors, along with their naturally divergent objectives. For these reasons, the international sharing, far from assured, of significant key principles and assumptions, such as the role of worker participation, fully defined as involvement in the decision-making process, is somewhat surprising.
On the other hand, for some aspects not explicitly addressed by the standard, such as free training and PPE for workers, which might be assumed in developed countries with robust regulatory systems for worker protection, it was necessary to supplement with a specific national appendix. This appendix is for all intents and purposes part of the text of the standard as implemented in Italy by UNI, and reiterates the mandatory requirements in our country.
Compared to OHSAS 18001, UNI EN ISO 45001:23 was developed as a useful tool for organizations, aligning primarily with the ISO regulatory provisions in terms of management systems, outlined in the Annex SL of the ISO/IEC Directives Part 1 of 2021[8]:

- standards easier to understand;
- identical structure for all management systems;
- same terminology for all management systems;
- efficient implementation of integrated management systems.

This ensures its full integrability with other management systems adopted according to ISO standards and in the overall management of the organization's activities; also, it introduces new definitions, as explained below.
These formal aspects underlie a substantial approach based on risk (and opportunity) management, which is the fundamental modality of any business process, as well as on enhancing leadership and participation, and the role of representatives.
As previously mentioned, some definitions in point 3 of the standard are of particular interest and originality.
Among these, in addition to the aforementioned "participation", there is the broadening of the definition of "worker", which certainly includes employees, but also top management, external collaborators and other people present in the

[8] "Procedures for the technical work - Consolidated ISO Supplement - Procedures specific to ISO"

workplace; the definition of “OH&S opportunities”, essential for an effective risk approach; finally, the roles of the "contractor" and "outsourcing" which draw attention to interested parties and widespread and inevitable contractual methods in the modern workload distribution and work expertise. At several points, the definition of "outsourcing" has sparked controversies and, for this reason, it is identified as one of the improvement targets for the future revision of the 45001 standard.

Some of the innovations introduced by the new ISO 45001 compared to OHSAS 18001 can be described as follows:

a) “Risk based thinking” as discussed in the previous paragraph.
b) Strategic planning tool: context analysis serves as the starting point for the adoption of the OH&SMS, aiming to highlight internal and external factors that can influence the implementation and management of the OH&SMS and the related outcomes; and, from a risk-based perspective, how they might impact business strategy.
c) Leadership of company management: top management acts as "leadership" of the organization. The greater involvement in implementing the OH&SMS is reflected in their attention to drafting the company policy, but also in defining and controlling processes, appropriate to the context and with close reference to objectives and strategies; also, in a broader commitment to leading and promoting an organizational culture oriented towards the full integration of health and safety goals into the strategic objectives of the organisation.
d) Attention to all interested parties (stakeholders): context awareness is one of the innovative aspects of UNI EN ISO 45001:2023. The organization looks beyond immediate management concerns and adopts a comprehensive approach, acknowledging how its activity can affect stakeholders (workers, suppliers, local authorities, community groups, citizens, etc.) and understanding their needs and expectations regarding occupational health and safety.
e) Adoption of processes for worker involvement at all stages of the OH&SMS: the requirement entails implementing processes for worker consultation and participation at every organizational level and ensuring their continuity throughout development, planning, implementation, and performance evaluation. A clear message that states that an OH&SMS relies on the commitment of all levels and all functions of the organization, supported and made more effective through processes of careful, active and informed consultation and participation by all workers. Top management supports consultation and participation of workers and their representatives, key management elements; it encourages workers to report hazardous situations without fear of threats, dismissal, disciplinary action or other retaliatory actions and pays careful attention to ensuring appropriate methods, times and tailored training.

The evolution of iso 45001 and the standards of the 45000 series

In 2013, at the start of the drafting for IS0 45001, a specific PC (project committee) called ISO/PC 283 was set up at ISO. In 2018, following a particularly complex and challenging process, the standard was published, and the PC was transformed into a TC (technical committee) focusing on furthering activities connected with the systemic management of occupational health and safety.
Since then, ISO/TC 283 has been notable for its continuous development of documents accompanying the main standard; and, far from stopping during the pandemic period, was awarded the ISO *Lawrence Eicher*[9] prize in 2022 as the best TC of the year.
Currently, there are several documents already published, others awaiting imminent publication and others still in the drafting phase. The following list of documents provides an overview of the extensive regulatory output, starting with documents closely related to the standard's application and then addresses more detailed topics and themes, particularly in recent times.

- The first document published was a Handbook for small and medium-sized enterprises which in Italy (at UNI) was decided not to adopt, as it was considered to provide little added value for the panorama of Italian SMEs.
- Conversely, the UNI ISO 45003:2021 standard *"Occupational health and safety management - Psychological health and safety at work - Guidelines for the management of psychosocial risks"* was promptly implemented and translated into Italian; in an absolutely pioneering manner (within the ambit of standardization) it addresses the highly sensitive topic of psychosocial risks within the systemic approach.
- During the pandemic, the ISO PAS 45005:2020 *"Occupational health and safety management - General guidelines for safe working during the COVID-19 pandemic*" was published. In this case as well, it was decided not to publish it in Italy, since it was believed that the document contains guidance that does not align well with the complex Italian regulations on the subject.
- The document dedicated to the management of Covid paved the way for the publication of ISO 45006 *"Occupational health and safety management - Preventing and managing infectious diseases at work - Guidelines for organizations"* dedicated more generally to managing infectious diseases[10].
- Perhaps the most significant document was issued in March 2023, namely the UNI ISO 45002:23 standard *"Management systems for health and safety at work - General guidelines for the implementation of UNI ISO 45001:2018"*. These are

[9] https://www.iso.org/lde-award.html
[10] At the time of writing (February 2024) the document has not yet been formally implemented and translated in Italy although it is realistic to think that it will be adopted shortly.

the application guidelines of ISO 45001 and provide detailed instructions for adopting and implementing the individual requirements of the standard[11].

- Another highly relevant document is ISO 45004 *"Occupational health and safety management - Performance evaluation guidelines"* which aims to provide guidance on assessing and improving OH&SMS performance. Its publication is expected in 2024[12], it is probable that it will be adopted in our country as well.

It is good to clarify a recurring misconception: organizations can adopt the guidelines of all these aforementioned regulatory documents but not be certified with respect to them. The only standard subject to certification remains UNI ISO 45001:23, as it defines the requirements for implementing the occupational health and safety management system.
Alongside this series of standards that are primarily application-oriented to the main standard, additional ones are being developed; they are undoubtedly characterized by a very strong innovative nature, at least in the field of technical standardization, and are:

- *ISO 45007 Occupational health and safety risks arising from climate change and climate action - Guidelines for organizations.* The project for this standard is already underway
- *ISO 45008 Occupational health and safety guidelines for working from home* - currently undergoing approval
- *ISO 45009 Governance and Leadership Top Management requirements for ISO 45001:2018* - currently undergoing approval
- *ISO 45010 Menstruation, menstrual health and menopause in the workplace* - currently undergoing approval

However, the most relevant aspect is certainly the upcoming of the parent standard ISO 45001:18. Also on this, it is worth retracing the stages that are leading us to this further stage.
ISO 45001:18 was published in March 2018 and was promptly implemented in Italy as UNI ISO 45001:18. Its adoption was crucially dependent on the integration with the national appendix, which contains the national legislative references already discussed. The standard, initially not implemented at European level, received this fundamental recognition only in 2023 when, in a second vote, the vast majority of European countries voted for its adoption in Europe. As a result, the standard will have to be implemented in all European countries and has been republished in Italy as UNI EN ISO 45001:23. This is an immensely valuable step, as well as a victory for our country which, through UNI, was its promoter.

[11] At the time of writing (February 2024) the document has been formally implemented but its publication in Italian will realistically take place at the end of the first half of 2024.
[12] Meanwhile ISO 45004 was published in March 2024 as ISO 45004:2024

It is in this context, in 2024, we are preparing for the revision of 45001, six years after its publication, with a work program aimed to be completed within a three-year timeframe. It's not guaranteed to be an easy transition. The five-year experience that led to the publication of ISO 45001 has taught us how delicate the topic is and lends itself to discussions between perspectives sometimes profoundly different. For instance, between representatives of labor unions and those of the associations of employers, including also certification bodies, with significant differences also linked to their belonging to vastly different geographical areas. Once again, our country will be at the forefront, active and proactive, in updating the standard to reflect the developments of the world of work; and it will be alert in ensuring that the standard is not "watered down" in its fundamental requirements, but instead evolves towards a better text, indicating even clearer and more explicit requirements.

2017-2021: FIVE YEARS ON A ROLLER COASTER, THE SOCIO-ECONOMIC CONTEXT UNDERLYING THE STUDY OF STRATEGIES TO APPROACH ACCIDENT RISK ASSESSMENT. THE COMPARISON BETWEEN CERTIFIED AND NON-CERTIFIED COMPANIES

S. Amatucci, G. Morinelli
Inail - General management - Statistical and Actuarial Consulting

Five years have passed since the last analysis which compared the accident rates of certified Italian companies with those of non-certified companies. In this timeframe, the world has been upheaved by the Covid emergency, and the consequences of the pandemic have been devastating: businesses once deemed stable have collapsed; while new businesses have emerged seemingly out of nowhere, leveraging the crisis to their advantage. Meanwhile, many others have reinvented themselves, facing the emergency by exploring new avenues and reconstructing their business structure from within. In these five years, some economic sectors have withstood the crisis, while others, particularly affected by various lockdowns, have seen their profits plummet and their survival severely tested. The country's economic structure has been redesigned from within, rebuilding, reshaping adapting the entire production and sales system.

Redesigning the economic structure of a country has meant quickly moving productions and specializations from one economic sector to another; it has required transitioning workers from one specialization to another, with some economic sectors suspending activities indefinitely until a future reopening date can be determined. Entire supply chains have been undermined at the fundamental nodes: just consider the world of art and entertainment, for example, which, unable to use spaces to host audiences in cinemas and theatres, has put the entire sector in crisis, from workers to actors to producers, as well as all the economic activities linked to this system.

Such a profound crisis (there are companies that still have not reopened today) has deeply impacted workers as well. Some returned to work only a year after the start of the pandemic, others were reallocated and perform a different activity, and still others have not been reinstated at all. Speaking about accident trends in these circumstances is quite delicate, also because that the risk of injury is linked to the relevant economic sector, and within the same economic sector, the difference in risk is determined by the specific task performed.

The employment trend has therefore redesigned a significant portion of the so-called risk maps for reasons linked to the causes just outlined.

In addition, due to the pandemic emergency, workers who continued to carry out their work "in person" were still exposed to the risk of contagion so, from a strictly

mathematical point of view, there was an increase in accidents and a decrease in workforce, which necessarily led to an increase in accident rates.
Italy's accident scenario has thus been significantly influenced, at least in recent years, by the repercussions of Covid-related infections, especially in the very first phase of the pandemic which, as mentioned, "froze" entire productive sectors.
Since the onset of the pandemic, the Italian Government intervened in several phases to support the economy and the labor market. The measures taken in the early stages were primarily emergency-focused, aiming at ensuring continuity of work, and consequently income, especially to workers affected by the closures imposed to curb the spread of the virus. Laws were enhanced to prohibit layoffs due to economic reasons, and the Redundancy Fund was extended to all economic sectors and businesses, irrespective of their scale.
In the second phase of the pandemic, governmental incentives were promptly directed towards restarting businesses and the economy as a whole. This involved infusing liquidity into businesses and setting forth clear safety criteria for a secure return to work, aimed at curbing virus transmission. The National Recovery and Resilience Plan which was financed by the European Community has certainly played a pivotal role in bolstering liquidity to businesses. Furthermore, through this Plan, our country initiated a series of public investments and reforms in areas such as ecological transition, infrastructure, digitalization, employment and social inclusion.
The measures to restrict mobility, as well as the complete halt of certain productive activities and the reorganization of work through the so-called Smart Working, resulted in GDP downturn unparalleled since the beginning of European statistical surveys in 1961. In particular, in the second quarter of 2020, the National Institute of Statistics documented a further 0.2 % decline in GDP. The situation we had to contend with was particularly challenging when looking at European level indices. Using the year 2000 as a reference point, the EU GDP in 2019 had increased by around 30 % compared to 2000, while in Italy, over the same period, the growth had been limited to just 4 %.
How has the world of work responded to this forced stop and go? What were the consequences of this sudden halt in activity and rapid restart in terms of accidents at work? Other questions must necessarily be asked when trying to analyze workers who previously carried out their work "in person" and now perform the same activity remotely through Smart Working.
These questions, raised at the start of this new study on the analysis of risk levels of certified and non-certified companies, have certainly heightened curiosity about new economic and accident scenarios in an evolving world. Also, they have underscored the importance of carefully identifying the so-called "noise" generated by misleading elements that could result in confusing results and conclusions.
Despite the challenges associated with the transformation of the economic structure of our country, this latest analysis, even with a new and improved approach

compared to the previous studies carried out in 2012 and 2018, is based on a model designed to be perfectly adaptable to any situation.
In this edition of the comparison between the risk levels of certified and non-certified companies, the data on accidents from the five years between 2017 and 2021 have been considered.
In this period, as already mentioned, we moved from an initial expansion of employment to a sharp contraction due to the pandemic crisis, and then to a renewed, very rapid resurgence in employment. Historically, under these conditions, we know that when an economy is in crisis or recovering from a crisis with a "vehement" rebound, there's a tendency to focus investments on production to avoid missing "the recovery train", often sidelining investments on safety; these, as we have seen from the analysis of the cost of accidents, constitute a significant portion, even up to 40%, of the overall costs that a company must bear to address workplace accidents.
According to the INAIL - CO&SI[13] model, the estimation of the overall burdens related to the occurrence of an accident includes coverage for the risk of injury (insurance cost), the indirect costs resulting from the occurrence of harmful event (loss of production, damage to machinery, reduced working capacity for the injured person etc.), as well as the accident prevention costs. It is precisely the investment in prevention measures that allows a company to reduce the other two cost items: the more effective the measure adopted, the more significant the reduction in the incidence of accidents, both in terms of frequency and severity. Consequently, the costs associated with the occurrence of harmful events will decrease.
The economic and accident scenario that was analyzed, therefore, entailed particular caution, to avoid placing excessive weight to endogenous variables that could have led to misleading results.
To eliminate anomalous shifts in accident indices, the forced decision was to eliminate Covid-related absences from the analysis. Indeed, at least in the initial phase, the infection was not uniformly distributed but concentrated in economic sectors that continued to be productive and thus were more exposed to contagion.
Alongside the elimination of absences from work caused by contracting the infection, injuries that occurred to workers during their commute between home and work (commuting accidents) were not considered and therefore excluded, thus not falling within the category of defined positive accidents.

Injuries

A work-related injury is defined positive when it is recognized as such by Inail.
Subsequently, a distinction was made between "Minor" and "Serious" injuries, considering "Serious" all those that resulted in "permanent" aftereffects, regardless

[13] https://www.Inail.it/cs/internet/attivita/prevenzione-e-sicurezza/promozione-e-cultura-della-prevenzione/software/co_si.html

of the days of convalescence, i.e., all injuries for which the victim suffered at least a degree of impairment, along with fatal cases with and without survivors.
The "Minor" injuries, on the other hand, are those that did not result in "permanent" aftereffects or led to the worker's death.
Therefore, the sum of "Minor" and "Serious" injuries give rise to "positive defined" injuries.

Employees

Since Inail "employees" are the number of workers estimated by the Institute based on the salaries reported by the employer, the precise number of employees of all categories of workers was not used, but rather an estimate. For this reason, to ensure compatibility between the number of individuals exposed to risk and the number of injured workers, all "defined positive" injuries occurring to apprentices, temporary workers, professional athletes, domestic workers and housewives were excluded from the analysis.
The following table shows the numbers regarding the Inail employees for each year of analysis and the number of elementary units (PAT - Territorial Insurance Positions) surveyed.

Table 1: 2017 - 2021: Employees and PAT

Year	**Employees**	**PAT**
2017	16,509,631	3,722,139
2018	16,902,888	3,722,158
2019	17,326,890	3,760,863
2020	15,944,341	3,710,734
2021	17,126,992	3,759,534
5-year period	**83,810,742**	**18,675,428**

The elementary unit of survey, namely, the reference PAT of each Inail client, was identified starting from the respective tax codes and VAT numbers provided by Accredia. Specifically, Accredia provided the list of all the companies subject to certification year by year, and for each certified company, the corresponding classification protocol was also provided.
The data referring to the tax code and VAT number was cross-referenced with the data present in the Inail database, returning the single client code as the discriminating element by which a company is uniquely registered in Inail.
Once the client code has been identified, the corresponding PAT vector linked to that company was determined. From the individual PAT associated with the identified client code it is possible to obtain, for each single year of certification, the

region in which it is located, the Inail tariff item, the number of Inail employees, the related accidents associated to each PAT and the related nature of the injury.

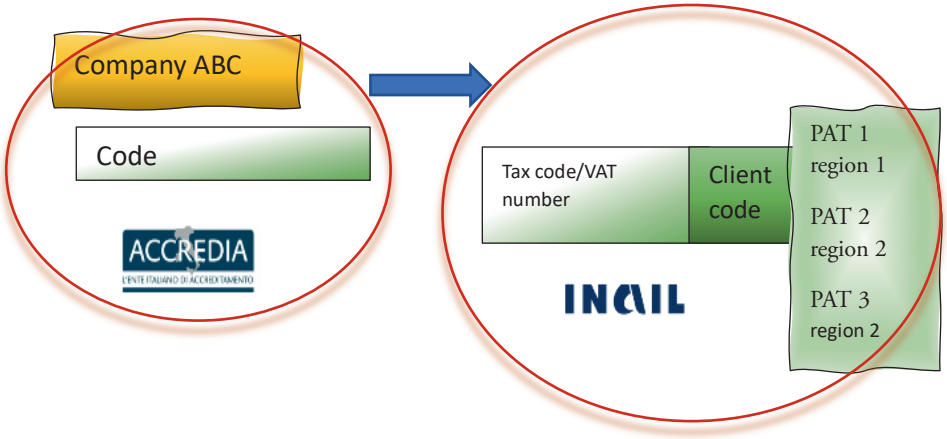


Figure 1: Data study flow

In the five years under study, Accredia communicated a total of 28,757 certifications related to the two standards: BS OHSAS 18001:2007 and UNI ISO 45001:2018

The data extracted from the Inail database refer to 25,932 certified companies. The vast majority of the nearly 3,000 certified sites that were not identified are represented by sites of companies headquartered abroad, and therefore their tax code/VAT number is not recognizable by Inail's computer systems.
Referring to Figure 1, the first phase of the analysis of the comparison between the two samples of certified and non-certified companies can be identified. This phase involves constructing the sample of certified companies by intercepting the individual companies present in the Inail database. Once each single certified company has been identified, it is broken down into all its PATs scattered throughout the Italian territory. Each PAT will represent the elementary statistical unit capable of providing the number of employees for each of the five years, the regional location, the economic activity performed according to the Inail classification and the trend of accidents divided into "Minor" and "Serious" injuries.
To provide a size to the statistical sample of certified companies, the process that led to the formation of the sample can be outlined: out of the 28,757 companies provided by Accredia, 25,932 were identified. Once "broken down", they provided

information on 74,652 PATs (approximately 15,000 each year and steadily increasing from 2017 to 2021) distributed according to Table 2.

Table 2: distribution of PATs related to the sample of certified companies per PAT region

Region	2017	2018	2019	2020	2021	overall total
Abruzzo	426	497	597	642	779	2.941
Basilicata	193	211	233	236	298	1.171
Bolzano	81	98	128	128	162	597
Calabria	269	272	291	272	412	1.516
Campania	686	752	891	998	1.167	4.494
Emilia Romagna	1.166	1.284	1.331	1.490	1.794	7.065
Friuli Venezia Giulia	370	395	410	378	449	2.002
Lazio	990	1.091	1.248	1.339	1.623	6.291
Liguria	338	368	407	417	523	2.053
Lombardia	2.229	2.537	2.660	3.065	3.756	14.247
Marche	339	353	417	457	577	2.143
Molise	140	145	162	177	217	841
Piemonte	764	871	959	1.084	1.399	5.077
Puglia	569	664	755	831	1.004	3.823
Sardegna	207	211	224	246	304	1.192
Sicilia	499	493	540	604	748	2.884
Toscana	889	1.014	1.076	1.200	1.489	5.668
Trento	159	186	226	218	274	1.063
Umbria	269	284	326	358	459	1.696
Valle d'Aosta	26	26	32	49	60	193
Veneto	1.338	1.471	1.584	1.486	1.816	7.695
ITALIA	11.947	13.223	14.497	15.675	19.310	74.652

Corresponding to this, in Table 3, over the five-year observation period, there were 7,048,530 employees (on average 1.4 million, also increasing from 2017 to 2021)

Table 3: Distribution of the employees related to the PATs of the sample of certified companies per PAT Region

Region	2017	2018	2019	2020	2021	Overall total
Abruzzo	19.123	20.720	24.529	25.204	32.021	121.597
Basilicata	5.221	6.111	6.755	11.797	15.242	45.126
Bolzano	7.083	7.490	8.534	5.521	11.605	40.233
Calabria	8.378	9.158	8.772	6.995	10.006	43.309
Campania	22.953	24.160	31.230	39.569	44.080	161.992
Emilia Romagna	106.789	117.648	116.928	124.487	198.675	664.527
Friuli Venezia Giulia	28.044	28.033	33.000	30.110	36.918	156.105
Lazio	131.862	372.711	389.769	337.383	454.240	1.685.965
Liguria	26.645	27.033	28.846	30.377	46.723	159.624
Lombardia	229.653	289.238	387.698	401.251	557.987	1.865.827
Marche	20.587	17.524	21.717	22.399	26.936	109.163
Molise	2.603	3.144	2.561	5.965	6.639	20.912
Piemonte	68.482	74.859	84.931	98.794	145.736	472.802
Puglia	35.106	39.779	33.922	45.724	60.391	214.922
Sardegna	6.195	6.502	6.975	7.222	10.028	36.922
Sicilia	19.265	20.938	26.239	21.964	31.216	119.622
Toscana	82.816	88.347	88.666	90.385	109.077	459.291
Trento	19.344	10.833	25.633	30.325	2.3841	109.976
Umbria	13.771	16.238	19.166	18.810	2.2581	90.566
Valle d'Aosta	1.446	1.533	1.792	2.281	3.150	10.202
Veneto	75.685	87.872	96.892	87.617	111.781	459.847
ITALIA	931.051	1.269.871	1.444.555	1.444.180	1.958.873	7.048.530

Table 4: *Distribution of PATs related to the sample of certified companies per company size class*

Size class	2017	2018	2019	2020	2021	Overall total
Up to 10 employees	5.063	5.587	6.040	6.746	7.850	31.286
From 11 to 50 employees	4.024	4.481	4.966	5.304	6.616	25.391
From 51 to 250 employees	2.172	2.398	2.692	2.766	3.695	13.723
Over 250 employees	688	757	799	859	1.149	4.252
Total	11.947	13.223	14.497	15.675	19.310	74.652

Table 5: Distribution of employees related to the PAT s of the sample of certified companies per company size

Size class	2017	2018	2019	2020	2021	Overall total
Up to 10 employees	17.174	19.195	20.335	22.626	26.671	106.001
From 11 to 50 employees	96.381	108.523	121.130	128.747	160.907	615.688
From 51 to 250 employees	230.605	257.668	291.434	296.839	395.515	1.472.061
Over 250 employees	586.891	884.485	1.011.656	995.968	1.375.780	4.854.780
Totale complessivo	931.051	1.269.871	1.444.555	1.444.180	1.958.873	7.048.530

From the sample of certified companies, the company's characteristics necessary to define, within the Universe of non-certified companies, the sample used for the analysis were identified. The comparison between the two samples was carried out through a mono-dimensional index capable of taking into account both the accident trend and the variation in exposure to risk over time and space. To make the comparison, as in the work of five years ago, the accident frequency and the injury severity ratio were chosen.

$$i_f = \frac{I}{A} \times 1000 \qquad r_g = \frac{I_G}{I} \times 100$$

- The frequency index expresses the average number of accidents per 1000 employees.
- The severity ratio expresses the percentage of serious accidents that occur out of a total number of accidents.

As mentioned, the construction of the sample of non-certified companies was carried out by selecting, from the universe of companies operating in Italy, those companies that showed the same identical characteristics as the companies in the sample of certified ones.
In particular, the required characteristics were those capable of replicating a "parallel world" compared to that of the certified companies, generating a completely homogeneous and comparable pattern. The variables for which correspondence was sought in the "reading" of the i-th company were identified on the basis of the:

- Region of operation
- Company size class
- Inail tariff item
- Year

These four variables analyzed in "AND" represented the pattern that discriminated between entry or non-entry into the sample of the non-certified companies.

By identifying the different combinations of these four variables we managed to construct the series of stratifications which in total amounted to 16,926.

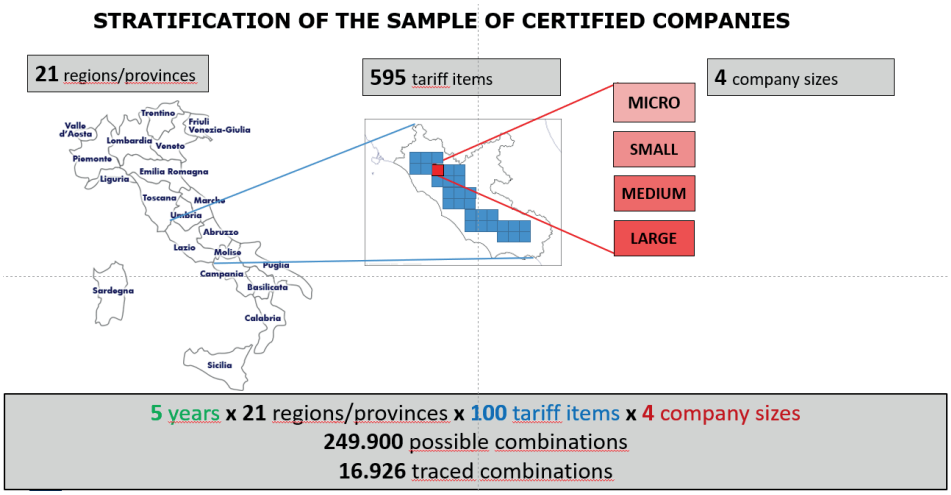


Figure 2: Construction of possible stratifications

These stratifications can be considered as single cells within which to place the values of the control data referring to the corresponding non-certified companies.
It should be noted that such a "strict" selection entailed careful evaluation during comparison. Indeed, given the extreme comprehensiveness of the data, it was not uncommon to encounter stratifications where only certified companies were found, and it was not possible to find the group of non-certified ones for comparison. This occurred mainly in smaller regions. In Molise, for example, if the sample of certified companies shows that in 2019, under tariff item number 2130, and with a company size of 11-50, there were 5 accidents and 20 employees, it was necessary to find companies with the same characteristics in terms of region, year, size and tariff item to compare their accident rates. In the absence of "non-certified" companies in this stratification, corrections were made to avoid misleading results, i.e., that the accident rate appeared significantly higher in certified companies compared to non-certified ones simply because non-certified companies were not found in that specific stratification.
In response to this and minor points of concern, precautions were taken by generating statistical algorithms capable of weighing choices and addressing

potentially inaccurate analyses that do not correspond to the real nature of the phenomenon under study.
Tables 6 and 7 show two representations which, similarly to the tables for the sample of certified companies, show the number of PATs and employees that have passed the likelihood test and have formed the sample of non-certified companies suitable for comparison.

Table 6: Distribution of PATs related to the sample of NON-certified companies per region of the PAT

Region	2017	2018	2019	2020	2021	Total
Abruzzo	50.861	62.352	54.463	53.616	55.560	276.852
Basilicata	22.366	22.281	22.174	22.501	22.417	111.739
Bolzano	14.493	19.132	19.026	21.613	22.407	96.671
Calabria	50.660	54.507	69.609	69.813	76.124	320.713
Campania	225.237	229.507	229.388	235.171	240.767	1.160.070
Emilia Romagna	236.572	237.568	236.303	234.695	239.556	1.184.694
Friuli Venezia Giulia	48.193	48.105	42.195	47.741	48.676	234.910
Lazio	267.495	264.994	276.411	277.748	283.607	1.370.255
Liguria	84.067	82.327	84.019	81.492	85.076	416.981
Lombardia	529.187	522.150	525.241	526.359	529.713	2.632.650
Marche	70.575	72.210	72.157	76.645	78.522	370.109
Molise	12.015	13.340	12.899	14.863	15.592	68.709
Piemonte	221.861	226.274	223.444	223.470	224.897	1.119.946
Puglia	128.592	160.343	161.162	141.634	169.694	761.425
Sardegna	60.391	51.882	60.990	51.939	66.633	291.835
Sicilia	186.794	151.892	157.063	152.081	192.119	839.949
Toscana	203.428	203.972	202.443	203.058	225.640	1.038.541
Trento	23.734	23.989	23.605	23.479	23.904	118.711
Umbria	32.356	32.048	33.345	38.075	39.657	175.481
Valle d'Aosta	3.541	3.019	4.847	5.561	5.723	22.691
Veneto	252.138	250.754	254.088	246.630	254.823	1.258.433
ITALIA	2.724.556	2.732.646	2.764.872	2.748.184	2.901.107	13.871.365

Table 7: Distribution of employees referred to the PATs of the sample of NON-certified companies per region of the PAT

Region	2017	2018	2019	2020	2021	Total
Abruzzo	142.454	157.436	150.131	137.669	158.778	746.468
Basilicata	45.752	48.285	56.750	54.583	59.808	265.178
Bolzano	76.843	92.710	96.716	99.136	108.966	474.372
Calabria	110.302	121.423	134.600	119.824	141.935	628.084
Campania	608.521	646.598	570.903	613.027	650.337	3.089.386
Emilia Romagna	1.162.746	1.207.112	1.242.075	1.170.451	1.250.669	6.033.053
Friuli Venezia Giulia	185.217	184.715	178.746	172.244	228.105	949.027
Lazio	1.542.727	1.399.195	1.489.769	1.284.449	1.339.268	7.055.407
Liguria	247.022	241.789	242.841	231.986	280.209	1.243.847
Lombardia	3.098.614	3.174.121	3.210.181	2.997.375	3.108.682	15.588.973
Marche	249.156	255.844	257.184	251.051	278.547	1.291.782
Molise	22.165	25.468	20.552	25.827	29.876	123.887
Piemonte	933.705	963.657	950.624	886.377	917.351	4.651.713
Puglia	412.045	473.560	464.979	416.852	493.125	2.260.561
Sardegna	167.061	127.528	143.894	121.796	151.773	712.053
Sicilia	412.527	374.505	450.731	414.113	501.380	2.153.255
Toscana	745.397	758.619	762.441	703.768	805.271	3.775.497
Trento	88.460	96.102	95.974	85.625	87.645	453.807
Umbria	107.921	118.182	119.094	114.803	129.827	589.827
Valle d'Aosta	13.031	12.496	12.907	12.267	13.355	64.057
Veneto	1.103.773	1.137.234	1.220.380	1.118.833	1.242.700	5.822.920
ITALIA	11.475.441	11.616.579	11.871.473	11.032.056	11.977.606	57.973.155

The high number of PATs and employees identified in the sample of non-certified companies highlights that, compared to previous analyses, not only has the number of certified companies increased, but also the range of stratifications (territory, economic activity, company size and year) considered has broadened. In fact, out of a total of approximately 3.7 million active PATs active every year, an average of 2.7 million, or 73%, fall into the sample of non-certified ones. Similarly, for employees, out of approximately 17 million workers per year, 11.5 million are included in the sample (68%).

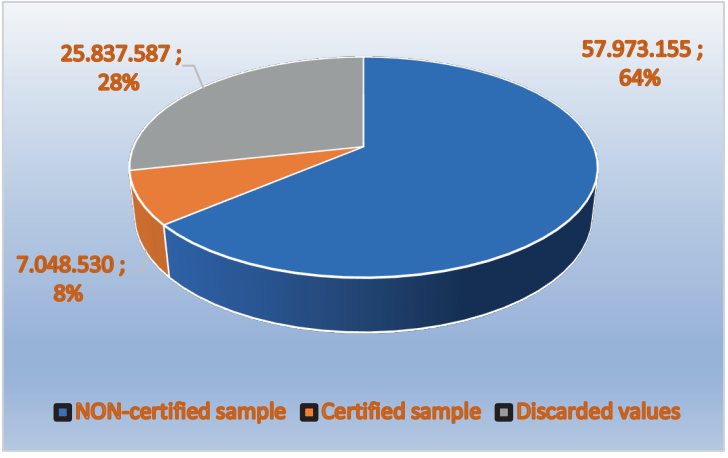
Table 8 Composition of the sample

5-year period		Sample of certified companies	Sample of NON-certified companies	Discarded elements	INAIL TOTAL
PATs		74,652	13,871,365	4,804.063	18,675,428
EMPLOYEES		7,048,530	57,973,155	25,837,587	83,810,742

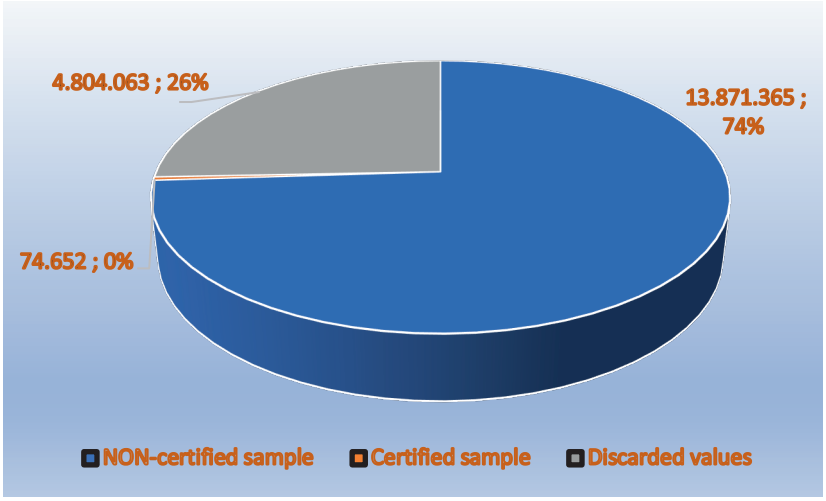
Table 9: Composition percentages between certified and non-certified employees

5-year period	Percentage ratio Certified /non-Certified
PAT	0.5%
Employees	12%

Graphic 1. Percentage composition of Inail employees



Graphic 2: Percentage composition of PATs



The data concerning the composition of the PATs, which may initially raise some doubts, is not actually significant because it is not the individual PATs that are analyzed, but rather the fundamental information of the "content" of the elementary units. By cross-referencing the information relating to PATs and employees, it becomes apparent that the PATs of certified companies represent approximately 1% of non-certified ones. However, their weight in terms of employees is significant, standing at around 12%.

As additional information, it can be inferred that certified companies have a considerable company size. From Table 4 and Table 5 it is deduced that the certified companies with more than 250 employees have, on average, 1,142 employees over the five-year period.

From Table 10, it is evident that the average size of certified companies is constantly higher than that of non-certified ones.

Table 10: average size of certified and non-certified companies

	Certified companies	Non-certified companies
Up to 10 employees	**3.4**	**1.6**
From 11 to 50 employees	**24.2**	**19.7**
From 51 to 250 employees	**107.3**	**97.2**
Over 250 employees	**1141.8**	**1044.3**

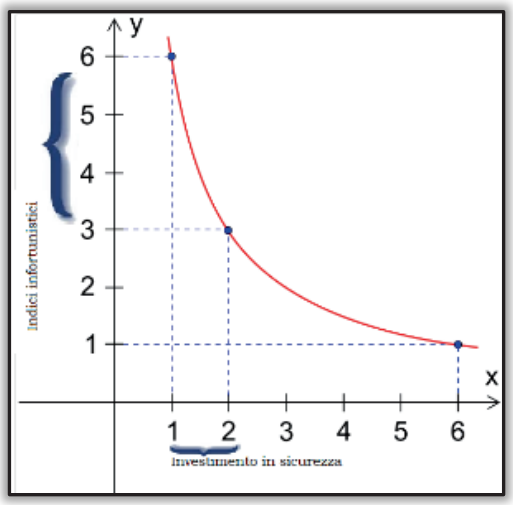
From this result arose the need, starting from the current analysis, to introduce company size as a new stratification variable for comparing the two samples of certified and non-certified companies.
As already mentioned, the extensiveness of the data and the four-level stratification of the two samples have led, in some cases, to the absence of a proper comparison sample. Not addressing the criticality in these cases could have compromised the investigation, with entire sectors contributing to the accidents and employees of the certified companies, but not those of the non-certified ones, not present in that specific stratification. In these cases, the choice made was to consider between two options:

1) completely eliminate the record related to certified companies and lose information on "those" employees, "those" accidents
2) artificially generate a level of stratification that mirrors that of the certified companies, with the same values both in terms of accidents and employees.

In either case, the critical issue could have been resolved but certainly, in the first case "portions" of information regarding the certified companies of that region, of that company size, of that year, of that Inail tariff item, would have been lost. Hence, the decision leaned towards adopting the solution by the second work scenario.
By doing so, the integrity of the overall data was preserved and the construction of an artificial stratification simply made those data inconsequential for the final analysis.
The representativeness test was carried out on all records from the 16,926 stratifications to ensure that the extracted data could accurately reflect the extracted volume. No combination of variables was discarded.
In this context, the descriptive statistical analysis of the specific statistical algorithms used to determine the likelihood is not described and is referred to another specific publication. However, it is worth noting that in the subsequent data processing phase, a correction was applied to the data of individual stratifications. Only the stratifications that presented values compatible within 15%, considering the specular

fluctuation relative to the reference value (two-tailed test) were included in the calculation. Through the module, positive and negative fluctuation was ensured, making it bilateral with an accepted fluctuation level set at a percentage value of 30% (i.e., ± 15%).
The bilateral tolerance level of 15% was applied both to the composition between Employees and Accidents and the composition between Employees and Serious Accidents.
In other areas of study, always employing a pragmatic and numerical approach, the cost of an injury has also been quantified on average. In particular, it has been highlighted that, beyond the immediate and obvious costs that the entrepreneur must bear at the time of the injury, there is a whole series of non-obvious costs, not immediately perceptible, that insidiously affect the economic management of the harmful event. Investing in safety, as will be seen in this analysis, entails a lower likelihood of incurring these costs; additionally, in the event of an injury, there is a high probability that it will be less severe. Reduced severity translates to, for instance, faster return-to-work times and lower costs for replacing the injured employee.
Investing in prevention therefore enables a proactive approach to mitigating the risk of work accidents. The return on such investments, in terms of reduced accidents, is even greater in sectors that have historically considered health and safety investments to be marginal and unconstructed.
Implementing preventive measures on risk levels certainly requires a commitment from the company. However, in return for this commitment, which is not only financial, the company builds an effective barrier against workplace injuries: this barrier will be all the more effective depending on the initial level of safety.
Graph 3 illustrates the relationship between investment levels and safety gains. The hyperbolic curve representing the relationship between increased investment and safety gains, shows how the curve bends more as one moves away from the origin of the axes, almost flattening out. This vision fits well with the actual gains achieved in terms of safety when switching from one safety investment level to a higher one. The curve reacts differently depending on the historical periods characterized by varying safety levels within companies over time. Simplifying, one could say that, in the part of the curve close to the y-axis, investing one euro results in a gain of three points. In a central phase, there is a correspondence between investment and safety gain, while moving further away from the y-axis, the roles reverse, meaning that one euro of investment corresponds to a disproportionally smaller gain.

Graphic 3: Comparing risk and investment



In other words, this graphical representation can be linked to the so-called return on investment (ROI). Calculating the ROI with concerning workplace accident prevention can be a complex process and depends on various factors, including the industry sector, company size, types of accidents prevented and preventive measures implemented. However, the general concept is linked to the curve just represented on the Cartesian plane: the greater the difference between benefits and costs, the larger the return on investment.

$$ROI = \left(\frac{Total\ benefits - Total\ costs}{Total\ costs}\right)$$

Total benefits are the savings or advantages achieved through the implementation of systems capable of preventing the occurrence of accidents, such as the reduction of medical costs, lower insurance rates and enhanced productivity.
Total costs entail expenses related to the implementation of preventive measures, such as purchasing safety equipment, staff training and production loss during training periods.
Interpreting the ROI value to determine how advantageous an investment in the workplace accidents prevention has been for a company involves evaluating the sign of the ratio: a positive ROI indicates that the benefits outweigh the costs, while a negative ROI indicates the opposite. However, it is worth noting that some benefits, such as improvements in corporate reputation and safety culture, may be challenging to quantify in financial terms, but can still be significant for the company's success.

Taking the ROI at National level involves complex work that must necessarily consider the different geographical areas and realities within the economic sectors. This is even more complex when considering Italy's unique geography. This study sheds light on the extensive network of certified companies under accreditation. There has been a huge evolution in recent years, despite the pandemic's disruption, but there still seems to be ample room for increasing the number of certified companies.

From the data presented in this analysis, it appears that in our country the situation aligns with the first phase of the curve, where investing in a health and safety management system, yields notably higher gains in workplace safety -therefore, with a very positive ROI, moderate expenses and economic gains far exceeding the investment.

In the next article, we will quantify this return in terms of accidents and we will try to assign a numerical value to safety level achieved by making targeted choices in injury prevention through a certified management system.

FROM APPROACHES TO RESULTS: EVIDENCE OF THE REDUCTION IN ACCIDENT TRENDS IN CERTIFIED COMPANIES

S. Amatucci*, M.I. Barra**, F. Benedetti**, S. D'Amario*, G. Morinelli*, A. Terracina**

* Inail - General management - Statistical and Actuarial consulting

** Inail - General management - Health and Safety technical consulting

Introduction

The European OH&S framework 2021-2027[14] establishes the priorities and key actions required to improve workers' health and safety in the upcoming years within the context of the post-pandemic world, characterized by green and digital transitions, economic and demographic challenges and the evolving concept of the traditional work environment. The plan underlines the need for safe working conditions, needful for a healthy and productive workforce, and emphasizes that this aspect is essential for the sustainability and competitiveness of EU economy as well[15].
In this context, Occupational Health and Safety Management Systems (OH&SMS) emerge as valuable tools for managing and enhancing workplace conditions, aiming to ensure they are healthy, safe, sustainable and competitive.
However, the awareness that proper health and safety management is fundamental both at national and corporate levels, since it serves as a lever to increase standards and enhance competitiveness, struggles to be effectively acknowledged by many companies.
The study in question highlights the effectiveness of certified management systems in improving health and safety conditions in the workplace, which translates into a reduction of accidents and the associated social and economic costs.

Analysis and distribution of certified companies

Before comparing the injury data (see next paragraph) of certified companies with not certified at a national level, it is appropriate to carry out a brief analysis of the composition of the sample of certified companies in relation to their distribution across various economic sectors.
The following analysis is carry on regarding the number of employees for each Territorial Insurance Position (PAT) according to the criteria and methodology described in the article "*2017-2021: Five years on a roller coaster, the socio-economic context underlying the study of strategies to approach accident risk assessment. The comparison between certified and non-certified companies*" of this volume and differs

[14] https://ec.europa.eu/social/BlobServlet?docId=24122&langId=en
[15] M.I. Barra *Workplace health and safety management systems: incentives and economic returns for companies AIFOS* Safety notebooks, n. 4, December 2022

from the data presented in the graphs in the article "*The evolution of management systems: technical and organizational aspects*" prepared by Accredia also in this volume. The following table shows the number of employees divided by economic activity over the 5 years under observation.

Table 1: number of employees related to the PATs of the sample of certified companies by type of economic activity of the PAT

Economic activity	2017	2018	2019	2020	2021	Totale
AGRICULTURE, FORESTRY AND FISHING	1.641	1695	1.530	738	892	6.495
MINING AND QUARRYING	2.294	2.690	2.748	31.188	31.506	70.426
MANUFACTURING ACTIVITIES	352.351	389.857	396.751	458.044	608.745	2.205.748
ELECTRICAL ENERGY, GAS, STEAM AND AIR CONDITIONING SUPPPLY	66.694	69.180	70.115	62.965	68.104	337.059
WATER, SEWAGE, WASTE MANAGEMENT	59.358	67.394	72.623	68.043	82.487	349.905
CONSTRUCTION	77.660	100.379	109.645	91.464	134.760	513.908
WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	43.401	42.400	53.105	54.332	83.151	276.390
TRANSPORT AND STORAGE	95.623	328.091	341.359	287.941	377.707	1.430.721
ACCOMMODATION AND RESTAURANT SERVICES ACTIVITIES	24.975	21.215	30.445	30.265	23.172	130.071
INFORMATION AND COMMUNICATION SERVICES	21.449	48.518	45.596	37.395	129.357	282.315
FINANCIAL AND INSURANCE ACTIVITIES	47.668	44.504	126.086	125.125	136.517	479.900
REAL ESTATE ACTIVITIES	3.769	3.995	4.901	3.116	7.087	22.868
PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES	40.858	32.888	36.556	38.627	60.138	209.067
RENTAL, TRAVEL AGENCIES, BUSINESS SUPPORT SERVICES	64.039	81.705	97.897	87.426	118.675	449.742
PUBLIC ADMINISTRATION AND DEFENSE; COMPULSORY SOCIAL INSURANCE	1.590	1.585	1.577	9.687	9.316	23.755
EDUCATION	1.764	1.571	1.836	1.562	1.498	8.230
HEALTH AND SOCIAL WORK	18.243	19.638	36.840	42.740	56.152	173.613
ARTISTIC, SPORTS, ENTERTAINMENT AND FUN ACTIVITIES	1.532	3.868	4.413	1.945	4.339	16.097
OTHER SERVICE ACTIVITIES	6.285	8.816	10.584	8.306	8.825	42.816
Undetermined	0	0	0	3.270	16.444	19.403
Total	**931.051**	**1.269.871**	**1.444.555**	**1.444.180**	**1.958.873**	**7.048.530**

Analyzing this distribution, the data from manufacturing activities stands out, recording over two million employees in certified companies during the five-year period considered. Similarly, transportation and storage companies recorded almost one and a half million employees in these companies over the same period. Conversely, Agriculture and Forestry, along with the education sector, have the lowest number of employees in certified companies.
Regarding the economic activity sector is the distribution of company size classes, as evidenced by Table 2 which provides a snapshot for the final year of the observation period.

Table 2: Year 2021 - Percentage distribution of company size classes by economic activity sector

	Up to 10 employees	Up to 50 employees	Up to 250 employees	over 250 employees	
AGRICULTURE, FORESTRY AND FISHING	5,45	23,84	39,05	31,66	100,0
MINING AND QUARRYING	1,02	7,33	9,93	81,71	100,0
MANUFACTURING ACTIVITIES	1,24	9,47	29,82	59,47	100,0
ELECTRICAL ENERGY, GAS, STEAM AND AIR CONDITIONING SUPPPLY	0,47	3,49	12,13	83,91	100,0
WATER, SEWAGE, WASTE MANAGEMENT	2,44	14,90	29,35	53,31	100,0
CONSTRUCTION	5,10	25,66	34,64	34,59	100,0
WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	2,75	13,10	19,64	64,50	100,0
TRANSPORT AND STORAGE	0,74	3,78	9,33	86,14	100,0
ACCOMMODATION AND RESTAURANT SERVICES ACTIVITIES	0,86	3,71	8,05	87,39	100,0
INFORMATION AND COMMUNICATION SERVICES	0,62	2,90	7,23	89,25	100,0
FINANCIAL AND INSURANCE ACTIVITIES	0,08	0,36	1,23	98,33	100,0
REAL ESTATE ACTIVITIES	3,49	11,02	27,34	58,15	100,0
PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES	2,75	12,28	29,49	55,48	100,0
RENTAL, TRAVEL AGENCIES, BUSINESS SUPPORT SERVICES	2,01	9,55	29,16	59,28	100,0
PUBLIC ADMINISTRATION AND DEFENSE; COMPULSORY SOCIAL INSURANCE	0,14	2,91	4,35	92,59	100,0
EDUCATION	7,06	31,79	47,35	13,80	100,0
HEALTH AND SOCIAL WORK	1,31	9,19	21,95	67,55	100,0
ARTISTIC, SPORTS, ENTERTAINMENT AND FUN ACTIVITIES	4,01	15,60	21,66	58,74	100,0
OTHER SERVICE ACTIVITIES	1,91	12,39	25,58	60,12	100,0

As can be easily observed, electrical supply, mining, transportation and storage, accommodation and food services are among the sectors with larger company sizes.
Not in all regions and not in all economic sectors has the trend towards certification evolved in a consistent and linear manner and in addressing the management of injury trends. A map can be created to compare certified and non-certified companies, outlining the profile in terms of regions and company size classes.
The following graph highlights the number of employees working in certified companies, in each region.

Graphic 1: Year 2021 - Percentage of employees in certified companies compared to those in non-certified ones, data by region

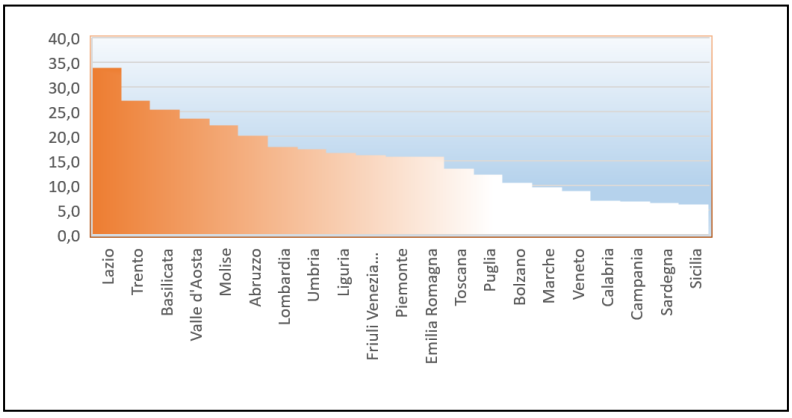


Table 3: Percentage of certified PATs by company size and Region

Region	Up to 10 employees	Up to 50 employees	Up to 250 employees	Over 250 employees
Abruzzo	49,0	32,9	14,2	3,9
Basilicata	48,3	32,9	16,4	2,3
Bolzano	36,4	37,0	21,0	5,6
Calabria	59,5	29,1	10,0	1,5
Campania	52,8	31,7	12,8	2,7
Emilia Romagna	31,9	36,5	22,9	8,7
Friuli Venezia Giulia	37,4	35,0	20,3	7,3
Lazio	44,9	31,2	15,0	8,9
Liguria	40,9	35,8	17,2	6,1
Lombardia	31,2	35,8	24,8	8,2
Marche	43,8	32,6	19,1	4,5
Molise	62,2	30,0	6,5	1,4
Piemonte	36,7	32,5	22,4	8,4
Puglia	46,3	36,4	13,0	4,3
Sardegna	48,7	31,9	17,8	1,6
Sicilia	54,4	29,3	13,1	3,2
Toscana	42,4	35,4	18,5	3,6
Trento	39,1	38,7	17,9	4,4
Umbria	42,9	36,4	17,0	3,7
Valle d'Aosta	43,3	36,7	15,0	5,0
Veneto	36,6	36,0	22,5	4,9
Italy	**40,7**	**34,3**	**19,1**	**6,0**

It is evident that smaller enterprises move at a different pace compared to other types of businesses. Among small enterprises, the cases of Molise and Valle d'Aosta stands out, where around 25%of employees work in certified companies. An exemplary case is the autonomous province of Trento where, in medium-sized enterprises, for every employee referring to non-certified companies there are almost 2.5 employees referring to certified companies.

Bringing up the rear in terms overall average data are the two largest islands, Sicily and Sardinia, where the percentage of workers employed by certified companies is around 6% of the number of employees in non-certified companies.

From the table emerges that, on average 41% of certified PATs have fewer than 10 employees.

In more detail, as shown in Table 3, 75% of certified companies are small-sized (up to 50 employees), while only 6% are large-sized companies (over 250 employees). However, if we compare the number of certified companies to the total number of Italian companies of the same size, we find that certified small companies account for just 4% of the total small Italian enterprises, while certified large companies cover

22% of the total Italian enterprises of the same size. Certified medium-sized companies cover 12% of the equivalent total of Italian companies and, at the regional level, there is a differentiation of Italian companies by company size.
This size distribution also affects the distribution of certified companies at a regional level. For instance, in Lombardy, Emilia-Romagna, Lazio and Piedmont, the highest incidence of large-sized companies is recorded among certified PATs, similarly to what occurs for the total number of Italian companies.
In any case, the data on the distribution of certification percentages show that the Italian landscape still has great possibility of improvement.

Accident trend analysis

The adoption of an OH&SMS involves the implementation of a series of activities implemented in a systematic and structured process with the ultimate aim of improving performance in terms of health and safety at work, thus reducing the incidence of accidents.
This assumption evidently requires verification, which Inail has repeatedly undertaken, and which has only recently seen similar analyses conducted by other international entities[16].
These studies indicate positive results associated with the adoption of an OH&SMS by organizations, primarily concerning three aspects:

- "institutional" which emphasizes the increase in legitimacy and, therefore, an improvement in public image as the primary result. The stakeholders expect to achieve this outcome by using appropriate documentation and communication systems with stakeholders - both mandatory within OH&SMS standards.
- "operative" which emphasizes the benefits with systematic tools such as PDCA (plan-do-check-act), procedures, continual improvement and the possibility of integration with other management systems within organizations. If organizations use these tools correctly, they should thus increase the maturity level of their OH&SMS and ensure a systematic and lasting approach, as well as special attention to occupational health and safety issues within them.
- "compliance" which emphasizes resources that help the organization comply with increasingly complex regulatory frameworks, especially for organizations operating in multiple countries and across different production sectors.

Nevertheless, studies do not always confirm the achievement of positive results in all three aspects mentioned above, which are, sometimes, only partially achieved by organizations.

[16] Wong, G., Greenhalgh, T., Westhorp, G., Buckingham, J., Pawson, R., 2013a. RAMESES publication standards: realist syntheses. BMC Med. 11, 21.

A recent Danish study[17] evaluated the activities undertaken, both in terms of planning and implementation and monitoring, respectively, by certified and non-certified companies. The results of the linear regression analysis of the collected data showed notably higher scores for the first type of companies; which implies that workplaces in certified companies provide better health and safety performance for all the processes investigated.

The INAIL study set a more direct objective and quantitatively assessed the outcomes of implementing an OH&SMS in terms of reducing the incidence of accidents at work.

The study is now in its fourth edition; an initial experimental analysis was conducted with Accredia, in 2012[18] and 2018[19]. Over time, the analyses have been able to rely on a growing of certificated companies' numbers, and therefore studies are more and more significant. This progressive growth may also have been supported by the introduction of the crimes of serious and very serious negligent injury and manslaughter caused by non-compliance with the regulations for protection against accidents and occupational diseases, among those punishable under Legislative Decree. no. 231/2001 and the consequent alignment, under paragraph 5 of Art. 30 of Legislative Decree 81, of OH&SMS with organizational and management models (OMMs) exempting from administrative liability of companies.

The data on the reduction in accident rates, in all four editions of the study, have consistently confirmed the effectiveness of the organizational management approach and of certified OH&SMS as an effective prevention method. Therefore, in the 2018 study, certified companies recorded 16% fewer accidents and a 40% lower severity of accidents compared to non-certified ones.

The study discussed in this report was carried out again in 2023, in collaboration with Accredia, analyzing the impact of OH&SMS over a more recent five-year period from 2017 to 2021. During this period, happened a lot of economic, political and social events, also linked to the pandemic emergency, that had a significant impact on the world of work. Furthermore, these years saw the transition between the reference standards for the adoption and certification of OH&S MS, moving from OHSAS 18001 to the UNI EN ISO 45001:23 standard.

The statistical methodology used in this study to identify and compare the two samples - certified and non-certified companies - is detailed in the article "*2017-2021: Five years on a roller coaster, the socioeconomic context underlying the study of*

[17] Christian Uhrenholdt Madsen , Sannie Vester Thorsen , Peter Hasle , Line Leonhardt Laursen , Johnny Dyreborg *Differences in occupational health and safety efforts between adopters and non-adopters of certified occupational health and safety management systems* Safety Science, Volume 152, 2022

[18] M. I. Barra, G. Morinelli; A. Terracina - *INAIL data on the effectiveness of H&S MSs to reduce accidents* -Accredia Osservatorio n.1 dated 2012

[19] Alessandro Nisi, Silvia Amatucci, Maria Ilaria Barra, Fabrizio Benedetti, Giuseppe Morinelli, Antonio Terracina - *Accidents at work, the effectiveness of certified management systems* Accredia Osservatorio n.1 dated 2012

strategies to approach accident risk assessment. The comparison between certified and non-certified companies" of this volume. The sample size, which has further and significantly increased, has allowed for a more robust statistical analysis.
The results obtained confirm the reduction in the statistical indices of accident frequency and severity observed in the past, even if this latest study cannot be considered directly comparable with those conducted in previous years, due to the increased sample of certified companies, which abled the adoption of more in-depth and precise analysis methodologies.
Table 4 shows the accident frequency index for both the sample of certified companies and the sample of non-certified companies, divided into the major Inail tariff groups to which they belong, along with the calculated percentage difference for each.

Table 4: Comparison of accident frequency indices between certified and non-certified *companies*

Frequency Index				
Major INAIL Group	Type of economic activity	certified company sample	non certified company sample	percentage difference
0	Various activities	9,8	14,6	-32,9
1	Mechanical agricultural work, fishing, farming	26,1	30,2	-13,6
2	Chemical, plastics and paper	9,7	16,4	-40,9
3	Construction of hydraulic systems, roads, buildings	28,8	35,5	-18,9
4	Electric energy, gas and fuels	13,4	19,2	-30,2
5	Wood industry	18,3	23,1	-20,8
6	Metallurgy, machines, means of transport	12,7	19,9	-36,2
7	Mining, processing of non-metallic materials	24,5	37,1	-34,0
8	Textiles and packaging, leather	10,2	13,1	-22,1
9	Transport, porter services, storage	23,8	29,9	-20,4
	Total activities	18,8	24,3	-22,6

The data shows a certain variability in the reduction of the index depending on the major tariff group, i.e., the activity carried out by the companies. Companies in the chemical sector show a reduction of over 40%, while those in the electricity, gas and fuel sectors, as well as those in mining and non-metallic material processing, show a reduction ranging from 30% to 40%. The lowest value is recorded in the major group of agricultural mechanical processing, fishing and farming. The overall reduction in the frequency index is 22.6% for certified companies.

Table 5 presents the severity index of accidents for both the sample of certified companies and the sample of non-certified companies, divided into the major Inail tariff groups to which they belong, along with the calculated percentage difference for each.

Table 5: Comparison between the severity gravity ratio of certified and non-certified companies

Severty ratio				
Major INAIL Group	Type of economic activity	certified company sample	non certified company sample	percentage difference
0	Various activities	12,8	15,2	-15,8
1	Mechanical agricultural work, fishing, farming	9,7	13,7	-29,2
2	Chemical, plastics and paper	15,3	17,8	-14,0
3	Construction of hydraulic systems, roads, buildings	25,5	33,4	-23,6
4	Electric energy, gas and fuels	18,7	27,1	-31,0
5	Wood industry	13,9	20,2	-31,2
6	Metallurgy, machines, means of transport	14,9	17,1	-12,9
7	Mining, processing of non-metallic materials	18,9	25,7	-26,5
8	Textiles and packaging, leather	13,1	21,4	-38,8
9	Transport, porter services, storage	12,8	20,8	-38,5
	Total activities	14,8	20,9	-29,2

There is decrease in the severity index in certified companies, which varies based on the nature of their activities, with values exceeding 30% for major groups such as electricity, gas and fuel, the textile and clothing apparel, leather and fur industries and transportation, porter service and warehousing. Values above 20% are recorded in major groups such as mechanical agricultural processing, fishing, farming, mining and processing of non-metallic materials; as well as in construction, hydraulic and road construction companies.

The overall reduction in the severity index for certified companies is 29.2%. From the observed accident data, it is evident when a certified occupational health and safety management system under accreditation is adopted, the accident frequency decreases by almost a quarter, while the average severity of any accident is reduced by just under 30%.

As observed in the study conducted five years ago, in 2018, it is confirmed that the accident frequency rate is decreasing less evidently than the severity ratio. In other words, the number of accidents is decreasing less compared to the extent of the consequences of the injuries suffered by workers.

While overall effective, organizational and management measures appear to be more effective in preventing severe accidents than minor ones

Focus on sectors where certification is most widespread

There is no doubt that there is a close correlation between the occurrence of accidents and the company propensity to improve health and safety conditions. Indeed, the economic sectors with the highest number of certified companies are Construction, Transportation and Warehousing (hereafter referred to as "Transportation") where the level of accident risk is very high both in terms of frequency and severity.
This study and the previous ones conducted in 2012 and 2018, confirm that constant investment in prevention is leading to a decreasing trend in accident risk.
Therefore, not only companies that adopt a certified management system have a lower record level than no certificate one, but, in more general terms, it also emerges that prevention has positive effects on the continuous decrease over time of the risk linked to the occurrence of a harmful event.
In fact, analyzing the data related to the two sectors considered as a whole and referring to the last five-year observation period, the accident frequency has decreased for both: by 10% in Construction and 19% in Transportation.
These results are part of an economic framework where the number of active companies insured Inail has remained almost constant (+1%) in the Construction sector and has slightly decreased (-5%) in Transportation. Therefore, the reduction in the number of companies is almost entirely concentrated in the Transportation's sector.
The overall downward trend in accident rates is the result of the combination of two factors: the trend of accidents over time and that of number of worker in each years.
To calculate the risk index, we analysed all the accidents that occurred to workers in the two sectors in the last five years, defined as positive by Inail, excluding commuting accidents and Covid cases.
In the 5-year reference period, the accident frequency, calculated as the ratio between accidents and employees, decreased both in Transportation, where accidents decreased by 14%, in response to a 7% increase in the number of employees, and in the Construction sector, where, in response to a significant growth in the number of employees (+18%), accidents increased by 6%. The latter figure, however, is significantly lower than the increase in employees, thus not raising the accident frequency rate.
Similarly to what happened with the accident frequency index, even the risk level calculated considering the severity of the accidents decreased in the observation period.
The severity ratio, determined as the percentage of serious injuries, i.e., those that have resulted in death or the assignment of at least one grade of disability, is slightly declining in Transportation, while it shows a more significant contraction (-7%) in Construction.

Prevention as an investment

Overall, the data confirms the effectiveness of the organizational management approach and of the OH&SMS certified under accreditation as a methodology to improve prevention performance and reducing accidents.
Reduction that is also useful to quantify from an economic point of view, in order to demonstrate how prevention in the workplace can be an investment rather than a cost.
A study conducted by the European Agency for Safety and Health at Work calculated the mere social costs related to occupational accidents and diseases in five European countries, including Italy[20].
The results are reported in the following table (Table 6).

Table 6: The value of workplace safety and health and the social costs of occupational accidents and diseases. European Risk Observatory. Summary, 2019

Country	Finland	Germany	Holland	Italy	Poland
Number of cases	131,867	2,262,031	323,544	1,907,504	1,156,394
Direct costs in millions of euros	484	10,914	2,137	8,491	1,882
Indirect costs in millions of euros	4,362	70,658	6,468	58,961	19,588
Intangible costs in millions of euros	1,196	25,557	5,147	37,392	22,311
Overall economic burden in millions of euros	6,042	107,129	23,751	104,844	43,781
% with respect to the GDP	2,9	3,5	3,5	6,3	10,2
Cost per case in millions of euros	45,8165	47,360	73,410	54,964	37,860

[20] European Agency for Safety and Health at Work "*The value of occupational safety and health and the societal costs of work-related injuries and diseases European Risk*" Observatory Executive Summary 2019

The very high costs calculated in this study clearly demonstrate that reducing the incidence of occupational accident and diseases not only improves the health and safety conditions of workers but also reduces the high costs associated with them.
Investing in safety, as seen in this analysis, certainly leads to a reduction in expenses both by decreasing the probability of occurrence and because, in the event of an accident, it will, on average, be less severe. Less severity means, for instance, faster return-to-work times and, therefore, lower associated costs.
The cited data show that approximately 8% of workers work in companies that have adopted a certified OH&SMS under accreditation. This translates to about seven million workers who have an approximately a 23% lower probability of getting injured compared to workers working in non-certified companies
If we applied the injury frequency rate of certified companies to these seven million workers (18.8 x1000) we would find that on average 131,600 workers would be injured in a year. However, if instead we calculated, the average number of accidents among these seven million workers using the accident frequency of non-certified companies in the calculation (24.3 x 1000), it would mean that there would be an average of 170,100 workplace accidents.
Furthermore, out of these 131,600 injured workers, in 29% of cases, the severity of the injury would be less compared to the 170,100 injuries.
The estimated total costs related to workplace injuries, which amount to 54,964 euros, as shown in Figure 2, and are consistent with Inail estimates, applied to the accident reduction calculated above, results in a cost reduction of 2 billion euros for the 7 million workers operating in certified companies.
This is a cost that businesses, families and the country have avoided, along with the suffering associated with workplace injuries.
Moreover, imagine if the number of certified companies were to increase even by a factor of 10. The number and consequences of injuries would decrease significantly, based on the reduction in frequency and severity measured in this study. We could expect to see this reflected in the overall data that the Institute records and publishes periodically.

LEGISLATIVE DECREE 231/2001 FOR THE ADMINISTRATIVE LIABILITY OF COMPANIES AND LEGISLATIVE DECREE 81/2008

M.I. Barra, F. Benedetti, P. Ricciardi, A. Terracina
Inail - General management - Health and safety technical consulting

Introduction

Administrative liability pertains to companies, corporations, non-governmental organizations, generally referred to in the law as "bodies", for crimes committed by their representatives or employees in the course of their duties. This means that a company can be held liable for unlawful actions committed by its employees, such as financial crimes, corruption, fraud, and others, subsequently expanded to include manslaughter and very serious negligent injuries caused by violation of workplace health and safety regulations.
The administrative liability of "bodies" is regulated by Legislative Decree 231/2001 “Regulation on administrative liability of legal entities, companies and associations, including those not having legal personality, according to Art. 11, law 29 September 2000, no. 300”.
The relationship between Legislative Decree 231/01 and crimes relating to health and safety at work is realized through law 123/07 "Measures regarding the protection of health and safety at work and delegation to the Government for the reorganization and reform of the relevant legislation" i.e., the law which will later give rise to Legislative Decree 81/08.
Article 9 of the aforementioned law 123/2007 incorporated the crimes of manslaughter (art. 589 of the Penal Code) and serious and very serious injuries (Art. 590 of the Penal Code) committed in violation of accident prevention regulations into the list of predicate offenses punishable under Legislative Decree 231/2001.
The sanctions envisaged for administrative liability complement the penalties of criminal nature and are borne by the body and thus effectively by its ownership. These are significant economic sanctions, which can amount to around 1.5 million euros, as well as interdictive sanctions on the economic activity of the company. For further information on these, refers to the law.
The body, as designated by Legislative Decree 231/2001, may obtain exemption from administrative liability if it can demonstrate that it has adopted and effectively implemented an organizational, management and control model (OMM) suitable for preventing crimes of the kind that occurred. The organisation must also establish a Monitoring and Control Body to oversee the effective implementation of the OMM, as well as an internal sanctioning system to penalize behavior of its employees not compliant with the indications and procedures set out in the model.

The regulatory novelty of law 123/2007 aroused considerable interest and not a few perplexities at the time, but it was nevertheless confirmed, indeed improved, with articles 30 and 300 of Legislative Decree 81/08. With these, the sanctions (Art. 300) and the characteristics and requirements of the OMM (Art. 30), applicable to the offenses of manslaughter (Art. 589 of the criminal code) and serious and very serious injuries (Art. 590 of the criminal code) committed in violation of the accident prevention regulations were delineated.
Furthermore, in Legislative Decree 81, paragraph 3 of Art. 51[21], entrusts to joint bodies with the task of certifying the adoption and effective implementation of these OMMs in companies[22].
Further subsequent ministerial acts have provided a series of essential clarifications, motivations and aids to companies to better interpret the law and make the regulatory act more clearly applicable: these acts are the circular from the Ministry of Labor of 11 July 2011[23] and the ministerial decree of 13 February 2014[24] (simplified procedures for the adoption of OMMs in small and medium-sized businesses)[25].
Today, 17 years after the law (d.lgs 123/07), we can state that the organizational and management models (OMMs) represent a tool used, also in the world of health and safety at work, to establish a structured and organic system that enables and facilitates the self-monitoring of business processes with a view to continuous improvement

21 3-bis. The joint bodies - *omitted* - issue an attestation of the performance of the activities and support services to the business system, including the asseveration of the adoption and effective implementation of the safety organization and management models referred to Article 30, which the supervisory authorities can take into account for the planning of their activities.
22 For further information and details, you can refer to AA.VV. "Sistemi di gestione della salute e si curezza sul lavoro. Contenuti stato dell'arte e prospettive per lo sviluppo di una cultura della sicurezza oltre gli adempimenti e verso i risultati (Occupational health and safety management systems. State-of-the-art contents and perspectives for developing a safety culture beyond obligations and towards results)" - Inail - Journal of occupational injuries diseases - Issue 1/2012 or also M.I. Barra, F. Benedetti, P. Ricciardi, A. Terracina, G. Miccichè "
Asseverazione dell'efficace attuazione dei modelli di organizzazione e gestione: il controllo sociale sui luoghi di lavoro (Asseveration of the effective implementation of organization and management models: social control in the workplace)" - Proceedings of the Continuing education seminars for Ctss, Csa professionals, Cit. Salute, Sicurezza sostenibilità: le sfide della quinta rivoluzione industriale (Health, safety, sustainability: the challenges of the fifth industrial revolution) - Rome, 4-6 December 2023 - Inail 2023.
23 https://www.lavoro.gov.it/documenti-e-norme/normative/Documents/2011/LC-11luglio2011.pdf
24 https://olympus.uniurb.it/index.php?option=com_content&view=article&id=10593:ministero-del-lavoro-e-delle-politiche-sociali-comunicato-recepimento-delle-procedure-semplificate-per-ladozione-e-la-efficace-attuazione-dei-modelli-di-organizzazione-e-gestione-della-sicurezza-nelle-piccole-e-medie-imprese-&catid=5&Itemid=137
25 F. Benedetti, A. Terracina, "Management models. Here are the new procedures for SMEs" - Environment & Safety at Work - March 2014 - Editor EPC

and consequently, in terms of health and safety, to the reduction of accidents and occupational diseases.

The novelty introduced by art. 30 of the legislative decree. 81/08, the ministerial circular and simplified procedures

As mentioned earlier, Legislative Decree 231/01 provides, as is well known, in its provisions the possibility of recognizing the exempting effectiveness of administrative liability for bodies to those companies that adopt and effectively implement an organizational and management model suitable for preventing certain crimes. The list of predicate offenses, as mentioned in the previous paragraph, has been supplemented since 2007 with the crimes of manslaughter and serious and very serious negligent injury committed in violation of the regulations on health and safety regulations at work.
However, Legislative Decree 231/01 does not clarify the constitutive elements of a compliant OMM, instead deferring to trade associations the task of drafting "codes of conduct" to be sent to the Ministry of Justice, which may formulate observations within 30 days. Moreover, the legislator certainly could not foresee the characteristics of an OMM for all production sectors and for all predicate offenses. An exception to this general rule is the OMM for the prevention of crimes related to OH&S, for which, however, a series of indications are found in Article 30 of Legislative Decree 81/08 and in subsidiary legislative acts derived from it, among which it may not be easy to navigate.
Specifically, Art. 30 is structured in such a way as to define, in its first 4 paragraphs the characteristics of an OMM, while in paragraph 5 it indicates the UNI INAIL guidelines of 2001 and the OHSAS 18001:07 as references that are equivalent with the requirements of Art. 30 but, as the text specifies, just for the "corresponding parts". Without dwelling too much on this aspect of the "corresponding parts", which has been extensively discussed, it is worth noting that Permanent Advisory Commission intervened on the topic with the aforementioned circular letter from the Ministry of Labor dated 11/7/2011. In comparing the paragraphs of Art. 30 with the corresponding elements of the cited standards, it identifies the disciplinary system as a non-corresponding part. However, as we will see later, it is also necessary to establish a so-called "Supervisory body".
Finally, in paragraph 5-bis of Art. 30, the legislator entrusts the Permanent Advisory Commission with the task of developing "simplified procedures for the adoption and effective implementation of safety organizational and management models in small and medium-sized enterprises." These procedures were developed and subsequently published with the Ministerial Decree of 13/2/2014.
In the following table, the various options available for implementing an OMM compliant with the provisions of Art. 30 of Legislative Decree 81/2008 are summarized:

	References	Additional organizational elements	Notes
A	Art. 30 of Legislative Decree 81/08 paragraphs 1 and 4 (the disciplinary system is prescribed in paragraph 3)	Necessary establishment of a surveillance body[26] (in addition to the disciplinary system already provided for in paragraph 3).	For some categories[27] OMM design guidelines are available.
B	BS OHSAS 18001[28] or UNI - INAIL Guidelines	Necessary establishment of a - Disciplinary system - Supervisory Body	Application guidelines for certain types of businesses and production sectors are available on the INAIL website [29]
C	Simplified procedure as per Ministerial Decree 13/2/14[15]	Necessary establishment of a Supervisory Body	The Ministerial Decree also provides the application forms

For the sake of completeness, the following considerations should be made:

1) from a content perspective, the three options outlined in the table are extremely similar but not identical; the first 4 paragraphs of Art. 30, if interpreted strictly, may be significantly restrictive on some fundamental aspects of systemic safety management, such as worker participation, the need for monitoring indicators or the management of non-compliances and near accidents;
2) a model created according to UNI - INAIL or OHSAS 18001:07 (now UNI EN ISO 45001:23) integrated as indicated in the table Is subject to a "presumption of conformity" in court proceedings; therefore, compliance is defined *ope legis (by law)*; effectively reversing the burden of proof, an immense advantage for a company that must demonstrate to a judge the effectiveness of its OMM-OH&S following an accident;
3) when adopting an OMM-OH&S using OHSAS 18001 (now UNI ISO 45001:23) it is worth to consider the value of its certification. The legislator does not express any opinion in this regard. There is never any mention of certified OMMs, but, as already mentioned and as we will see later in more detail, the regulations provide that they can be asseverated. However, it is undeniable, that the certification of a system would carry weight in legal proceedings.

[26] The function of the Supervisory body in small-sized enterprises can be performed by the Management Body (d.lgs. 231/01 art. 6. c.4)
[27] We recall, among others, Confindustria, ABI, ANCE
[28] Since September 2021, the BS OHSAS 18001standards have been withdrawn, as the transition period for the definitive exclusive application of the standard ISO 45001 has ceased, which, as will be seen later, is not mentioned in paragraph 5-bis of Art. 30 of Legislative Decree 81/2008.
[29] https://www.Inail.it/cs/internet/attivita/prevenzione-e-sicurezza/promozione-e-cultura-della-prevenzione/sgsl/modelli-applicativi.html

Finally, following what as been above written on the characteristics of "conformity" it is worth remembering what Art. 30 provides for adoption and effective implementation of an OMM. The exempting effectiveness of liability, as well as the substantial effectiveness, of an organizational and management model therefore undoubtedly depends on its compliance which, however, proves to be absolutely useless in terms of prevention if it is not effectively implemented.

The points of contact between article 30 and Uni En Iso 45001:23

Already in 2018, with the publication of the ISO 45001:18 standard and the start of the transition period that would, in just over three years, lead to the repeal of BS OHSAS 18001:07, the current applicability of Art 30, which explicitly cited this standard, was questioned.
Actually, with great foresight, the legislator of Legislative Decree 81/08 had addressed the issue of the potential changes in the reference standards. Indeed, paragraph 5 of the aforementioned Art. 30 states: *"Upon first application, the business organizational models defined in accordance with the UNI INAIL Guidelines for an occupational health and safety management system (OH&SMS) of 28 September 2001, or the British Standard OHSAS 18001:2007 are presumed to comply with the requirements of this article for the corresponding parts…. (omitted) ….For the same purposes, further business organizational and management models may be indicated by the Commission as set out in Article 6 (Permanent Advisory Commission)".*
Therefore, the legislator, aware of the natural inevitable updating of the technical standards, had stated that the Permanent Advisory Commission would evaluate which additional business organization models could be subject to the presumption of conformity envisaged, in the initial application, in Art. 30 for the UNI-INAIL Guidelines and for BS OHSAS 18001:07.
Since today, such regulatory provision has not been followed up, and there are no indications whatsoever from the Advisory Commission, even though the UNI ISO 45001:18 standard, also adopted in Europe now as UNI EN ISO 45001:2023, is a document of significantly higher rank than 18001, being at the international level and formally adopted by the Italian standardization body (UNI) and the European Committee for Standardization (CEN).
Without exploring reasons for this legislative gap, it is legitimate to question whether the above international standard is still adequate to form the backbone of an OMM-OH&S[30] with exempting effectiveness of liability and whether, as such, it can be used regardless of explicit pronouncements from the Advisory Commission.

[30] UNI technical standards definition of an organization and management model established to prevent the crimes referred to points 589 and 590 of the Civil Code: negligent injury and manslaughter committed in violation of workplace hygiene and safety regulations.

To answer these questions, we can certainly approach the topic from a technical perspective by evaluating *the corresponding parts*. It's worth remembering that the key interpretation of paragraph 5 of Art. 30, as reiterated in the circular letter of 11/7/2011, was precisely the correspondence between the requirements of Art. 30 (paragraphs 1, 2, 3 and 4) and the technical standards cited in paragraph 5 (BS OHSAS 18001:07 and UNI-INAIL Guidelines).
The following table mirrors the analogous one from the mentioned circular and supplements it with an additional column listing the requirements of UNI EN ISO 45001:23[31] .

Ref. Art. 30 D. Lgs. no. 81/2008	Ref. UNI-INAIL Guidelines (2001)	Ref. BS OHSAS 18001:2007	Ref. UNI EN ISO 45001:23[32]
c. A1 letter a: compliance with legal technical-structural standards relating to equipment, systems, workplaces, chemical, physical and biological agents.	A. Purpose B. cyclical sequence of an OH&SMS C. OH&S policy D. Planning E.1. Management system E.6. Documentation E7. Integration of occupational health and safety into company processes and operational management	4.1 General requirements 4.2 OH&S policy 4.3.1 Hazard identification, risk assessment and control determination 4.3.2 Legal and other provisions 4.3.3 Objectives & programs 4.4.4 Documentation 4.4.6 Operational control 4.5.2 Conformity assessment	1. Scope and field of application 4.2 Understanding the needs and expectations of workers and other stakeholders 5.2 OH&S policy 6.1.2 Hazard identification and risk and opportunity assessment 6.1.3 Determination of legal and other requirements 6.2.1 Objectives 6.2.2 Planning to achieve objectives 7.5 Documented information 8 Operational activities 9.1.2 Conformity assessment

[31] Adapted from *The workplace safety management system. UNI ISO 45001:18 Guide to adoption, certification and migration.* Antonio Terracina & Lucina Mercadante. EPC - 2018
[32] It is worth mentioning again that the standard was republished in 2023 following its adoption at the European level by CEN - European Committee for Standardization

Ref. Art. 30 D. Lgs. no. 81/2008	Ref. UNI-INAIL Guidelines (2001)	Ref. BS OHSAS 18001:2007	Ref. UNI EN ISO 45001:23[32]
c. 1 letter b: risk assessment activities and preparation of consequent prevention and protection measures.	A. Purpose B. Cyclical sequence of an OH&SMS C. OH&S policy D. Planning E.1 Management system E7: Integration of occupational health and safety in company processes and operational management	4.1 General requirements 4.2 OH&S policy 4.3.1 Hazard identification, risk assessment and control determination 4.3.2 Legal and other provisions 4.3.3 Objectives & programs 4.4.6 Operational control	1. Scope and field of application 5.2 OH&S policy 6.1.2 Hazard identification and risk and opportunity assessment 6.1.3 Determination of legal and other requirements 6.2.1 Objectives 6.2.2 Planning to achieve objectives 6.1.4 Planning activities 8 Operational activities
c. 1 letter. c: organizational activities, such as:	A. Purpose B. Cyclical sequence of an OH&SMS C. OH&S policy D. Planning E 2. Definition of tasks and responsibilities	4.1 General requirements 4.2 OH&S policy 4.3 Planning	1. Scope and field of application 5.2 OH&S policy 6.2.1 Objectives 6.2.2 Planning to achieve objectives
Emergency First aid	E7. Integration of occupational health and safety into company processes and operational management	4.4.7 Emergency preparedness and response	8.2 Emergency preparedness and response
Contract Management	E 5. Communication, information flow and cooperation E7. Integration of occupational health and safety into company processes and operational management	4.4.3.1 Communication 4.4.6 Operational control	7.4 Communication 8 Operational activities
Regular safety meetings	E 3. Staff involvement	4.4.3 Communication, participation and consultation	3.4 Participation 3.5 Consultation 5.1 Leadership and commitment 7.4 Communication 7.4.2 Internal communication

Ref. Art. 30 D. Lgs. no. 81/2008	Ref. UNI-INAIL Guidelines (2001)	Ref. BS OHSAS 18001:2007	Ref. UNI EN ISO 45001:23[32]
Consultation with Workers' Safety Representatives (RLS)	B. Cyclical sequence of an OH&SMS C. OH&S policy E 3: Staff involvement	4.2 OH&S policy 4.4.1 Resources, roles, responsibilities, and authorities 4.4.3 Communication, participation and consultation	5.2 OH&S policy 5.3 Roles, responsibilities and authorities in the organization 5.4 Consultation and participation of workers
c. 1 letter d: health surveillance activities	A. Purpose B. Cyclical sequence of an OH&SMS C. OH&S policy E.1 Management system E7: Integration of occupational health and safety into company processes and operational management	4.1 General requirements 4.2 OH&S policy 4.4.6 Operational control	1. Scope and field of application 5.2 OH&S policy 8 Operational activities
c. 1 letter e: information and training activities	A. Purpose B. Cyclical sequence of an OH&SMS C. OH&S policy E.1 Management system E 4, Training, education and awareness E 5. Communication, information flow and cooperation	4.1 General requirements 4.2 OH&S policy 4.4.2 Competence, training, awareness	1. Scope and field of application 5.2 OH&S policy 7 Support 7.2 Competence 7.3 Awareness 7.4 Communication 7.4.2 Internal communication
c. 1 letter. f: surveillance activities with reference to workers' compliance with work procedures and instructions on safety	A. Purpose B. Cyclical sequence of an OH&SMS C. OH&S policy E.1 Management system E7. Integration of occupational health and safety into company processes and operational management F1. Internal security monitoring (1st level) F 2. Characteristics and responsibilities of auditors F 3. Monitoring Plan	4.1 General requirements 4.2 OH&S policy 4.4.6 Operational control 4.5.1 Performance monitoring and measurement 4.5.2 Conformity assessment 4.5.3 Investigation of accidents, non-conformities, corrective actions and preventive actions 4.5.4 Control of records 4.5.5 Internal audit	1. Scope and field of application 5.2 OH&S policy 8 Operational activities 9 Evaluation of performance 9.1.2 Conformity assessment 9.2 Internal audit 10.1 Accidents, non-conformities and corrective actions

Ref. Art. 30 D. Lgs. no. 81/2008	Ref. UNI-INAIL Guidelines (2001)	Ref. BS OHSAS 18001:2007	Ref. UNI EN ISO 45001:23[32]
c. 1 letter g: acquisition of mandatory documentation and certifications required by law	A. Purpose B. Cyclical sequence of an OH&SMS C. OH&S policy D. Planning E.1 Management system E.6. Documentation	4.1 General requirements 4.2 OH&S policy 4.3.2 Legal and other requirements 4.4.4 Documentation 4.4.5 Document review 4.5.2 Conformity assessment	1. Scope and field of application 5.2 OH&S policy 6.1.3 Determination of legal and other requirements 7.5 Documented information 7.5.3 Control of documented information 9 Evaluation of performance 9.1.2 Conformity assessment
c. 1 letter h: regular checks of the application and effectiveness of the procedures adopted	A. Purpose B. Cyclical sequence of an OH&SMS C. OH&S policy E.1 Management system F1 Internal safety monitoring (2nd level) F 2 Characteristics and responsibilities of auditors F 3 Monitoring plan	4.1 General requirements 4.2 OH&S policy 4.5.1 Performance monitoring and measurement 4.5.4 Control of records 4.5.5 Internal audit	1. Scope and field of application 5.2 OH&S policy 7.5.3 Control of documented information 9 Evaluation of performance 9.2 A Internal audit
c. 2: The organizational and management model as per C. 1 must be preceded by suitable systems for recording the completion of the activities referred to in point 1	A. Purpose B. cyclical sequence of an OH&SMS C. OH&S MS policy E.1 Management system E.6 Documentation	4.1 General requirements 4.2 OH&S policy 4.4.4 Documentation 4.4.5 Document control 4.5.4 Control of records	1. Scope and field of application 5.2 OH&S policy 7.5 Documented information 7.5.3 Control of documented information
C. 3: the organizational model must in all cases include, to the extent required by the nature and size of the organization and the type of activity carried out, an articulation of functions that ensures the technical skills and powers necessary for:	A. Purpose B. Cyclical sequence of an OH&SMS C. OH&S policy E.1 Management system E 2 Definition of tasks and responsibilities E 4 Training, Education and awareness	4.1 General requirements 4.2 OH&S policy 4.4.1 Resources, roles, responsibilities and authorities 4.4.2 Competence, training and awareness	1. Scope and field of application 5.2 OH&S policy 5.3 Roles, responsibilities and authorities of the organization 7.2 Competence 7.3 Awareness

Ref. Art. 30 D. Lgs. no. 81/2008	Ref. UNI-INAIL Guidelines (2001)	Ref. BS OHSAS 18001:2007	Ref. UNI EN ISO 45001:23[32]
risk verification, assessment, management and control;	D. Planning E7 Integration of occupational health and safety into company processes and operational management F1 Internal safety monitoring F2 Characteristics and responsibilities of auditors F 3 monitoring plan	4.3 Planning 4.3.1 Hazard identification, risk assessment and control determination 4.3.3 Objectives and programs 4.4.6 Operational control 4.5.1 Performance Monitoring and measurement 4.5.2 Conformity assessment 4.5.3 Investigation of accidents, non-conformities, corrective actions and preventive actions	6. Planning 6.1 Actions to address risks and opportunities 6.1.2 Hazard identification and of risks and opportunities assessment 6.1.4 Planning activities 6.2 OH&S objectives and their achievement 8 Operational activities 8.1.2 Elimination of hazards and reduction of risks for OH&S 9 Evaluation of performance 9.1.2 Conformity assessment 10.2 Accidents, non-compliance corrective actions
A disciplinary system suitable for sanctioning failure to comply with the measures indicated in the model.	NON-CORRESPONDING PART	NON-CORRESPONDING PART	NON-CORRESPONDING PART
C. 4: the organizational model must also include a suitable monitoring system on the implementation of the model and on the maintenance over time of the suitability conditions of the measures adopted.	F1 Internal safety monitoring F 2 Characteristics and responsibilities of auditors F 3 Monitoring Plan	4.5.1 Performance Monitoring and Measurement 4.5.2 Conformity assessment 4.5.3 Investigation of accidents, non-conformities, corrective actions and preventive actions 4.5.5 Internal audit	1. Scope and field of application 5.2 OH&S policy 9 Evaluation of performance 9.1.2 Conformity assessment 9.2 Internal audit 10.2 Accidents, non-conformities, corrective actions 9.3 Management review
the review and any modification of the organizational model must be adopted when significant violations of the rules relating to accident prevention and occupational hygiene are discovered, or in the event of changes in the organization and activity in relation to scientific and technological progress	A. Purpose B. Cyclical sequence of an OH&SMS C. Policy E.1 Management system F4 Management review	Introduction 4.1 General requirements 4.2 OH&S policy 4.6 Management review	1. Scope and field of application 4.2 Understanding the needs and expectations of workers and other interested parties 5.2 OH&S policy 9.3 Management review

The table shows with great clarity and simplicity how the new UNI EN ISO 45001:23 standard follows precisely the same pattern as the previous ones, and that there are indeed the same correspondences; in fact, it essentially presents additional requirements that certainly do not undermine the correspondences, but rather strengthen them.
The reference to the "non-corresponding part" consisting of the "disciplinary system suitable for sanctioning non-compliance with the measures indicated in the model" which is not even present in UNI EN ISO 45001:23, remains identical.
Therefore, a company adopting international standard and wishing to use it to establish an OMM-OH&S will still have to adopt, as in the past, of the aforementioned disciplinary system, as well as a Supervisory body in accordance with Article 6 of Legislative Decree. 231/01.
Furthermore, it's worth noting that, in the opinion of the writer, among companies and professionals, this transition has been considered natural, as the international standard has completely replaced the British one, which was officially withdrawn.
Among the most authoritative references, a passage worth mentioning is from the Confindustria guidelines, which in the 2021 version (page 47) states as follows: *"In this sense, to improve the efficiency of the organizational models required by decree 231, it will be important to enhance the synergy with the documentation (usually divided into internal manuals, procedures, operational instructions and records) of the company systems on accident prevention (UNI - INAIL or OHSAS 18001 or ISO 45001)".*

Finally, this is not the appropriate place to assert from a legal perspective that an OMM-OH&S developed using the reference standard ISO 45001 is subject to the presumption of conformity for the purposes of exempting effectiveness of liability, as this task is entrusted to the Permanent Advisory Commission. However, from a technical point of view and from that of user practice, it is certainly reasonable to argue that an OMM-OH&S- that uses an OH&SMS compliant with UNI EN ISO 45001:23 is suitable to meet the requirements of Art. 30. In fact, in the experience of the writer, this standard undoubtedly provides more effective organizational and management as it represents the evolution of the state of the art at the international level.

The disciplinary system

A few words should be said regarding the first and most immediate "non-corresponding" element (see table above) and therefore the "disciplinary system suitable for sanctioning non-compliance with the measures indicated in the Model" that fulfills the regulatory requirement of Art. 6 (paragraph 2 letter d).
Applied to offences related to health and safety at work, therefore, the body must adopt a system to identify and sanction behaviors that may facilitate the commission of offences envisaged by Article 300 of Legislative Decree n. 81/2008 (Article 25-

septies of the Legislative Decree of 8 June 2001, n. 231, and subsequent amendments and additions).
Given the relevance that sanctions may have, it is essential that the type and extent of such measures are consistent with the applicable legislative and contractual references and must be documented.
The disciplinary system must be defined and formalized by the employer, equivalent to top management according to the Ministerial Decree of 13 February 2014, and subsequently communicated to all relevant parties, such as:

- Employer (if not the same of top management as is often the case in many SMEs);
- Managers or other top-level individuals
- People in charge;
- Workers;
- Surveillance Body (see next paragraph);
- Auditors/audit team;
- H&S manager;
- MC.

Moreover, the company must also define suitable procedures to select, monitor and, where necessary, sanction external collaborators, contractors, suppliers and other parties with contractual relationships with the company. To ensure the applicability of these procedures, the company must ensure that specific operational clauses referring to the necessary requirements and behaviors, as well as the sanctions for non-compliance, are included in individual contracts; in the worth case the sanction must be the resolution of the contract itself.
The disciplinary system is suitable and effective if it is characterized by a prompt response to violations of the model's rules. In the event of an accident, being able to prove in court that the system not only exists on paper but also that it is actually functional, as sanctions were imposed prior to the accident, represents a very strong indicator of the actual implementation of the system and therefore of the "right" to be subjects the so-called "exempting effectiveness of liability".

The surveillance body

This is one of the peculiarities of the "exempting effectiveness of liability" system required by Legislative Decree 231/01, certainly among the most complex and debated. According to this important regulatory provision, it is necessary that the management body, in addition to having adopted the Model in accordance with the elements set out above, has entrusted the task of supervising the functioning and

compliance for the Model, and of ensuring its updating to a body within the organization endowed with autonomous powers of initiative and control[33].
There are no specific provisions in the law regarding the composition of this particular element of the company. Therefore, useful indications can be found in various guidelines (generally from employer organisations) and in case law. Today it is generally agreed that this can be either monocratically or composed of multiple members, depending on the range of predicate offenses it aims to prevent and the related competences the surveliance body must ensure collectively.
In other words, depending on the size of the company, the activity sector and the complexity of the adopted system, it may consist of a single individual person or more people.
The only explicit indication in the regulation concerns the possibility that, in small-sized organisations, the role and typical tasks of the surveillance body may be fulfilled by the Employer (Art. 6, par. 4), where small-sized entities refer to mean small and medium-sized enterprises[34].
In general, it is worth remembering that a surveillance bodymust have the following characteristics:

- Autonomy and independence
- Professionalism
- Continuity of action

As a rule, the OMMs provide that the surveillance bodyis the recipient of information flows, which keep it regularly updated on the functionality of the model, so that it can formulate its surveillance activities and, if considered necessary, propose modifications to the model.

Sanctions

The sanction system provided by Legislative Decree 231/01 and specifically by Article 300 of Legislative Decree 81/08 is designed differently from that of Legislative Decree 81/08.
Indeed, these are administrative sanctions that include prohibitory sanctions on the body's economic activity and monetary penalties applicable in quotas and at differentiated quota values.
The number of quotas is determined by the severity of the offense, the level of the body's responsibility, as well as the actions taken to eliminate or mitigate the consequences of the offense to prevent further wrongdoing.

[33] d. lgs 231/01 - Art. 6, co. 1, letter B. (Supervisory Body)
[34] See the simplified procedures published in DM 13/2/2014

The amount of the quota is set on the basis of the economic and financial conditions of the body to ensure the effectiveness of the sanction, and it ranges from a minimum of €258.23 to a maximum of €1,549.37.
The following table summarizes the applicable sanctions for offenses related to the OH&S.

PENAL CODE CRIME	PROHIBITORY	FINANCIAL
Manslaughter (viol. art 55 c 2 VDR)	From 3 months to 1 year	1000 quotas
Manslaughter	From 3 months to 1 year	From 250 to 500 quotas
Negligent injuries	Up to 6 months	Up to 250 quotas

In this regulatory context, monetary sanctions can indeed reach up to 1,500.000 euros. However, needless to say, entrepreneurs are particularly frightened by those prohibitory sanctions, which can have a much greater impact.

The asseveration of an omm

The task of asseverating the adoption and effective implementation of an OH&S-OMM- as per Art. 30 of Legislative Decree 81/08 was assigned, as previously mentioned, by the legislator to the joint bodies, as stated in Art. 51 of the same decree. With this regulatory provision the legislator has effectively assigned to these bodies an important strategic role of monitoring and verification, which we could call "social control", and which represents a great opportunity for the system of bipartisanship and the contribution it can provide to businesses. Although expressly mentioned in paragraph 5 of Art. 30 of Legislative Decree 81/2008, regarding documents related to OH&SMS (the UNI INAIL Guidelines and BS OHSAS 18001) as a constituent element of an organizational and management model, what is then presented in Article 51, is not the certification of the management system, but rather the asseveration of the OMM by the joint bodies; this is a significant added value given by the legislator to the system of bipartisanship.
To support the importance given to the certification process, the legislator has also provided that public supervisory authorities take it into account in planning their inspection activities. This regulatory provision was already envisaged by Legislative Decree 81/08 as a sort of invitation to asseverated companies to a lower level of control than non-asseverated companies, as the former are already subject to verification by the joint body.

This provision was reaffirmed and clarified by the recent amendment to Article 51 of the d.lgs 81/08 brought about by law n. 215/2021[35], whereby the joint bodies annually report to Inl and Inail the data relating to the issuance of certifications for the purpose of identifying priority criteria in the planning of surveillance and reward criteria in the determination of insurance charges by Inail.
The law, in Art. 51 of Legislative Decree 81, does not provide specific details regarding the methods or rules that joint bodies must follow in order to carry out the asseveration activities correctly, transparently and uniformly across the territory. This need for clarification has been effectively addressed by technical regulations.
In the absence of such indications, the asseveration process of the OMM adopted by companies, which relies on joint bodies as its strength to improve workplace safety, would have risked not being recognized and valued or, worse, being reduced to the mere offering of paid services with little preventive effectiveness.
For these reasons, Inail, within the framework of UNI standardization activity, along with some joint bodies from different working sectors that have taken steps in this direction, is contributing to defining the contours of this delicate process through a series of dedicated technical standards, as described in the next paragraph.

Joint bodies

The "joint bodies", defined by Legislative Decree 81/2008, Art. 2 letter ee), are mainly characterized by being composed of 50% representatives from the employer side and 50% from the trade union side, representing a specific work sector.
The asseveration of the OMMs is entrusted to parties representing the social partners, namely associations of employers and workers, pursuant to Art. 51 of Legislative Decree 81/2008, tasked with providing training and assistance services to businesses. The lack of clear rules on the representativeness of such entities has determined, in the past, the provision of such services, including the asseveration of the OMM, by bodies of questionable legitimacy.
To resolve this critical issue, the ministerial decree of 11 October 2022, no. 171, established the "National register of joint bodies" within the Ministry of Labor and Social Policies, General Directorate for workplace health and safety.
Registration the National Register confirms the existence of the identifying requirements specified in Article 2, paragraph 2 of the decree of the Ministry of Labor and Social Policies of 11 October 2022, no. 171 and enables the performance of the tasks and activities outlined in Article 51 of Legislative Decree of 9 April 2008, no. 81, including the activity of asseveration of OMMs.

[35] "Conversion into law, with amendments, of the legislative decree of 21 October 2021, n. 146, containing urgent measures in economic and fiscal matters, to protect employment and for undeferrable needs ".

It should be remembered that, from a strictly technical standpoint, concerning the expertise required to carry out and issue the asseveration, joint bodies must establish, in accordance with Art. 51 paragraph 3-ter, specific technically competent joint commissions, which must also possess characteristics of parity.
Therefore, as underlined by the technical standards currently in force, while it is the responsibility of the joint bodies to oversee the issuance of the asseverations, it is the task of these commissions to delve into the details of the OMM-OH&S, of their compliance with Art. 30 and above all of its effective implementation in a specific work setting.

The technical standards supporting the asseveration process

Since 2013, Inail and UNI have been carrying out a joint commitment to identify pathways for the asseveration process that are in some way reproducible across all productive sectors, without, however, removing the necessary specificities required for the evaluation of the OMMs implemented for different work activities.
The standardization effort has primarily aimed to ensure that serious, effective, transparent methods of verification and asseveration of the OH&S OMMs could be adopted, thus avoiding discrepancies in verification timelines, costs and the use of some evaluation parameters. Such discrepancies could lead to pathways of dubious credibility and varying difficulty for companies asseverated by different bodies, resulting in evident penalizations for some companies compared to others.

Initially, the process saw the issuance of two reference practices, UNI PdR 2:2013 "Operational guidelines for Asseveration in the Construction and Civil Engineering Sector" and UNI PdR 22:2016 "Guidelines for the Operational Procedure for the Asseveration of Health and Safety Organization and Management Models in Local Environmental Services Companies", respectively developed at the request and active participation of the then National Commission of Territorial Joint Committees in Construction (Cncpt), now Formedil, and the Rubes Triva Foundation, a joint body in the environmental services sector.

Table 1: The technical standards for the asseveration of OMM

UNI/TR 11651:2018	Adoption and effective implementation of Occupational Health and Safety Organization and Management Models (MOG-SSL) - Asseveration procedures of the Joint Bodies
UNI 11751-1:2019	Adoption and effective implementation of Occupational Health and Safety Organization and Management Models (MOG-SSL) - Part 1: Asseveration process in the construction or civil engineering sector
UNI 11751-2:2020	Adoption and effective implementation of Occupational Health and Safety Organization and Management Models (MOG-SSL) - Part 2: Knowledge, skill and competence requirements of the technical professionals involved in the asseveration process in the construction or civil engineering sector
UNI 11856-1:2022	Adoption and effective implementation of Occupational Health and Safety Organization and Management Models (MOG-SSL) - Mono and multiutility companies of public local services - Part 1: Asseveration procedures of the Joint Bodies
UNI 11856-2:2022	Adoption and effective implementation of Occupational Health and Safety Organization and Management Models (MOG-SSL) - Mono and multiutility companies of public local services - Part 2: Knowledge, skill, independence and responsibility requirements of the technical professionals involved in the asseveration process
UNI 11857-1:2022	Adoption and effective implementation of Occupational Health and Safety Organization and Management Models (MOG-SSL) - Travel companies, cleaning and pest control services, training companies, consulting, job services, private investigation and commercial information services - Part 1: Asseveration procedures of the Joint Bodies
UNI 11857-2:2022	Adoption and effective implementation of Occupational Health and Safety Organization and Management Models (MOG-SSL) - Travel companies, cleaning and pest control services, training companies, consulting, job services, private investigation and commercial information services - Part 2: Knowledge, skill, independence and responsibility requirements of the technical professionals involved in the asseveration process

Subsequent requests for drafting specific reference practices for further productive sectors led the UNI Safety Commission and its working group "Methods and Management Systems for Occupational Health and Safety", coordinated by Inail, to

issue a regulatory document on asseveration, the technical report UNI/TR 11709:2018, which provides operational guidelines applicable to all productive sectors.
This report serves as the parent document from which specific technical standards for various productive sectors, have been derived. This includes sectors for which the reference practices had already been developed, but were now approaching expiration, having exceeded their designated validity period as outlined in UNI regulations.
Table 1 lists the currently effective UNI standards for some production sectors, whilst, for other sectors where specific technical standards are not yet available, reference can be made to the technical report UNI/TR 11709:2018.

Opportunities associated to the asseveration process

The discipline of the asseveration process through technical standards certainly represents a significant step in recognizing the asseveration process, which therefore effectively constitutes an opportunity for businesses to obtain benefits in various area: judicial, relating to qualification of companies and pertaining to attention from the surveillance body, as discussed in the first paragraph.
Regarding the judicial aspect, the company can rely on having the exempting effectiveness recognized through the adoption and effective implementation of its company OMM, demonstrating the conformity of the model itself with Art. 30 of Legislative Decree 81/2008, with particular reference to its correct and effective implementation. In this sense, asseveration can constitute a fundamental element in attesting the real effectiveness of the OMM.
Article 27 of Legislative Decree 81/2008 is dedicated to the topic of a company qualification system, specifying how this system is implemented for the construction sector: *"at least through the adoption and dissemination, under the terms and conditions identified by the Presidential Decree referred to in Article 6, paragraph 8, letter g), of a tool that allows for the continuous verification of the suitability of companies and self-employed workers"*. Furthermore, Article 27 provides for the possibility, at paragraph 2, of extending this method to other sectors, not only construction.
In this context, an important initiative by Inail should be noted, which is experimenting with the "accident and prevention rating". This parameter reflects the accident history of a specific company and its organizational choices in terms of prevention, by adopting a certified OH&SMS or an asseverated OMM. The rating, calculable through a specific application available on the Inail website, can be used by public contracting authorities during the tendering phases and, also through asseveration, will contribute to favoring safe companies on the market.
Such a choice is in line with Inail's policies, which has always supported and encouraged the systemic safety management through various channels and modalities, including economic ones.

The financial support tools implemented by Inail are mainly two:

1) the first is called "prevention rate fluctuation", provided for by Art. 23 of the Ministerial Decree of 27 February 2019, which consists of a discount on the insurance premium which is recognized to those public or private companies that, in compliance with the occupational health and safety legislation and with their contributory obligations towards Inail and Inps, implement interventions for health and safety prevention in the workplace, going beyond mere compliance with mandatory regulations;
2) the second is the funding for businesses provided for by paragraph 5 of Art. 11 of Legislative Decree 81/2008, in place since 2010, known as the ISI call for proposals. This is a true non-repayable loan for projects aimed at improving hygiene and safety conditions in the workplace.

The preventive interventions to the prevention rate fluctuation that companies can request annually through the online submission of the OT23 form cover various areas of interest. In particular, a section of the form (section E) is dedicated to the adoption of an OH&S-OMM and an OH&SMS.
As regards ISI calls for proposals, there are various possible funding areas. Annex 1.2 is dedicated to the adoption of an OH&SMS and an OMM-OH&S. Many companies request these types of projects, leading INAIL to increase the allocated resources which, starting from the ISI 2021calls for proposals, have increased from 2 to 5 million euros.
More details are presented in the contributions of this monograph dedicated precisely to these topics.

Conclusions

With a brilliant insight, the legislator of Legislative Decree 81/08 has explicitly stated in Article 30 the very strong logical, operational and, upon closer examination, also ethical and value-based connection between OH&S OMM and OH&SMS. This connection has enjoyed legislative imprimatur since 2008 and has provided an incredible impetus to the dissemination of OH&SMSs and OH&S-OMM. This is clearly highlighted, among other things, by the data on certifications under accreditation, which have practically increased tenfold in these last 15 years.
As a side note, the aforementioned Art. 30 does not refer to the certification of the OH&SMS or the asseveration of the OMM, but it quickly became evident clear that this additional step would provide considerable added value both in legal and substantive terms. This is because the magistrates, both investigating and adjudicating, in the event of an accident and in the application of the provisions of administrative liability, cannot ignore the fact that an organization has voluntarily undergone third-party verification. Substantively, because - as the research results presented in this volume once again demonstrate - companies that approach systemic

safety management seriously have a significantly lower number and severity of accidents.
The publication of UNI EN ISO 45001:23, a standard recognized today in Italy, in Europe and much of the world, does not change in any way the connection between an OH&SMS and an OMM that Art. 30 of Legislative Decree 81/08 aimed to make explicit.
Indeed, what Legislative Decree 81/08, OH&SMS and OH&S-OMM have in common is the organizational and managerial approach to worker protection.
The standards that describe the requirements of an OH&SMS, as well as the elements of an OH&S-OMM, simply provide management methods and tools for the timely compliance with a regulatory provision, Legislative Decree 81, which itself already inherently contained similar organizational management elements. It could be said that OH&SMS and OH&S-OMM- are the best method (according to the current state of the art) for implementing the legislation.
An approach laid out more than 35 years ago with Directive 89/391/EU (which forms the basis of Legislative Decree 81/08) and subsequently, more than 10 years later, with the first documents concerning OH&SMS, but which remains as relevant as ever. Indeed, through the updating of technical standards, it remains constantly at the service of organizations, despite the continuous changes in society and the world of production and work.

THE OPPORTUNITIES OF ADOPTING A CERTIFIED OH&SMS

S. Amatucci*, M.I. Barra**, V. Chiodo***, S. D'Amario*, L. Frusteri**, S. Mochi*, P. Ricciardi**, A. Terracina**, R. Vallerga**

*Inail - General management - Statistical and Actuarial Consulting

** Inail - General management - Health and Safety Technical Consulting

*** Inail - Central Directorate for Prevention

INTRODUCTION

A company's awareness of good practices in workplace health and safety and risk factors is increasingly becoming a distinguishing element between one production reality and another. Through the adoption of an OH&SMS, a company effectively attests to a greater focus on business management, in terms of increased process efficiency. Also, it has greater confidence in its legislative compliance, which allows the company itself to operate more confidently in terms of surveillance by the bodies in charge of this purpose.

The adoption of an OH&SMS in a company brings about easily noticeable improvements, both in terms of workplace health and safety performance and in terms of the image projected on the market[36]. An enhanced reputation will coincide with improved relationships with the company's workers themselves, who, upon seeing an OH&SMS implemented, will have the perception and confidence that they are operating in a reality that prioritizes health and safety of workers. They will thus naturally be inclined to provide better professional performances, leading to positive effects in relationships with the stakeholders as well.

Without forgetting, moreover, that the value created by a management system can also be recognized at a legal level thanks to the provisions of Article 30 of Legislative Decree 81/2008, which exempts from administrative liability as outlined in legislative Decree 231/2001 those who have adopted and effectively implemented workplace health and safety management models.

Nonetheless, many companies, before facing the burdens of implementing an OH&SMS as well as those of a certification, ask themselves the same question: is adopting an OH&SMS in my company truly effective in preventing accidents? It is certainly a legitimate question, considering that the process of adopting an OH&SMS is not only demanding in terms of time and human resources but also from an economic point of view.

The answer to this question has been given by several studies, including the one presented in this volume, which demonstrated the real effectiveness of adopting an

[36] F. Benedetti, M. I. Barra, E. Lenoci, "The economic benefits of prevention" - Journal of occupational injuries and diseases - issue n. 1/2015

OH&SMS in terms of reducing accident occurrences. Therefore, although the implementation and adoption of an OH&SMS entails a considerable commitment for the company, the resulting benefits provide enormous value to the effort undertaken[37], including the continuous dissemination of the "safety culture", which represents a key shift in safeguarding workers' health and safety.
However, despite the undeniable benefits, adopting an OH&SMS or an OMM requires commitment and investments, and companies, especially those less structured and of smaller sizes, may struggle to embark on implementation paths that require capabilities and competences that these types of companies may not have available internally [38].
For these reasons, Inail has long been making insurance and economic support tools available to companies, among which economic incentives stand out, granted for the implementation of projects aimed at reducing accidents and occupational diseases, as well as implementing workplace safety and health levels. This is by virtue of the institutional function recognized to Inail by Legislative Decree 81/2008 and subsequent amendments and developed in recent years above all through procedures involving funding and tariff facilitations.
The funding is provided to companies as non-repayable grants to encourage the implementation of projects aimed at improving levels of workplace health and safety. Tariff facilitations, consisting of reductions in insurance premiums, are directed at companies which, according to specific participation criteria, can obtain these benefits by implementing significant interventions aimed at preventing accidents and occupational diseases.

Support to businesses from Inail

Funding for businesses. ISI public notices

The adoption of workplace health and safety management systems (OH&SMS) by companies falls within set of preventive measures funded through the ISI Calls for proposals since the first edition in 2010. This economic incentive tool closely follows the entry into force of Legislative Decree no. 81/2008 which, in Art. 11 paragraph 5, for the first time assigned to INAIL the task of financing *with its own resources [...] projects [...] aimed at experimenting with innovative solutions and organizational and management tools inspired by the principles of corporate social responsibility.*

[37] M.I. Barra; F. Benedetti, A. Terracina, "Occupational safety and business competitiveness. OH&S MS system, OMM and tools for estimating the costs of non-safety" - Proceedings of the 31st National Congress of Industrial Hygiene. - Naples, 25-27 June 2014
[38] F. Benedetti, "The safety management system: from cost to opportunity" Environment and Safety at Work - n. 12, December 2006 - Publisher EPC Libri.

Indeed, an incentive based on the philosophy of valuing corporate social responsibility, could not fail to include within it a section that explicitly puts it into practice[39].
The holistic, ecosystemic or, in other words, sustainable approach, referred to OH&S MS, reminds us that, as individuals, we are part of a complex and interconnected context and, therefore, the adoption of an integrated model, of a management system allows companies to rethink the protection of workers, to experiment with new organizational solutions and achieve innovation under the most favorable conditions.
The new field of action did not find Inail unprepared because the Institute, in collaboration with UNI, had promoted the establishment of a working group with the main trade unions and employer associations since 2000, dedicated to the development of guidelines for the implementation of OH&SMS; these guidelines were published in September 2001.
At the same time, following the entry into force of Legislative Decree n. 38/2000 which provided for the issuance of separate premium tariffs for the four tariff managements of Industry, Crafts, Tertiary and Other activities, instead of the previous single Industrial tariff, and which invited consideration of the company's accident trend and implementation of the provisions of Legislative Decree no. 626/1994, already since 2001, as will be seen in detail in paragraph below, the Institute had introduced an insurance tool for the annual reduction of the premium rate, which included, among other measures, the adoption and maintenance of OH&SMS by businesses.
The experience thus gained made it easy to clearly define the outlines of the projects to be funded through the ISI Calls for Proposals, both in terms of scope and the documentation to be submitted when completing the application and for final reporting.
As for the scope, the interventions have always been characterized by a substantial distinction between certified OH&SMSs, OH&SMSs according to Inail- Social Partners agreements and non-certified OH&SMSs. Table 1 below highlights the changes made since 2010 to the interventions based on regulatory developments and the different structure of the Calls for Proposals.
With regard to the technical documentation, the request was limited to only essential documents needed to prove the system's operability, which must always necessarily be present in the case of adopting OH&SMS:
a. Certified: the certificate of the certification body;

[39] C. Colagiacomo, M. I. Barra, Stefano Signorini *The Survey "In ISI. Survey on incentives for small and medium-sized enterprises to improve health and safety levels in the workplace"* pages 87-116 and Ragazzi E., Colagiacomo C., Radin, De Santo A., *Monitoring Analysis of ISI Calls: focus on ISI initiatives for the organizational model axis*, pages 317-342 in Castaldo A., Ragazzi E., Sella L. (7/2023). *Is it possible to encourage safety in the workplace? Design, context and implementation of ISI INAIL offers.* Giappichelli, Torino

b. not certified: the policy document, the system manual, the list of procedures, and the minutes of internal audit and management reviews.

On the economic front, however, it was necessary to carry out thorough assessments of the suitability of the eligible amounts, taking into due account the costs of implementing and certifying systems, not only with reference to the increased complexity associated with the size aspects of the businesses, but also to the riskiness deriving from the various types of work performed.
A parametric system was thus developed to assess the economic suitability of OH&SMS adoption projects, based on the Institute's experience in technical standardization with UNI. The system, set out in the Technical Annex to the ISI Calls for proposals dedicated to OH&SMS, organizational and management models (OMM) and corporate social responsibility, has remained unchanged in all editions of the ISI Call for proposal and consists of two separate tables:

c. the first lists the parametric values attributed according to the complexity of the requesting company; expressed as a combination of the activity carried out in terms of the Ateco 2007 macro-sector and the number of employees.
d. the second allows you to see which Ateco 2007 activities fall within the macro-sectors listed in the first table.

Table 1 - Schematic evolution of the interventions related to OH&SMS in the ISI Calls for Proposals.

<table>
<tr><th>2010/2012</th><th>2013</th><th>2014/2016</th><th>2017</th><th>2018/2022</th><th>2023</th></tr>
<tr><td>OH&SMS certified to BS OHSAS 18001 by bodies accredited for the specific sector by Accredia or by other national accreditation bodies with mutual recognition agreement for this standard</td><td>OH&SMS certified to OHSAS 18001 by bodies accredited for the specific sector by Accredia or by other national accreditation bodies that operate in compliance with the technical regulation RT12 SCR rev. 1 published by Sincert in 2006.</td><td>OH&SMS certified to BS OHSAS 18001:07 by bodies accredited for the specific sector by Accredia in compliance with the technical regulation RT12 SCR rev. 1 published by Sincert in 2006</td><td rowspan="2">OH&SMS certified to BS OHSAS 18001:07</td><td rowspan="2">OH&SMS certified to UNI ISO 45001:2018</td><td rowspan="2">OH&SMS certified to UNI EN ISO 45001:2023</td></tr>
<tr><td>OH&SMS certified by bodies not accredited for the specific sector by Accredia</td><td>OH&SMS certified to OHSAS 18001 by certification bodies not accredited for the specific sector by Accredia or by another national accreditation body that operates in compliance with the technical regulation RT12 SCR rev. 1 published by Sincert in 2006.</td><td>OH&SMS certified to BS OHSAS 18001:07 by certification bodies accredited by accreditation bodies other than Accredia</td></tr>
<tr><td colspan="6">Sector-specific OH&SMS provided for by agreements between INAIL and Social Partners</td></tr>
<tr><td colspan="6">OH&SMS not falling within the previous cases</td></tr>
</table>

The maximum allowable amount for a project is then determined by multiplying the parametric value reported in the first table by a fixed amount for consultancy costs and by a lower fixed amount for any certification costs.
During the first editions of the ISI Call for Proposal, it was evident that companies faced difficulty in accessing the economic incentive for the types of intervention indicated in Table 1. This criticality is confirmed by the low incidence of admission

of this type of project compared to the total number presented, probably caused, in the selection phase, by the unbalanced competition of OH&SMS-related interventions with those, highly requested, that involve the purchase of machinery and other assets for the reduction of accident and technology-related hazards, which have a higher economic value. In order to counteract this phenomenon and promote business participation in the adoption of an OH&SMS, the Institute has implemented structural revisions of the ISI Call for Proposal system.
Starting from the 2018 ISI Call for Proposal, the Axis 1 "*Generalist"* was divided into two, and a dedicated sub-axis (Axis 1.2) was assigned to the adoption of OH&SMS, OMM and social responsibility models; this led to a significant increase in the number accepted projects (see table 2).

Table 2 - Data relating to the projects submitted and approved for the adoption of OH&SMS and organizational and social responsibility models for the ISI Calls for Proposals from 2014 to 2022. The dedicated sub-axis 1.2 was introduced starting from the 2018 ISI call for Proposal; from the 2021 ISI Call for Proposal, the allocated funding has increased rose to €5 million.

ISI Call for Proposal	Total ACCEPTED projects	PRESENTED OH&SMS/OMM projects	ACCEPTED OH&SMS/OMM projects	Percentage of OH&SMS/OMM accepted projects out of total	Amount requested for OH&SMS/OMM projects SUBMITTED	Amount requested for OH&SMS/OMM projects ACCEPTED	Percentage between submitted and accepted OH&SMS/OMM project
2014	3.434	1.459	202	5.88%	21.529.157	1.937.077	9%
2015	3.382	1.279	120	3.55%	12.861.911	1.295.720	10%
2016	2.842	629	40	1.41%	6.254.836	443.717	7%
2017	3.521	651	58	1.65%	6.273.517	607.605	10%
2018	5.111	533	221	4.32%	5.098.274	1.976.029	39%
2020	2.675	308	195	7.29%	3.366.024	1.998.491	59%
2021	3.650	192	192*	5.26%	2.242.438	2.242.438	100%
2022	4.709	324	324*	6.88%	3.846.493	3.846.493	100%

** For the years 2021 and 2022 the number of those accepted also includes applications that have lapsed and not been completed, as they did not result in a progression on the same axis.*

From an economic point of view to the new Axis 1.2 was initially allocated a budget of 2 million euros, subsequently increased, for the ISI 2021 Call, to 5 million euros. This has led to a 100% rate of companies surpassing the "click day", ensuring that, as of today, the allocated resources have proven more than sufficient to cover the required funding (see Figure 1). Moreover, for the ISI 2023 Call, it is reasonable to expect the certain admission of all companies that will participate for Axis 1.2.

Finally, acknowledging the new admission percentages for requests regarding the adoption of OH&SMS, during the design of the ISI 2023 Call, a technical/administrative simplification was implemented, introducing new operational methods that may allow this type of funding request to bypass the need for accessing the online portal to obtain a chronological order for admission purposes.
In particular, in cases where the allocated resources are equal to or greater than the total funding requested by the applications in the regional list of a specific funding Axis (e.g., Axis 1.2/Umbria), the chronological list (NCD), ordered by the date of application registration, will be promptly published. The interested companies will then be able to complete the documentation submission phase and proceed to the next phase of technical-administrative assessment. The passage through the online portal (click-day) would indeed be redundant, as the absence of competition allows for the immediate admission of all applications in the specific regional list.

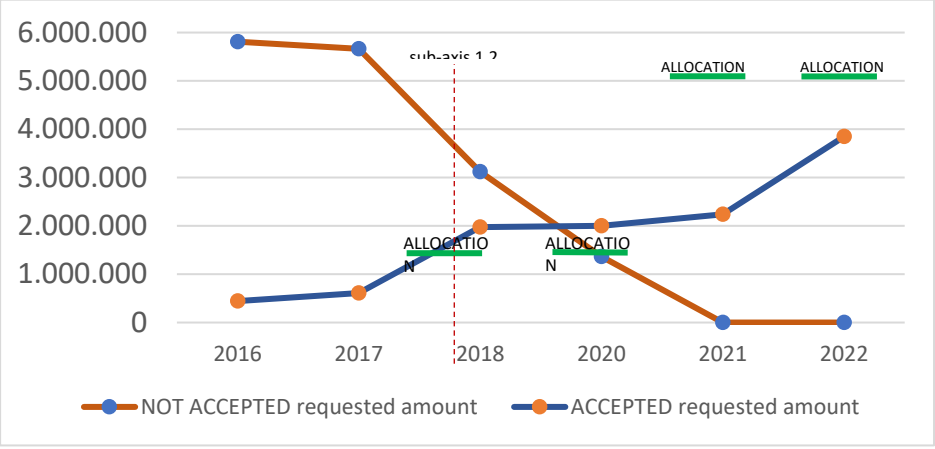


Figure 1 - Comparison between the amounts of not accepted and accepted projects. Since the ISI 2021 Call, thanks to the allocation of €5 million, the resources have been sufficient to fund all submitted projects. Before 2018, no dedicated sub-axis was envisaged.

Concurrently, the interventions for the OH&SMS adoption provided by Axis 1.2 have been limited to only certified systems and to those envisaged by the agreements between Inail and the social partners, considering both the preference shown in the past by companies for certified OH&SMS, and the aim to enhance the collaboration between the Institute and the social partners in drafting guidelines for numerous production sectors.

Despite the changes made over the years, participation, and therefore the number of companies admitted to funding, related to Axis 1.2 still remains low overall, never exceeding 10% of the total number of accepted companies (with a peak of 8, 5% in the latest ISI 2022 Call).
It therefore appears useful to further enhance the promotional initiatives of the economic tool constituted by the ISI Calls in order to increase companies' knowledge of OH&SMS, in particular certified ones, and their fundamental role in effectively reducing accidents and technology-related injuries.
In the future, within the ISI Calls, it could be evaluated the introduction of a reward mechanism, enabling companies with an already certified management system and intending to apply for funding, to reach more easily the threshold score or gain priority for admission. Alternatively, increasing the intensity or maximum aid amount could be envisaged, for the implementation of a combined project involving both the adoption of an intervention linked to the adoption of an OH&SMS and a risk mitigation intervention.

The fluctuation of the prevention premium rate

The reduction of the Inail insurance premium has been an active tool since 2000, as provided for by Art. 24 of the Ministerial Decree of 12 December 2000 on the application methods of the premium tariff.
With the issuance of the new premium tariffs in 2019 (D.I. 27 February 2019), the benefit obtainable by "virtuous" companies has remained substantially unchanged, with the exception of small variations in the applied percentages and the name of the application form, previously called OT24 and currently known as OT23, in reference to the new Article 23 of the premium tariff application method (MAT).
The OT23 therefore represents a discount on the insurance rate that companies are required to pay annually to INAIL, to guarantee insurance benefits and exemption from civil liability in the event of injury or occupational illness of its workers; a benefit, therefore, for entrepreneurs who concretely demonstrate their real interest in workplace health and safety. This discount is in addition to the premium rate fluctuation on accident trends, which operates similarly to the "bonus/malus" system provided by car insurance and can thus cause the rate to vary either positively or negatively.
The insurance premium discount is granted to those companies (public or private) which, in compliance with workplace hygiene and safety legislation and their contribution obligations to Inail and Inps, have demonstrated an attention to workplace prevention that went beyond mere compliance with legislation.
To obtain it, it is necessary to fill in the OT23 self-declaration form, which is annually adjusted in terms of the preventive measure provided and the specific scores associated with them, allowing companies to choose the measures most appropriate

to their needs. The company must select a number of interventions such as to reach the minimum threshold required to qualify for the discount.
The amount of the discount varies, starting at 8% for newly established companies (less than two years old) that implement measures to improve prevention and health and safety conditions in the workplace. After the first two years of activity, the reduction percentage is defined on the basis of the number of workers-years in the last three years (Figure 2). The obtainable discount ranges from a minimum of 5% for companies with over 200 worker-years (in the 3-year period), up to a maximum of 28% for companies with fewer than 10 worker-years (in the 3-year period).

worker-years of the 3-year period of the PAT	reduction
up to 10	**28%**
from 10.01 to 50	**18%**
from 50.01 to 200	**10%**
over 200	**5%**

Figure 2: Reduction of the average tariff rate for prevention

Among the various interventions foreseen by the model OT23, the adoption of a safety management system or an organizational management model by companies can alone achieve the score necessary to obtain the discount. An entire section of the form is dedicated to this type of intervention (section E). Table 3 shows an extract of the interventions from Section E.

Table 3: Extract Section E of the OT23 2024 form

E	HEALTH & SAFETY MANAGEMENT: ORGANIZATIONAL MEASURES
E-1	The company has adopted or maintained an occupational health and safety management system certified according to UNI ISO 45001:19 standards by Certification bodies accredited for the specific sector by accreditation bodies that are signatories of the EA/MLA and IAF mutual recognition agreements.
E-2	The company has adopted or maintained an occupational health and safety management system certified according to UNI 10617 standard.
E-3	The company has adopted or maintained an occupational health and safety management system that meets the criteria defined by the UNI INAIL ISPESL Guidelines and Social Partners, or by standards recognized at national and international level (excluding those companies at risk of major accidents that are already legally obligated to adopt and implement the system).
E-4	The company, in accordance with agreements between Inail and Social Partner Organizations or Bilaterality System Bodies, has adopted or maintained a management system in compliance with: a) OH&SMS - AR POLICY GUIDELINES: For the implementation of Health and Safety Management Systems in Network Businesses b) OH&SMS - MPI POLICY GUIDELINES: For the implementation of Occupational Health and Safety Management Systems in Micro and Small Enterprises c) SGI - AE POLICY GUIDELINES: Integrated Management System for Health, Safety, Environment, Energy Companies d) OH&SMS - AA POLICY GUIDELINES: Health and Safety Management System for Fixed-Wing Aeronautical Companies e) POLICY GUIDELINES: Health and Safety Management System for contract works in Shipbuilding f) OH&SMS-GP POLICY GUIDELINES: Occupational Health and Safety Management System for companies in the Rubber & Plastics sector g) POLICY GUIDELINES: For the implementation of an Occupational Health and Safety Management System for the Chemical Industry h) OH&SMS-AS POLICY GUIDELINES: Occupational Health and Safety Management System in Public Healthcare Enterprises in the Lazio Region i) OH&SMS for Wind Farm operating companies j) OH&SMS-U POLICY GUIDELINES: Worker health and safety management system for water, environmental, energy and funeral service companies. k) OH&SMS-CP POLICY GUIDELINES: Worker health and safety management system for pre-mixed concrete production companies
E-5	The company has adopted or maintained an organizational and management model according to Art. 30 of Legislative Decree 81/08 and subsequent amendments, including the simplified procedures in the Ministerial Decree. 13/2/2014
E-6	The company has adopted or maintained an organizational and management model according to Art. 30 of Legislative Decree 81/08 and subsequent amendments, asseverated in compliance with the Technical Report UNI TR 11709.
E-7	The company has adopted or maintained an organizational and management model according toArt. 30 of Legislative Decree 81/08 and subsequent amendments, asseverated in compliance with the UNI 11856-1 standard "Adoption and effective implementation of Organizational and Management Models of health and safety at work (OH&S-OMM) - Mono-utility and multi-utility companies of local public services - Part 1: Procedures for asseveration by Joint Bodies".

E-8	The company has adopted or maintained an organizational and management model according to Art. 30 of Legislative Decree 81/08 and subsequent amendments, asseverated in compliance with the UNI 11751-1 standard "Adoption and effective implementation of the Organizational and Management Models for health and safety at work (OH&S -OMM) - Part 1: Procedures for asseveration in the construction or civil engineering sector".
E-18	The company has adopted or maintained an organizational and management model according to Art. 30 of Legislative Decree 81/08 and subsequent amendments, asseverated in compliance with the UNI 11857-1 standard "Adoption and effective implementation of the Organization and Management Models of health and safety at work - Travel agencies, cleaning and pest control services, training, consulting, employment services and private investigation and business information services- Part 1: Procedures for asseveration by Joint Bodies".

As can be seen from the Table, some interventions in the section concern the adoption of an OH&SMS certified according to UNI EN ISO 45001:23 standards, by certification bodies accredited for the specific sector by accreditation bodies that are signatories of the EA/MLA mutual recognition agreements, both not certified but complying with the criteria defined by the UNI Inail Ispesl Guidelines and Social Partners, or by standards recognized at national and international level, or in compliance with the guidelines developed in implementation of agreements between Inail and the Social Partners Organization or Bodies of the Bilaterality System, as listed in the model itself.
Other interventions involve the adoption of organizational and management models according to Art. 30 of Legislative Decree 81/08 and subsequent amendments.
The organizational and management models can be “asseverated” according to the provisions of Article 51, paragraph 3-bis) of Legislative Decree. 81/2008.
All these interventions are assigned the maximum score, although the distinctions among the different types imply different procedures for formulating the request and for verification in the event of a random check.
In the case of companies adopting a certified OH&SMS or an asseverated OMM, the application and verification procedures are simpler because the organizational and management systems are verified by third-party bodies. For example, in the case of certification issued by Certification bodies accredited for the specific sector by accreditation bodies signatories of the EA/MLA and IAF/MLA mutual recognition agreements, the conformity of the entire system with the reference standards is ensured, and the reliability of the system itself is guaranteed through audits conducted by the Body in compliance with the international rules managed in the individual countries by the accreditation bodies authorized to operate therein.
In the case of the asseveration of an OMM, the territorially competent joint body guarantees, through the issuance of an asseveration certificate, that the OH&S-OMM is adopted and effectively implemented.
The interventions relating to the OH&SMS and OH&S-OMM in the OT23 form have multi-year validity, so it is possible to obtain the premium discount even in

subsequent years, as long as evidence of the adoption and effective implementation can always be provided.
It is important to remember that the insurance premium discount and the ISI funding are additive. This means that a company implementing, with Inail funding, an OH&SMS or an OH&S-OMM in a given year, can obtain the insurance premium reduction the following year, by presenting the OT23 form.
Seeking the adoption of an organizational and management model, financially incentivized by Inail, can therefore not only represent legal protection for the company, but it can also become a truly effective tool in reducing workplace accidents and thus protecting the right to health, as enshrined in the Constitution of the Italian Republic even before occupational health and safety legislation.

Policy Guidelines

In 2001 the International Labor Organization (ILO) published guidelines for a safety management system, suggesting the opportunity for the social systems of different countries to develop national guidelines suited to consider the normative, regulatory, cultural and structural specificities of each nation terms of labor relations.
The ILO indicated this as a way to expedite the implementation process of a company OH&SMS.
Further facilitation for companies, according to the ILO perspective, would have come if, within each country, tailored guidelines had been developed to suit the sectoral specificities of the companies themselves. This reasoning is summarized in the figure below.

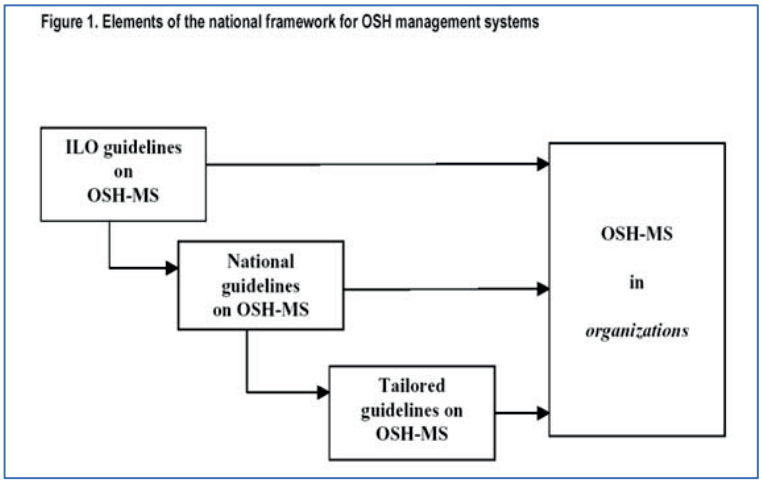


Figure 3: ILO/OSH 2001 - Guidelines on an occupational safety and health system.

Inail has supported this process in Italy through agreements signed with representative entities, in various productive sectors at both national and local level of companies and workers. It has produced a series of guidelines that offer an extensive range of application proposals for companies interested in developing and implementing their own occupational health and safety management system.
On the Inail website, a variety of policy and guidance documents are now available for the implementation of an OH&SMS or OH&S-OMM applicable to specific productive sectors or different company sizes (e.g., the OH&SMS Guidelines - MPI for micro and small businesses), or to the organizational and structural typologies of businesses (for example the OH&SMS - AR Guidelines for Network Businesses).
For further details, refer to the Inail website[40]

Accident and Prevention Rating: a new tool for improving health and safety conditions in the workplace

The results of the study on the comparison of accident rates between companies that have adopted a certified occupational health and safety management system and standard companies show a constant reduction in accident rates over the years.
Based on this result, an evaluative rating was also constructed, which can be used, for example, for premium purposes in public or private tender competitions, for companies, aiming at encouraging companies to focus as much as possible on workplace safety.
The rating is called "Accident and Prevention Rating" (RSP[41]) and consists of two components:

- accident rating, linked to the company's accident trend
- prevention rating, according to the occupational health and safety management policy.

The formula for calculating the accident rating is as follows:

$$RSP = R_{\text{Accident rating}} + R_{\text{Prevention}}$$

Given the characteristics of the two indicators, their joint use is mandatory since the resulting RSP indicator allows for an overall assessment of company health and safety performance, or rather for minimizing both the effects of underreporting of workplace accidents in small companies and attempts at "safety washing", perhaps through appropriate post-accident certifications.

[40] https://www.inail.it/cs/internet/attivita/prevenzione-e-sicurezza/promozione-e-cultura-della-prevenzione/sgsl/modelli-applicativi.html
[41] From the italian “Rating di Sinistrosità e Prevenzione”

In order to identify the accident rating, used in public procurement activities and to "reward" the most qualified economic operators, two accident risk indices were used: the first takes into account the frequency of accidents (IFI[42]) and the second their severity (RGI[43]), differentiated by economic activity, territory and company size.
The Accident Frequency Index (IFI) is the ratio between the number of defined positive accidents at work (therefore excluding commuting accidents) and net of Covid-19 cases, by sector of economic activity, territory and company size, and the related number of employees per 1000.
While the Accident Severity Ratio (RGI) is the ratio between the number of severe accidents (cases with at least one degree of impairment and fatal cases) for each sector of economic activity, territory, and company size, defined as positive accidents at work (therefore excluding commuting accidents) and net of Covid-19 cases and the related number of defined positive accidents at work, net of Covid-19 cases, per 100.
Both indices take into account accidents that occurred anywhere on Italian territory and attributed to the area in which the company is based. The observation period for injury events is the last 5-year period, recorded up to 31 October of each year.
The RS rating is based on these two indices, used both to calculate the company's accident risk level and to calculate benchmarks, which are useful for determining the deviation between company's accident rates and the average accident rate.
In analogy to the model comparing certified and standard companies, the risk level of Italian companies has been divided into approximately 7,000 benchmarks against which the individual company is compared.
The comparison of company indices with benchmark indices is used to assign an accident score to the company ($R_{\text{Accident rating}}$) which will be the average of the scores relating to the frequency and severity index.
Depending on the result of the comparison, different scenarios may occur:

- company accident rating scenario is higher than both the benchmark and the threshold level (threshold < benchmark) - High-risk companies: the company has a high accident risk, so a $R_{\text{Accident rating}}$ score of 0 will be assigned
- company accident rating scenario falls between benchmark and threshold level (threshold > benchmark) - Companies with a higher risk level but close to the benchmark: the company has a high accident risk, but lower than the threshold, so $R_{\text{Accident rating}}$ score of 1 will be assigned
- company accident rating scenario is lower than the benchmark (threshold > benchmark) - Companies with a lower risk than the benchmark: the company will be assigned a $R_{\text{Accident rating}}$ score between 3 and 4.5, determined according to the deviation from the benchmark

[42] From the italian "Indice di Frequenza degli Infortuni"
[43] From the italian "Rapporto di gravità degli infortuni"

- company accident rating scenario is zero- Companies with zero accidents: if the company has not recorded any accidents in the 5-year observation period, it will always be assigned $R_{\text{Accident rating}}$ score of 5.

For the prevention indicator, it was deemed appropriate to select some parameters capable of evaluating the managerial and systemic approach to health and safety by companies and capable of providing equal access opportunities to all companies with good management levels.
The parameters identified for calculating the $R_{\text{Prevention}}$, respond to the following criteria:

- objective
- verifiable (by the contracting authority)
- representative of key areas of health and safety management.

Two alternative paths were therefore hypothesized, with a different score linked to the demonstrated managerial/organizational level of each economic operator.

- Path 1 - Higher rewards for companies with certified OH&SMS by accredited bodies or asseverated OMMs.
- Path 2 - Rewards, albeit minor, for companies that, despite not having implemented a certified OH&SMS or an asseverated OMM, demonstrate the implementation of a health and safety policy aimed at protecting workers' health and safety according to the principles of management systems and organizational models.

Path 1			
Alternative options	YES	NO	Score
1. Is the company equipped with an OH&SMS (Occupational Health and Safety Management System) certified according to UNI EN ISO 45001:23 standards by certification bodies accredited for the specific sector by accreditation bodies signatories of EA/MLA and IAF/MLA mutual recognition agreements?			5
2. Is the company equipped with an OMM (Organizational and Management Model) in according to Art.30 of Legislative Decree 81/08 and subsequent amendments, asseverated by Joint Bodies in compliance with the UNI TR 11709:2018 technical report or UNI technical standards?			5

Figure 3: Path 1 Scores

Path 2, still in development, involves a set of questions and indicators aimed at verifying the implementation of the main elements of OH&SMS and OMM (taking as reference the UNI EN ISO 45001:2318 standard and the simplified procedures

for the adoption of Organization and Management Models (OMM) in small and medium-sized enterprises (SMEs).
The maximum score achievable with Path 2 is however lower than Path 1.
The numerical value resulting from the combination of accident rate and prevention criteria is synthetically represented, for illustrative purposes, in the following table:

Evaluation criteria	**Hypothetical methods for assigning scores**
RSP value composed of the following elements:	Max points total 10
- $R_{Accident}$	Max points 5
- $R_{Prevention}$ **path 1**: UNI ISO 45001 certification/OMM asseveration **path 2:** Set of prevention indicators	Max points 3 (less than path 1)

Figure 4: RSP scores

Within the 10 points assignable for subjective requirements, the contracting authority, in the tender specifications, in accordance with the provisions of the Procurement Code[44], will choose the maximum score to be attributed to the RSP during the evaluation and selection of contractors.
Inail has developed an application, available online, capable of calculating the RSP rating for individual companies and issuing a final, registered report with the obtained score. This report can be submitted by each company during participation in calls for tender.
The accident data are pre-loaded in the case of Inail-insured companies. The application is linked to the Accredia database of certified companies; therefore, the form is pre-filled with data from this database. For certified companies not listed in the Accredia database or for companies that have implemented an OMM, it is necessary to fill in all the fields.
The Accident and Prevention Rating (RSP), built on objective, transparent and independent criteria, through an effective competitive comparison, ensures similar evaluation opportunities for all companies, facilitating public procurement clients in choosing the most virtuous companies in terms health and safety in the workplace.
The Accident and Prevention Rating has multiple areas of application, ranging from the selection for awarding contracts in calls for tenders promoted by public procurement for the qualification of economic operators in health and safety in the workplace, to the identification of companies that require interventions in

[44] d.lgs. n. 50/16 - Code for Public Contracts 2016 and d.lgs n.36/23 - Code for Public Contracts 2023

occupational health and safety, also including the assessment of the RSP as a requirement for companies' access to the lists of suppliers of the contracting stations. With some of the main contracting authorities, experiments are underway, or are being initiated within the agreements and protocols[45] established between them and Inail.

[45] For example, with Gruppo FS, ASPI, ENI, ENEL, Utilitalia and others.

Inail - Directorate for planning and communication
Piazzale Giulio Pastore, 6 - 00144 Roma
dcpianificazione-comunicazione@inail.it
www.inail.it

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